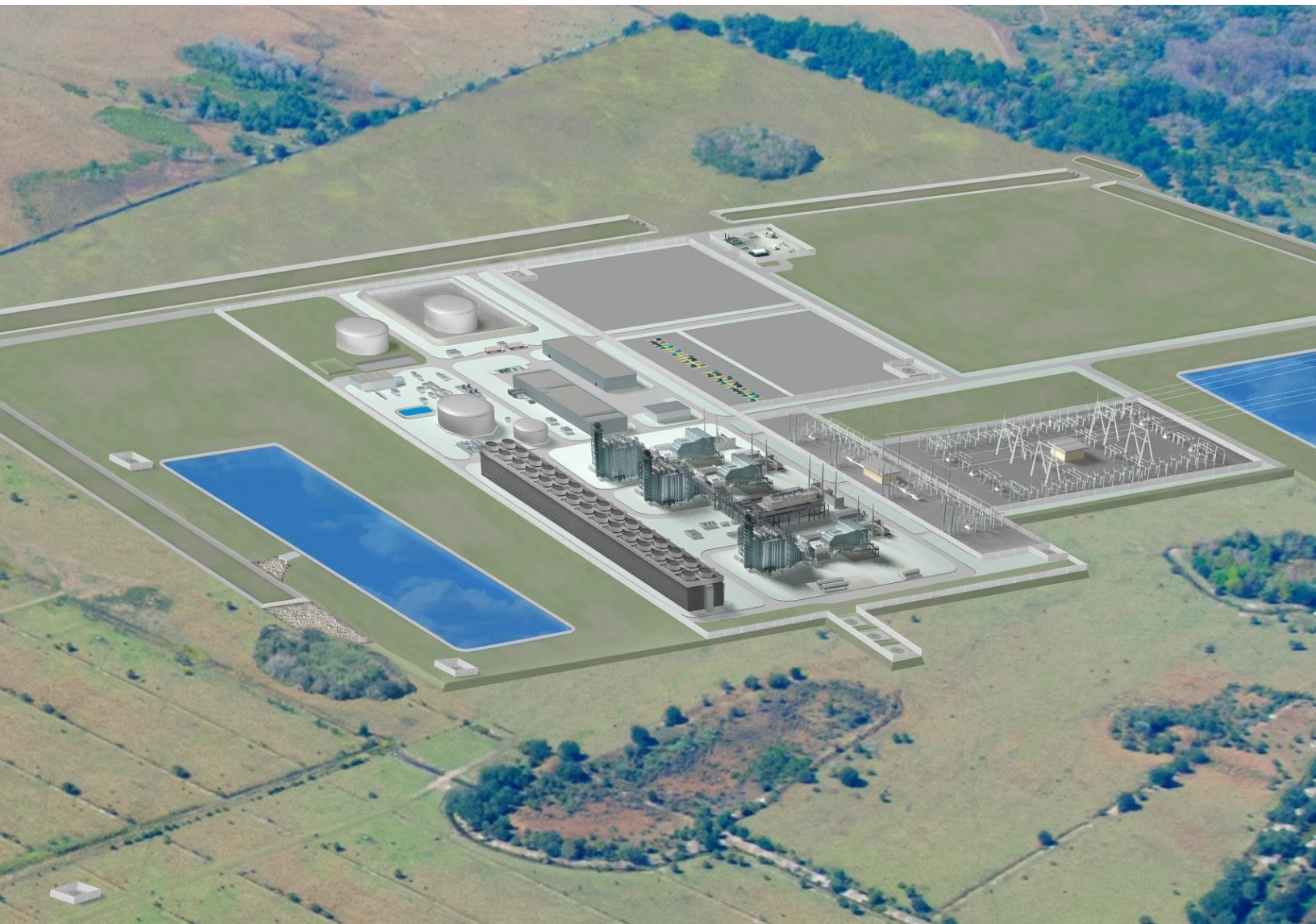


Okeechobee

Clean Energy Center



SITE CERTIFICATION APPLICATION

Volume I of IV



September 2015

**SITE CERTIFICATION APPLICATION
OKEECHOBEE CLEAN ENERGY CENTER**

VOLUME 1 OF 4

Submitted by:

**Florida Power & Light Company
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Juno Beach, Florida 33408**

September 2015

14-14979



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LIST OF ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
°F	degrees Fahrenheit
μPa	Micropascals
μS/cm	microsiemens per centimeter
AADT	annual average daily traffic
AAQS	Ambient Air Quality Standards
AERMOD	American Meteorological Society and EPA Regulatory Model
ANSI	American National Standards Institute
APPZ	Avon Park Permeable Zone
BACT	Best Available Control Technology
BMPs	Best Management Practices
Btu/kWh	British thermal units per kilowatt-hour
Btu/lb	British thermal units per pound
Btu/scf	British thermal units per standard cubic foot
C&D	construction and demolition (waste)
C.I.E.	Commission Internationale de l'Eclairage (International Commission on Illumination)
CadnaA	Computer Aided Noise Abatement
cd	Candelas
cd/m ²	candelas per square meter
CEM	continuous emission monitoring
CESQG	Conditionally Exempt Small Quantity Generator
cf/yr	cubic feet per year
CFR	Code of Federal Regulations
CH ₄	Methane
CNWA	Chassahowitzka National Wilderness Area
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	CO ₂ equivalent emissions
CT	combustion turbine or combustion turbine generator
CUP AH	SJRWMD Applicant's Handbook: Consumptive Uses of Water
CWA	Clean Water Act
dB	decibels
dBA	A-weighted decibels
DHR	Florida Division of Historical Resources
DLE	dry low emissions
DLN	dry low-NO _x
EDTA	ethylene diamine tetra-acetic acid
eGRID	Emissions & Generation Resource Integrated Database
EIA	U.S. Energy Information Administration
ENP	Everglades National Park
EPA	U.S. Environmental Protection Agency
ERP	Environmental Resource Permit
ERP AH	Environmental Resource Permit Applicant's Handbook
ESP	electrostatic precipitator

F.A.C.	Florida Administrative Code
F.S.	Florida Statutes
FAS	Floridan Aquifer System
FCREPA	Florida Committee on Rare and Endangered Plants and Animals
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FEMA	Federal Emergency Management Agency
FWC	Florida Fish and Wildlife Conservation Commission
FGT	Florida Gas Transmission
FLUCFCS	Florida Land Use, Cover and Forms Classification System
FMSF	Florida Master Site File
FNAI	Florida Natural Areas Inventory
FPL	Florida Power & Light Company
FPSC	Florida Public Service Commission
ft	feet
ft/day	feet per day
ft/yr	feet per year
ft ² /day	square feet per day
ft-bgs	feet below ground surface
FWS	U.S. Fish and Wildlife Service
g/bhp-hr	grams per brake horsepower-hour
GEP	good engineering practice
GHG	greenhouse gas
GIS	geographic information systems
gpd	gallons per day
gpm	gallons per minute
gr/100 scf	grains per 100 standard cubic feet
GWP	Global Warming Potential
H ₂ SO ₄	sulfuric acid
HAP	hazardous air pollutant
HHV	higher heating value
hp	horsepower
hr/yr	hours per year
HRSG	heat recovery steam generator
Hz	hertz
I	Interstate (highway)
ICU	Intermediate Confining Unit
ISO	International Organization for Standardization
IWW	Industrial Wastewater
kg	kilograms
klux	kilolux
km	kilometer
kV	kilovolts
kW	kilowatt
L ₁	sound pressure level exceeded 1 percent of the time
L ₁₀	sound pressure level exceeded 10 percent of the time

L ₅₀	sound pressure level exceeded 50 percent of the time
L ₉₀	sound pressure level exceeded 90 percent of the time
lb/hr	pounds per hour
lb/MMBtu	pounds per million British thermal units
lb/MWh	pounds per megawatt-hour
lb CO ₂ e/MWh	pounds CO ₂ -equivalent (e) per megawatt-hour
L _{eq}	equivalent sound pressure level
LFA	Lower Floridan Aquifer
LHV	lower heating value
L _{max}	maximum sound pressure level
L _{min}	minimum sound pressure level
LOS	Level of Service (traffic)
L _w	octave band sound power levels
m	meters
MACT	maximum achievable control technology
mag/arcsec ²	magnitudes per square arcsecond
MCU	Middle Confining Unit
MG	million gallons
mg/L	milligrams per liter
MGD	million gallons per day
MMBtu/hr	million British thermal units per hour
MMcf/hr	million cubic feet per hour
MSW	municipal solid waste
MW	Megawatt
N ₂ O	nitrous oxide
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NGVD 29	National Geodetic Vertical Datum 1929
NHPA	National Historic Preservation Act
NO ₂	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NOT	Notice of Termination
NO _x	nitrogen oxides
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NSPS	New Source Performance Standards
NSR	New Source Review
NTU	nephelometric turbidity units
NWS	National Weather Service
O ₂	Oxygen
OCEC	Okeechobee Clean Energy Center
OFW	Outstanding Florida Waters
OSHA	Occupational Safety and Health Administration
Plan	Comprehensive Plan
PM	particulate matter
PM ₁₀	particulate matter with an aerodynamic diameter of 10 micrometers or less

PM _{2.5}	particulate matter with an aerodynamic diameter of 2.5 micrometers or less
POTW	publicly owned treatment works
ppm	parts per million
ppmvd	parts per million by volume dry
PPSA	Florida Electrical Power Plant Siting Act
ppt	parts per thousand
PSD	Prevention of Significant Deterioration
PV	Photovoltaic
PVC	polyvinyl chloride
QA/QC	quality assurance/quality control
RARE	Roadless Area Review and Evaluation
RFP	request for proposals
RICE	reciprocating internal combustion engines
SR	State Road
SAS	surficial aquifer system
SCA	Site Certification Application
SCR	selective catalytic reduction
SCRAM	Support Center for Regulatory Air Models
SFWMD	South Florida Water Management District
SJRWMD	St. Johns River Water Management District
SHPO	State Historic Preservation Office
SO ₂	sulfur dioxide
SPL	sound pressure level
STG	Steam turbine generator
SWPPP	Storm Water Pollution Prevention Plan
TDS	total dissolved solids
TPD	tons per day
TPY	tons per year
TTN	Technology Transfer Network
UFA	Upper Floridan Aquifer
ULSD	ultra low sulfur distillate
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
VOC	volatile organic compound

SITE CERTIFICATION APPLICATION DEFINITIONS

1. “FPL’s Okeechobee County Property” or “Property” – refers to the approximately 2,842 acre FPL-owned property.
2. “Okeechobee Clean Energy Center,” “Project” or “OCEC” – refers to the entire “Project” for which FPL seeks certification, including construction and operation of the combined cycle generating unit (referred to as Unit 1 for naming purposes), mitigation area, the construction parking and laydown areas, area for potential future solar generation, linear facility corridor, and other associated facilities as described in the Site Certification Application.
3. “Site” – refers to the approximately 2,341 acre area proposed for certification that will be occupied by OCEC Unit 1, the mitigation area, and the area for potential future solar generation.
4. “OCEC Unit 1” or “Unit 1” - consists of a combined cycle unit including all major equipment such as combustion turbines/heat recovery steam generators (CTs/HRSGs), steam turbine generator, and all other supporting facilities including laydown areas, parking, maintenance and administrative buildings, 500-kV switchyard, and the stormwater management system.
5. “Linear facility corridor” – refers to the off-Site corridor within which the access road improvements and transmission interconnection will be located.

1.0 INTRODUCTION AND GENERAL INFORMATION

This chapter of the Site Certification Application (SCA) provides background on the Site and the applicant, Florida Power & Light Company (FPL or the Company). Chapter 1 also addresses specific applicant information requirements, provides an overview of the Okeechobee Clean Energy Center Project (OCEC or Project) for which FPL seeks certification, references the state determination of need and separate federal licensing projects, and provides a summary of FPL's public outreach program for the Project.

1.1 Introduction

FPL proposes to construct a new combined cycle natural gas fired generating unit (OCEC Unit 1), providing approximately 1,600 megawatts (MW) nominal of electric generation in 2019. The Project for which FPL is seeking certification includes the construction and operation of OCEC Unit 1, the Site to be certified (the "Site"), as well as associated linear facilities. The Site is comprised of approximately 2,341 acres of FPL's 2,842 acre Property located adjacent to the existing 500-kV transmission system in northeastern Okeechobee County (Figure 1.1-1). The Site includes an area designated for potential future development of approximately 200 MW of photovoltaic (PV) solar generation that will bring the net ultimate Site capacity to 1,800 MW nominal. A conceptual illustration of OCEC Unit 1 is presented in Figure 1.1-2.

FPL purchased the Property in unincorporated Okeechobee County in 2011. The Site is ideally located in an area adjacent to both natural gas and electrical transmission through lateral connections or existing structures. The Site also has groundwater available to support plant operations including process water, steam cycle makeup, cooling water makeup, and miscellaneous plant uses. A boundary survey that contains the Site legal description on FPL Property is included in Attachment C of Appendix 10.4.

FPL is seeking approval of the OCEC Project under the Florida Electrical Power Plant Siting Act (PPSA), Chapter 403, Part II, Florida Statutes (F.S.). The PPSA provides a centralized review and licensing process for new steam or solar electrical generating facilities in Florida of 75 MW or greater, balancing "the increasing demand for electrical power with the broad interests of the public." The Florida Public Service Commission (FPSC) is the sole forum for the determination of need for a proposed facility (Section 403.519, F.S.). FPL is currently seeking a determination of need for the OCEC Unit 1. The Florida Department of Environmental Protection (FDEP) acts as the coordinator for the Site Certification process, with input from various state, regional, and local agencies, along with interested citizens. Ultimate disposition of the SCA is determined by the Governor and Cabinet



sitting as the Siting Board, or by the Secretary of the FDEP. This SCA is being filed with FDEP pursuant to Section 403.5064, F.S., and Chapter 62-17, Florida Administrative Code (F.A.C.). The SCA describes the Project and addresses its environmental and socioeconomic aspects by presenting information on the existing natural and human environment, the facilities to be constructed and operated, and the impacts of the Project on those environments. The format and content of this SCA follow FDEP's draft "*Application Instruction Guide: Electrical Power Plant Sites and Associated Facilities Electrical Transmission Lines*" dated September 1, 2009. FPL is concurrently filing with FDEP an Air Construction/Prevention of Significant Deterioration (PSD) Permit Application. A U.S. Army Corps of Engineers (USACE) Section 404 application is currently under review. In March 2015, the FDEP issued an Underground Injection Control (UIC) Class V Permit (Permit No. 0330373-001-UC/1EX) for an exploratory well and a dual zone monitoring well. FPL will obtain a UIC Class I construction and operational testing permit upon completion of the exploratory well and dual zone monitoring well and submission of the injection well completion report to DEP. The UIC Class I permit will authorize conversion of the exploratory well to an injection well and construction of a second injection well. FPL requests that the certification for the Project include one variance pursuant to Rule 62-17.051(3)(a), F.A.C.:

- SJRWMD ERP Applicant's Handbook Vol. II, Section 8.8 (Pond Depth) and 8.9 (Pond Configuration): Modification to the applicable design parameters pertaining to the stormwater pond configuration and depth, as described below in SCA Section 4.8.1.

1.2 The Applicant

FPL, a subsidiary of NextEra Energy, Inc., is the largest electric utility in Florida with a service area of approximately 27,650 square miles. FPL serves approximately 4.8 million customer accounts, with a service territory in all or parts of 35 Florida counties (Figure 1.2-1).

FPL's existing generating resources are located at power plant sites (Figure 1.2-1) distributed geographically around its service territory, and also include partial ownership of two units located in Jacksonville, Florida, and one unit in Georgia. The total summer system firm generating capability as of December 31, 2014 was 25,072 MW, consisting of nuclear units (3,453 MW), coal units (897 MW), combined cycle units (14,817 MW), oil/gas fossil steam units (3,663 MW), combustion turbines (319 MW), and gas turbines (1,908 MW) (FPL, 2015). In addition, there are two solar PV facilities with a combined generation capacity of 35 MW and a solar thermal facility capable of producing steam that can generate 75 MW. The solar thermal facility is the world's first hybrid energy center to combine solar thermal technology with an existing combined cycle generation unit.



FPL's bulk transmission system is composed of approximately 6,888 circuit miles of transmission lines. Integration of the generation, transmission, and distribution system is achieved through FPL's approximately 596 substations (FPL, 2015).

FPL is a leader among the nation's electric utilities for its partnerships with customers in conservation and in energy management.

The following information addresses the applicant identification requirements:

Applicant's Official Name:	<u>Florida Power & Light Company (FPL)</u>
Address:	<u>700 Universe Boulevard, Juno Beach, FL 33408</u>
Address of Official Headquarters:	<u>700 Universe Boulevard, Juno Beach, FL 33408</u>
Business Entity (corporation, partnership, co-operative):	<u>Corporation</u>
Name and Title of Chief Executive Officer:	<u>Eric Silagy, President and CEO</u>
Name, Address, and Phone Number of Official Representative responsible for obtaining certification:	<u>Matthew J. Raffenberg, Director of Environmental Licensing, Environmental Services Department, 700 Universe Boulevard, JES/JB, Juno Beach, FL 33408</u> <u>Phone: (561) 691-2808</u>
Site Location (county):	<u>Okeechobee County</u>
Nearest Incorporated Cities:	<u>City of Vero Beach (24 miles) and City of Okeechobee (27 miles)</u>
Latitude and Longitude:	<u>27° 38' 03"; 80° 47' 28".</u>
UTM Coordinates:	Northerly <u>3,056.69 kilometers (km) N;</u> Easterly <u>520.60 km E (Zone 17)</u>
Section, Township, Range:	<u>Portions of Sections 1,2,11 &12, Township 33 South, Range 35 East</u>
Name Plate Generating Capacity:	<u>Site Certification: Nominal 1,622-MW (net) combined cycle unit (and up to 200 MW of potential future solar for a net ultimate Site capacity of 1,822 MW nominal).</u>

The specific location information above is for the electrical generating unit. The proposed linear facilities corridor extends north from the Site approximately 1 mile to State Road (SR) 60 located in Indian River County.



1.3 Overview of the Project

The OCEC Unit 1 will be a net 1600 MW nominal 3-on-1 combined cycle electrical generating unit that will consist of three new advanced-technology combustion turbine/electric generators (CTs), three new heat recovery steam generators (HRSGs), and one steam turbine/electric generator, along with on-Site supporting facilities. The CTs are similar to, but much larger and more efficient than, traditional aircraft jet engines. The CTs produce electrical energy by direct connection to an electric generator. The exhaust heat from the CTs, which would otherwise be wasted energy released to the atmosphere, will be routed through the HRSGs, which act as boilers to produce steam for the new steam turbine generator to produce additional electricity. Off-Site associated facilities include a minimal transmission line interconnection to existing 500-kV transmission lines and improvements to an existing access roadway. Natural gas will be the primary fuel for OCEC Unit 1. Ultra low-sulfur distillate (ULSD) “light oil” will be used as a backup fuel for the CTs. The natural gas will be provided, and the associated off-Site pipeline will be owned and separately permitted, by a third party supplier. The cooling water source for the Project will be groundwater from the Upper Floridan Aquifer. The surficial aquifer will be used for service and potable water. The annual average withdrawal from the UFA will be 9 MGD (3,287 MGY) and the maximum daily withdrawal will be 11 MGD. The annual average withdrawal from the surficial aquifer will be 0.046 MGD (16.8 MGY) and the maximum daily withdrawal will be 0.0806 MGD. The Project also includes an area for potential future solar PV generation of up to 200 MW. Future solar generation on the Site would be the subject of a supplemental application for certification under section 403.517, F.S.

In addition to providing clean, safe, and reliable power for FPL’s customers, the Project will result in significant environmental and economic benefits. By using natural gas as the primary fuel for OCEC Unit 1 and technology that is recognized by FDEP as the Best Available Control Technology (BACT) for minimizing air emissions, OCEC Unit 1 will be among the cleanest and most efficient fossil fuel electric-power generating units in Florida. In addition, OCEC Unit 1 is estimated to generate approximately \$238.8 million in tax revenue from 2019/2020 to 2048/2049.

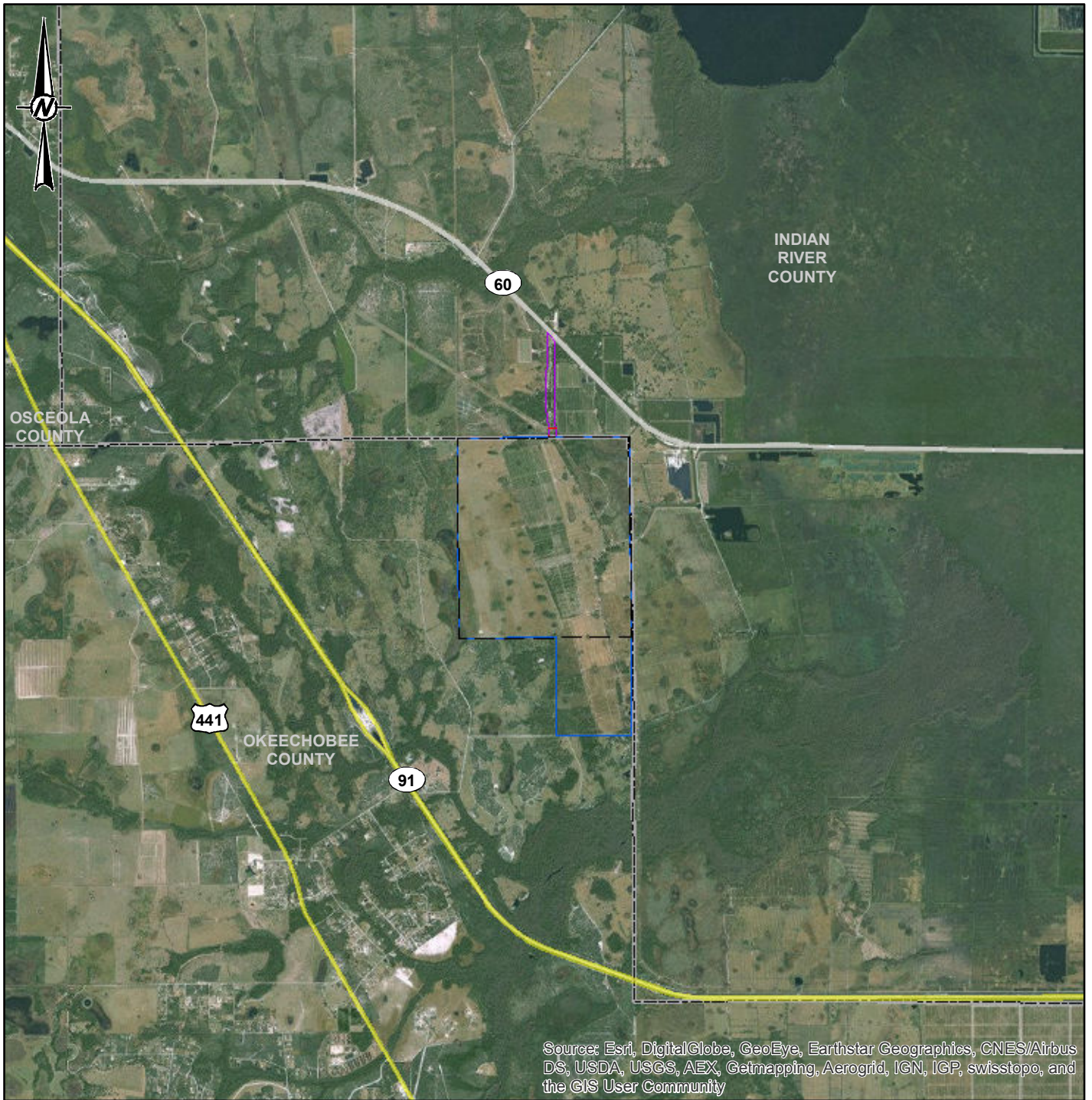
1.4 Summary of Public Outreach Program

FPL has involved the community early in the Project licensing to ensure that local interests and community-specific information are taken into account. Representatives of FPL have been involved with Okeechobee and Indian River County communities for many years. FPL uses several communication channels to engage neighbors in constructive and collaborative dialogue, providing project information and gaining input from local stakeholders.



The Project was formally announced in March 2015. Since that time and leading up to the submittal of the SCA, FPL reached out to stakeholder groups including elected officials, site neighbors, environmental groups, government agencies, and Okeechobee and Indian River counties (see Appendix 10.1 Coordination). Local media outlets were notified about the Project to inform residents surrounding the Site. FPL mailed out 718 letters to residents, business owners and owners of property within a 5-mile radius of the Site. The mailing included a fact sheet informing them of the Project and identified how they can provide feedback. In addition, two public open houses, one held in Okeechobee (May 26, 2015) and the other in Vero Beach (June 2, 2015) provided an opportunity to share detailed Project information with the local community, obtain individual feedback, and answer questions. Information resources developed include: fact sheet; facility conceptual renderings; a website (www.FPL.com/AffordableCleanEnergy), which includes a project overview and FAQs; a PowerPoint presentation (for stakeholder briefings); and numerous information boards used at the open houses. Over the past six months and in the future throughout Project permitting, FPL has and will continue to maintain proactive outreach and dialogue with the community. FPL's goal is to be the first and best source of information about the Project and is committed to responding to questions and comments in a timely manner.

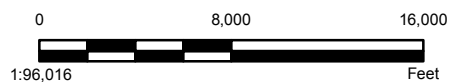
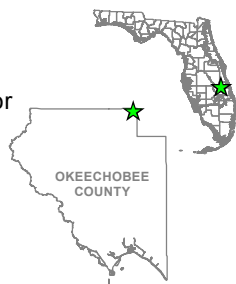
FIGURES



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LEGEND

- FPL Owned Property
- Linear Facility Corridor
- Transmission Interconnection Corridor
- Certified Site Boundary
- County Boundary



REFERENCE(S)

PROPERTY, LINEAR FACILITY CORRIDOR, CERTIFIED BOUNDARY, FPL & GOLDER ASSOCIATES INC., 2015

CLIENT
FPL

PROJECT
OKEECHOBEE CLEAN ENERGY CENTER

TITLE
**GENERAL LOCATION
MAP**



YYYY-MM-DD	2015-09-08
DESIGNED	NRL
PREPARED	NRL
REVIEWED	KAB
APPROVED	KFK

PROJECT NO.
1414979

CONTROL
B023

REV.
0

FIGURE
1.1-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI/A 25mm

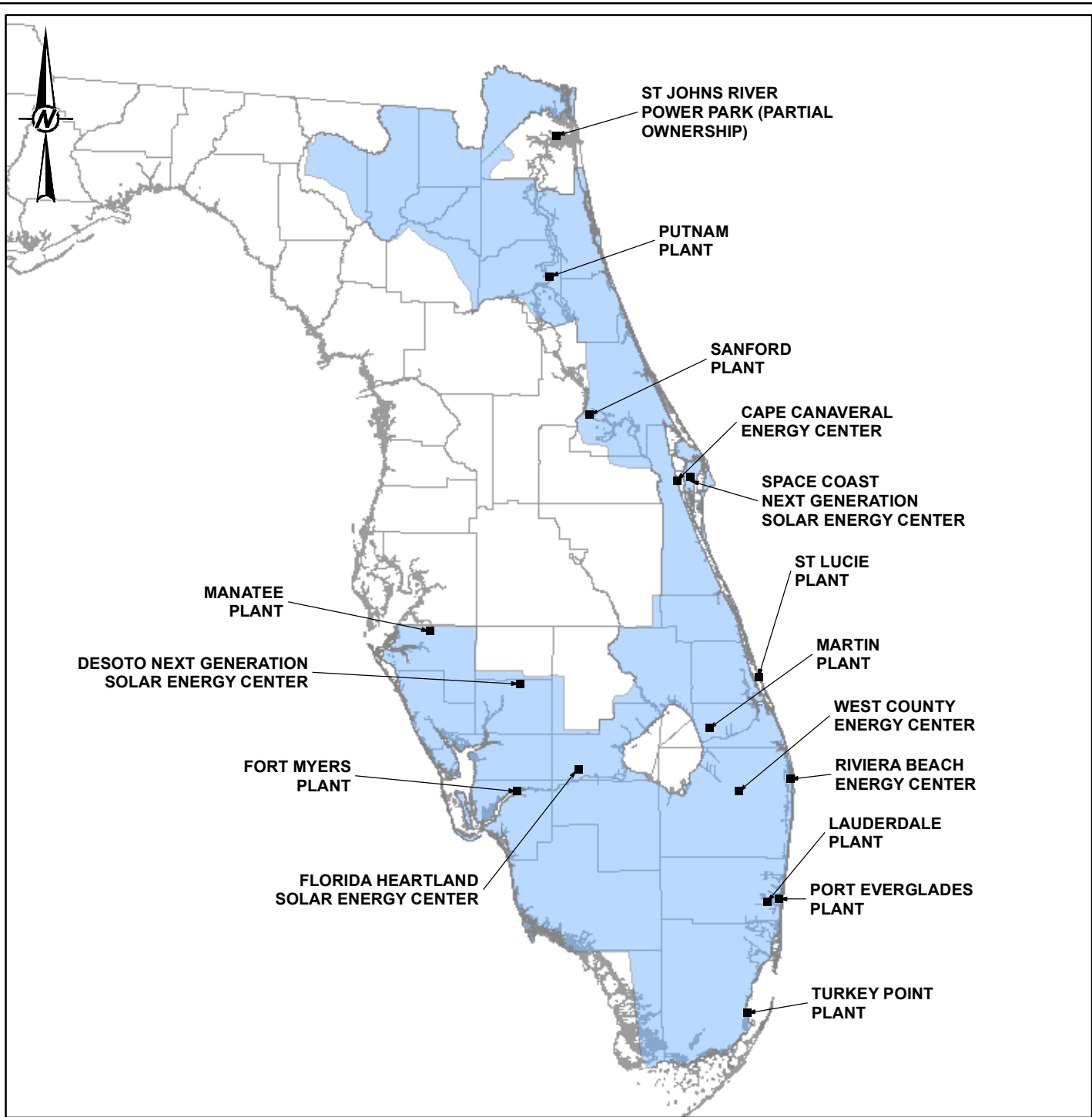


Figure 1.1-2
Conceptual Illustration of Okeechobee Clean Energy Center

Source: FPL, 2015.

Y:\Projects\2014\14-14979 FPL Okeechobee SCA\Figures\Chapter 1\Figure 1.1-2 Conceptual Illustration of OCEC.docx





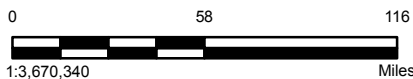
LEGEND

- FPL Power Plants
- FPL Service Territory

CLIENT
FPL

PROJECT
OKEECHOBEE CLEAN ENERGY CENTER

TITLE
**SERVICE TERRITORY AND
POWER PLANTS**



REFERENCE(S)
FPL SERVICE TERRITORY, FPL POWER PLANTS, FPL, 2007



YYYY-MM-DD	2015-09-08
DESIGNED	NRL
PREPARED	NRL
REVIEWED	KAB
APPROVED	KFK

PROJECT NO.
1414979

CONTROL
B024

REV.
0

FIGURE
1.2-1

2.0 NEED FOR THE PROPOSED FACILITY

The FPSC is the sole forum for the determination of need for a proposed facility subject to the PPSA (Section 403.519, F.S.). On September 3, 2015, FPL filed with the FPSC a petition for an affirmative determination of need for the Project. The petition included supporting documents and testimony that provided information on the need for the Project when considering: the need for electric system reliability and integrity; the need for adequate electricity at a reasonable cost; the need for fuel diversity and supply reliability; whether the proposed plant is the most cost-effective alternative available; whether renewable energy sources and technologies, as well as conservation measures, are utilized to the extent reasonably available; and conservation measures taken or reasonable available that might mitigate the need. The FPSC determination is expected to be obtained in January 2016. FPL will provide a copy of the FPSC determination when available.

3.0 SITE AND VICINITY CHARACTERIZATION

3.1 Site and Associated Facilities Delineation

The FPL Property comprises approximately 2,842 acres in northeast Okeechobee County, Florida, located approximately 24 miles west of Vero Beach and 27 miles north-northeast of Okeechobee on the border with Indian River County (Figure 3.1-1). An existing paved road (226th Court) provides access to the property from SR 60. An existing transmission line right-of-way is located adjacent to portions of the northern and eastern property boundary.

The Site for which certification is being sought is approximately 2,341 acres. The Site is located in portions of Sections 1, 2, 11, and 12, Township 33 South, Range 35 East. The Site includes the approximately 220-acre plant area where the new generating facilities will be located, along with construction laydown areas, parking, stormwater ponds, and associated infrastructure; an approximately 376-acre mitigation area; approximately 1,629 acres for potential future solar generation; and approximately 104 acres identified as open space (Figure 3.1-2).

3.1.1 Adjacent Properties and Nearby Areas

The area within 1 mile of the OCEC Unit 1 is unincorporated Okeechobee County and unincorporated Indian River County. There are no municipal jurisdictions within a 5-mile radius of the OCEC Unit 1 (Figure 3.1-1).

The existing land uses within 1 mile of the OCEC Unit 1 are consistent with the existing characteristics of the Site in that agricultural uses (*i.e.*, farming, cattle, and horses) are predominant with scattered single-family and manufactured homes. There are two single-family residences within 1 mile of the OCEC Unit 1; one is situated north along the main access road, and one is situated near the eastern Site boundary.

3.1.2 One Hundred Year Flood Zone

The Federal Emergency Management Agency (FEMA) maps for the Site are shown as an overlay to the aerial image of the Site in Figure 3.1.2-1. As recorded on the Flood Insurance Rate Maps (Panel No.1201770075B and No.12061C0175H), the Site is situated within Zone C and Zone A within Okeechobee County and within Zone A and Zone X within Indian River County. Zones C and X are areas that are determined to be outside of the 100-year flood zone with minimal flooding. Zone A is a Special Hazard Area and is determined to be inundated by the 100-year flooding (FEMA, 2015).

3.2 SOCIAL AND POLITICAL ENVIRONMENT

The PPSA is a comprehensive and coordinated review process involving multiple agencies and local governments coordinated by the FDEP Siting Coordination Office. Through the PPSA, the State has



preempted the certification of electrical power plants to which the Act applies, and the certification issued pursuant to that process is the sole non-federal license necessary to construct, operate, and maintain an electrical power plant, including associated facilities. As a result, the licensing process is conducted pursuant to the PPSA and applicable rules, rather than the procedural requirements of the individual agencies or local governments. Applicable non-procedural requirements of reviewing agencies, including local governments, are considered during the SCA review and may be proposed for application to the Project via the conditions of certification.

The following sub-sections describe governmental jurisdictions within five miles of the OCEC Unit 1, relevant provisions of the State Community Planning Act, the Strategic Regional Policy Plans (SRPP) for the Central Florida Regional Planning Council and the Treasure Coast Regional Planning Council, and applicable land development regulations and Codes of Ordinances for Okeechobee County and Indian River County.

3.2.1 Governmental Jurisdictions

The Site is located within unincorporated Okeechobee County, with the main access road located within unincorporated Indian River County. There are no municipalities within 5 miles of the OCEC Unit 1. Figure 3.2.1-1 depicts an area map showing a 1-mile radius around OCEC Unit 1. Figure 3.2.1-2 depicts an area map with 1-, 2-, 3-, 4-, and 5-mile radii around the OCEC Unit 1, and identifies state jurisdictions; county jurisdictions; and any major private landholdings that have a primary purpose of environmental protection. There are no federal jurisdictions within 5 miles of OCEC Unit 1.

The St. Johns River Water Management District's (SJRWMD's) Fort Drum Marsh Conservation Area is located adjacent to the Site, on the eastern boundary. The SJRWMD's Blue Cypress Conservation Area is located within a mile to the northeast of the OCEC Unit 1. The Kissimmee-St. Johns River Connector Project and Pine Island Slough Ecosystem Project are located within 5-miles of the OCEC Unit 1. There are also several conservation easement areas within 5-miles of OCEC Unit 1 (i.e., Pressley Ranch Flowage Easement, Twenty Mile Bend Flowage Easement, three parcels under the Grasslands Reserve Program Easements, and Padgett Branch Conservation Easement) as identified in Figure 3.2.1-2. There are no Okeechobee County parks or recreational facilities within 5 miles of the OCEC Unit 1. In Indian River County, the Blue Cypress Park is located about 4.5 miles northeast of the OCEC Unit 1.

None of the following governmental jurisdictions are located within 5 miles of the Site:

- National Parks
- National Forests
- National Seashores
- National Wildlife Refuges
- National Wilderness Areas
- National Memorials or Monuments
- National Historic Landmarks
- Marine Sanctuaries
- Estuarine Sanctuaries
- Roadless Area Review and Evaluation (RARE) Areas
- National Wild & Scenic Rivers
- State Parks
- State Marine Sanctuaries
- State Forests
- State Wildlife Refuges
- State Wilderness Areas
- State Areas of Critical State Concern
- Save Our Rivers Lands
- State Archaeological Landmarks or landmark zones
- Aquatic Preserves
- Florida Springs
- Outstanding Florida Waters
- Florida Wild & Scenic Rivers
- Indian Reservations
- Military Reservations

3.2.2 Zoning and Land Use Plans

The Site and associated facilities are consistent with existing land use plans and zoning ordinances, as explained below. The proposed transmission line improvements are exempt from the requirements of land use plans and zoning ordinances under Chapter 163 and Section 380.04, F.S.

3.2.2.1 State Community Planning Act

On June 2, 2011, the Florida Local Government Comprehensive Planning and Land Development Regulation Act was re-designated as the Community Planning Act. Under the new Act, each county and municipality in Florida is still required to adopt a local comprehensive plan that complies with the Florida Statutes. Although some provisions of the Act have been repealed or amended, comprehensive plans which were adopted prior to June 2, 2011 are still valid.

The State Community Planning Act provides long range policy guidance for the orderly social, economic, and physical development within the State. The State Community Planning Act does not create regulatory authority that is not otherwise authorized by State law (FLSCPA, 2015).

3.2.2.2 Strategic Regional Policy Plan for the Central Florida Regional Planning Council

The Strategic Regional Policy Plan (SRPP) for the Central Florida Planning Council (composed of five counties, including Okeechobee County) was adopted on April 28, 1997. The SRPP is a long-



range guide for the physical, economic, and social development of the region. The SRPP is described as a direction-setting document and does not create regulatory authority or allow for the adoption of agency rules, criteria, or standards not otherwise authorized by State law.

Although the goals and policies of the SRPP are designed to implement regional, rather than site-specific, land development, the Project will be consistent with the SRPP goals and policies. Specifically, the Project will be consistent with Policies 1.2.2 (conduct development activities in a manner that protects surface water quality), 1.5.3 (locating infrastructure to minimize impacts to environmentally sensitive areas), and 1.17.2 (minimization of large-scale development project air pollution emissions) (CFRPC, 2015).

3.2.2.3 Strategic Regional Policy Plan for the Treasure Coast Region

The SRPP for the Treasure Coast Region (comprised of four counties including Indian River County) was adopted December 15, 1995. The SRPP is a long-range guide for the physical, economic, and social development of the region. The SRPP is described as a direction-setting document and does not create regulatory authority or authorize the adoption of agency rules, criteria, or standards not otherwise authorized by law.

The Project is consistent with the goals, strategies, and policies of the SRPP. For example, the Project furthers Regional Goal 3.6 (“Diversification of the year-round economy and establishment of an economic climate that will allow the Region to compete effectively in the global economy”) and is consistent with goals related to the protection of natural systems (e.g., 6.8 “Protection of endangered and potentially endangered species”). In addition, the Project is consistent with the Vision Statement for the Region, more specifically, Goals 8.1 (“Public facilities which provide a high quality of life”), 9.1 (“Decreasing vulnerability of the Region to fuel price increases and supply interruptions”), and 13.1 (“Maintenance of acceptable air quality levels”).

The Economic Development element identifies important regional issues, including the importance of public infrastructure, and recognizes that electrical generation and transmission systems are components of basic supporting structures. The ability to attract and sustain economic development is predicated on the quality of public facilities. The Project will comply with the intent of the SRPP for the Treasure Coast Region (TCRPC, 2015).

3.2.2.4 Okeechobee County Comprehensive Plan

The Okeechobee County-adopted Comprehensive Plan has been prepared in accordance with the requirements of the Community Planning Act (Chapter 163, F.S., as amended); the minimum criteria rule for local government comprehensive plans (Chapter 9J-5, F.A.C., as amended); the Central



Florida Comprehensive Regional Policy Plan (Chapter 29G-1, F.A.C., as amended); and the State Comprehensive Plan (Chapter 187, Florida Statutes, as amended). The Okeechobee County Comprehensive Plan was adopted in April 1992 and was last amended in May 2009. The Plan consists of two documents: Data and Analysis, and Goals, Objectives, and Policies, which are presented in 12 sections or elements. The Goals, Objectives, and Policies were adopted by ordinance and are implemented by the Okeechobee County Board of County Commissioners as required by Chapter 163, F.S.

According to the County's Future Land Use Map (a component of the Future Land Use Element), the FPL property is within the Agricultural future land use designation (Figure 3.2.2-1). See Figure 3.2.2-2 for future land use within 5 miles of the OCEC. Policy L9.5 states that "public utilities needed to service existing and future land uses shall be permitted in all future land use classifications, provided the performance standards in the Power Plant Siting Act, Transmission Line Siting Act, the Okeechobee County Comprehensive Plan, Okeechobee County land development regulations, and any other applicable land development regulations are met" (OKC, 2015).

3.2.2.5 Indian River County Comprehensive Plan

The Indian River County Comprehensive Plan was prepared in accordance with Chapter 163, Part II, F.S., The Local Government Comprehensive Planning and Land Development Regulations Act of 1985 and Rule 9J-5, F.A.C., Minimum Criteria for Review of Local Government Comprehensive Plans and Determination of Compliance.

According to the County's Future Land Use Map, the parcels along the northern boundary of the FPL property are identified as within the Agricultural (AG-3) future land use category (Figure 3.2.2-2). As stated in Policy 1.10, development of agriculture-designated lands are limited to uses of agricultural activities, public facilities, industrial uses, as well as public and private utilities (limited and heavy). Therefore, improvements associated with the main access road within these areas are consistent with the intent of the future land use category (IRC, 2015).

3.2.2.6 Okeechobee County Land Development Regulations

Part II of the Code of Ordinances for Okeechobee County contains the County's Land Development Regulations. The Site is within the Agricultural zoning district. Permitted and permissible uses in the Agricultural zoning district are basically limited to agricultural, with some allowance for other uses. As identified in Section 2.04.01(A)(11), "public utility facilities and utility plant Sites including independent power company generation plants and directly associated facilities" are permitted within the Agricultural zoning district (OKCb, 2015).



3.2.2.7 Indian River County Land Development Regulations

Title IX of the Code of Ordinances for Indian River County contains the County's Land Development Regulations. The area of the existing access road is within the Agricultural 3 (A-3) zoning district. The improvements to the existing access road are general infrastructure improvements and do not require zoning actions or other land use approvals from the County, as confirmed in a meeting with Indian River County staff on May 20, 2015.

3.2.3 Demography and Ongoing Land Use

3.2.3.1 Demography

The area within 5 miles of the Site is predominantly associated with agricultural uses (e.g., farming, cattle, and horses), conservation areas, and some Low Density-Residential development. There are no municipalities within 5 miles of the Site.

As shown in the following table, from 2000 to 2010, the population for Okeechobee County increased by approximately 10.21 percent and Indian River County saw a population increase of approximately 18.17 percent (UF/BEBR, 2014). In that same time period, Florida's population increased by approximately 12.67 percent.

Jurisdiction	U.S. Census 2000	U.S. Census 2010	2013 Estimates	Percent Change (2000 – 2010)
Okeechobee County	35,910	39,996	39,762	10.21
Indian River County	112,947	138,028	139,586	18.17
State of Florida	15,982,378	18,301,332	19,259,543	12.67

Source: UF/BEBR data released on June 2014.

According to the University of Florida Bureau of Economic Business Research (UF/BEBR, 2014), the population projections for Okeechobee County and Indian River County indicate continued growth, with an estimated population of approximately 44,820 and 193,699 by 2040 (UF/BEBR, 2014), a 12 percent and 39 percent increase over the US Census, 2010.

3.2.3.2 Ongoing Land Use

Existing land use patterns on FPL's property and within the access road right-of-way are depicted in Figure 3.2.3-1. Land uses in the vicinity of the Site are consistent with existing agricultural uses on the Site and include scattered single-family and manufactured homes as well as County and State management lands and preservation areas. There are two single-family residences within 1 mile of the Site; one is situated north of the Site along the main access road and one is situated near the

eastern boundary of the Site. The residences in the vicinity of the Site are located within large land tracts and are associated with agricultural activities on the land.

Based on the population data and existing land use data described above, there are no abnormal changes anticipated with the population or land use patterns in the vicinity of the Site. State and County recreational areas are situated throughout Okeechobee and Indian River Counties in designated (and government-owned) lands. The majority of these areas are not in the immediate area of the Site, with the exception of the St. Johns River Water Management District's Fort Drum Marsh Conservation Area, located adjacent to the Site on the eastern boundary, and the St. Johns River Water Management District's Blue Cypress Conservation Area, located northeast of the Site.

3.2.4 Leases, Easements, Title, Agency Works

The need for public leases, easements, titles, or agency works approvals is not anticipated for the Project.

3.2.5 Regional, Scenic, Cultural, and Natural Landmarks

There are no regional, scenic, cultural or natural landmarks under federal jurisdiction within five miles of the OCEC Unit 1. The SJRWMD's Fort Drum Marsh Conservation Area is located adjacent to the Site, on the eastern boundary. The SJRWMD's Blue Cypress Conservation Area is located approximately 1.5 miles to the northeast of the OCEC Unit 1. There are several wildlife management and conservation areas within five miles of the OCEC Unit 1, as shown in Figure 3.2.1-2. There are no Okeechobee County parks or recreational facilities within five miles of the OCEC Unit 1. The Indian River County Blue Cypress Park is located approximately 6 miles to the north.

The Kissimmee Prairie Preserve State Park is located approximately 10 miles west of the Site. The park preserves one of the largest remaining dry prairies in Florida and is home to an array of endangered plants and animals. The preserve offers vehicular, hiking, bicycling, and equestrian opportunities. The Ordway-Whittell Kissimmee Prairie Sanctuary is located within the Kissimmee Prairie Preserve State Park. The sanctuary protects 7,315 acres of Florida's dry prairie habitat.

The Kissimmee/Okeechobee Land Management Region, located north and southwest of the Site along the Kissimmee River basin, is a project area of the Save Our Rivers Program. The purchase of land within this area (*e.g.*, Kissimmee Prairie Preserve State Park) is part of the ongoing state commitment to protect water resources, native plant communities, fish and wildlife populations, and natural features of the land.

3.2.6 Archaeological and Historical Sites

Archaeological and Historical Conservancy, Inc. conducted both a Phase I cultural resource assessment of the OCEC Unit 1 and linear facilities corridor and a desktop cultural resource assessment of the remainder of the Site in March 2015 (Appendix 10.7.2). The assessments were conducted in accordance with Chapter 267, F.S., and conform to guidelines and specifications set forth in Chapter 1A-46, F.A.C.

The assessments consisted of a review of relevant archives and literature that contained archaeological reports for northeast Okeechobee County and western Indian River County, a review of information from the Florida Master Site File in Tallahassee, examination of U.S. Geological Survey (USGS) maps, the collection and review of aerial photographs (color and black/white), and a reconnaissance visit (*e.g.*, pedestrian survey and shovel testing).

Based on the assessments conducted of the Site and linear facilities corridor, it was determined that the Site and corridor contain no significant archaeological or historic resources that would be eligible for listing in the National Register of Historic Places. A total of 78 shovel tests were performed across the OCEC Unit 1 area, and all were negative for archaeological material. Aerial photos revealed that farming has occurred within OCEC Unit 1 and the access road, increasing the likelihood that any archaeological sites that may have been in the area would have been affected by ground disturbance activities, in particular, citrus farming. Outside of OCEC Unit 1, a total of 16 hammocks were considered to have a high probability for archaeological sites. Part of one of the identified hammocks is located adjacent to the existing access road, while the other hammocks are located within the areas designated for mitigation and future solar generation. Four medium probability areas, specifically uplands adjacent to sloughs and larger ponds, were also identified, three of which are located within the proposed mitigation area.

3.2.7 Social and Economic Characteristics and Public Services

3.2.7.1 Social and Economic Characteristics

The Site is located within Okeechobee County, with the linear facilities corridor situated within Indian River County. There are no municipalities within 1 mile of the Site.

3.2.7.2 Labor Force

The labor force in Okeechobee County and Indian River County was reported as 17,887 and 62,289, respectively, as of December 2014, with approximately 16,754 and 58,577 residents listed as employed (Florida Department of Economic Opportunity, Labor Market Statistics Center, 2015).

According to the Florida Department of Economic Opportunity, Okeechobee County had an unemployment rate of 6.3 percent, with Indian River County at 6.0 percent, and Florida at 5.4 percent in December 2014.

The 2014 average private-sector employment, by major industry groups, for Indian River, Martin, Okeechobee, and Saint Lucie Counties (Workforce Region 20) is presented in the following table. The employment projections are also presented. Construction and Utilities provided approximately 6.21 percent and 0.87 percent of the Region's employment, while much of the employment was supplied by Health Care and Social Assistance (17.27 percent), Retail Trade (15.93 percent), and Accommodation and Food Services (10.84 percent).

Major Industry Group	Employment (2014)	Employment Projections (2022)	Average Wage (2014)
All Industries	184,625	235,177	\$37,452
Agriculture, Forestry, Fishing, and Hunting	5,143	5,045	\$28,596
Mining	114	133	\$43,776
Construction	11,458	15,688	\$35,952
Manufacturing	8,566	8,740	\$43,776
Wholesale Trade	5,237	6,565	\$48,024
Retail Trade	29,404	32,124	\$25,536
Transportation and Warehousing	4,548	3,993	\$43,624
Utilities	1,600	1,412	\$88,756
Information	1,989	1,992	\$50,892
Finance and Insurance	4,488	5,051	\$62,044
Real Estate and Rental and Leasing	3,286	3,539	\$33,900
Professional Scientific and Technical Services	8,601	10,325	\$51,500
Management of Companies and Enterprises	478	544	\$103,960
Administrative and Waste Services	10,824	13,742	\$26,060
Educational Services	13,323	2,639	\$52,028
Health Care and Social Assistance	31,889	38,401	\$42,232
Arts, Entertainment, and Recreation	5,394	5,868	\$33,380
Accommodation and Food Services	20,020	21,968	\$17,892
Other Services	7,264	9,033	\$29,084
Public Administration	10,939	28,813	\$48,452
Unclassified	60	19,562	\$28,884

The employment projections for Workforce Region 20 indicate the Construction sector jobs are expected to increase by about 37 percent between 2014 and 2022, while Utilities sector jobs decrease

about 12 percent (Florida Department of Economic Opportunity, Labor Market Statistics Center, 2015).

3.2.7.3 General Income

As reported in March 2014, Okeechobee County and Indian River County had an estimated per-capita personal income of \$27,423 and \$54,448, respectively, which is an increase of \$2,318 and \$6,142 since 2010 (Bureau of Economic Analysis, CA1-3, 2015). The State of Florida and United States had a reported per capita personal income of \$41,497 and \$44,765 for the same time frame, respectively (Bureau of Economic Analysis, CA1-3, 2015).

According to the Florida Bureau of Economic Business Research, the 2013 estimated median household income in Okeechobee County and Indian River County was \$35,954 and \$44,326, respectively (BEBR, 2015). When compared to the 2010 data, Okeechobee County saw a 1.5 percent increase in median household income, while Indian River County saw a 6.7 percent decrease in median household income. Florida had an estimated median household income of \$46,021 in 2013, which was an increase of 3.7 percent from the 2010 data.

Within Workforce Region 20, Construction and Utilities provide approximately 7 percent of the region's employment in 2014. The average wage per construction worker in the second quarter of 2014 in Workforce Region 20 was approximately \$35,952 (Florida Department of Economic Opportunity, Labor Market Statistics Center, 2015). The average wage per job in 2013 was \$34,994 for Okeechobee County and \$38,955 for Indian River County (Bureau of Economic Analysis, CA3-4, 2015), whereas the average wage per job for the entire State of Florida was \$45,064.

3.2.7.4 Housing

The total number of housing units in Okeechobee County is estimated at 18,232, with an estimated vacancy rate of 30.4 percent. In Indian River County, the total number of housing units is estimated at 76,576, with an estimated vacancy rate of 23.6 percent. The majority of the housing stock in Okeechobee County was constructed prior to 2000, with only 0.6 percent constructed since 2010 (Indian River County; 0.2 percent). These estimates are based on an American Community Survey for the period of time of 2011 to 2013 (US Census, 2015).

The total occupied housing units in Okeechobee County is estimated at 12,688 (Indian River County: 58,531), with 71.1 percent of those units occupied by the owners (Indian River County: 74.1 percent) and 28.9 percent occupied by renters (Indian River County: 25.9 percent). The estimated median purchase price of a home in Okeechobee County in 2013 dollars was \$98,800 (Indian River County: \$148,400) (US Census, 2015).

Within Workforce Region 20, the number of available total lodging units was estimated as 22,888 in 2013. This total number of units includes 1,369 vacation rental units, 431 apartment units, 3,153 motel units, 3,652 hotel units, and approximately 8,605 rooming houses and bed and breakfast units. In addition, the available recreational vehicle parks and recreational camps within the region were estimated at five establishments within 25 miles of the Project area (Gocampingamerica.com, 2015).

3.2.8 Area Public Service and Utilities

3.2.8.1 Education

Public education in Florida is operated on a countywide basis. Each county's respective school district establishes educational policies and staffing requirements. The Okeechobee County School District includes five elementary schools, two middle schools, one high school, and two alternative schools. Okeechobee County had a total student membership of 6,420 for the 2013-2014 school year (FLDOE, 2015). The County anticipates a decrease in school enrollment to approximately 6,336 by 2016, a decrease of approximately 1.3%.

Okeechobee County schools employed approximately 807 personnel (405 instructional staff, 182 clerical, 39 administrators, and 181 other administrative support positions) for the 2014-2015 school year (FLDOE, 2015).

The table below identifies workforce opportunities for the 2012-2013 school year for the school districts of Okeechobee, Indian River, Martin, and St. Lucie Counties.

County	Average Daily Membership	No. Elementary Schools	No. Middle Schools	No. High Schools	No. Charter Schools	Other
Okeechobee	6,458	5	2	1	0	2-Alt
Indian River	18,658	13	4	3	5	3 -Adult/Alt
Martin	18,472	12	5	5	2	4 – Alt/Special
St. Lucie	39,195	17	4 (plus 1 k-8)	6 (plus 1 6-12)	5	5-Magnet, 2 Alt, 2-k-12 Virtual

Source: www.fldoe.org/schools/k-12-public-schools/dis-contact-info, 2015.

3.2.8.2 Transportation

Access to the Site is from SR 60, approximately 7.5 miles east of Florida's Turnpike and about 17 miles west of Interstate (I)-95. SR 60 is a four-lane principal arterial roadway oriented in an east-west direction with connections to U.S. Highway (US) 441, Florida's Turnpike and I-95. The access road from SR 60 is 226th Court, a full-access roadway that aligns with an existing SR 60 median opening that includes a westbound left-turn lane. The existing level-of-service (LOS) for SR 60, based on

Florida Department of Transportation (FDOT) traffic counts taken near the connection with 226th Court, is LOS B. The FDOT annual average daily traffic count for SR 60 averaged 4,942 vehicles from 2009 through 2013, with a maximum of 5,029 vehicles in 2013. For a rural four-lane divided highway with a median, the FDOT LOS B maximum average daily volume is 25,700 vehicles. The existing traffic volume on SR 60 is well within FDOT LOS B. A traffic study was performed that included an assessment of existing traffic as well as an evaluation of the impacts of construction and operation (see Appendix 10.7.4).

3.2.8.3 Medical Facilities

There are nine hospital facilities within 30 miles of the Site. Predominantly serving Indian River County and St. Lucie County, the closest Level II trauma center is approximately 29 miles east-southeast of the Site. Lawnwood Regional's Treasure Coast Trauma Center is part of the Lawnwood Regional Medical Center & Heart Institute, which provides emergency response and general medical services to Indian River, Martin, Okeechobee and St. Lucie counties.

3.2.8.4 Police Protection

Police protection for the Project will be provided by the Okeechobee County Sheriff's Office Uniform Patrol Division. The Uniform Patrol Division, is comprised of 50 sworn deputies and is the front-line defense for Okeechobee County citizens and visitors. In 2013, the Division responded to 24,464 service calls. In addition, the Division has several support programs within the County that require both citizen volunteer and sworn deputy positions, such as: School Resource Unit, Court Security/Civil Process, Auxiliary, Posse (*e.g.*, Parade, Security Detail, etc.), Citizens Observation Patrol, Dive Team, Special Response Team, and the Sheriff's Emergency Response Team (OKC Police, 2015).

3.2.8.5 Fire Fighting Facilities

The Okeechobee County Fire Rescue provides a variety of services to protect Okeechobee County citizens and visitors, such as fire, accidents, medical emergencies, and hazardous material releases. In addition to the Administrative Services office, the County has 4 Fire Rescue stations located throughout the County. The closest of the four stations is Fire Rescue Station 3, which is located 23 miles to the southwest along US Highway 441 (OKC Fire, 2015). The closest Fire Station to the Site is within Indian River County (Fire Station 7), which is approximately 18 miles due east of the Site (IRC Fire, 2015).

3.2.8.6 Recreation Facilities

Okeechobee County offers parks and recreational services to County residents and visitors. The County Parks and Recreation Department oversees eight County amenities that include civic centers,



community centers, historical parks, sport complexes and sport fields. Within 5 miles of the Site, there are no Okeechobee County parks or recreational facilities.

Within Indian River County, the Recreation Department includes the Parks Division that oversees grounds, buildings, and equipment as well as the recreational facilities and programs offered to County citizens and visitors. There are a total 40 various park and recreational facilities throughout the County. There are no Indian River County parks or recreational facilities within five miles of the Site.

The closest County recreational facility, Blue Cypress Park, is located within Indian River County approximately seven miles to the northeast of the Site. SJRWMD's Ft. Drum Marsh Conservation Area is directly east and adjacent to the site. The SJRWMD's Blue Cypress Conservation Area is located within a mile to the northeast of the site.

3.2.8.7 Electricity and Gas

Electricity in unincorporated Okeechobee County is provided by FPL and Glades Electric Cooperative, Inc. Several suppliers provide propane in Okeechobee County.

3.2.8.8 Water Supply and Domestic Wastewater Treatment Facilities

The Okeechobee Utility Authority (OUA) operates and maintains a regional water and wastewater system to provide services for residential, commercial, and other utility customers located within Okeechobee County and a portion of Glades County (OUA, 2015).

Okeechobee County does not provide potable water for residents in unincorporated areas of the County. There are approximately 74 water treatment facilities in the County; most of these are small and serve a single commercial business or residential community (OKC CP, 2015).

Eighty percent of unincorporated Okeechobee County is served by septic systems as presently no sewer system is available in those areas. There are approximately 27 private treatment plants, which are small and generally treat residential-type wastes. The City of Okeechobee owns and operates a sewage treatment plant that serves the City as well as portions of the unincorporated County, which surrounds the City (OKC CP, 2015).

3.2.8.9 Solid Waste Disposal

Solid waste generated within unincorporated Okeechobee County is transported to the Berman Road Landfill owned and operated by Chambers Waste System of Florida, Inc. (approximately 13 miles northeast of the City of Okeechobee; north of SR 70). The unincorporated County does not have a mandatory collection service; however, solid waste is collected through voluntary subscription by



Waste Management Corporation. Those that do not subscribe to collection services deliver solid waste directly to the landfill or dispose of it in other ways; including incineration or disposing of it in dumpsters (OKC CP, 2015).

3.3 Physical and Biological Environment

3.3.1 Geology and Hydrology

The regional and local geology and hydrogeology of the Site have been well documented. Regional geology and hydrogeology was detailed in “Synthesis of the Hydrogeologic Framework of the Floridan Aquifer System and Delineation of a Major Avon Park Permeable Zone in Central and Southern Florida” (Reese, R.S. and Richardson, Emily, 2008). Local geology and hydrogeology are presented in “Ground-Water Resources of Okeechobee County, Florida” (Bradner, 1994). Ardaman & Associates, Inc. (March 27, 2015) completed a subsurface exploration program in the area of the power plant and along the entrance road. The subsurface exploration program included soil borings at 16 locations to depths between 30 and 100 feet and in-situ permeability and infiltrometer tests at three locations. This section summarizes information presented in these reports and additional available reports and cited references.

3.3.1.1 Geologic Description of the Site and Vicinity

The Florida peninsula is divided into three physiographic zones (White, 1970). The Southern zone is present from the southern end of the Florida peninsula to a line that cuts across the peninsula from the vicinity of the city of Stuart on the east coast to the city of Fort Myers on the west coast. The Central physiographic zone extends northward from this line to a line that extends from approximately St. Augustine on the east coast to approximately Perry near the west coast. The Northern physiographic zone extends northward from this line to Georgia. The Site is located in the Central physiographic zone of the Florida peninsula, which is characterized by sub-parallel highland ridges separated by broad valleys. More specifically, the Site is located on the Osceola Plain within the physiographic division of the Eastern Flatwoods District and sub divisions of the Holopaw-Indian Town Ridges and Swales and the St. Johns Marsh (Brooks, 1981).

The land surface elevation across the Site rises from approximately 30 feet mean sea level (msl) in the east to approximately 50 feet msl in the west of the Site, with respect to North American Vertical Datum of 1988 (USGS, 2015). The topography of the area is largely influenced by the formation of marine terraces that were deposited during the Pleistocene Epoch. The marine terrace deposits at the Site are the Talbot and the Penholoway terraces (Parker, 1955) and (Bradner, 1994).

The Florida Platform basement rocks separated from the African plate and became a part of the North American craton as the super-continent Pangea rifted apart in the Triassic age (Smith, 1982). These basement rocks then served as a platform on which a thick sequence of primarily carbonate rocks (limestone, dolomitic limestone, dolomite, calcareous sands, anhydrite) with minor amounts of siliciclastic sediments (quartz sands, silts, marls, and clays) were deposited. Strata overlying the basement rocks range in age from mid-Mesozoic to Recent (Scott, 1992). A generalized description of the geology and hydrogeology in the vicinity of the Site is provided in Figure 3.3.1-1. Post-Mesozoic geologic units underlying the Site include, from youngest to oldest, undifferentiated Pleistocene to Pliocene age sediments, the Hawthorn Group of Miocene to Late Oligocene age, the Ocala Limestone of late Eocene age, the Avon Park Formation of middle Eocene age, the Oldsmar Formation of early Eocene age, and the Cedar Keys Formation of the Paleocene Age. Each of the geologic units is described in the paragraphs that follow.

Undifferentiated Deposits

The undifferentiated Holocene to Pliocene age sedimentary deposits consist of clayey sand, coarse to fine-grained sand, silt, clay, marl, and shell deposits. These deposits are commonly interbedded and can be variable laterally and vertically and are typically 100 to 200 feet (ft) in thickness in Okeechobee County (USDA, 2003). The undifferentiated Holocene and Pliocene sediments are anticipated to be present at the project Site from land surface to a depth of approximately 150 feet below land surface (ft bls). The base of the undifferentiated deposits typically consists of low-permeability clayey sand and silt. The undifferentiated Holocene to Pliocene sediments comprises the Surficial Aquifer. The Surficial Aquifer is the primary fresh water source in the vicinity of the Site. The water table in the Surficial Aquifer in Okeechobee County ranges from land surface to approximately 10 ft bls and fluctuates in response to seasonal changes (Bradner, 1994).

Hawthorn Group

The Hawthorn Group of the Miocene Age to late Oligocene Age includes the Peace River and Arcadia Formations in Okeechobee County. The Peace River Formation consists of greenish-gray phosphatic clay and silt interbedded with quartz sand and sandstone and overlies the Arcadia Formation. The Arcadia Formation consists primarily of poorly consolidated phosphatic limestone and dolomite. The Hawthorn Group constitutes the confining interval between the Surficial Aquifer and the Floridan Aquifer System (FAS); often called the Intermediate Confining Unit (ICU). It is anticipated to be present at the Site from a depth of approximately 150 to 400 ft bls (Scott T. M., 1988). The Hawthorn Group is anticipated to have very limited productivity at this location due to the generally low permeability of the sediments.



Floridan Aquifer System

The FAS is characterized geophysically by high gamma ray activity and low resistivity. The high gamma ray activity of the formation is a result of the high phosphate content of the sediments. The low resistivity is indicative of the highly mineralized clay

Ocala Limestone

The Ocala Limestone of the Late Eocene Age and is anticipated to occur from a depth of approximately 400 to 500 ft bls at the Site. This formation generally consists of white to tan, highly fossiliferous limestone and generally has high porosity and permeability (Reese, R.S. and Richardson, Emily, 2008). It is characterized geophysically by low gamma ray activity and moderate resistivity. Water produced from the Ocala Formation is typically brackish (TDS between 1,000 and 3,000 mg/L) and is frequently used for raw water supply for reverse osmosis water treatment plants in Florida.

Avon Park Formation

The Avon Park Formation of the Mid-Eocene Age is anticipated to occur from a depth of approximately 500 to 2,100 ft bls. The Avon Park Formation consists primarily of interbedded, micritic to fossiliferous limestone, dolomitic limestone and dolomite. The permeability in portions of the formation is typically high due to fracturing which is common within the dolomite units (Reese, R.S. and Richardson, Emily, 2008). The upper portion of the formation is more permeable than the lower portion and contains water-producing intervals. The lower portion of the Avon Park Formation consists of relatively low-permeability limestone, dolomitic limestone and dolomite and prevents fluids of differing quality from migrating between more permeable zones above and below this confining interval. Water produced from the upper portion of the Avon Park is typically brackish, while water from the lower portion of the formation is saline to highly saline (TDS between 3,000 and 35,000 mg/L).

Oldsmar Formation

The top of the Oldsmar Formation of the Early Eocene Age is anticipated to occur from a depth of approximately 2,100 ft bls. The lithology of the Oldsmar Formation at the Site is anticipated to consist of dolomite, dolomitic limestone, and limestone. Glauconitic limestone marks the top of Oldsmar Formation in east-central Florida (Reese, R.S. and Richardson, Emily, 2008). The upper portion of the formation is confining in nature. The lower portion of the formation is anticipated to include a highly transmissive, fractured, and cavernous interval known as the "Boulder Zone". The Boulder Zone is used as the injection zone for most Class I deep injection wells in south Florida. The top of Boulder Zone is anticipated to be located at a depth of approximately 2,600 ft bls at the Site.

The relatively low-permeability upper portion of this formation combined with the lower portion of the Avon Park Formation make up the confining unit that overlies the Boulder Zone.

Cedar Keys Formation

The Cedar Keys Formation is of the Paleocene Age. The top of the Cedar Keys Formation is anticipated to be at a depth of approximately 3,200 ft at the Site. The upper portion of the Cedar Keys Formation is often dolomite and dolomitic limestone, while the lower portion consists of thick beds of anhydrite. The Cedar Keys Formation is generally considered to be the lower confining unit to the Floridan Aquifer System.

3.3.1.2 Detailed Site Lithology

The surface soils of the Site consist of nearly level, poorly drained, sandy soil to a depth of more than 80 inches. Loamy or organically coated subsoil may be present. These soils are deposited in areas of flatwoods, sloughs and on hammocks and identified on the general soil map of the Soil Survey of Okeechobee County, Florida (USDA, 2003) as the Riviera-Basinger-Myakka unit over the majority of the Site, and the Riviera-Basinger-Myakka unit to the western edge of the Site. Based on the Custom Soil Resource Report (Appendix 3, Ardaman, 2015), the majority (>80 percent) of the soils to more than 80 inches are Myakka fine sand and Basinger fine sand with 0 to 2 percent slopes. These soils are classified as Hydrologic Soil Group A/D.

Based on boring data, soils at the Site consist generally of loose to medium dense fine sand with varying amounts of clay and shell fragments from the ground surface to depths of about 43 to 48 feet followed by moderately hard slightly clayey, poorly cemented sand and shell and sandy shell to depths of about 58 to 63 feet, in turn followed by alternating layers of loose to medium dense slightly clayey to clayey fine sand with shell fragments and medium stiff to stiff clay to the termination depth of our deepest boring at about 100 feet (Ardaman, 2015). Groundwater in the boreholes of the SPT borings was observed at depths of approximately 0.5 to 2 feet below the ground surface in the area of the OCEC and at depths of about 3 to 7 feet beneath the entrance roadway.

3.3.1.3 Geologic Maps

Figure 3.3.1-2 provides a map depicting Pleistocene age marine terraces of Okeechobee County. Figure 3.3.1-3 provides an isopach map of the Surficial Aquifer. The low-permeability Hawthorn Group underlies the Surficial Aquifer.

3.3.2 *Subsurface Hydrology*

3.3.2.1 Subsurface Hydrologic Data for the Site Aquifers

There are three major components to the subsurface hydrogeologic framework of southern Florida and the Site: the unconfined surficial aquifer; the confined FAS; and the nearly impermeable sediments of the Hawthorn Group, which separate the two aquifer units.

Surficial Aquifer System

Although the thickness of the surficial aquifer system is generally between 100 and 250 ft thick in Okeechobee County, it is expected to be approximately 100 ft thick in the vicinity of the Site. The surficial aquifer in the vicinity of the Site is unconfined and consists of layers of silt, clay, sand, and shell of the undifferentiated Holocene to Pliocene age sedimentary deposits. The yield from wells installed within the surficial aquifer in Okeechobee range between 10 and 400 gallons per minute (gpm) and the specific capacity (calculated from the South Florida Water Management District well completion reports) ranges from approximately 3 to 50 gpm/ft (Bradner, 1994). The higher yields are from wells that are installed deep enough within highly productive coarse sands and shell zones. Based on the SJRWMD East Central Florida Steady (ECFS) Model, the transmissivity of the surficial aquifer in the area of the site is approximately 1,703 ft²/day. Based on the characteristics of the soils at the depth of the water table (predominately fine sand), the specific yield is likely between 0.15 and 0.25. The surficial aquifer is recharged by rainfall and the downward percolation of irrigation water. The water table fluctuates in response to changes in seasonal precipitation amounts, evapotranspiration, and pumping. In Okeechobee County, the surficial aquifer water table ranges from land surface to 10 ft bls. Most of the domestic and public supply wells in Okeechobee County withdraw from the surficial aquifer (Bradner, 1994).

Intermediate Confining Unit

The intermediate confining unit (ICU) consists of the clay-rich, fine grained deposits of the Hawthorn Group. The clay-rich deposits form a confining unit that separates the Surficial Aquifer System from the deeper artesian FAS. The ICU is expected to be approximately 275 ft thick at the Site and extend to a depth of 400 ft bls (Scott T. M., 1988). The Hawthorn Group is frequently referred to as the Intermediate Aquifer; however, it is anticipated to have very limited productivity at the Site due to low permeability. The overall hydraulic conductivity of the Hawthorn Group is very low and provides good confinement for the underlying FAS. The calibrated ECFS groundwater flow model developed by the St. Johns River Water Management District uses a transmissivity of 1,938 feet squared per day [(ft²)/day) for the layer representing the combined Intermediate Aquifer System (IAS) and ICU. The ground water flow model suggests a leakance coefficient of 6.8×10^{-6} feet per

day per foot (ft/day/ft) for the ICU at the OCEC Site. The highest value of ICU leakance within a 10-mile radius of the site is 1.0×10^{-5} ft/day/ft; the lowest value of ICU leakance within a 10-mile radius of the Site is 6.0×10^{-6} ft/day/ft.

Floridan Aquifer System

The FAS in the vicinity of the Site consists of the Upper Floridan Aquifer (UFA), Avon Park Permeable Zone (APPZ) also known as the Middle Floridan Aquifer (MFA), and Lower Floridan Aquifer (LFA) and is comprised of limestone, dolomitic limestone, and dolomite that range in age from Paleocene to Eocene. In Okeechobee County, the FAS is generally between 2,700 and 3,000 ft thick (Bradner, 1994). The Avon Park Formation, except for the APPZ/MFA, is generally less permeable than the UFA and LFA and is often referred to as the middle confining unit. Most wells installed in the Floridan Aquifer in Okeechobee County range between the depths of 750 ft to 1,200 ft bls. In the northeastern portion of Okeechobee County, the wells are typically installed to more shallow depths between 600 and 700 ft bls to avoid brackish water (Bradner, 1994).

Upper Floridan Aquifer

The top of the UFA in most of the county is encountered at a depth of approximately 400 ft, at the top of the white, foraminiferous, carbonate rocks that correspond to the Ocala Limestone. The UFA consists of the Ocala Limestone and the upper portion of the Avon Park Formation. The UFA is under artesian pressure and serves as a source of brackish water in South Florida. The base of the lowermost Underground Source of Drinking Water (USDW) is anticipated to be located in the upper portion of the Avon Park Formation at a depth of approximately 1,550 ft bls at the Site (Reese, 2004). The potentiometric surface in the vicinity of the Site typically ranges from approximately 40 to 50 ft msl and slightly fluctuates between the dry and wet seasons (Bradner, 1994).

Previous testing of the yield, transmissivity and specific capacity values of wells installed within the Upper and Lower Floridan Aquifers throughout Okeechobee County are referenced from the data compiled in the USGS Water-Resources Investigations Report 92-4166, titled, "Ground-Water Resources of Okeechobee County, FL" (Bradner, 1994). The yields from wells installed within the UFA in Okeechobee County range between 50 and 1,500 gpm. The transmissivity is generally less than 10,000 ft²/day, which is much lower than the typical transmissivity values in much of Florida that are between 100,000 to greater than 1,000,000 ft²/day. Specific capacity ranges from approximately 2 to 100 gpm/ft throughout Okeechobee County in the UFA. A well installed approximately 7 miles southeast of the Site within the UFA to a depth of 686 ft bls recorded a

transmissivity of 20,000 ft²/day and a specific capacity of 100 gpm/ft. The SJRWMD ECFS Model uses a transmissivity of 84,400 ft²/day in the UFA.

Middle Confining Unit and the Avon Park Permeable Zone

The Middle Confining Unit (MCU) underlies the UFA separating the UFA and LFA and is characterized by lower permeability (hydraulic conductivities) than the UFA and LFA. The lithologies are typically micritic limestones, dolomitic limestones, and dolomite. The MCU is located within the Avon Park Formation at a depth of approximately 750 ft bls and the overall thickness is approximately 800 ft at the Site. The MCU is divided into two parts (MC1 and MC2) by the APPZ. Based on the ECFS Model, the APPZ is approximately 417 feet thick at the Site. The ECFS Model uses a leakance value of 0.034 ft/day/ft for MC1 and a value of 6.1×10^{-4} ft/day/ft for MC2. The transmissivity of the APPZ in the ECFS Model is 1.66×10^6 ft²/day in the vicinity of the Site.

Lower Floridan Aquifer

The LFA consists of the lower portion of the Avon Park Formation and the Oldsmar Formation. The LFA consists of several permeable zones separated by extensive confining intervals. The lower portion of the LFA contains a zone of cavernous permeability, called the Boulder Zone. The Boulder Zone is typically developed in fractured dolomite in southern Florida and at the Site. The top of the Boulder Zone is anticipated at a depth of approximately 2,600 ft bls at the Site. The base of the LFA is expected to be encountered at a depth of 3,200 ft bls at the Site. Two deep injection wells have been installed in Okeechobee County and are installed to a depth of approximately 3,200 and 3,500 ft bls.

3.3.2.2 Karst Hydrogeology

Karst terrains develop in areas underlain by carbonate rocks such as limestone. They often have drainage systems that are reflected on the surface as sinkholes, springs, disappearing streams, or even caves.

According to Map Series No. 10, Sinkhole Type, Development, and Distribution in Florida (William C. Sinclair and J.W. Stewart, 1985), the site is located in Area II, where the cover is reported to be 30 to 200 ft thick. In these areas, sinkholes are reported to be few, shallow, of small diameter and develop gradually. Furthermore, within the prior boring drilled at the Area II site, indicators of karst geology such as voids or loss of circulation were not encountered. There are no karst topological features in the region (Ardaman, 2015).

3.3.3 Site Water Budget and Area Users

3.3.3.1 Site Water Budget

The Site is located in east-central peninsular Florida within the south Indian River Lagoon Basin, where the climate is characterized as subtropical humid with a high annual rainfall, and moderate temperatures. The annual average temperature is approximately 74 degrees Fahrenheit (°F) and the majority of the annual rainfall occurs during June through October (Bradner, 1994). Figure 3.3.3-1 illustrates the monthly average minimum, mean, and maximum temperature and the monthly average precipitation in the vicinity of the Site for the period from 1981 to 2010.

Available rainfall data for Fort Drum, Florida showed a mean annual rainfall between the years of 1943 to 2006 of about 51.61 inches [SJRWMD, National Oceanic and Atmospheric Administration (NOAA), 2015]. Annual average lake evaporation in the area of the Site is approximately 48 inches per year; evapotranspiration is approximately 36 inches per year (Fernald and Patton, 1984). As discussed below in Section 3.3.4, based on data from the Fort Drum gaging station, the total annual average surface runoff (direct and indirect) in the vicinity of the Site is approximately 11.9 inches/year; and peak runoff rates can be 10 times the average. Therefore, the net annual average surficial aquifer recharge is approximately 3.7 inches/year [51.6-36-11.9]. Peak runoff rates may be as high as 8.8 cfs/sq. mile of drainage basin area.

3.3.3.2 Area Users

Surface water and groundwater use in the vicinity of the Site is regulated by SJRWMD. Information gathered from the SJRWMD was used to prepare the following summary of water uses near the Site. Figure 3.3.3-1 presents the water use permits within 5 miles of the OCEC Unit 1. The primary water source identified by SJRWMD is from the Upper Floridan Aquifer and Floridan Aquifer, with the closest active wells located northeast of the OCEC Unit 1. To the southwest of the OCEC Unit 1, there are several Floridan Aquifer wells associated with the Florida Turnpike Fort Drum Service Plaza.

3.3.4 Surficial Hydrology

The Site is located in the Upper St. Johns River watershed. Soils in the upland areas are generally Myakka or Basinger fine sand (>80 percent) with 0 to 2 percent slopes. These soils are poorly drained under natural conditions, with the depth to water between 6 and 18 inches. The Hydrologic Soil Group for these soils is A/D.

Within the Site, there are several small surface water features including ditches, canals, ponds and wetlands. Much of the Site has been used for citrus, cattle, and other agricultural purposes. There are

no large natural lakes, rivers or streams on the Site. The closest lake is Blue Cypress Lake, which is approximately 4.5 miles northeast of the OCEC Unit 1. Blue Cypress Lake is approximately 6,500 acres in size, with an average depth of approximately 8 feet. There are several streams, creeks, or ditches that enter Blue Cypress Lake from the south and west.

Padgett Branch is the closest stream to the Site, located approximately 2 miles to the north. The gaging station on Padgett Branch and State Road 60 (SJRWMD Station 10991415) has a median flow of 13 cfs, but ranges between 0 and 191 cfs. The closest large creek in Okeechobee County is Jim Green Creek, located approximately 3 miles to the southwest. This creek parallels the west side of the Florida Turnpike and flows under the Florida Turnpike south of the Ft. Drum Rest Area. The flow at this location (SJRWMD Station 11001520) was measured once at 0.34 cfs. Jim Green Creek flows into Fort Drum Creek and continues south. Fort Drum Creek is gaged as it crosses the Florida Turnpike (USGS Station 02231342). At this gaging station, the flow is between 0 and 467 cfs and the average flow is 46.5 cfs. Given that the drainage basin is 52.6 square miles, the annual average runoff from this drainage basin equals 0.88 cfs/sq. mile, or 11.9 inches/year.

Surface water in the vicinity of the site is classified by the State as Class III fresh water.

3.3.4.1 Measurement Programs

No surface waters will be directly affected by OCEC Unit 1. Chemical and Physical parameters will be obtained for the UIC Class V exploratory well permit as described in Appendix 10.2.8. The models used to determine groundwater impacts of the Project are presented in Appendix 10.9.

3.3.5 Vegetation/Land Use

Characteristic vegetative communities/land uses within the Site and associated linear facilities were classified utilizing the FLUCFCS Level III (FDOT, 1999) during field reconnaissance conducted in November through February 2015. Vegetative communities within and adjacent to the approximately 2,341-acre Site proposed for certification are discussed in detail in Subsection 3.3.6.1, including the approximately 220-acre proposed location for the OCEC Unit 1 and approximately 104 acres of adjacent open space, the 1,629-acre area proposed for potential future solar generation, and the approximately 376-acre mitigation area (Figure 3.1-2). Appendix 10.7.1.1 presents photographs representative of vegetation/land use classifications within each area of the Site.

3.3.5.1 OCEC Unit 1

The approximately 220-acre area of the Site proposed for construction of the OCEC Unit 1 is located in the north-central portion of the property. Existing vegetation/land use within the area is dominated by active citrus groves (FLUCFCS 221) bisected by manmade irrigation ditches (FLUCFCS 511),



with three small areas of mixed wetland forest wetlands (FLUCFCS 617) surrounded by drainage ditches (Figure 3.3.5-1). Approximately 104 acres designated as open space surround OCEC Unit 1; these areas are dominated by pasture and citrus grove lands similar to the OCEC Unit 1 area, with small areas of saw palmetto prairie (FLUCFCS 321) and upland mixed hardwood-conifer forest (FLUCFCS 434) along the northern Site boundary.

3.3.5.2 Area of Potential Future Solar Generation

The approximately 1,629-acre area of potential future solar generation is located to the west and south of the OCEC Unit 1. The area is dominated by improved pasture (FLUCFCS 211) and citrus groves (FLUCFCS 221), with additional areas of saw palmetto prairie (FLUCFCS 321), upland mixed hardwood-conifer forest (FLUCFCS 434), irrigation and drainage ditches (FLUCFCS 511), mixed wetland hardwoods (FLUCFCS 617), mixed hardwood-conifer forested wetlands (FLUCFCS 630), and freshwater marsh (FLUCFCS 641) (Figure 3.3.5-1).

3.3.5.3 Mitigation Area

The approximately 376-acre mitigation area is located within the undeveloped northeastern portion of the property, bounded on the west and south by existing drainage ditches and on the east and north by the property boundary. Approximately 50% of the existing vegetative communities within the mitigation area are high-quality wetlands, including mixed wetland hardwoods (FLUCFCS 617), mixed hardwood-conifer forested wetlands (FLUCFCS 630), wetland shrubs (FLUCFCS 631), freshwater marsh (FLUCFCS 641), and wet prairie (FLUCFCS 643), with ditches (FLUCFCS 511) along the western and southern perimeter (Figure 3.3.5-1). Upland communities are dominated by shrub and brushland (FLUCFCS 320), mixed hardwood-conifer forest (FLUCFCS 434), pine flatwoods (FLUCFCS 411), and unimproved pasture (FLUCFCS 212).

3.3.6 Ecology

3.3.6.1 Species-Environmental Relationships

The following subsections include descriptions of flora and fauna within the Site, including the locations of the OCEC Unit 1, the area proposed for potential future solar generation, the on-Site mitigation area, and surrounding areas. This discussion includes information related to the abundance of species found and the value of the habitats present, by FLUCFCS Level III codes.

Vegetative Communities of the OCEC Unit 1 Area

Improved and Unimproved Pasture (FLUCFCS 211 and 212) – Approximately 34.5 acres of improved and unimproved pasture occur within the area proposed for the OCEC Unit 1; an additional 60.7 acres of pasture occur within adjacent areas designated as open space. These pasture areas have

been historically converted from natural vegetation to bahia grass (*Paspalum notatum*) and support active cattle grazing. Additional species include scattered shrubs and trees, including wax myrtle (*Myrica cerifera*), groundsel tree (*Baccharis halimifolia*), laurel oak (*Quercus laurifolia*), live oak (*Quercus virginiana*), cabbage palm (*Sabal palmetto*), and a variety of common herbaceous species, such as broomsedge bluestem (*Andropogon virginicus*), dogfennel (*Eupatorium capillifolium*), slender flattop goldenrod (*Euthamia caroliniana*), carpet grass (*Axonopus* spp.), and blackberry (*Rubus cuneifolius*).

Citrus Groves (FLUCFCS 221) – Areas of active citrus groves comprise approximately 163.5 acres of the area proposed for the OCEC Unit 1 and 11.2 acres of the adjacent areas designated as open space. These areas were historically cleared and graded to create elevated rows of citrus trees and irrigation ditches. Natural vegetative communities have been removed and are routinely controlled through application of herbicides, although a variety of weedy herbaceous and shrub species occur within the citrus groves, such as bahia grass, beggarticks (*Bidens alba*), caesarweed (*Urena lobata*), woodland false buttonweed (*Spermacoce remota*), and the exotic species Brazilian pepper (*Schinus terebinthifolius*) and cogon grass (*Imperata cylindrica*).

Ditches (FLUCFCS 511) – Irrigation and drainage ditches occur throughout the citrus grove and improved pasture areas, comprising approximately 14.6 acres within the proposed location of the OCEC Unit 1 and 7.8 acres of the adjacent areas designated as open space. These ditches support a variety of nuisance/exotic and native herbaceous species, such as Peruvian primrose willow (*Ludwigia peruviana*), cattail (*Typha latifolia*), marsh pennywort (*Hydrocotyle umbellata*), water spangles (*Salvinia minima*), duckweed (*Lemna minor*), torpedo grass (*Panicum repens*), soft rush (*Juncus effusus*), smartweed (*Polygonum* spp.), dayflower (*Commelina diffusa*), alligator weed (*Alternanthera philoxeroides*), Mexican primrose willow (*Ludwigia octovalvis*), arrowhead (*Sagittaria lancifolia*), pickerelweed (*Pontederia cordata*), leather fern (*Acrostichum danaeifolium*), and Virginia chain fern (*Woodwardia virginica*). Occasional shrub species occur along the edges of the ditches, including the exotic Brazilian pepper as well as coastal plain willow (*Salix caroliniana*), wax myrtle, groundsel tree, and sapling red maple (*Acer rubrum*).

Mixed Wetland Hardwoods (FLUCFCS 617) – Four areas of mixed wetland hardwoods occur within the proposed location of the OCEC Unit 1, comprising approximately 6.5 acres; an additional three areas of mixed wetland hardwoods totaling 3.3 acres occur within the area designated as open space. These forested wetlands are surrounded by drainage ditches connecting to the network of citrus irrigation ditches. The canopy is dominated by red maple, with occasional subdominant species including cabbage palm, American elm (*Ulmus americana*), blackgum (*Nyssa sylvatica*), and laurel

oak (*Quercus laurifolia*). Brazilian pepper typically forms a dense shrub layer along the perimeter of these mixed hardwood wetlands, with additional shrub species present including wax myrtle and groundsel tree. The groundcover within the interior of the wetlands includes a variety of species such as swamp fern (*Blechnum serrulatum*), cinnamon fern (*Cinnamomea camphora*), royal fern (*Osmunda regalis*), sawgrass (*Cladium jamaicense*), arrowhead, Virginia chain fern, marsh pennywort, leather fern, and the exotic old world climbing fern (*Lygodium microphyllum*).

Vegetative Communities of the Area Proposed for Future Solar Generation

Improved and Unimproved Pasture (FLUCFCS 211 and 212) – Approximately 1,167.3 acres of improved and unimproved pasture occur in the western and southern portion of the Site within the area of proposed future solar generation. The pasture within the western portion of the site does not contain the same frequency of drainage ditches compared to the pasture to the east of the citrus groves. Dominant vegetation is similar to that described within the improved pasture area proposed for construction of the NGCC unit and associated non-linear facilities, with the addition of soft rush, yellow-eyed grass (*Xyris* spp.), and scattered saw palmetto (*Serenoa repens*).

Citrus Groves (FLUCFCS 221) – Areas of active citrus groves comprise approximately 135.3 acres of the area of potential future solar generation. Vegetative communities within the groves are as described above within the citrus grove area proposed for construction of the NGCC unit and associated non-linear facilities.

Shrub and Brushland/Saw Palmetto Prairie (FLUCFCS 320 and 321) – Approximately 37.7 acres of shrub and brushland and saw palmetto prairie occur in the southwestern portion of the area proposed for potential future solar generation. In addition, approximately 6.1 acres of saw palmetto prairie occur within the area designated as open space adjacent to the northern border of the Site. These areas are dominated by low growth of saw palmetto and gallberry (*Ilex glabra*) over sandy soils, with additional subdominant species including bahia grass, broomsedge bluestem, blackberry, bracken fern (*Pteridium aquilinum*), wiregrass (*Aristida stricta*), and wax myrtle.

Mixed Hardwood-Conifer Forest (FLUCFCS 434) – Areas of upland mixed pine and oak forest occur within the area proposed for potential future solar generation, comprising approximately 24.6 acres primarily along the western edge of the southern-most citrus grove. Approximately 4.5 acres of mixed hardwood-conifer forest also occur within areas designated as open space near the northern boundary of the Site. The canopy is dominated by a slash pine (*Pinus elliotii*) with a mixture of cabbage palm, water oak (*Quercus nigra*), and laurel oak, while the understory includes saw

palmetto, American beautyberry (*Callicarpa americana*), wax myrtle, rusty lyonia (*Lyonia ferruginea*), gallberry, and occasional cogon grass.

Ditches (FLUCFCS 511) - The area proposed for potential future solar generation contains approximately 55.1 acres of drainage ditches within pasture areas and irrigation ditches within citrus groves. Vegetation within the irrigation ditches is similar to that described above for ditches occurring within the proposed location of the NGCC unit and associated non-linear facilities. Drainage ditches within pastures on the western portion of the site typically connect to mixed wetland hardwoods and mixed hardwood-conifer forested wetlands, described in the following paragraphs.

Mixed Wetland Hardwoods (FLUCFCS 617) – A total of approximately 48.3 acres of mixed wetland hardwoods occur within the area proposed for potential future solar generation. These wetlands are surrounded by improved pasture and/or citrus groves, and have been historically impacted by drainage ditches. Typically, perimeter ditches surround these forested wetlands and connect to additional drainage ditches within the surrounding pasture or irrigation ditches within the citrus groves. The canopy is dominated by a mixture of red maple, blackgum, and sweet bay (*Magnolia virginiana*), with a variety of subdominant canopy species, including American elm, cabbage palm, dahoon holly (*Ilex cassine*), loblolly bay (*Gordonia lasianthus*), water oak, laurel oak, and slash pine. Common shrubs include the exotic species Brazilian pepper as well as a mixture of native species such as wax myrtle, saw palmetto, highbush blueberry (*Vaccinium corymbosum*), fetterbush (*Lyonia lucida*), gallberry, and groundsel tree. A diverse assemblage of understory species occur within these mixed wetland hardwoods, including sawgrass (*Cladium jamaicense*), swamp fern, maidencane (*Panicum hemitomon*), arrowhead, pickerelweed, Virginia chain fern, lemon bacopa (*Bacopa caroliniana*), fireflag (*Thalia geniculata*), soft rush, goldenrod (*Solidago* sp.), lizard's tail (*Saururus cernuus*), sedges (*Cyperus* spp.), bushy broomsedge (*Andropogon glomeratus*), and the exotic old world climbing fern.

Mixed Hardwood-Conifer Forested Wetlands (FLUCFCS 630) - A total of approximately 11.2 acres of mixed hardwood-conifer forested wetlands occur within the area proposed for potential future solar generation. As the case with mixed wetland hardwoods, these wetlands are surrounded by improved pasture and/or citrus groves, and have been historically impacted by drainage ditches. The vegetative composition is similar to that described above for mixed wetland hardwoods, with the addition of slash pine as a co-dominant species in the canopy.

Freshwater Marsh (FLUCFCS 641) – Freshwater marshes comprise approximately 63.8 acres within the area proposed for potential future solar generation. The marshes have been ditched and connect to the drainage ditch network within the surrounding improved pastures. The vegetative

community composition is dominated by native species, such as soft rush, cordgrass (*Spartina bakeri*), smartweed, sawgrass, bushy broomsedge, yellow-eyed grass, maidencane, arrowhead, pickerelweed, Virginia chain fern, capeweed (*Phyla nodiflora*), marsh pennywort, lemon bacopa, and goldenrod.

Wet Prairie (FLUCFCS 643) – Approximately 21.6 acres of wet prairies occur within the area proposed for potential future solar generation, primarily within the southeastern and southwestern portions of the Site. These areas are underlain by hydric soils and support hydrophytic vegetation, but typically contain shallow standing water for only a portion of the year. Common vegetative species observed within these wet prairies include yellow-eyed grass, St. Johns wort (*Hypericum fasciculatum*), bushy broomsedge, goldenrod, sphagnum moss (*Sphagnum* sp.), sundews (*Drosera* spp.), pipeworts (*Eriocaulon* sp.), mermaidweed (*Proserpinaca pectinata*), and occasional arrowhead and pickerelweed.

Vegetative Communities of the Mitigation Area

Unimproved Pasture (FLUCFCS 212) – Areas of unimproved pasture occur along the southern and western portions of the mitigation area, comprising approximately 23 acres. These areas have been historically converted from natural vegetation to bahia grass, but have not been actively maintained and support a variety of weedy herbaceous species and scattered shrubs and trees such as wax myrtle, laurel oak, live oak, and slash pine.

Shrub and Brushland (FLUCFCS 320) – Approximately 98 acres of shrub and brushland occur within the mitigation area, generally within the central portion. Saw palmetto is the dominant species in the shrub layer, with a variety of subdominant species include gallberry, rusty lyonia, fetterbush, wax myrtle, American beautyberry, and running oak (*Quercus pumila*), as well as occasional trees including cabbage palm, laurel oak, slash pine, and persimmon (*Diospyros virginiana*). The groundcover is relatively sparse due to the dense shrub cover; common species include blackroot (*Pterocaulon pycnostachyum*), wiregrass, witchgrass (*Dichanthelium* sp.), muscadine (*Vitis rotundifolia*), ticktrefoil (*Desmodium* sp.), bahia grass, and field paspalum (*Paspalum laeve*).

Pine Flatwoods (FLUCFCS 411) – Pine flatwoods comprise approximately 13.5 acres within the mitigation area. The canopy is dominated by slash pine, with occasional laurel oak and an understory dominated by saw palmetto. Additional shrub species include wax myrtle, gallberry, running oak, fetterbush, and rusty lyonia.

Hardwood-Coniferous Mixed (FLUCFCS 434) – A total of approximately 54 acres of upland hardwood-coniferous forest are located within the mitigation area. Slash pine, cabbage palm, and live



oak are the primary canopy species, with occasional water oak and laurel oak also present. Shrub species include saw palmetto, gallberry, rusty lyonia, American beautyberry, and wax myrtle.

Ditches (FLUCFCS 511) – Approximately 7 acres of ditches occur within western and southern edges of the mitigation area. Typical vegetation within and adjacent to the ditches includes pickerelweed, soft rush, lemon bacopa, alligator weed, Peruvian primrose willow, Mexican primrose willow, smartweed, arrowhead, water spangles, duckweed, torpedo grass, and water hyacinth (*Eichhornia crassipes*).

Mixed Wetland Hardwoods (FLUCFCS 617) – High-quality mixed wetland hardwoods comprise approximately 35 acres of the mitigation area. The canopy species composition is diverse, including red maple, blackgum, pop ash (*Fraxinus caroliniana*), dahoon holly, coastal plain willow, cabbage palm, American elm, and persimmon. A variety of shrub and groundcover species are present, such as buttonbush (*Cephalanthus occidentalis*), groundsel tree, wax myrtle, Brazilian pepper, pickerelweed, arrowhead, fireflag, swamp fern, sawgrass, Virginia chain fern, maidencane, canna (*Canna flacida*), false nettle (*Boehmeria cylindrica*), iris (*Iris hexagona*), water spangles, duckweed, and Virginia saltmarsh mallow (*Kosteletzkya pentacarpos*).

Hydric Pine Flatwoods (FLUCFCS 625) – Approximately 19 acres of hydric pine flatwoods occur within the mitigation area. The community composition is similar to pine flatwoods, with the addition of red maple, dahoon holly, and a variety of plants adapted to hydric soils such as redroot (*Lachnanthes caroliniana*), bogbuttons (*Lachnocaulon* sp.), St. John's wort, sundews, meadowbeauty (*Rhexia* sp.), orange milkroot (*Polygala lutea*), and candyroot (*Polygala nana*).

Mixed Wetland Forest (FLUCFCS 630) – Mixed wetland forest comprises approximately 25.6 acres of the mitigation area. This wetland type contains a similar composition as described above for mixed wetland hardwoods, but with the addition of slash pine as a common canopy component as well as cabbage palm and live oak.

Wetland Shrub (FLUCFCS 631) – Approximately 42 acres of wetland shrubs occur primarily within the east-central portion of the mitigation area. This vegetative community is dominated by a mixture of shrub and groundcover species with a scattered overstory of wetland trees. Common species include saw palmetto, fetterbush, wax myrtle, St. John's wort, gallberry, redroot, carpet grass, camphorweed (*Pluchea odorata*), maidencane, candyroot, bogbuttons, red maple, blackgum, dahoon holly, cabbage palm, slash pine, and live oak.

Freshwater Marsh (FLUCFCS 641) – Large areas of high-quality freshwater marshes occur within the mitigation area, comprising a total of approximately 55.6 acres. The marshes are concentrated along the eastern edge of the mitigation area, contiguous with parcels of mixed wetland hardwoods and wetland shrubs. The herbaceous vegetative community is diverse, with dominant species including maidencane, St. John's wort, and cordgrass and a variety of subdominant species such as pickerelweed, arrowhead, buttonbush, redroot, blue maidencane (*Amphicarpum muhlenbergianum*), fireflag, lemon bacopa, yellow-eyed grass, camphorweed, Virginia chain fern, iris, mermaidweed, marsh pennywort, bushy bluestem, pipeworts, and swamp fern. Shrub and canopy species along the edges and occasionally within the interior of freshwater marsh wetlands include wax myrtle, dahoon holly, blackgum, red maple, cabbage palm, and coastal plain willow.

Wet Prairie (FLUCFCS 643) – Approximately 4 acres of wet prairie occur adjacent to unimproved pasture along the western edge of the mitigation area. These are areas of hydric soil that support low-growing herbaceous wetland vegetation, but typically are not inundated. Common species include yellow-eyed grass, St. Johns wort, mermaidweed, bushy bluestem, marsh pennywort, blue maidencane, sedges, and sundews.

Vegetative Communities Adjacent to the Site

Outside of the Site, dominant features include the SJRWMD Fort Drum Marsh Conservation Area, Blue Cypress Conservation Area, and agricultural lands supporting citrus groves and cattle pasture.

The Fort Drum Marsh Conservation Area comprises approximately 20,862 acres to the east of the OCEC, in the southwestern corner of Indian River County, between the Florida Turnpike and SR 60. The marsh contributes to the headwaters of the St. Johns River and was acquired as part of the Upper St. Johns River Basin Project, undertaken jointly by the SJRWMD and the U.S. Army Corps of Engineers (USACE). The area is managed by the SJRWMD and Florida Fish and Wildlife Conservation Commission (FWC) and contains a mixture of upland and wetland vegetative communities dominated by freshwater marsh, with additional areas of pasture, pine flatwoods, and mixed wetland hardwoods. Fort Drum Creek enters the marsh from the southwest, south of the OCEC property. Water flows north from the marsh through SJRWMD control structures adjacent to SR 60 to enter the Blue Cypress Conservation Area.

The Blue Cypress Conservation Area contains approximately 61,574 acres located between SR 60 and the Indian River/Brevard county line, containing freshwater marsh dominated by maidencane, sawgrass, willows, and buttonbush, as well as lakes, scattered tree islands, and cypress domes. The Blue Cypress Conservation Area is part of the Upper St. Johns Basin project managed by the

SJRWMD and USACE. The area provides recreation opportunities for fishing, waterfowl hunting, and airboat recreation within Blue Cypress Lake, Kenansville Lake, Stick Marsh, and the Blue Cypress Water Management Area.

3.3.6.2 Terrestrial Ecology Systems – Fauna

The Site and surrounding areas provide habitat for a variety of wildlife, primarily avian species and mammals common to pasturelands and forested wetlands. The wildlife habitat in the region surrounding the Site supports a variety of species characteristic of freshwater marsh and agricultural lands of south-central Florida.

A summary of wildlife observed on the Site is provided in Table 3.3.6-1, including avian species, mammals, and herpetofauna. Non-listed terrestrial wildlife directly observed, observed through tracks, scat, and/or burrows, or likely to occur are discussed below based on primary habitat types within the Site; species classified as threatened, endangered, species of special concern (listed species) are discussed in Section 3.3.6.4.

Pastures (FLUCFCS 211 and 212) – Pastures provide limited foraging and breeding/nesting opportunities for many wildlife species, due to a variety of factors such as low diversity of native vegetative forage and insect prey, lack of protection from predators, and frequent disturbances from agricultural operations. Non-listed wildlife observed within areas of pasture include common avian species such as Eastern meadowlark (*Sturnella magna*), savannah sparrow (*Passerculus sandwichensis*), grasshopper sparrow (*Ammodramus savannarum*), cattle egret (*Bubulcus ibis*), killdeer (*Charadrius vociferus*), American kestrel (*Falco sparverius*), red-tailed hawk (*Buteo jamaicensis*), American crow (*Corvus brachyrhynchos*), fish crow (*Corvus ossifragus*), tree swallow (*Tachycineta bicolor*), Eastern phoebe (*Sayornis phoebe*), loggerhead shrike (*Lanius ludovicianus*), and northern mockingbird (*Mimus polyglottos*). Common mammalian wildlife observed within these areas includes nine-banded armadillo (*Dasypus novemcinctus*), coyote (*Canis latrans*), feral hog (*Sus scrofa*), and white-tailed deer (*Odocoileus virginianus*).

Citrus Groves (FLUCFCS 221) – Citrus groves provide limited wildlife habitat due to the historic clearing of native vegetation, topographic grading, ditching, and installation of citrus trees. Common wildlife species observed or likely to occur within the citrus groves include Northern mockingbird, savannah sparrow, Eastern phoebe, blue-gray gnatcatcher (*Polioptila caerulea*), palm warbler (*Setophaga palmarum*), house wren (*Troglodytes aedon*), mourning dove (*Zenaida macroura*), common ground-dove (*Columbina passerine*), northern cardinal (*Cardinalis cardinalis*), wild turkey (*Meleagris gallopavo*), raccoon (*Procyon lotor*), feral hog, white-tailed deer, and nine-banded armadillo.

Shrub and Brushland/Saw Palmetto Prairie (FLUCFCS 320/321) – Non-listed wildlife observed within upland shrub and brushland and saw palmetto prairie habitats on the Site include avian species such as common ground-dove, northern mockingbird, house wren, Carolina wren (*Thryothorus ludovicianus*), white-eyed vireo (*Vireo griseus*), blue-gray gnatcatcher, common yellowthroat (*Geothlypis trichas*), palm warbler, painted bunting (*Passerina ciris*), and Eastern meadowlark, mammalian species such as nine-banded armadillo, feral hog, coyote, and, white-tailed deer, and herpetofauna such as black racer (*Coluber constrictor priapus*) and yellow rat snake (*Pantherophis alleghaniensis*).

Upland Forest (FLUCFCS 411 and 434) – Areas of upland forest on the Site provide suitable forage and breeding/nesting habitat for non-listed avian species such as wild turkey, swallow-tailed kite (*Elanoides forficatus*), red-shouldered hawk (*Buteo lineatus*), barred owl (*Strix varia*), mourning dove, red-bellied woodpecker (*Melanerpes caroliniana*), pileated woodpecker (*Hylatomus pileatus*), yellow-bellied sapsucker (*Sphyrapicus varius*), white-eyed vireo, blue jay (*Cyanocitta cristata*), tufted titmouse (*Baeolophus bicolor*), Carolina wren, blue-gray gnatcatcher, ruby-crowned kinglet (*Regulus calendula*), American robin (*Turdus migratorius*), catbird (*Dumetella carolinensis*), black-and-white warbler (*Mniotilta varia*), yellow-rumped warbler (*Setophaga coronata*), northern parula (*Setophaga americana*), northern cardinal, and painted bunting. Common mammalian species observed or likely to occur include feral hog, white-tailed deer, and nine-banded armadillo, while a variety of herpetofauna are likely to occur within upland forests on the Site including yellow rat snake, black racer, ring-necked snake (*Diadophis punctatus*), Cuban brown anole (*Anolis sagrei*), and green anole (*Anolis caroliniana*).

Ditches (FLUCFCS 511) – Citrus irrigation ditches and pasture drainage ditches provide habitat for a variety of non-listed terrestrial wildlife, including wading birds such as great egret, green heron, and great blue heron, raptors such as American kestrel and red-shouldered hawk, passerine birds such as belted kingfisher (*Megasceryle alcyon*), northern mockingbird, savannah sparrow, eastern phoebe, marsh wren (*Cistothorus palustris*), house wren, red-winged blackbird (*Agelaius phoeniceus*), common grackle (*Quiscalus quiscula*), and boat-tailed grackle (*Quiscalus major*), herpetofauna such as water moccasin (*Agkistrodon piscivorus*), banded water snake (*Nerodia fasciata*), leopard frog (*Lithobates pipiens*), southern cricket frog (*Acris gryllus*), green tree frog (*Hyla cinerea*), and mammalian species including feral hog, white-tailed deer, coyote, and raccoon.

Forested Wetlands (FLUCFS 617 and 630) – Forested wetlands on the Site provide suitable forage and breeding/nesting habitat for avian species, mammals, and herpetofauna. Non-listed terrestrial species observed or likely to occur with these habitats include a variety of avian species, such as

swallow-tailed kite, red-shouldered hawk, short-tailed hawk (*Buteo brachyurus*), barred owl, red-bellied woodpecker, pileated woodpecker, yellow-bellied sapsucker, blue jay, tufted titmouse, Carolina wren, blue-gray gnatcatcher, ruby-crowned kinglet, American robin, black-and-white warbler, yellow-rumped warbler, northern waterthrush (*Parkesia noveboracensis*), northern parula, northern cardinal, red-winged blackbird, and common grackle. Non-listed mammalian species include raccoon, gray squirrel, marsh rabbit, nine-banded armadillo, and feral hog. A variety of herpetofauna utilize forested wetlands, including water moccasin, leopard frog, southern cricket frog, banded water snake, green tree frog, Cuban brown anole, and green anole.

Non-forested Wetlands (FLUCFCS 631, 641, and 643) – A variety of non-listed wildlife species were observed or are likely to occur within the non-forested wetlands on the Site. These include wetland-dependent avian species such as mottled duck (*Anas fulvigula*), anhinga (*Anhinga anhinga*), great egret (*Casmerodias albus*), green heron (*Butorides virescens*), great blue heron (*Ardea herodias*), Wilson’s snipe (*Gallinago delicata*), belted kingfisher, red-winged blackbird, common grackle, and boat-tailed grackle. Other avian species observed or likely to occur within non-forested wetlands on the OCEC Site include red-shouldered hawk, marsh wren, common yellowthroat, and northern waterthrush. Mammalian species such as white-tailed deer and raccoon were observed, along with herpetofauna such as banded water snake and southern cricket frog.

3.3.6.3 Aquatic Ecology Systems – Fauna

Aquatic systems on the Site are limited to excavated irrigation and drainage ditches and wetlands. Wetlands on the site provide limited habitat for aquatic biota due to fluctuations in water levels and ditching. The citrus irrigation ditches provide more perennial water and do support common freshwater forage and gamefish as well as some exotic species of fish. Species observed or likely to occur include mosquitofish (*Gambusia holbrokii*), least killifish (*Heterandria formosa*), golden topminnow (*Fundulus chrysotus*), and sailfin molly (*Poecilia latipinna*), as well as brown bullhead (*Ameiurus nebulosus*), the exotics brown hoplo (*Hoplosternum littorale*) and sailfin catfish (*Pterygoplichthys multiradiatus*), and common sunfish such as bluegill (*Lepomis macrochirus*), largemouth bass (*Micropterus salmoides*), redear sunfish (*Lepomis microlophus*), and warmouth (*Lepomis gulosus*). Additional aquatic species likely to utilize the irrigation ditches include softshell turtle (*Apalone ferox*), red-eared slider (*Trachemys scripta elegans*), common snapping turtle (*Chelydra serpentina*), eastern mud turtle (*Kinosternon subrubrum*), and common musk turtle (*Sternotherus odoratus*).

3.3.6.4 Threatened and Endangered Species – Flora and Fauna

Listed plant species are those plants that are listed by the U.S. Fish and Wildlife Service (USFWS) or the Florida Department of Agriculture and Consumer Services (FDACS) as endangered, threatened, of special concern, or commercially exploited. Listed animal species are those animals classified as endangered, threatened, or of special concern, federally by the USFWS or within the State of Florida by the Florida Fish and Wildlife Conservation Commission (FWC).

There are a number of federal- and state-listed animals that have been observed or are likely to occur at the Site. These species are common to the area and use other similar habitats that are found throughout the surrounding region.

Threatened and Endangered Species - Methodology

Prior to field reconnaissance, county-specific lists of threatened and endangered species were obtained from the Florida Natural Areas Inventory (FNAI, 2014) (Table 3.3.6-2). In addition, geographic information system (GIS) data were obtained from the FNAI, which maintains a database of known occurrences of listed species throughout the State of Florida.

The FNAI database was queried and documented locations of listed species within the Site and vicinity were identified. Listed and non-listed wildlife species observed during the 2014 and 2015 field surveys were recorded, supplemented by evaluation of habitat conditions suitable for listed species to help identify additional species that were not observed but are likely to occur. In addition, site visits were conducted with representatives of the FWC on 3/4/2015 and 4/29/2015 and with representatives of the USFWS on 4/29/2015.

Plant and Animal Surveys

Because of the rarity and seasonality of threatened and endangered species, either multi-season surveys or an evaluation of threatened and endangered species habitat conditions are necessary to determine their presence or absence. For this study, multi-season threatened and endangered species surveys were combined with the evaluation of habitat conditions to determine the presence or absence of threatened and endangered species. Based on the Okeechobee County list of threatened and endangered species and the available habitats within the Site and surrounding area, federally and state-listed species that were observed or are likely to occur within the area were identified and are discussed below.

Flora – Threatened, endangered, and/or plant species of special concern known to occur in Okeechobee County and their probability of occurrence at the Site are listed in Table 3.3.6-2. The

FNAI database review did not indicate any reported occurrences of listed plant species in the vicinity of the Site. No listed plant species were observed within the Site during field surveys, however, based on presence of suitable habitat there is a moderate likelihood of occurrence for four species of state-endangered plants, the many-flowered grass-pink (*Calopogon multiflorus*), celestial lily (*Nemastylis floridana*), hand fern (*Ophioglossum palmatum*), and cutthroat grass (*Panicum abscissum*). A brief description of each species is provided below.

Many-flowered grass-pink (E) - The many-flowered grass-pink is a species of orchid that occurs in dry to moist flatwoods with longleaf pine, wiregrass, and saw palmetto (FNAI, 2001). It is an herbaceous plant with 1-2 thin grass-like basal leaves typically approximately 4 inches long and a flower stalk up to 16 inches tall, with up to 15 dark pink flowers between March and July. It prefers open flatwoods that burn every 2 to 3 years. No individuals were observed on the OCEC Site, although they may occur within areas of flatwoods within the mitigation area in the northeastern portion of the Site.

Celestial lily (E) – The celestial lily is a perennial herb of the iris family that occurs in wet flatwoods, prairies, marshes, and cabbage palm hammock edges (FNAI, 2001). It grows from a bulb with a few grass-like basal leaves and a single stem with scattered small leaves. The celestial lily flowers between August and October, with its dark blue 6-petaled flowers opening around 4 PM and closing by dusk. As with the many-flowered grass pine, it prefers more open habitat that are regularly burned on a 2 to 3 year rotation. No individuals were observed on the OCEC Site, although they may occur within areas of wet flatwoods within the mitigation area in the northeastern portion of the Site.

Hand fern (E) – Hand ferns occur in old leaf bases of cabbage palms in maritime hammocks and wet hammocks (FNAI, 2001). They have flat, fleshy, drooping, coarsely veined, evergreen leaves with up to 7 lobes or “fingers” and long leaf stalks. No individuals were observed on the OCEC Site, but based on the presence of suitable habitat there is a moderate probability of occurrence on the Site, primarily in forested uplands and wetlands with cabbage palm within the mitigation area.

Cutthroat grass (E) - Cutthroat grass is classified as endangered in the State of Florida, but is not listed by the USFWS. It is a perennial grass found in mesic flatwoods and dry prairies; wet flatwoods; edges of depressional marshes; wet prairies; and, on the ecotones between flatwoods and drainageways. No individuals were observed, but based on the presence of suitable habitat there is a moderate likelihood of occurrence on the OCEC Site.

Fauna – Threatened, endangered, and/or animal species of special concern known to occur in Okeechobee County and their probability of occurrence at the Site are listed in Table 3.3.6-2. The

FNAI database review did not indicate any reported occurrences of listed animal species in the vicinity of the Site.

Listed animal species observed within and adjacent to the Site during the field reconnaissance conducted November 2014 through July 2015 include six species of wading birds, limpkin (*Aramus guarauna*), little blue heron (*Egretta caerulea*), tricolored heron (*Egretta tricolor*), white ibis (*Eudocimus albus*), Florida sandhill crane (*Grus canadensis pratensis*), and wood stork (*Mycteria americana*), as well as the American alligator (*Alligator mississippiensis*), Sherman's fox squirrel (*Sciurus niger shermani*), gopher tortoise (*Gopherus polyphemus*), Southeastern American kestrel (*Falco sparverius paulus*), and caracara (*Caracara cheriway*).

Species that were not observed, but have a moderate or high probability of occurrence at the OCEC Site (Table 3.3.6-2) based on the presence of suitable habitat, include the gopher frog (*Rana capito*), Eastern indigo snake (*Drymarchon couperi*), Florida grasshopper sparrow (*Ammodramus savannarum floridanus*), Florida burrowing owl (*Athene cunicularia floridana*), snowy egret (*Egretta thula*), and snail kite (*Rostrhamus sociabilis plumbeus*).

A brief description of each species observed or with a moderate or high probability to occur on the OCEC Site is provided below.

Limpkin (SSC) - The limpkin is classified as a species of special concern by the FWC, but is not listed federally. It is a large, brown feathered, long-billed, long legged wader of swamps and marshes. Limpkins inhabit mangroves, freshwater marshes, swamps, springs and spring runs, and pond and river margins. They are also found along lake margins in peninsular Florida and swales, strand swamps, sloughs, and impoundments in south Florida and may also forage in ruderal areas such as sugarcane fields and the banks of irrigation canals. Limpkins utilize a wide range of nesting sites, including mounds of aquatic vegetation and marsh grasses among cypress knees and high up in trees. Nesting generally occurs from late February - May in north Florida and late January - March in central Florida, and possibly earlier in south Florida (FNAI, 2001). An individual was observed adjacent to the irrigation ditch between the citrus groves and western pasture on the OCEC Site.

Little blue heron (SSC) - The little blue heron is classified as a species of special concern by the FWC, but is not listed by the USFWS. The little blue heron is a medium-sized heron, with a purplish to maroon-brown head and neck, small white patch on throat and upper neck, and slate-blue body. The little blue heron feeds in shallow freshwater, brackish, and saltwater habitats. The largest nesting colonies of little blue herons occur in coastal areas, but they prefer to forage in freshwater lakes, marshes, swamps, and streams. Little blue herons nest in a variety of woody vegetation types,

including cypress, willow, maple, black mangrove, and cabbage palm. They usually breed in mixed-species colonies in flooded vegetation or on islands. Little blue herons are mostly resident throughout year, but numbers in north Florida in winter are lower than numbers during spring, summer, and fall (FNAI, 2001). Little blue herons were observed within freshwater marsh and ditch habitats on the OCEC Site.

Tricolored heron (SSC) - The tricolored heron is classified as a species of special concern by the FWC, but is not listed by the USFWS. It is a medium-sized heron with dark slate coloration on the head, neck, and body that contrasts with the white rump, belly, and undertail. Most tricolor nesting colonies occur on mangrove islands or in willow thickets in fresh water, but nesting sites include other woody thickets on islands or over standing water. Egg laying can begin as early as February in south Florida and continue into August (Ogden, 2001c). Tricolored herons prefer coastal environments, but will feed in a variety of permanently and seasonally flooded wetlands, mangrove swamps, tidal creeks, ditches, and edges of ponds and lakes. Tricolored herons are permanent residents and found throughout Florida in all seasons, except they are rare in winter in the western Panhandle and also somewhat less common inland during winter (FNAI, 2001). Tricolored herons were observed within freshwater marsh and ditch habitats on the OCEC Site.

White ibis (SSC) - The white ibis is classified as a species of special concern by the FWC, but is not listed by the USFWS. The white ibis is found throughout Florida in a wide variety of habitats, including freshwater and brackish marshes, salt flats and salt marsh meadows, many types of forested wetlands, wet prairies, swales, seasonally inundated fields, and man-made ditches. White ibis typically nest in Florida from March to August. Nesting occurs in trees, shrubs, cactus, and grass clumps, from ground level to a height of approximately 50 feet. Eggs incubate for a period of approximately 22 days and young begin leaving the nest around 9 to 16 days of age, but complete independence from the parents does not occur until 40 to 50 days of age (FWC, 2003). White ibis were observed within pasture, freshwater marsh, and ditch habitats on the OCEC Site.

Florida sandhill crane (T) - The Florida sandhill crane is classified as threatened by the FWC, but is not listed by the USFWS. The Florida sandhill crane is a subspecies that is indistinguishable from the greater sandhill crane, which winters in Florida. Greater sandhill cranes generally arrive in Florida in October and leave in March. Florida sandhill cranes typically start nesting in late December and continue through June, creating nest mounds of plant material in herbaceous wetlands. The female will lay two eggs, which incubate for 28 to 32 days. Fledging occurs at about 67 days (FWC, 2003). Sandhill cranes were observed within pasture areas near freshwater marsh and ditch habitats on the

OCEC Site. Due the time of year, it was not possible to determine if the individuals were the non-listed greater sandhill crane or the resident Florida sandhill crane.

Wood stork (E) - The wood stork is classified as threatened by the USFWS and the FWC. Wood storks utilize a variety of habitats, including cypress/gum ponds, forested wetlands, river swamps, marshes (freshwater and saltwater), and bays. The wood stork is highly gregarious in its nesting and feeding behavior. They are tactile feeders (vision is seldom used to locate or catch prey) and usually forage in shallow water (6 to 20 inches). Small fish are the primary food items, but storks also consume crustaceans, salamanders, tadpoles, and insects. The distance between nesting colonies and feeding areas can range up to 60 miles or more, although the average distance is typically 12 to 15 kilometers (km) (7 to 9 miles) (Ogden, 1996a). Colonies are typically located on coastal islands and on willow islands in swamps, cypress swamps, impoundments, and other inundated areas. Nesting has been reported throughout the year, with nests consisting of platforms of sticks formed in tall cypress trees and, less often, mangroves. Typically, three to five eggs are laid and incubate for 28 to 32 days before hatching, while the young fledge in 50 to 55 days. In south Florida, the area within 18.6 miles of a wood stork colony is considered a core foraging area. The OCEC Site is not located within the core foraging areas associated within any wood stork colonies. Wood storks were observed adjacent to ditch habitats on the OCEC Site, primarily the irrigation ditch between the citrus groves and the western pasture.

American alligator (SAT) – American alligators are classified as threatened by the USFWS due to their similarity in appearance to the endangered American crocodile (*Crocodylus acutus*). The FWC also regulates the harvesting of alligators and their eggs. Alligators nest in late spring and young hatch in the summer. Females nest along the water edge, creating a nest mound of herbaceous vegetation. Approximately 30 to 60 eggs will be laid and will incubate for 2 months in the decomposing vegetation. About half of these eggs will survive to maturity, with young typically hatching in mid-August through September (FNAI, 2001). Alligators are commonly observed within the citrus irrigation ditches on the OCEC Site.

Sherman's fox squirrel (SSC) – Sherman's fox squirrel is classified as a species of special concern by the FWC, but is not listed federally by the USFWS. Sherman's fox squirrels are larger than gray squirrels and have tails almost as long as their head and torso length. They occur in sandhills, pine flatwoods, pastures, and other open, ruderal habitats with scattered pines and oaks. They depend on a variety of oak trees for seasonal food and nest material; longleaf pine cones and seeds are important foods. Sherman's fox squirrels are active year-round in Florida (FNAI, 2001). An individual was

observed within mixed hardwood – forest habitat within the OCEC mitigation area in the northeastern portion of the Site.

Gopher tortoise (T) – Gopher tortoises are classified as a threatened species in the State of Florida due to loss of preferred habitat, and are a candidate species for listing by the USFWS. They are medium-sized terrestrial turtles that dig burrows for shelter, typically in dry sandy areas where the depth to the seasonal high water table is greater than 45 centimeters (FWC, 2009). Gopher tortoises are commonly found in dry upland habitats, such as sandhills, scrub, xeric oak hammock, and dry pine flatwoods. They are also found in pastures and old fields (FNAI, 2001). The breeding season for gopher tortoises is generally considered to be spring, but males may attempt to mate from April through December. During May and June, females deposit 3-12 eggs in the sand mounds in their burrow mounds or in other nearby open sandy sites. Incubation depends upon climate and takes from 80 to 110 days. Other listed species such as the Eastern indigo snake, gopher frog, Florida mouse, and Florida pine snake may utilize gopher tortoise burrows. One individual gopher tortoise and an active burrow were observed on the OCEC Site near the northern edge of the property to the west of the existing access road, outside of the area proposed for the OCEC Unit 1. Two additional burrows were observed within the southwestern portion of the Site in the area proposed for future solar generation. It is likely that additional gopher tortoise burrows occur within the saw palmetto shrub and brushland within the southwestern portion of the Site, as well as within upland shrub and brush habitat within the mitigation area in the northeast portion of the Site.

Southeastern American kestrel (T) – Southeastern American kestrels are classified as threatened by the FWC, but are not listed federally by the USFWS. Kestrels are the smallest falcon in the U.S. They are found throughout Florida year-round, but northern migrants are also present in the winter. The subspecies that breeds in Florida (southeastern American kestrel) is listed as threatened by the FWC, but the northern migrants are not listed. Northern migrants generally arrive in September and leave by March, but there are some records outside of these dates. In Florida, the southeastern American kestrel typically nests from March to June (Collopy, 1996). American kestrels were observed flying over pasture habitats at the OCEC Site, but due to the time of the observation, it was not possible to determine if they were the listed subspecies.

Caracara (T) - The caracara is classified as threatened by both the FWC and USFWS. It is primarily a bird of open habitats, and most abundant in south central Florida, including Osceola, Highlands, Okeechobee, DeSoto, Glades, and Hendry Counties (FNAI, 2001). Its nesting habitat in Florida consists of large expanses of pastures, grasslands, or prairies dotted with numerous shallow ponds and sloughs and single or small clumps of live oaks (*Quercus virginiana*), cabbage palms (*Sabal*

palmetto), and cypress (*Taxodium* spp.) (Morrison 2001). Preferred nest trees are cabbage palms, and adult pairs generally stay year-round on territory, which may be maintained for years (Morrison, 2001). One individual caracara was observed during field surveys within a pine tree on the eastern edge of the western pasture, within the area proposed for future solar generation. No nest trees were observed.

Gopher Frog (SSC) - The gopher frog is listed as a species of special concern by the FWC, but is not listed federally by the USFWS. The gopher frog is a medium-sized, boldly spotted frog with a chunky appearance. Gopher frogs are found in dry, sandy uplands that include isolated wetlands or large ponds within one mile. Breeding occurs in seasonal or more permanent wetlands. Gopher frogs are nocturnal, spending the daytime hours in stump holes, tunnels, or burrows (particularly those of gopher tortoises) (FNAI, 2001). No individuals were observed on the OCEC Site.

Eastern indigo snake (T) - The Eastern indigo snake is classified as a threatened species by both the USFWS and the FWC. In peninsular Florida, the Eastern indigo snake may be found in a variety of habitats ranging from swamps to xeric pinelands and scrub (Moler, 1992). In its northern range, it is often commensal with gopher tortoises, using their burrows for shelter during the winter (FNAI, 2001). No individuals were observed at the OCEC Site, but they may occur based on the presence of suitable habitat.

Florida grasshopper sparrow (E) - The Florida grasshopper sparrow is endemic to the dry prairie of south-central Florida, dependent upon large (greater than 50 ha), treeless, relatively poorly-drained grasslands that have a history of fires (USFWS, 1988) at a frequency of every two to three years to maintain its open vegetative habitat and to prevent the invasion of pines and hardwoods (USFWS, 1999). It is a non-migratory subspecies of the non-listed grasshopper sparrow (*Ammodramus* *savannarum*) and is classified as endangered by both the USFWS and FWC. This secretive, ground-dwelling subspecies historically ranged from the prairie and grassland regions of central to south Florida, with records in Collier, DeSoto, Glades, Hendry, Highlands, Miami-Dade, Polk, Okeechobee, and Osceola (USFWS, 1999). More recent surveys have shown it has become narrowly restricted to the prairie and cattle pasture region of central and south central Florida, primarily Polk, Osceola, Highlands, and Okeechobee counties (FNAI, 2001), within the Three Lakes Wildlife Management Area, Kissimmee Prairie State Preserve, and Avon Park Air Force Range (USFWS 2008). The primary threats to their biological success are historically tied to the degradation of dry prairie and grassland habitats and conversion of them into agricultural uses, primarily intensively managed and maintained cattle pasture, sod farms, and row crops. Low nesting success rates, primarily due to nest predation from native snakes and mammals and invasive exotic species such as

the red imported fire ant (*Solenopsis invicta*), also pose a threat to the viability of the existing populations (USFWS, 2008).

No individuals were observed on the OCEC Site; however, based on the presence of pasture habitat and site review with representatives of the USFWS on April 29, 2015, there is a moderate probability of Florida grasshopper sparrow occurrence within pastures on the western portion of the Site, within the area proposed for future solar generation. Based on discussion with USFWS representatives at the Site, the improved pasture within the area proposed for the OCEC Unit 1 does not provide conditions suitable for the Florida grasshopper sparrow, primarily due to lack of open, treeless conditions, presence of cattle, and lack of preferred groundcover vegetation and shrub structure.

Florida burrowing owl (SSC) - Florida burrowing owls are classified as a species of special concern by the FWC, but are not listed federally by the USFWS. They are opportunistic feeders, preying on invertebrates, small mammals, and other birds. Burrowing owls are small, ground-dwelling owls with long legs, white chin strip, round head, and a stubby tail. They will often dig their own burrows, and prior to laying eggs, will line the entrance of the burrows with materials such as palm fronds and grass clumps. In Florida, burrowing owl burrows are considered active (potentially having eggs or unfledged young) from February 15 to July 10. The female lays 7 to 10 eggs, which she incubates for 28 to 30 days (FWC, 2011). No individuals were observed on the OCEC Site, but due to the presence of suitable pasture habitat, there is a moderate probability of occurrence.

Snowy egret (SSC) - The snowy egret is classified as a species of special concern by the FWC, but is not listed by the USFWS. The snowy egret is a medium sized, all-white wading bird. Adults have black legs with bright yellow feet. Snowy egrets occur in Florida in all seasons, but are generally less common in winter. Snowy egrets nest both inland and in coastal wetlands, with nests placed in many types of woody shrubs, especially mangroves and willows. Almost all nesting is over shallow waters or on islands that are separated from shoreline by extensive open water. Snowy egrets feed in a variety of permanently and seasonally flooded wetlands, streams, lakes, and swamps, and in manmade impoundments and ditches. A wide variety of wetland types must be available within 7 miles to support breeding colonies (FNAI, 2001). Nesting may begin as early as January in southern Florida. Egg laying occurs primarily between late March and June, but may continue into August (Ogden, 1996b). Although no individuals were observed during field surveys, it is likely that they utilize freshwater marsh and ditch habitats on the OCEC Site.

Snail kite (E) - The snail kite is classified as endangered by both FWC and USFWS. It is a medium-sized raptor with a square-tipped tail and distinctive white base, red eyes, and a slender decurved bill adapted for extracting the kite's primary prey, the native and exotic apple snail (*Pomacea paludosa*

and *P. insularum*). The Florida population of snail kites is restricted to the watersheds of the Everglades, lakes Okeechobee and Kissimmee, and the upper St. Johns River, with a highly specific diet composed almost entirely of apple snails (USFWS, 1999). Snail kites are nomadic in response to water depths, hydroperiod, food availability, and other habitat changes (Sykes, 1978 and 1983; Beissinger and Takekawa, 1983; Bennetts *et al.*, 1994). Snail kite habitat consists of freshwater marshes and the shallow vegetated edges of lakes (natural and manmade) where apple snails can be found (USFWS, 1999). Snail kites require foraging areas that are relatively clear and open in order to visually search for apple snails, with interspersed emergent vegetation, which enables apple snails to climb near the surface to feed, breathe, and lay eggs (USFWS, 1999). Nearly continuous flooding of wetlands for more than 1 year is needed to support apple snail populations that, in turn, sustain foraging by the snail kite (Sykes, 1979; Beissinger *et al.*, 1988). Critical habitat was designated for the snail kite in 1977 and USFWS has also proposed a consultation area outside the designated critical habitat, which includes all of South Florida from north of Lake Okeechobee to Florida Bay. The OCEC Site is not located within designated snail kite critical habitat but is within the consultation area. No individuals were observed on the OCEC Site, although freshwater marshes within the mitigation area in the northeastern portion of the Site may provide suitable habitat.

3.3.6.5 Pre-Existing Stresses

The pre-existing stresses to ecological systems on the Site and surrounding areas are the result of historical conversion of native habitat to citrus and cattle production. The natural topography, soils, and hydrology of the majority of the Site have been altered as a result of the conversion to agricultural land uses. Natural surface water drainage features have been modified through construction of citrus grove irrigation ditches and drainage ditches within pastures. Wetlands within the Site have been affected by drainage ditches and conversion of adjacent native upland habitat for agricultural uses. Upland forest and shrub and brushland have been affected by fire suppression.

3.3.6.6 Measurement Programs

Terrestrial ecological resources were evaluated through field reconnaissance, consultation and site visits with FWC and USFWS, previous studies, and literature searches. Vegetative communities, wildlife utilization, and potential for threatened and endangered wildlife occurrence were addressed during field surveys conducted from November 2014 to July 2015.

3.3.7 Noise

3.3.7.1 Background

Sound propagation involves three principal components: a noise source, a person or a group of people, and the transmission path. While two of these components, the noise source and the



transmission path, are easily quantified (*i.e.*, by direct measurements or through predictive calculations), the effect of noise on humans is difficult to determine due to the varying responses of humans to the same or similar noise patterns. The perception of sound (noise) by humans is subjective, and just as for odors and taste, it is very difficult to predict a response from any particular individual to these levels.

Noise above certain levels could impact the health and welfare of plant employees, the general public and wildlife. The magnitude of noise levels or loudness is referred to as “sound pressure level” (SPL), with units in decibels (dB). Decibels are calculated as a logarithmic function of SPL in air to a reference effective pressure, which is considered the hearing threshold, or:

$$\text{SPL} = 20 \log_{10} (P_e/P_o)$$

where: P_e = measured effective pressure of sound wave in micropascals (μPa), and

P_o = reference effective pressure of 20 μPa .

To account for the effect of how the human ear perceives sound pressure, at moderate to low levels, SPLs are adjusted for frequency (or pitch). One of the most commonly used frequency filters is the A-weighting (dBA), which adjusts measurements for the approximated response of the human ear to low frequency SPLs [*i.e.*, below 1,000 hertz (Hz)] and high frequency SPLs (*i.e.*, above 10,000 Hz).

Noise has two types of effects on people: the direct physical effect such as hearing loss, and the less direct effect involving interference with activities such as sleep and conversation. In the early 1970s, the EPA established numerical noise standards (EPA, 1974). The noise standards were developed without considering cost or technical feasibility. In developing these standards, the EPA drew upon a large body of survey data describing the degree of activity interference and resulting annoyance for a variety of noise levels. However, these standards were not meant to be pragmatic or realistic for short-term noise control purposes (Harris, 1991).

3.3.7.2 Noise Regulations

There are no federal, State, or Okeechobee County noise regulations or standards applicable to the Project. Under the Clean Air Act, the EPA administrator established the Office of Noise Abatement and Control (ONAC) to carry out investigations and studies on noise and its effect on public health and welfare. Through ONAC, the EPA coordinated all federal noise control activities, but in 1981 concluded that noise issues were best handled at the state and local level. However, the EPA has identified noise levels necessary to protect public health and welfare against hearing loss, annoyance and activity interference. These noise levels are contained in the EPA document, "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate

Margin of Safety." One of the purposes of this document was to provide a basis for State and local governments' judgments in setting standards. The document identifies a 24-hour exposure level of 70 decibels as the level of environmental noise that will prevent any measurable hearing loss over a lifetime. Likewise, levels of 55 decibels outdoors and 45 decibels indoors are identified as preventing activity interference and annoyance. These levels of noise are considered those that will permit spoken conversation and other activities such as sleeping, working and recreation, which are part of the daily human condition (EPA, 1974). Many local government noise ordinances have adopted noise standards similar to those recommended by EPA.

Indian River County is located on the border of the Site boundary and has residences within two miles of the Project location. Indian River County has a noise ordinance contained in Title IX, Chapter 974 Noise and Vibration Control of the Indian River County Code of Ordinances. This noise ordinance is not applicable to portions of the Project that are located in Okeechobee County, but will be used for comparative purposes only.

Chapter 974 establishes noise requirements that include a general prohibition of unnecessary and unreasonably loud noise, specific activities that are prohibited and quantitative noise limits by zoning district. Section 974.05 establishes the Indian River County quantitative noise standards for five zoning districts.

For evaluation purposes, the construction noise and operational noise impacts are compared to noise levels for residential districts, since some residences are located beyond FPL's property to the north and northeast. For construction noise, the numerical noise value that would be appropriate for comparison is the L_{10} , representing noise from sources that occur intermittently such as construction equipment and traffic. The L_{10} noise limit in the Indian River County noise ordinance for residential zoned districts is 65 dBA during the daytime and 60 dBA during the nighttime. For operational noise, the numerical noise value that would be appropriate for comparison is the L_{50} . The L_{50} noise limit in the Indian River County noise ordinance for residential zoned districts is 60 dBA during the daytime and 55 dBA during the nighttime.

The Indian River County noise ordinance also includes various exemptions that include authorized safety signals and warning devices and agricultural operations. The Indian River County L_{10} and L_{50} noise standards by zoning district are similar to noise levels generally adopted by local governments and are recognized as appropriate levels that would not be considered unreasonably loud or a nuisance.

3.3.7.3 Ambient Noise Measurements

Ambient noise monitoring was conducted in January 2015 to obtain baseline noise measurements for this Project. The equipment and procedures used to monitor the baseline noise levels conformed to the requirements for procedures, methods, and equipment specified by the American National Standards Institute (ANSI) (1993, R2008). Specifically, the noise measurements followed the ANSI S12.9/Part 3-1993 (R2008): “Quantities and Procedures for Description and Measurement of Environmental Sound, Part 3: Short-term Measurements with an Observer Present.”

Noise measurements were taken using a sound-level meter that was set to the slow-response mode to obtain consistent, integrated, A-weighted SPLs. Concurrent one-third octave band frequencies were also measured at all monitoring locations. The octave band data from each monitoring location was measured and stored during each monitoring period. Both daytime and nighttime monitoring measurements were performed to accurately assess the baseline noise conditions.

Integrated SPL data consisting of the following noise parameters were collected at each location:

- L_{eq} - The sound pressure level averaged over the measurement period; this parameter is the continuous, steady sound pressure level that would have the same total acoustic energy as the real fluctuating noise over the same time period;
- L_{max} - The maximum sound pressure level for the sampling period;
- L_{min} - The minimum sound pressure level for the sampling period; and
- L_n - The sound-pressure levels which were exceeded n percent of the time during the sampling period. For example, L_{90} is the level exceeded 90 percent of the time.

The SPL data were analyzed and reported in both dB and dBA. The higher the decibel value, the louder the sound.

The SPL averages were calculated using the following formula:

$$\text{Average SPL} = 10 \log \frac{\sum_{i=1}^N 10^{(SPL_i/10)}}{N}$$

where: N = number of observations, and
 SPL_i = individual SPL in data set.

The SPLs and octave-band data were collected during each monitoring event.



The noise monitoring equipment used during the study included:

- Larson Davis Model 824 and 831 Precision Integrating Sound Level Meters with Real Time Frequency Analyzer,
- Larson Davis Model PRM902 Microphone Preamplifier,
- Larson Davis Model 2560 Prepolarized ½ inch Condenser Microphone,
- Windscreen, tripod, and various cables, and
- Larson Davis Model CAL200 Sound Level Calibrator, 94/114 dB at 1,000 Hz.

Monitoring was conducted using the sound-level meter mounted on a tripod at a height of 1.5 meters (m) (5 ft) above grade. A windscreen was used because all measurements were taken outdoors. The microphone was positioned so that a random incidence response was achieved. The sound level meter and octave-band analyzer were calibrated immediately prior to and just after the sampling period to provide a quality control check of the sound-level meter's operation during monitoring.

Local meteorological conditions (wind speed, wind direction, temperature, and relative humidity) were measured during the monitoring periods. The operator recorded detailed field notes during monitoring and included major noise sources in the area. The Larson Davis sound level meter complies with Type I - Precision requirements set forth for sound-level meters and for one-third octave filters. The calibration certificates are provided in SCA Appendix 10.7.3.

3.3.7.4 Noise Monitoring Locations

Figure 3.3.7-1 presents the six locations where SPLs and octave-band data were collected during the January 2015 ambient-noise monitoring. The locations included one 24-hour measurements location and five locations where daytime (between 7 a.m. and 10 p.m.) and nighttime (between 10 p.m. and 7 a.m.) measurements were collected for a minimum of 15 minutes. The 24-hour monitoring site was located on the OCEC Unit 1 near areas where operations are expected. The daytime and nighttime sites were located close to sensitive receptors.

The receptors most sensitive to noise typically include residences, hospitals, schools, parks, and churches. The closest sensitive receptors to the Power Block are residences about 1 mile northwest and east of the OCEC Unit 1. No other sensitive receptors are located within two miles of the Site.

3.3.7.5 Measured Ambient Noise Levels

Table 3.3.7-1 presents the baseline ambient sound pressure levels obtained in January 2015. SPL data are integrated over the monitoring period, and reflect the “equivalent,” “minimum,” “maximum,” and “10th percentile” (L_{90} = the SPL exceeded 90 percent of the time during the monitoring period).

The L_{eq} reflects the total noise energy over the monitoring periods at each location. As a result, loud transient noises, such as noise from traffic, aircraft, insects, and barking dogs, all influenced the observed values. The more persistent the transient loud noises, the higher the L_{eq} . For this reason, a more appropriate indicator of background noise levels is the L_{90} , which is the sound pressure level exceeded 90 percent of the time. Transient noise is generally excluded from the L_{90} unless almost continuous noise occurs during monitoring, such as along a heavily traveled highway. The L_{90} also is appropriate for background noise levels generated by continuously operating equipment associated with industrial activities such as a power plant. The L_{min} and L_{max} reflect the minimum and maximum observed sound pressure levels, respectively. When the magnitude of the L_{max} is close (within a few dBA) to the L_{eq} , the observed noise levels are typically influenced by a continuous source of noise. When the magnitude of the L_{min} is close (within a few dBA) to the L_{90} , the observed sound pressure levels typically indicate lower amounts of transient noises.

The ambient daytime L_{eq} observed in January 2015 are shown in Table 3.3.7-1 and reflect the influence of distant highway and local traffic, airplane and helicopter noise and typical noise sources from surrounding farmland and open pastures – such as insects, sounds of nature and cattle during the daytime and nighttime. The daytime L_{eq} for the property’s 15-minute monitoring locations ranged from 48.8 dBA at Monitoring Location 5 during the morning to 36.1 dBA at Monitoring Location 2 during the afternoon. The nighttime L_{eq} noise levels ranged from 50.0 dBA at Monitoring Location 5 to 37.6 dBA at Monitoring Location 3.

The L_{90} excludes most of the transient noise and is more reflective of continuous noise sources. For the 15-minute monitoring locations, the daytime L_{90} ranged from 41.6 dBA at Monitoring Location 5 during the afternoon to 33.5 dBA at Monitoring Location 1 during the afternoon. The nighttime L_{90} noise levels ranged from 37.9 dBA at Monitoring Location 4 to 32.7 dBA at Monitoring Location 1.

Monitoring Locations 1, 2, 4 and 5 were located in Indian River County. During the measurements, noise was caused by nearby cattle mooing loudly during the monitoring. Agricultural activities are exempt from the noise ordinance. The daytime L_{10} ranged from 52.1 dBA at Site 5 in the morning to 37.2 dBA at Site 2 in the afternoon. The nighttime L_{10} ranged from 54.4 dBA at Site 5 to 37.6 dBA at

Site 2. The daytime L_{50} ranged from 46.8 dBA at Site 5 in the morning to 35.1 dBA at Site 2 in the afternoon. The nighttime L_{50} ranged from 42.6 dBA at Site 5 to 35.2 dBA at Site 2.

3.3.8 Other Environmental Features

3.3.8.1 Lighting

Outdoor lighting for OCEC will be necessary to satisfy Occupational Safety and Health Administration (OSHA) requirements for safety and security. Unconstrained lighting can cause “light pollution,” which includes “sky glow” and “light trespass.” Sky glow is the result of stray light being scattered in the atmosphere, brightening the natural sky background level. Light trespass is the term used to describe light or illuminance that strays from its intended purpose and potentially becomes an annoyance. To evaluate the existing nighttime light conditions at the Site, an ambient outdoor lighting study was conducted and is presented in this section.

Background

Light is part of the electromagnetic spectrum, which ranges from radio waves to gamma rays. Electromagnetic radiation waves are fluctuations of electric and magnetic fields, which can transport energy from one location to another. Visible light is not inherently different from other parts of the electromagnetic spectrum, with the exception that the human eye has evolved to detect visible waves. The human eye responds to light based on its frequency. The frequency of light that is within the visible range establishes the observed color. While the response varies from person to person, the Commission Internationale de l’Eclairage (C.I.E., International Commission on Illumination) defined standard luminosity coefficients for the human eye in 1931.

A “candela” refers to the luminous intensity of a lighting source and is measured in candelas (cd). A “lumen” is the total luminous flux of a light source of one candela of luminous intensity. Illuminance is the total luminous flux incident on a surface per unit area. A “lux” is the measure of illumination (1 lumen) that falls on one square meter. The English measurement is the “foot-candle,” which is the same illumination (1 lumen) falling on one square feet. A lux is equivalent to 0.093 foot-candle; one foot-candle is 10.76 lux. Luminance is the perceived brightness of an object which has been illuminated by a source. Common examples of luminance are presented in Table 3.3.8-1. The luminance of an object depends on its material characteristics and reflectance and is measured in candelas per square meter (cd/m^2).

Light Trespass

Some municipalities and states have established programs to reduce light trespass. Light trespass standards are typically based on the amount of light from a light source that is transmitted onto

adjoining properties. Light trespass standards are typically different for various land uses. The State of Florida, Okeechobee County, and Indian River County do not have quantitative requirements pertaining to light trespass.

Sky Glow

The earliest measures of sky glow, also called sky brightness, were based on a scale upon which the magnitude of stars visible to the human eye is divided into 6 levels. The brightest star is a magnitude 1 and the dimmest (faintest) star is a magnitude 6. More recently, the magnitude scale was modified to express astronomical surface brightness (stars, planets, etc.) in units known as magnitudes per square arcsecond (mag/arcsec^2). The measurement scale is inverse and logarithmic, and is generally used in small area photometry and astronomy.

Ambient Illumination Measurements

Sky glow measurements were taken to assess the existing ambient conditions in the vicinity of the Site at the same locations as the noise monitoring locations Sites 1 through 5 (see Figure 3.3.7-1). The illumination monitoring field efforts were conducted during January 2015. The January 2015 baseline monitoring events were conducted to obtain ambient nighttime light (illuminance) measurements. Measurements were taken using a calibrated Unihedron SQM-LU Sky Quality Meter and recorded in magnitudes per square arcsecond (mag/arcsec^2). This was then converted to lux (lumen/m^2) for comparison to Table 3.3.8-2.

The January 2015 illuminance measurements were collected at five light monitoring locations at a height of 5 ft above grade. The measurements were collected with the meter facing directly up to the night sky. There was no observable sky glow on the horizon in any direction that could be caused by external anthropogenic sources.

The nighttime ambient illuminance measurements for January 2015 at locations around the FPL Property boundary are summarized in Table 3.3.8-2. The observations were collected during a new moon on a clear evening with little to no cloud cover. The nighttime illuminance of the sky meter had a range from 20.96 mags/arcsecond^2 or $4.51\text{E-}04$ lux at Site 2 to 21.01 mags/arcsecond^2 or $4.24\text{E-}04$ lux at Site 4. The darker the sky the less illuminance, and the greater the apparent magnitude of the sky as more stars are visible. Based on Table 3.3.8-1, these measurements are between a moonless, clear night sky and a moonless overcast sky. This would indicate slight ground fog beginning to form due to a warm ground and cooler, humid air. These measurements reflect a baseline environment with little to no anthropogenic light sources.

TABLES

TABLE 3.3.3-1
WATER USE PERMITS WITHIN 5 MILES OF OCEC

Permit ID	Site ID	Site Name	Owner	County	Source	Status	MAX_CAP_QT
80463	37562	Twenty Mile Bend Groves	Twenty Mile Bend Groves LLC	Indian River	FAS - Upper Floridan Aquifer	Removed	0
80463	37562	Twenty Mile Bend Groves	Twenty Mile Bend Groves LLC	Indian River	On-site Retention	Active	1504
80463	37562	Twenty Mile Bend Groves	Twenty Mile Bend Groves LLC	Indian River	On-site Retention	Active	2251
80463	37562	Twenty Mile Bend Groves	Twenty Mile Bend Groves LLC	Indian River	Floridan Aquifer	Active	0
80463	37562	Twenty Mile Bend Groves	Twenty Mile Bend Groves LLC	Indian River	On-site Retention	Active	12000
80463	37562	Twenty Mile Bend Groves	Twenty Mile Bend Groves LLC	Indian River	On-site Retention	Inactive	0
80463	37562	Twenty Mile Bend Groves	Twenty Mile Bend Groves LLC	Indian River	On-site Retention	Active	12000
80463	37562	Twenty Mile Bend Groves	Twenty Mile Bend Groves LLC	Indian River	Floridan Aquifer	Active	0
80463	37562	Twenty Mile Bend Groves	Twenty Mile Bend Groves LLC	Indian River	Floridan Aquifer	Active	0
80463	37562	Twenty Mile Bend Groves	Twenty Mile Bend Groves LLC	Indian River	On-site Retention	Active	2711
80463	37562	Twenty Mile Bend Groves	Twenty Mile Bend Groves LLC	Indian River	Floridan Aquifer	Active	0
124267	294967	Pressley Ranches	Gary Pressley	Indian River	Floridan Aquifer	Active	12
124267	294967	Pressley Ranches	Gary Pressley	Indian River	Floridan Aquifer	Active	210
124267	294967	Pressley Ranches	Gary Pressley	Indian River	Floridan Aquifer	Active	150
124267	294967	Pressley Ranches	Gary Pressley	Indian River	Floridan Aquifer	Active	175
124267	294967	Pressley Ranches	Gary Pressley	Indian River	Floridan Aquifer	Active	250
124267	294967	Pressley Ranches	Gary Pressley	Indian River	Floridan Aquifer	Active	250
124267	294967	Pressley Ranches	Gary Pressley	Indian River	Floridan Aquifer	Active	120
124267	294967	Pressley Ranches	Gary Pressley	Indian River	Floridan Aquifer	Active	8
124267	294967	Pressley Ranches	Gary Pressley	Indian River	FAS - Upper Floridan Aquifer	Active	20
124267	294967	Pressley Ranches	Gary Pressley	Indian River	FAS - Upper Floridan Aquifer	Active	20
124267	294967	Pressley Ranches	Gary Pressley	Indian River	Floridan Aquifer	Active	120
124267	294967	Pressley Ranches	Gary Pressley	Indian River	Floridan Aquifer	Active	75
124267	294967	Pressley Ranches	Gary Pressley	Indian River	Floridan Aquifer	Active	100
129582	300988	VISIONQUEST	Peter Ranalli	Okeechobee	FAS - Upper Floridan Aquifer	Active	10
129582	300988	VISIONQUEST	Peter Ranalli	Okeechobee	FAS - Upper Floridan Aquifer	Active	10
129582	300988	VISIONQUEST	Peter Ranalli	Okeechobee	FAS - Upper Floridan Aquifer	Active	60
130628	302120	Sanchelima Dairy Farms, Inc.	Sanchelima Dairy Farms Inc	Okeechobee		Inactive	500
130628	302120	Sanchelima Dairy Farms, Inc.	Sanchelima Dairy Farms Inc	Okeechobee	FAS - Upper Floridan Aquifer	Active	0
132154	303786	Ft Drum Service Plaza	Florida Dept of Transportation	Okeechobee		Proposed	0
132154	303786	Ft Drum Service Plaza	Florida Dept of Transportation	Okeechobee	FAS - Upper Floridan Aquifer	Active	150
132154	303786	Ft Drum Service Plaza	Florida Dept of Transportation	Okeechobee	FAS - Upper Floridan Aquifer	Abandoned	210
132154	303786	Ft Drum Service Plaza	Florida Dept of Transportation	Okeechobee	Floridan Aquifer	Inactive	0
132154	303786	Ft Drum Service Plaza	Florida Dept of Transportation	Okeechobee	Floridan Aquifer	Inactive	0
132154	303786	Ft Drum Service Plaza	Florida Dept of Transportation	Okeechobee	FAS - Upper Floridan Aquifer	Active	150
132154	303786	Ft Drum Service Plaza	Florida Dept of Transportation	Okeechobee	Floridan Aquifer	Inactive	0
132154	303786	Ft Drum Service Plaza	Florida Dept of Transportation	Okeechobee	FAS - Upper Floridan Aquifer	Abandoned	210
132154	303786	Ft Drum Service Plaza	Florida Dept of Transportation	Okeechobee	Floridan Aquifer	Inactive	0
134678	306366	Daniel Rooney	Daniel Rooney	Indian River	internal canal	Active	1200
134678	306366	Daniel Rooney	Daniel Rooney	Indian River	FAS - Upper Floridan Aquifer	Active	885
134678	306366	Daniel Rooney	Daniel Rooney	Indian River		Proposed	1200
134678	306366	Daniel Rooney	Daniel Rooney	Indian River	internal canal	Active	3000
140456	312833	Okeechobee Grove	Okeechobee AG Land Trust	Okeechobee	Floridan Aquifer	Active	0

Source: SJRWMD, 2015.

Table 3.3.6-1. Wildlife Observed on OCEC Site during Field Surveys November 2014 - July 2015

Scientific Name	Common Name	State Status	Federal Status
BIRDS			
<i>Anas fulvigula</i>	Mottled duck	---	---
<i>Meleagris gallopavo</i>	Wild turkey	---	---
<i>Mycteria americana</i>	Wood stork	T	T
<i>Phalacrocorax auritus</i>	Double-crested cormorant	---	---
<i>Anhinga anhinga</i>	Anhinga	---	---
<i>Pelecanus erythrorhynchos</i>	American white pelican	---	---
<i>Ardea alba</i>	Great egret	---	---
<i>Bubulcus ibis</i>	Cattle egret	---	---
<i>Egretta caerulea</i>	Little blue heron	SSC	---
<i>Butorides virescens</i>	Green heron	---	---
<i>Egretta tricolor</i>	Tri-colored heron	SSC	---
<i>Eudocimus alba</i>	White ibis	SSC	---
<i>Coragyps atratus</i>	Black vulture	---	---
<i>Cathartes aura</i>	Turkey vulture	---	---
<i>Elanoides forficatus</i>	Swallow-tailed kite	---	---
<i>Buteo brachyurus</i>	Short-tailed hawk	---	---
<i>Buteo lineatus</i>	Red-shouldered hawk	---	---
<i>Buteo jamaicensis</i>	Red-tailed hawk	---	---
<i>Haliaeetus leucocephalus</i>	Bald eagle	---	---
<i>Pandion haliaetus</i>	Osprey	---	---
<i>Aramus guarana</i>	Limpkin	SSC	---
<i>Grus canadensis pratensis</i>	Florida sandhill crane	T	---
<i>Gallinago delicata</i>	Wilson's snipe	---	---
<i>Charadrius vociferous</i>	Killdeer	---	---
<i>Columbina passerine</i>	Common ground-dove	---	---
<i>Zenaida macroura</i>	Mourning dove	---	---
<i>Strix varia</i>	Barred owl	---	---
<i>Megaceryle alcyon</i>	Belted kingfisher	---	---
<i>Melanerpes carolinus</i>	Red-bellied woodpecker	---	---
<i>Dryocopus pileatus</i>	Pileated woodpecker	---	---
<i>Sphyrapicus varius</i>	Yellow-bellied sapsucker	---	---
<i>Falco sparverius</i>	American kestrel	---	---
<i>Caracara cheriway</i>	Crested caracara	T	T
<i>Sayornis phoebe</i>	Eastern phoebe	---	---
<i>Lanius ludovicianus</i>	Loggerhead shrike	---	---
<i>Vireo griseus</i>	White-eyed vireo	---	---
<i>Cyanocitta cristata</i>	Blue jay	---	---
<i>Corvus brachyrhynchos</i>	American crow	---	---
<i>Corvus ossifragus</i>	Fish crow	---	---
<i>Tachycineta bicolor</i>	Tree swallow	---	---
<i>Baeolophus bicolor</i>	Tufted titmouse	---	---
<i>Cistothorus palustris</i>	Marsh wren	---	---
<i>Troglodytes aedon</i>	House wren	---	---
<i>Thryothorus ludovicianus</i>	Carolina wren	---	---
<i>Poliophtila caerulea</i>	Blue-gray gnatcatcher	---	---
<i>Regulus calendula</i>	Ruby-crowned kinglet	---	---



Table 3.3.6-1. Wildlife Observed on OCEC Site during Field Surveys November 2014 - July 2015

Scientific Name	Common Name	State Status	Federal Status
<i>Turdus migratorius</i>	American robin	---	---
<i>Dumetella carolinensis</i>	Catbird	---	---
<i>Mimus polyglottos</i>	Northern mockingbird	---	---
<i>Geothlypis trichas</i>	Common yellowthroat	---	---
<i>Mniotilta varia</i>	Black-and-white warbler	---	---
<i>Setophaga palmarum</i>	Palm warbler	---	---
<i>Setophaga coronata</i>	Yellow-rumped warbler	---	---
<i>Parkesia noveboracensis</i>	Northern waterthrush	---	---
<i>Setophaga americana</i>	Northern parula	---	---
<i>Passerculus sandwichensis</i>	Savannah sparrow	---	---
<i>Ammodramus savannarum</i>	Grasshopper sparrow	---	---
<i>Cardinalis cardinalis</i>	Northern cardinal	---	---
<i>Passerina ciris</i>	Painted bunting	---	---
<i>Agelaius phoeniceus</i>	Red-winged blackbird	---	---
<i>Quiscalus quiscula</i>	Common grackle	---	---
<i>Quiscalus major</i>	Boat-tailed grackle	---	---
<i>Sturnella magna</i>	Eastern meadowlark	---	---
<i>Spinus tristis</i>	American goldfinch	---	---
MAMMALS			
<i>Sus scrofa</i>	Feral hog	---	---
<i>Procyon lotor</i>	Raccoon	---	---
<i>Odocoileus virginianus</i>	White-tailed deer	---	---
<i>Dasypus novemcinctus</i>	Nine-banded armadillo	---	---
<i>Canis latrans</i>	Coyote	---	---
<i>Sciurus niger shermani</i>	Sherman's fox squirrel	SSC	---
HERPETOFAUNA			
<i>Anolis sagrei</i>	Cuban brown anole	---	---
<i>Anolis carolinensis</i>	Green anole	---	---
<i>Coluber constrictor priapus</i>	Black racer	---	---
<i>Nerodia fasciata</i>	Banded water snake	---	---
<i>Pantherophis alleghaniensis</i>	Yellow rat snake	---	---
<i>Diadophis punctatus</i>	Ring-necked snake	---	---
<i>Apalone ferox</i>	Florida softshell turtle	---	---
<i>Trachemys scripta elegans</i>	Red-eared slider	---	---
<i>Gopherus polyphemus</i>	Gopher tortoise	T	C
<i>Alligator mississippiensis</i>	American alligator	SAT	SAT
FISH			
<i>Gambusia holbrokii</i>	Mosquitofish	---	---
<i>Micropterus salmoides</i>	Largemouth bass	---	---
<i>Lepomis microlophus</i>	Redear sunfish	---	---
<i>Lepomis macrochirus</i>	Bluegill	---	---

C = Candidate species; E = Endangered; T = Threatened; SSC = Species of Special Concern; SAT = Treated as Threatened due to similarity of appearance



Table 3.3.6-2. Threatened, Endangered, and Species of Special Concern Known to Occur in Okeechobee County and Probability of Occurrence within the OCEC Site

Species	Status	Probability of Occurrence
PLANTS		
Many-flowered grass-pink (<i>Calopogon multiflorus</i>)	State – E	Moderate
Large-flowered rosemary (<i>Conradina grandiflora</i>)	State – T	Low
Pine pinweed (<i>Lechea divaricata</i>)	State – E	Low
Celestial lily (<i>Nemastylis floridana</i>)	State – E	Moderate
Florida beargrass (<i>Nolina atoocarpa</i>)	State – T	Low
Hand fern (<i>Ophioglossum palmatum</i>)	State – E	Moderate
Cutthroat grass (<i>Panicum abscissum</i>)	State – E	Moderate
Giant orchid (<i>Pteroglossaspis ecristata</i>)	State – E	Low
AMPHIBIANS and REPTILES		
Gopher frog (<i>Rana capito</i>)	State – SSC	Moderate
American alligator (<i>Alligator mississippiensis</i>)	State – SAT Federal – SAT	Observed
Eastern indigo snake (<i>Drymarchon couperi</i>)	State – T Federal – T	Moderate
Gopher tortoise (<i>Gopherus polyphemus</i>)	State – T Federal - C	Observed
BIRDS		
Florida grasshopper sparrow (<i>Ammodramus savannarum floridanus</i>)	State – E Federal - E	Moderate
Florida scrub jay (<i>Aphelocoma coerulescens</i>)	State – T Federal – T	Low
Limpkin (<i>Aramus guarauna</i>)	State – SSC	Observed
Florida burrowing owl (<i>Athene cunicularia floridana</i>)	State – SSC	Moderate
Caracara (<i>Caracara cheriway</i>)	State – T Federal – T	Observed
Little blue heron (<i>Egretta caerulea</i>)	State – SSC	Observed
Snowy egret (<i>Egretta thula</i>)	State – SSC	High
Tricolored heron (<i>Egretta tricolor</i>)	State – SSC	Observed
White ibis (<i>Eudocimus albus</i>)	State – SSC	Observed
Southeastern American kestrel (<i>Falco sparverius paulus</i>)	State – T	Observed
Florida sandhill crane (<i>Grus canadensis pratensis</i>)	State – T	Observed
Wood stork (<i>Mycteria americana</i>)	State – T Federal – T	Observed
Snail kite (<i>Rostrhamus sociabilis plumbeus</i>)	State – E Federal - E	Moderate
Least tern (<i>Sternula antillarum</i>)	State – T	Low
MAMMALS		
Florida bonneted bat (<i>Eumops floridanus</i>)	State – E Federal - E	Low
Sherman's fox squirrel (<i>Sciurus niger shermani</i>)	State - SSC	Observed
West Indian manatee (<i>Trichechus manatus</i>)	State – E Federal - E	None

E = Endangered

T = Threatened

SSC = Species of Special Concern

SAT = Threatened due to Similarity in Appearance



TABLE 3.3.7-1
AMBIENT SOUND PRESSURE LEVELS OBSERVED AT LOCATIONS IN VICINITY TO THE OCEC - JANUARY 2015

Monitoring Location	Coordinates	Date	Time	Sound Pressure Levels (dBA)						Observations
				Min	Max ^P	L ₁₀	L ₅₀	L ₉₀	L _{eq}	
1 - Indian River County	520552.00 m E	21-Jan-15	Afternoon	32.3	55.9	41.8	36.4	33.5	38.8	Wind in trees, birds, insects, distant traffic, airplane.
	3058272.00 m N	21-Jan-15	Night	31.7	43.2	43.1	36.3	32.7	39.2	Distant traffic, insects, trucks.
		22-Jan-15	Morning	33.5	50.6	39.1	36.8	35.1	37.6	Distant traffic, helicopter, birds.
2 - Indian River County	519158.00 m E	21-Jan-15	Afternoon	32.9	61.3	37.2	35.1	33.8	36.1	Wind, cattle, insects, birds, airplane, distant traffic.
	3057674.00 m N	21-Jan-15	Night	33.1	66.0	37.6	35.2	34.0	43.4	Cattle - loud, insects, distant highway traffic.
		22-Jan-15	Morning	33.7	49.7	39.4	36.2	34.8	37.2	Helicopter in distance. Insects, cattle, birds.
3 - Okechobee County	521335.00 m E	21-Jan-15	Afternoon	32.9	51.2	38.9	36.2	34.5	37.2	Airplane, wind, insects.
	3054152.00 m N	21-Jan-15	Night	34.9	68.2	37.7	36.8	36.1	37.6	Insects, distant traffic, cattle.
		22-Jan-15	Morning	36.4	67.1	47.5	42.9	39.3	47.8	Helicopter manouvers to the East - constant, insects, birds, airplane.
4 Indian River County	522972.00 m E	21-Jan-15	Afternoon	34.4	63.3	41.0	38.3	36.5	39.9	Traffic, cattle, insects. Sounds of nature. Airplane noise.
	3056498.00 m N	21-Jan-15	Night	34.9	57.4	48.5	42.4	37.9	45.0	Traffic, frogs, insects, cattle.
		22-Jan-15	Morning	35.7	62.7	44.8	39.2	37.2	44.2	Helicopters, distant traffic, airplane, insects, sounds of nature.
5 Indian River County	523021.00 m E	21-Jan-15	Afternoon	38.3	57.5	50.5	46.2	41.6	47.7	Traffic, airplane, insects, sounds of nature.
	3057294.00 m N	22-Jan-15	Night	33.0	62.7	54.4	42.6	35.6	50.0	Traffic, frogs, insects.
		22-Jan-15	Morning	36.8	65.2	52.1	46.8	41.1	48.8	Traffic, insects, distant helicopters, sounds of nature.
24-Hour - Okechobee County	520702.00 m E 3056729.00 m N	21-22-Jan-15	24-hour	22.1	76.8	40.5	34.4	28.5	39.7	Birds, wind in trees, insects, distant traffic, airplane.
Indian River County Noise Ordinance, Title IX, Chapter 974.05 Residential Area (Daytime/Nighttime)						65 / 60	60 / 55			Residential
						75/75	70/70			Agricultural (Note: residential developments in agricultural considered residential for the purpose of the noise ordinance)

Source: Golder, 2015.

TABLE 3.3.8-1
EXAMPLES OF TYPICAL ILLUMINANCE AND APPARENT MAGNITUDE

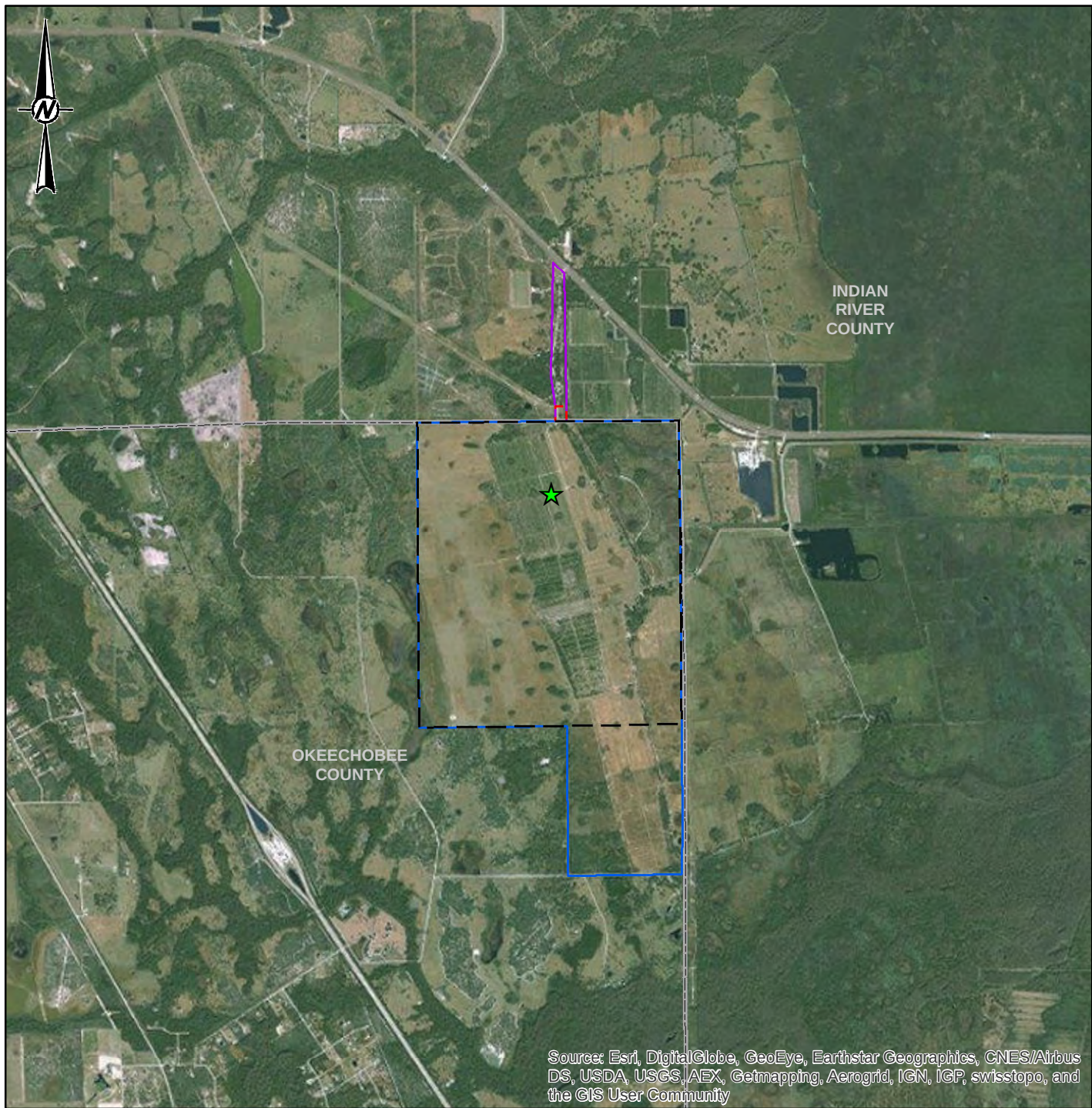
		Illuminance^a (lux)	Sky Brightness / Apparent Magnitude^b (mags/arcsecond²)
Outdoor	Bright Sun	100,000 - 130,000	>0.1
	Hazy Day	32,000	1.3
	Partly Cloudy	25,000	1.6
	Cloudy	10,000	2.6
	Overcast	1,000	5.1
	Sunrise/Sunset on Clear Day	400	6.1
	Full Moon	0.1	15.1
	Moonless Clear Night Sky	0.001	20.1
	Moonless Overcast Night Sky	0.0001	22.6
	Starlight	0.00005	23.3
Indoor	Typical TV Studio	1,000	5.1
	Bright Office with Large Contrast	400	6.1
	Hall Way	80	7.8
	Living Room	50	8.3
	Good Street Lighting	20	9.3
	Poor Street Lighting	1	12.6
^a Electro-Optics Handbook, 1979; Williams, 1999.			
^b Calculated based on conversion from lux to mags/arcsecond ²			

TABLE 3.3.8-2
BASELINE ILLUMINANCE IN THE VICINITY OF THE FPL OCEC SITE
JANUARY 2015

Monitoring Location	Coordinates	Date	Weather	Direction	SQM Readings		Observations
					mags/arcsecond ²	Lux	
1 - Indian River County	520552.00 m E 3058272.00 m N	21-Jan-15	Clear/New Moon	Up	21.00	0.0004	Clear, moonless night. No skyglow observed in surrounding area
2 - Indian River County	519158.00 m E 3057674.00 m N	21-Jan-15	Clear/New Moon	Up	20.95	0.0005	Ground fog and hazy. No observed skyglow in surrounding area
3 - Okechobee County	521335.00 m E 3054152.00 m N	21-Jan-15	Clear/New Moon	Up	20.96	0.0004	Clear, moonless night. No skyglow observed in surrounding area
4 Indian River County	522972.00 m E 3056498.00 m N	21-Jan-15	Clear/New Moon	Up	21.01	0.0004	Clear, moonless night. No skyglow observed in surrounding area
5 Indian River County	523021.00 m E 3057294.00 m N	22-Jan-15	Clear/New Moon	Up	20.96	0.0004	Clear, moonless night. No skyglow observed in surrounding area

Source: Golder, 2015.

FIGURES



LEGEND

- ★ Project Location
- Certified Site Boundary
- FPL Owned Property
- Linear Facility Corridor
- - - Transmission Interconnection Corridor
- County Boundary



REFERENCE(S)

PROPERTY, PROJECT LOCATION, LINEAR FACILITY CORRIDOR, CERTIFIED BOUNDARY, FPL & GOLDER ASSOCIATES INC., 2015
5-MILE BUFFER, GOLDER ASSOCIATES INC., 2015

CLIENT
FPL

PROJECT
OKEECHOBEE CLEAN ENERGY CENTER

TITLE
**LOCATION OF
THE FPL PROJECT**



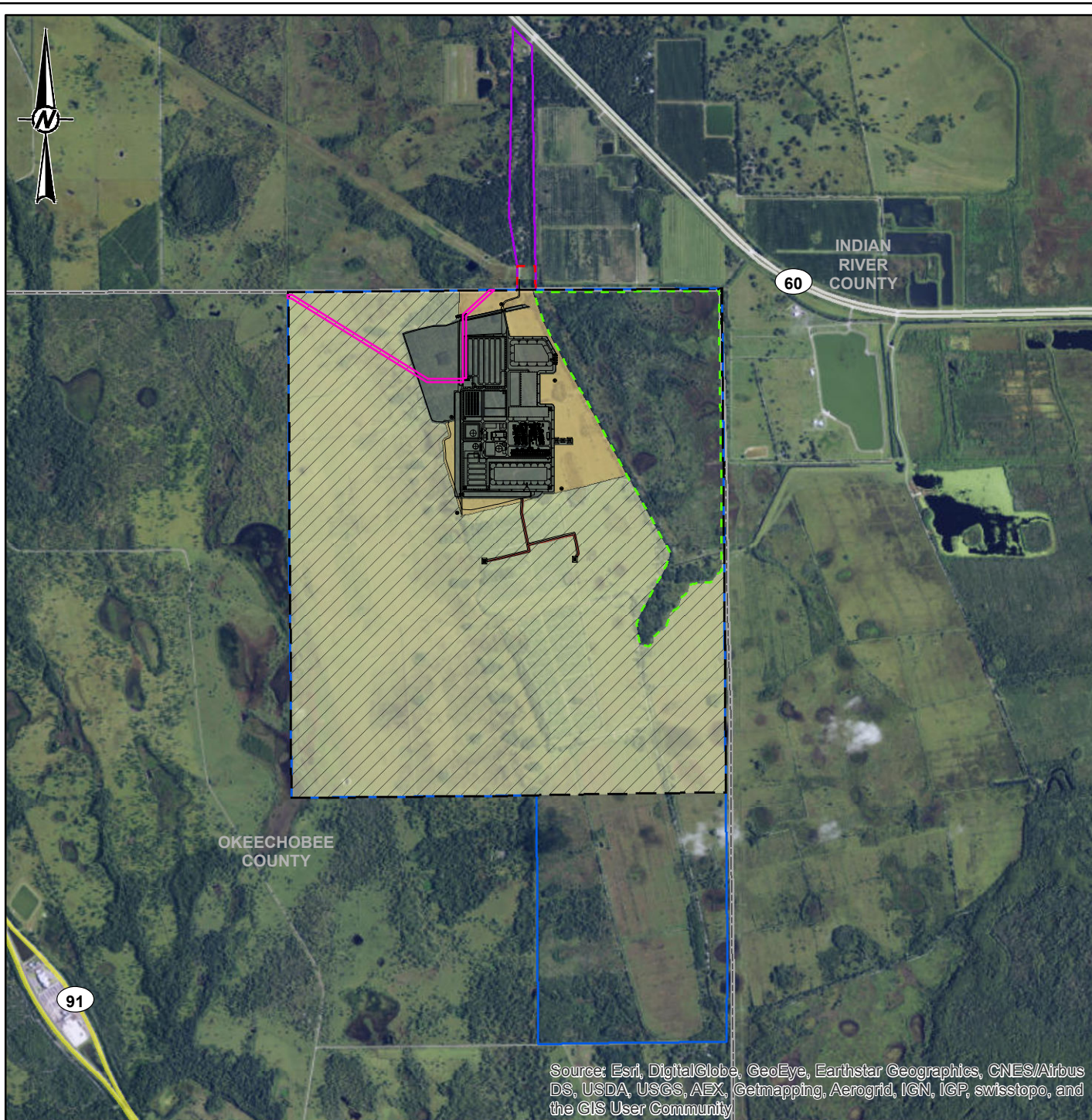
YYYY-MM-DD	2015-09-18
DESIGNED	NRL
PREPARED	NRL
REVIEWED	KAB
APPROVED	KFK

PROJECT NO.
1414979

CONTROL
B025

REV.
0

FIGURE
3.1-1



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LEGEND

- OCEC Unit 1
- Open Space
- UFA Well Delivery Pipeline
- Mitigation Area
- Certified Site Boundary
- FPL Owned Property
- Linear Facility Corridor
- Transmission Interconnection Corridor
- On-Site Gas Pipeline Alternatives
- Future Solar Area

0 3,200 6,400
1:38,400 Feet

REFERENCE(S)

PROPERTY, LINEAR FACILITY CORRIDOR, CERTIFIED BOUNDARY, FUTURE SOLAR AREA, OPEN SPACE, MITIGATION AREA, FPL & GOLDER ASSOCIATES INC., 2015
FACILITY LAYOUT, BLACK & VEATCH, 2015

CLIENT
FPL

PROJECT
OKEECHOBEE CLEAN ENERGY CENTER

TITLE
SITE PLAN



YYYY-MM-DD	2015-09-17
DESIGNED	NRL
PREPARED	NRL
REVIEWED	KAB
APPROVED	KFK

PROJECT NO.
1414979

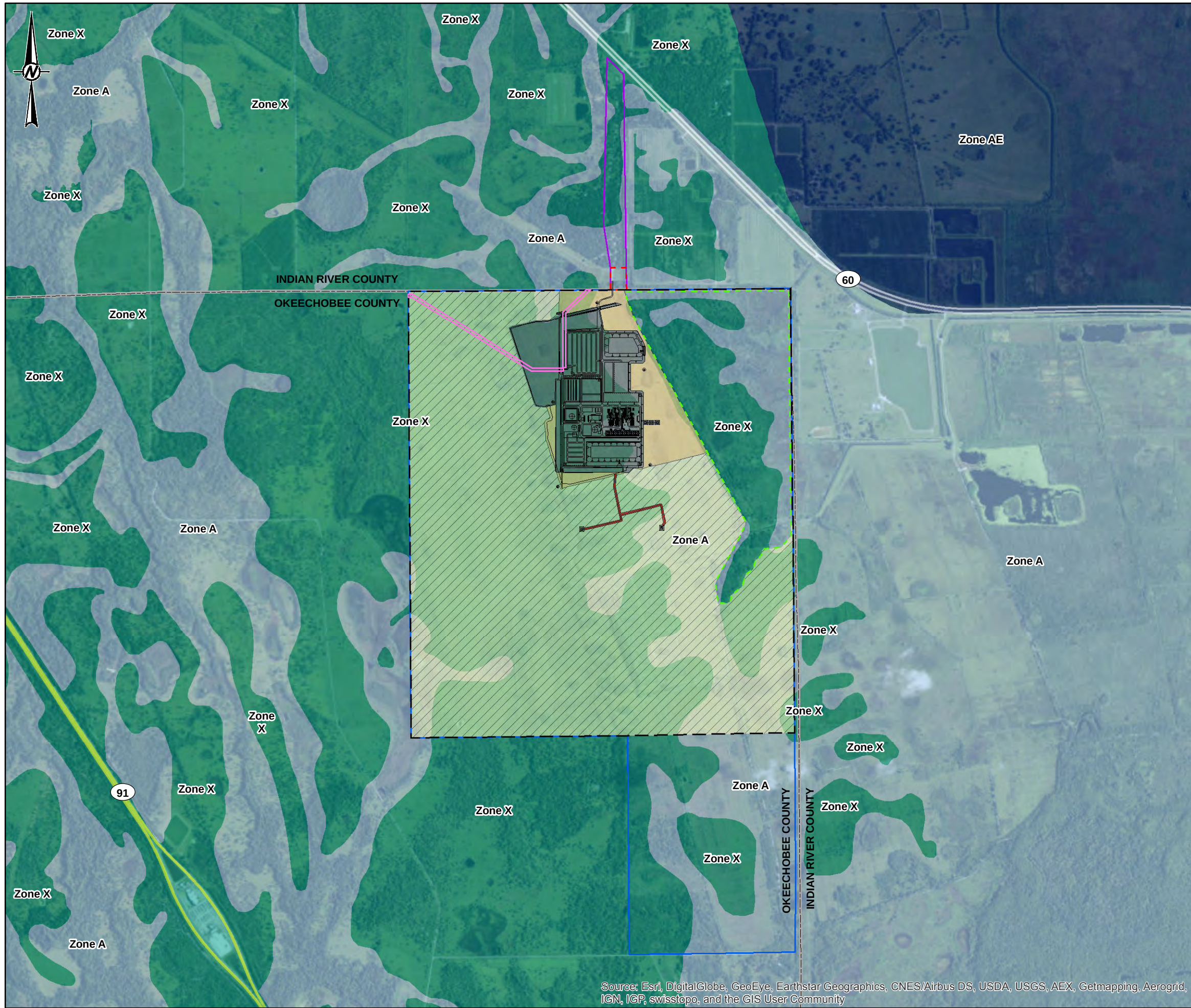
CONTROL
B026

REV.
0

FIGURE
3.1-2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A
25mm

PATH: G:\PROJECTS\FPL\Okeechobee\99_PROJECTS\1414979_B_SCA_Project\02_PRODUCTION\X01414979_B027_FEMA_FloodZones.mxd



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LEGEND

- Certified Site Boundary
- Mitigation Area
- FPL Owned Property
- Linear Facility Corridor
- Transmission Interconnection Corridor
- On-Site Gas Pipeline Alternatives
- OCEC Unit 1
- Open Space
- UFA Well Delivery Pipeline
- Future Solar Area

A: Areas subject to inundation by the 1-percent-annual-chance flood event. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown.

AE: Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. BFEs are shown within these zones. (Zone AE is used on new and revised maps in place of Zones A1–A30.)

X: Minimal risk areas outside the 1-percent and .2-percent-annual-chance floodplains. No BFEs or base flood depths are shown within these zones. (Zone X (unshaded) is used on new and revised maps in place of Zone C.)



REFERENCE(S)

PROPERTY, LINEAR FACILITY CORRIDOR, CERTIFIED SITE BOUNDARY, FUTURE SOLAR AREA, OPEN SPACE, MITIGATION AREA, FPL & GOLDER ASSOCIATES INC., 2015
FACILITY LAYOUT, BLACK & VEATCH, 2015
FLOOD ZONES, FEMA, 2012-2015

CLIENT

FPL

PROJECT

OKEECHOBEE CLEAN ENERGY CENTER

TITLE

**FEMA
FLOOD ZONES**



YYYY-MM-DD	2015-09-17
DESIGNED	NRL
PREPARED	NRL
REVIEWED	KAB
APPROVED	KFK

PROJECT NO.
1414979

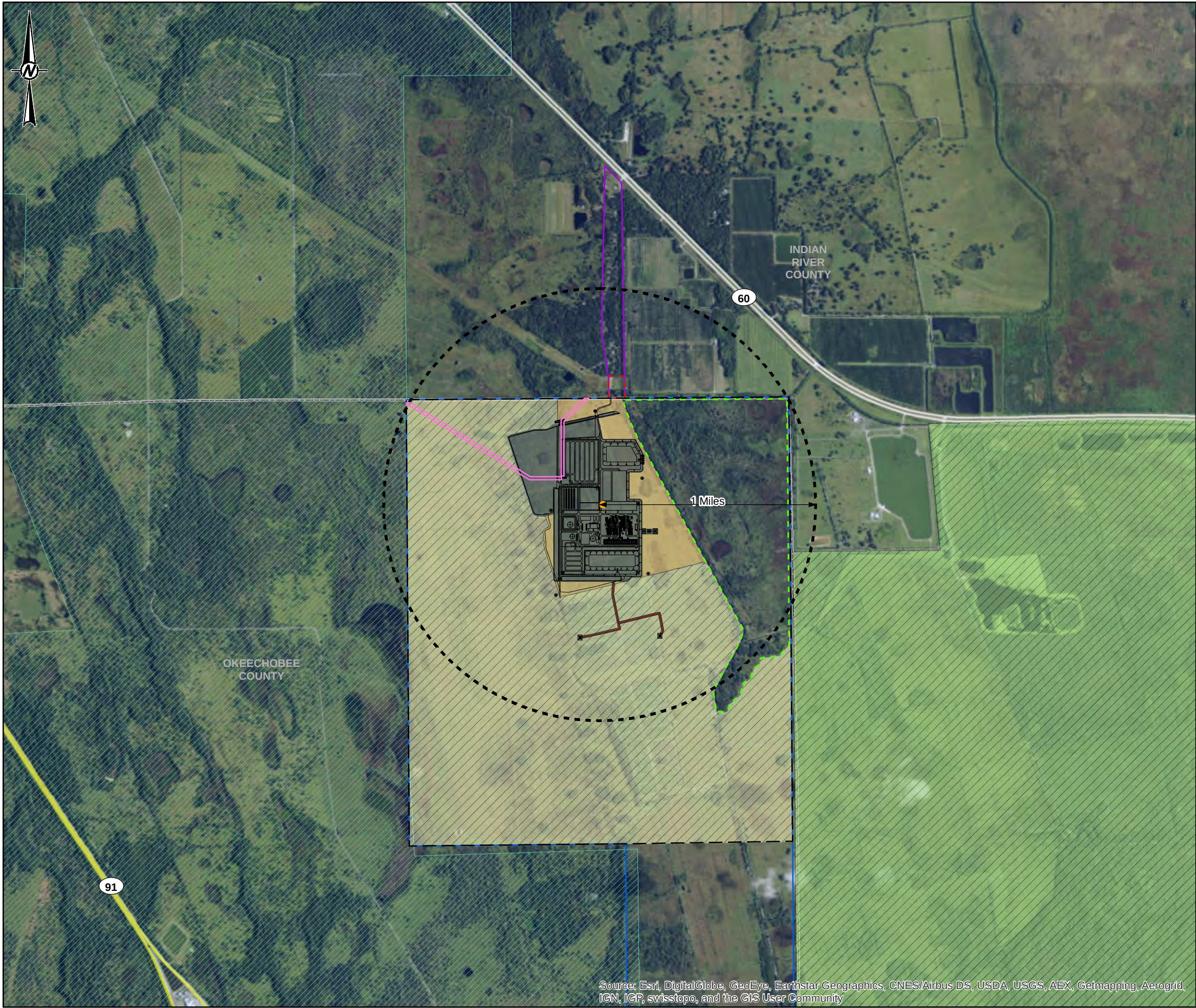
CONTROL
B027

REV.
0

FIGURE
3.1.2-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

28mm



LEGEND

- Project Location
- - 1 Mile Buffer
- Kissimmee-St. Johns River Connector Florida Forever BOT Project
- Fort Drum Marsh Conservation Area
- Certified Site Boundary
- Mitigation Area
- FPL Owned Property
- Linear Facility Corridor
- Transmission Interconnection Corridor
- On-Site Gas Pipeline Alternatives
- OCEC Unit 1
- Open Space
- UFA Well Delivery Pipeline
- Future Solar Area

REFERENCE(S)

PROPERTY, LINEAR FACILITY CORRIDOR, CERTIFIED SITE BOUNDARY, FUTURE SOLAR AREA, OPEN SPACE, MITIGATION AREA, FPL & GOLDER ASSOCIATES INC., 2015
FACILITY LAYOUT, BLACK & VEATCH, 2015
KISSIMMEE-ST. JOHNS RIVER CONNECTOR FLORIDA FOREVER BOT PROJECT, FORT DRUM MARSH CONSERVATION AREA, SJRWMD, 2015

CLIENT

FPL

PROJECT

OKEECHOBEE CLEAN ENERGY CENTER

TITLE

GOVERNMENTAL JURISDICTIONS
WITHIN 1-MILE RADIUS



YYYY-MM-DD	2015-09-17
DESIGNED	NRL
PREPARED	NRL
REVIEWED	KAB
APPROVED	KFK

PROJECT NO.
1414979

CONTROL
B028

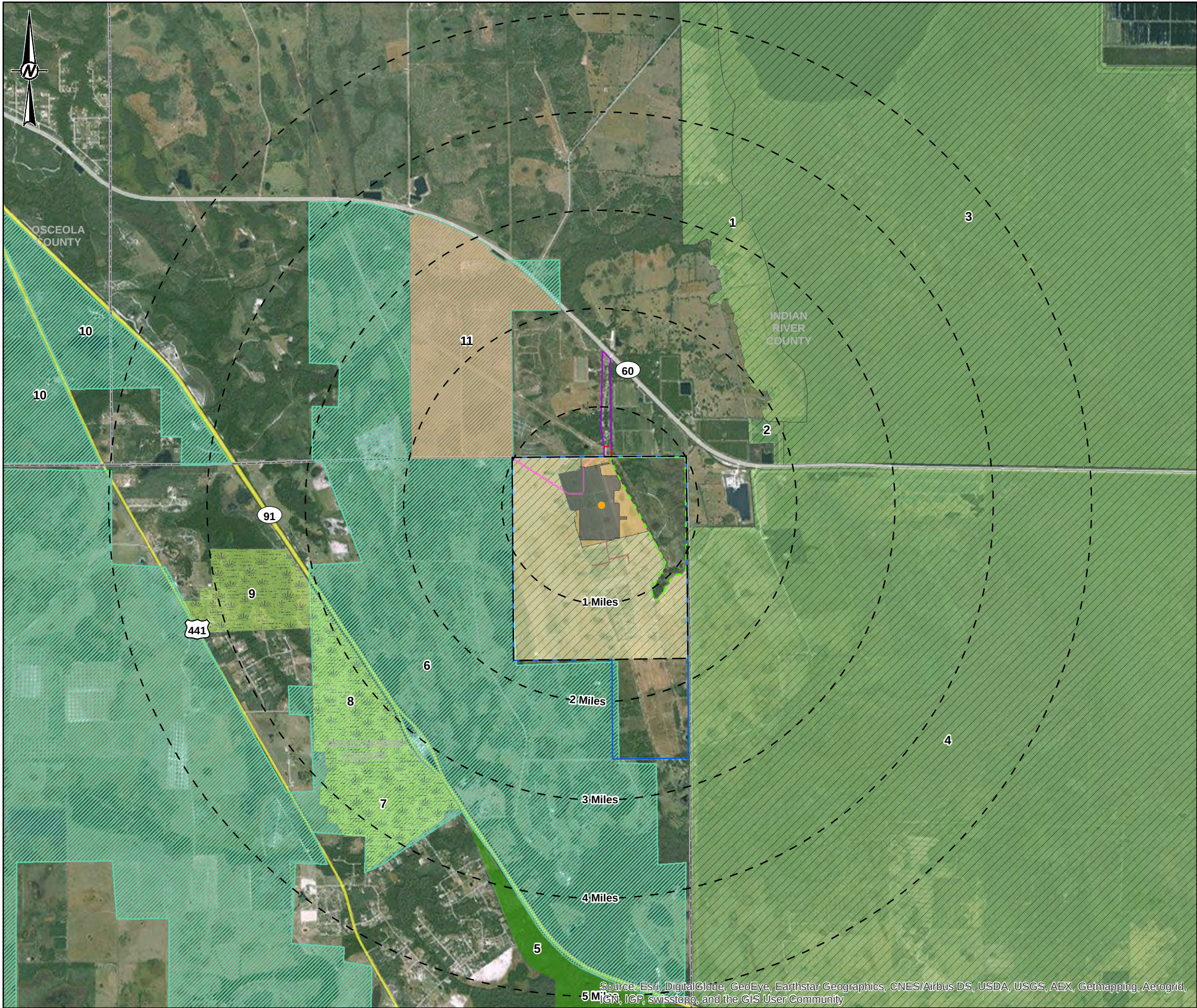
REV.
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FIGURE
3.2.1-1

PATH: G:\PROJECTS\FPL\Okeechobee\99_PROJECTS\1414979\B_SCA_Project\02_PRODUCTION\XDU1414979_B028_GovJur1Mile.mxd

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B 25mm



LEGEND

Project Location

1-5 Mile Buffer

Mitigation Area

FPL Owned Property

Linear Facility Corridor

Transmission Interconnection Corridor

On-Site Gas Pipeline Alternatives

OCEC Unit 1

Open Space

UFA Well Delivery Pipeline

Future Solar Area

Indian River County Managed Areas

Red Bay Stronghold Foundation Managed Areas

St. Johns River Water Management District Managed Areas

US Dept. of Agriculture, Natural Resources Conservation Service Managed Areas

Florida Forever BOT Project Managed Areas

MAP ID	NAME
1	Pressley Ranch Flowage Easement
2	Twenty Mile Bend Flowage Easement
3	Blue Cypress Conservation Area
4	Fort Drum Marsh Conservation Area
5	Red Bay Foundation Preserve
6	Kissimmee-St. Johns River Connector Florida Forever BOT Project
7	Grassland Reserve Program Easement #103
8	Grassland Reserve Program Easement #101
9	Grassland Reserve Program Easement #102
10	Pine Island Slough Ecosystem Florida Forever BOT Project
11	Padgett Branch Conservation Easements



REFERENCE(S)
PROPERTY, LINEAR FACILITY CORRIDOR, CERTIFIED SITE BOUNDARY, FUTURE SOLAR AREA, OPEN SPACE, MITIGATION AREA, FPL & GOLDER ASSOCIATES INC., 2015
FACILITY LAYOUT, BLACK & VEATCH, 2015
MANAGED AREAS, FLORIDA NATURAL AREAS INVENTORY FLORIDA CONSERVATION LANDS (FLMA), AND FLORIDA FOREVER BOARD OF TRUSTEES PROJECTS, 2015

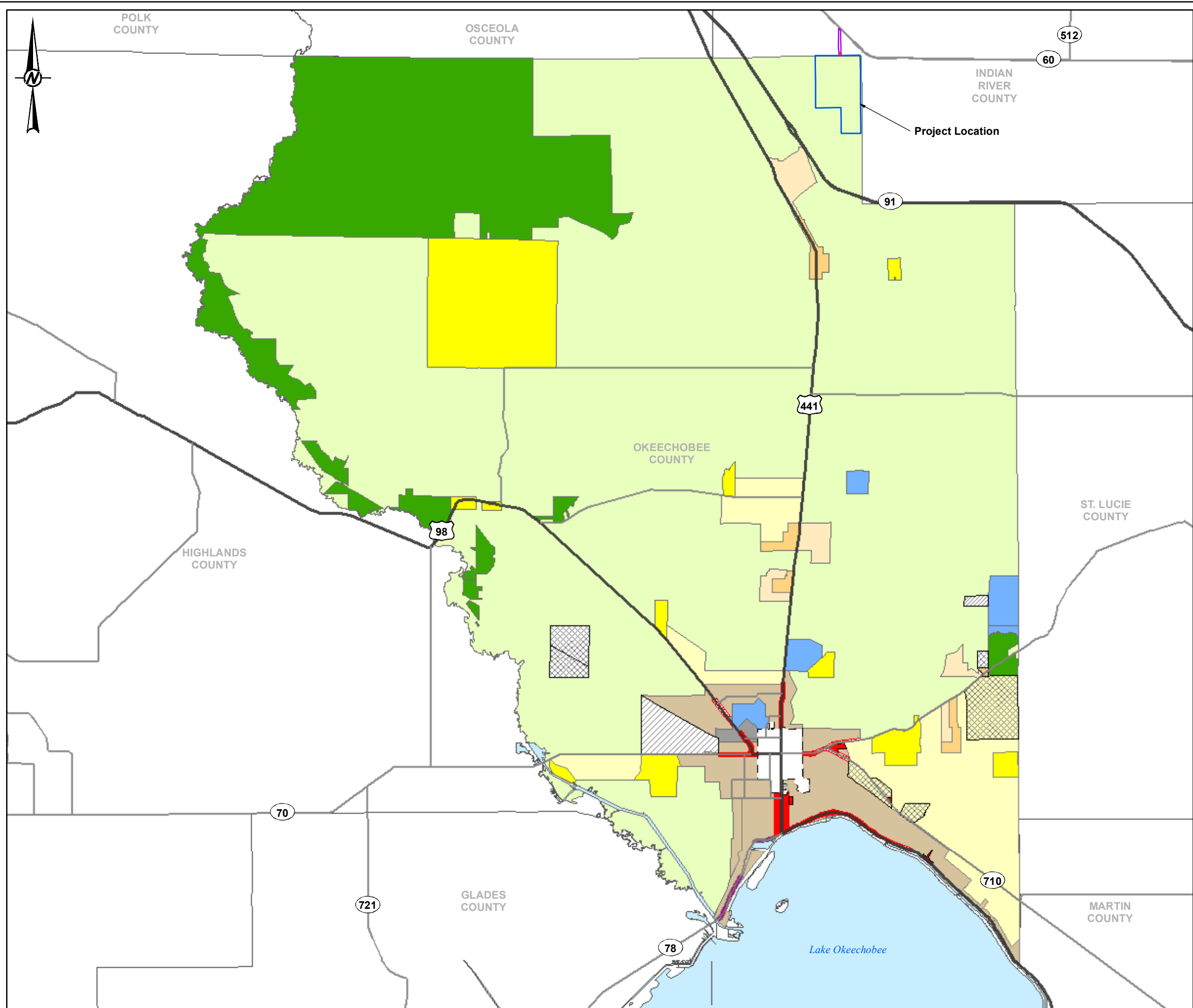
CLIENT
FPL

PROJECT
OKEECHOBEE CLEAN ENERGY CENTER

TITLE
GOVERNMENTAL JURISDICTIONS
WITHIN 1-, 2-, 3-, 4-, AND 5-MILE RADII

	YYYY-MM-DD	2015-09-17
	DESIGNED	NRL
	PREPARED	NRL
	REVIEWED	KAB
	APPROVED	KFK

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LEGEND

- FPL Owned Property
- FUTURE LAND USE CLASSIFICATIONS**
- AGRICULTURE
- CITY OF OKEECHOBEE
- COMMERCIAL ACTIVITY CENTER
- COMMERCIAL CORRIDOR MIXED USE
- COMMERCIAL CORRIDOR MIXED USE *
- CONSERVATION 1
- INDUSTRIAL
- INDUSTRIAL *
- INDUSTRIAL OVERLAY
- INDUSTRIAL OVERLAY *
- PUBLIC / SEMI-PUBLIC FACILITIES
- RESORT ACTIVITY CENTER
- RESORT CORRIDOR
- RURAL ACTIVITY CENTER
- RURAL ACTIVITY CENTER LOW DENSITY (L)
- RURAL ACTIVITY CENTER RURAL DENSITY (R)
- RURAL ESTATE
- URBAN RESIDENTIAL MIXED USE



NOTE(S)
* SEE COMPREHENSIVE PLAN POLICIES FOR SPECIFIC DEVELOPMENT CRITERIA

REFERENCE(S)
PROPERTY, LINEAR FACILITY CORRIDOR, FPL & GOLDER ASSOCIATES INC., 2015
FUTURE LAND USE, OKEECHOBEE COUNTY PLANNING AND DEVELOPMENT, 2009-2015

CLIENT
FPL

PROJECT
OKEECHOBEE CLEAN ENERGY CENTER

TITLE
**OKEECHOBEE COUNTY
FUTURE LAND USE MAP**



YYYY-MM-DD	2015-09-08
DESIGNED	NRL
PREPARED	NRL
REVIEWED	KAB
APPROVED	KFK

PROJECT NO.
1414979

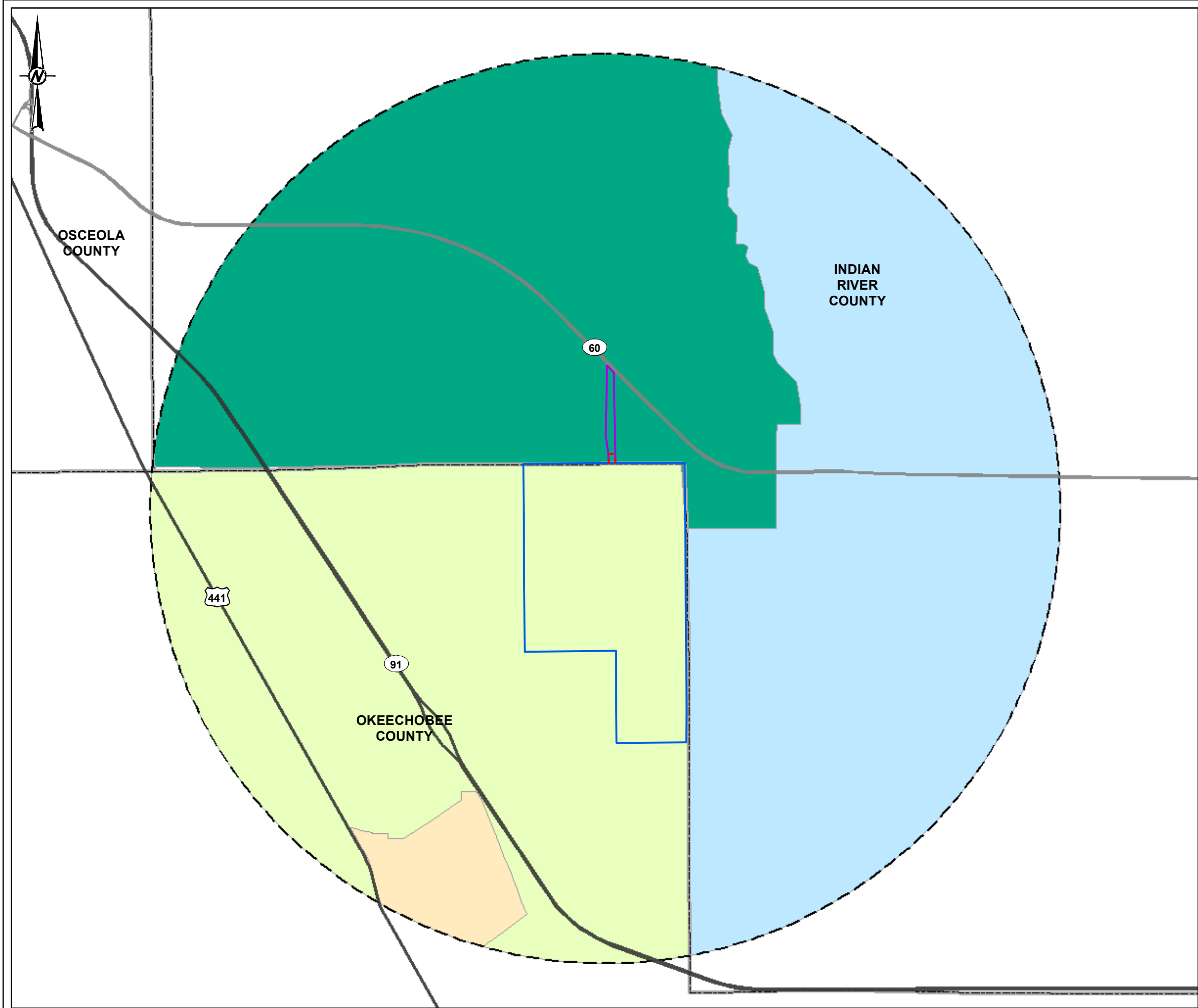
CONTROL
B030

REV.
0

FIGURE
3.2.2-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B 28mm

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LEGEND

- FPL Owned Property
- Linear Facility Corridor
- Transmission Interconnection Corridor
- 5 Mile Buffer
- Indian River County Future Land Use**
 - Agricultural-3 District (up to 1 unit/20 acres)
 - Public Lands Conservation District (Zero (0) Density)
- Okeechobee County Future Land Use**
 - Agriculture
 - Rural Activity Center Rural Density (R)



NOTE(S)
N/A

REFERENCE(S)
PROPERTY, LINEAR FACILITY CORRIDOR, FPL & GOLDER ASSOCIATES INC., 2015
OKEECHOBEE FUTURE LAND USE, OKEECHOBEE COUNTY PLANNING AND DEVELOPMENT, 2009-2015
INDIAN RIVER FUTURE LAND USE, INDIAN RIVER COUNTY PLANNING AND DEVELOPMENT, 2015

CLIENT
FPL

PROJECT
OKEECHOBEE CLEAN ENERGY CENTER

TITLE
FUTURE LAND USE
WITHIN 5 MILES

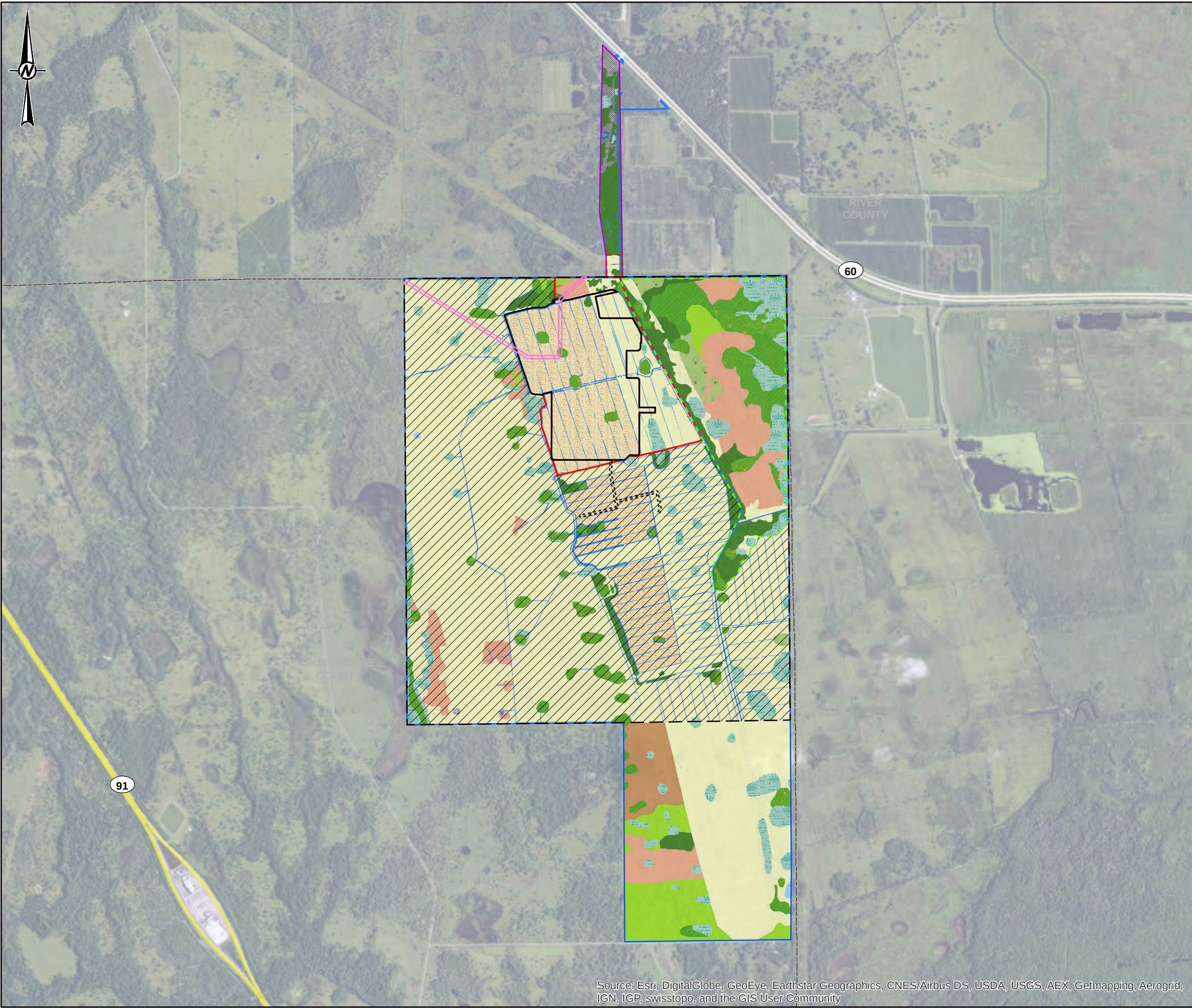


YYYY-MM-DD	2015-08-11
DESIGNED	NRL
PREPARED	NRL
REVIEWED	KAB
APPROVED	KFK

PROJECT NO. 1414979	CONTROL B045	REV. 0	FIGURE 3.2.2-2
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
28mm

PATH: G:\PROJECTS\FPL\Okeechobee\99_PROJECTS\1414979\B_SCA_Project\02_PRODUCTION\XDU1414979_B031_Existing_LandUse.mxd



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LEGEND

- Certified Site Boundary
- Mitigation Area
- FPL Owned Property
- Linear Facility Corridor
- Transmission Interconnection Corridor
- On-Site Gas Pipeline Alternatives
- OCEC Unit 1
- Open Space
- UFA Well Delivery Pipeline
- Potential Mitigation Area
- Future Solar Area

Existing Land Use

- Cropland and Pastureland
- Tree Crops
- Shrub and Brusland
- Mixed Rangeland
- Upland Coniferous Forests
- Upland Hardwood Forests
- Streams and Waterways
- Reservoirs
- Wetland Hardwood Forests
- Wetland Coniferous Forests
- Wetland Forests Mixed
- Freshwater Marshes

Disturbed Lands 2,400 4,800
1:28,800 Feet

REFERENCE(S)

PROPERTY, LINEAR FACILITY CORRIDOR, CERTIFIED SITE BOUNDARY, SOLAR AREA, OPEN AREA, MITIGATION AREA, FPL & GOLDER ASSOCIATES INC., 2015
EXISTING LAND USE, SJRWMD & GOLDER ASSOCIATES INC., 2009-2015

CLIENT

FPL

PROJECT

OKEECHOBEE CLEAN ENERGY CENTER

TITLE

EXISTING LAND USE
(FLUCCS LEVEL II)



YYYY-MM-DD	2015-09-17
DESIGNED	NRL
PREPARED	NRL
REVIEWED	KAB
APPROVED	KFK

PROJECT NO.
1414979

CONTROL
B031

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FIGURE
3.2.3-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

28mm

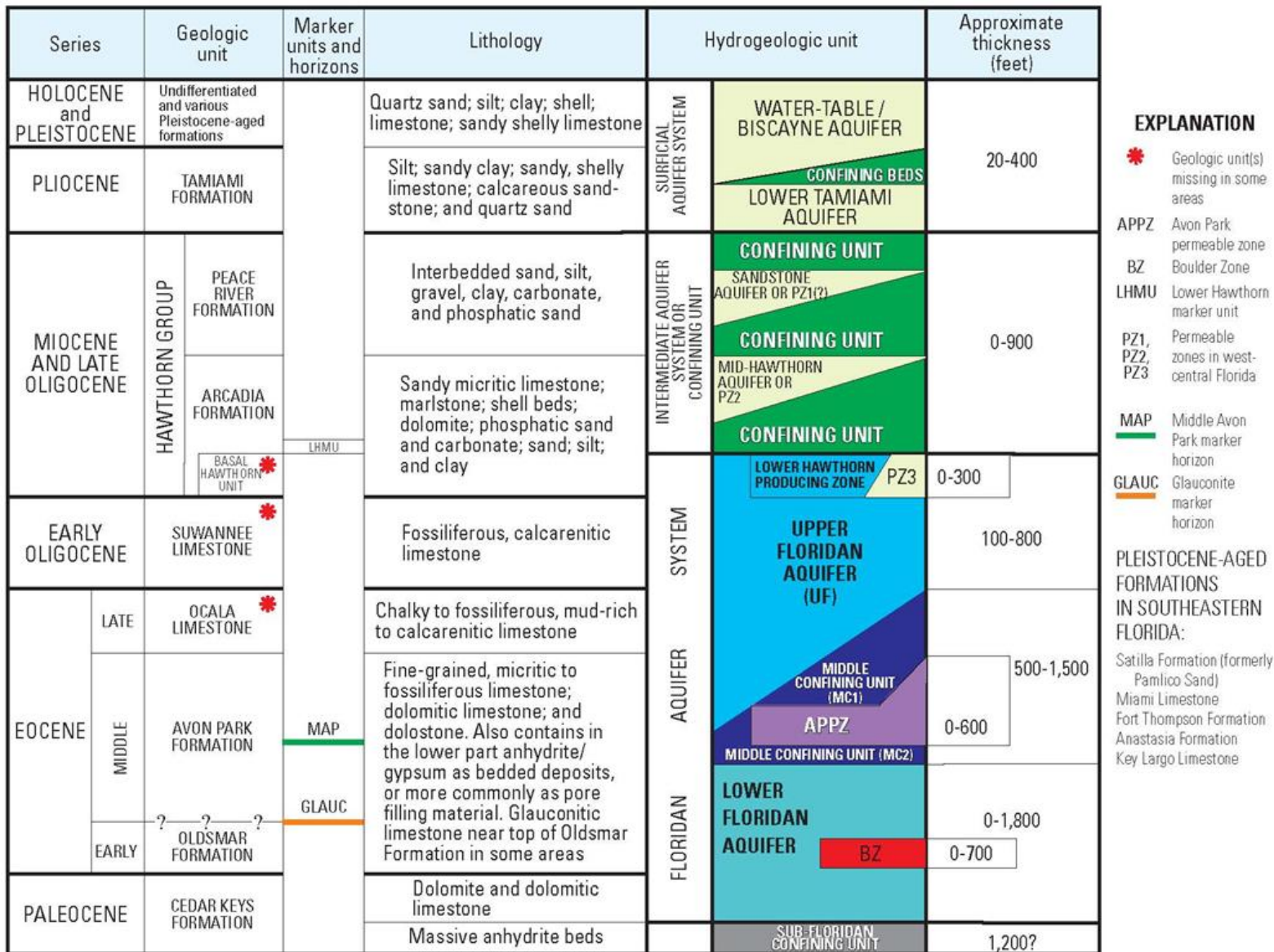


Figure 3.3.1-1
Generalized Geologic and Hydrogeologic Column of South and Central Florida

Source: Reese and Richardson, 2007; USGS Scientific Investigations Report 2007-5207.

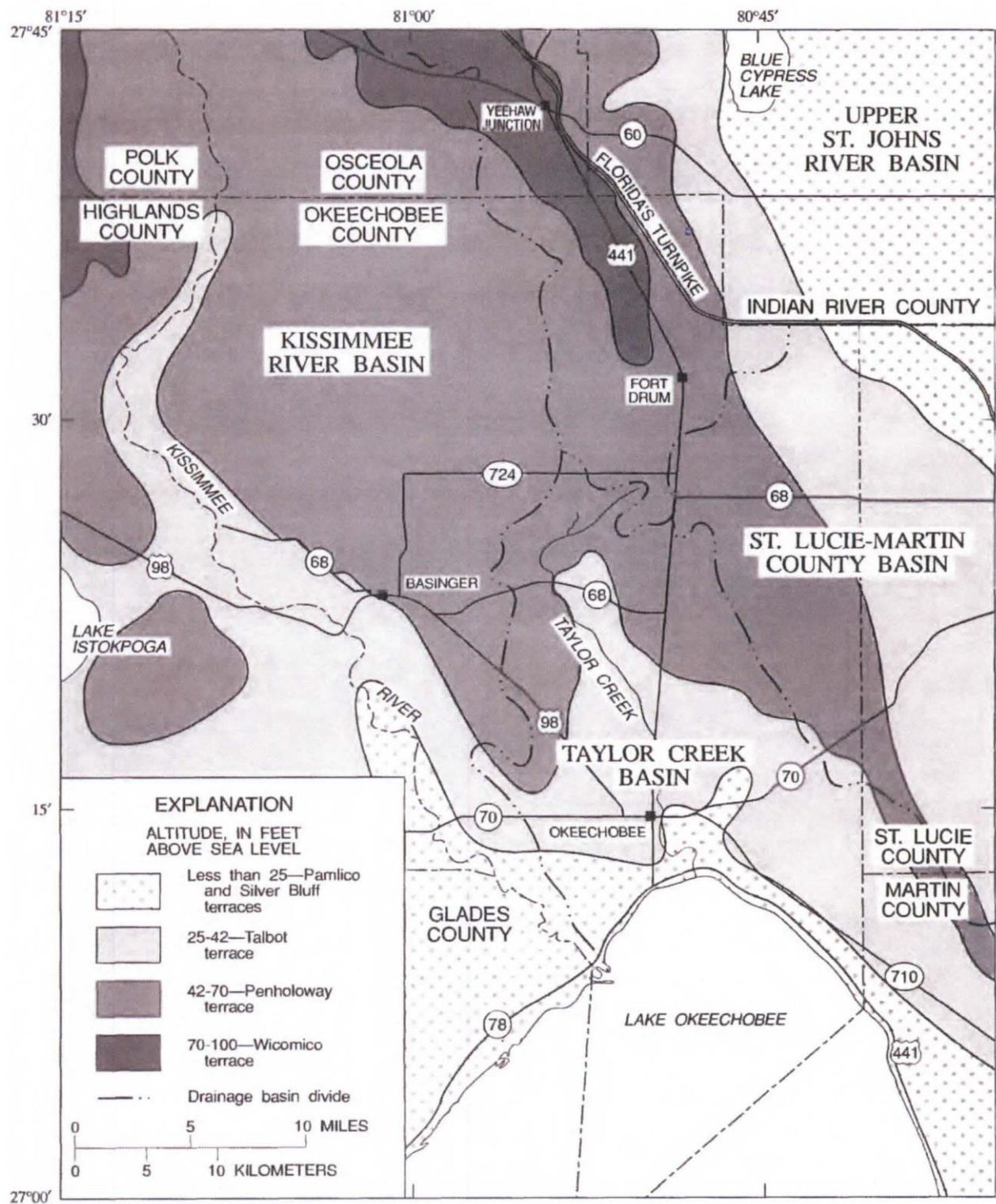


Figure 3.3.1-2
 Pleistocene Marine Terraces in Okeechobee County

Source: Bradner, 1994; USGS Water Resources Investigations Report 92-4166

Y:\Projects\2014\14-14979 FPL Okeechobee SCA\Figures\Chapter_3\Fig 3.3.1-2.docx



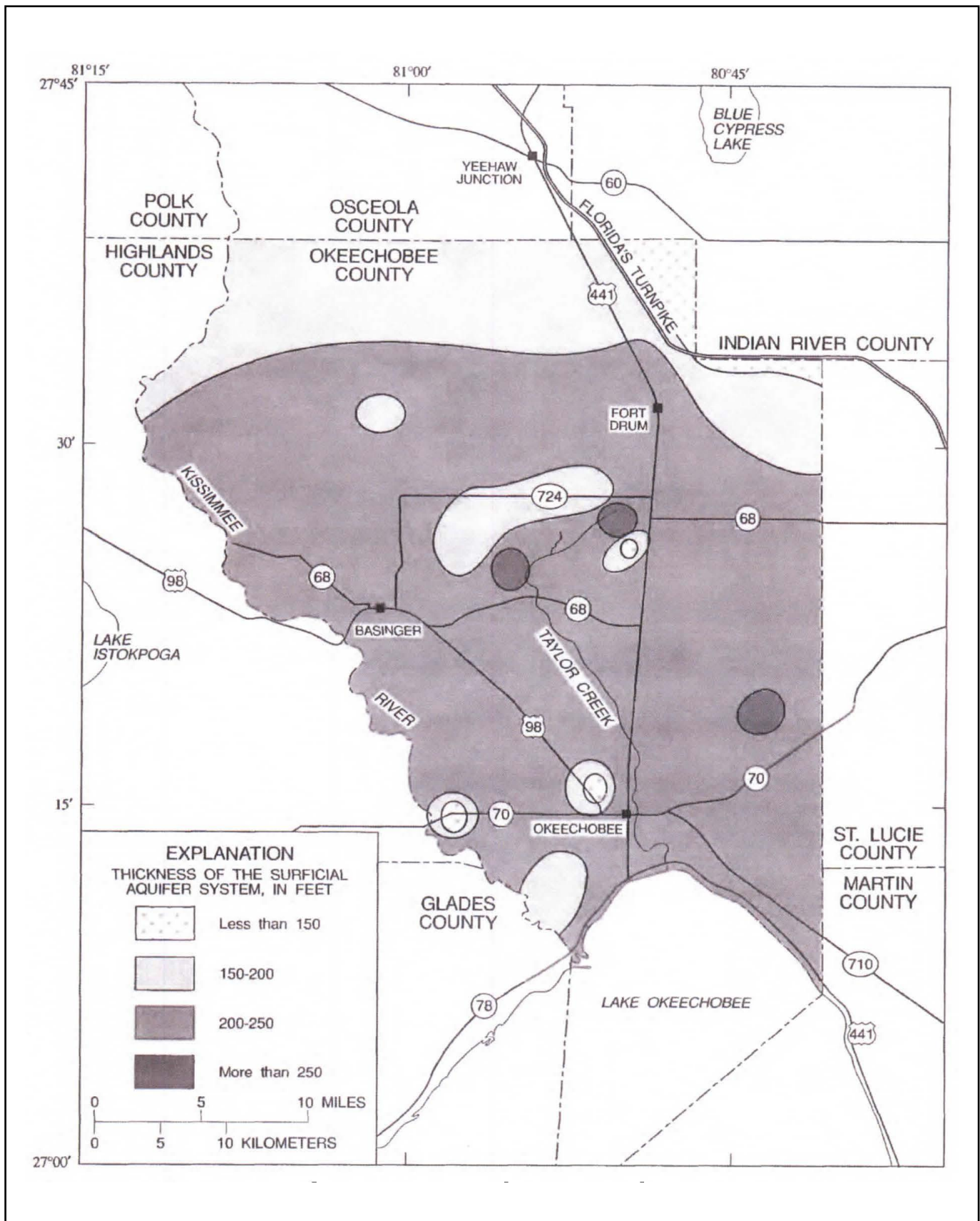


Figure 3.3.1-3
Thickness of the Surficial Aquifer in Okeechobee County

Source: Bradner, 1994; USGS Water Resources Investigations Report 92-4166

Y:\Projects\2014\14-14979 FPL Okeechobee SCA\Figures\Chapter_3\Fig 3.3.1-3.docx



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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

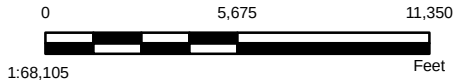
LEGEND

- ★ Project Location
- ▭ Certified Site Boundary
- ▭ Mitigation Area
- ▭ FPL Owned Property
- ▭ Linear Facility Corridor
- ▭ Transmission Interconnection Corridor
- ▭ On-Site Gas Pipeline Alternatives
- ▭ OCEC Unit 1
- ▭ Open Space
- ▭ UFA Well Delivery Pipeline
- ▭ Future Solar Area

Water Use Permits

Source - Status

- N/A - Inactive
- N/A - Proposed
- FAS - Upper Floridan Aquifer - Abandoned
- FAS - Upper Floridan Aquifer - Active
- FAS - Upper Floridan Aquifer - Removed
- Floridan Aquifer - Active
- Floridan Aquifer - Inactive
- On-site Retention - Active
- On-site Retention - Inactive
- Internal canal - Active



REFERENCE(S)

PROPERTY, LINEAR FACILITY CORRIDOR, CERTIFIED SITE BOUNDARY, FUTURE SOLAR AREA, OPEN SPACE, MITIGATION AREA, FPL & GOLDER ASSOCIATES INC., 2015
WATER USE PERMITS, SJRWMD, 2015

CLIENT

FPL

PROJECT

OKEECHOBEE CLEAN ENERGY CENTER

TITLE

**WATER USE PERMITS
WITHIN A
5-MILE RADIUS**



YYYY-MM-DD	2015-09-17
DESIGNED	NRL
PREPARED	NRL
REVIEWED	KAB
APPROVED	KFK

PROJECT NO.
1414979

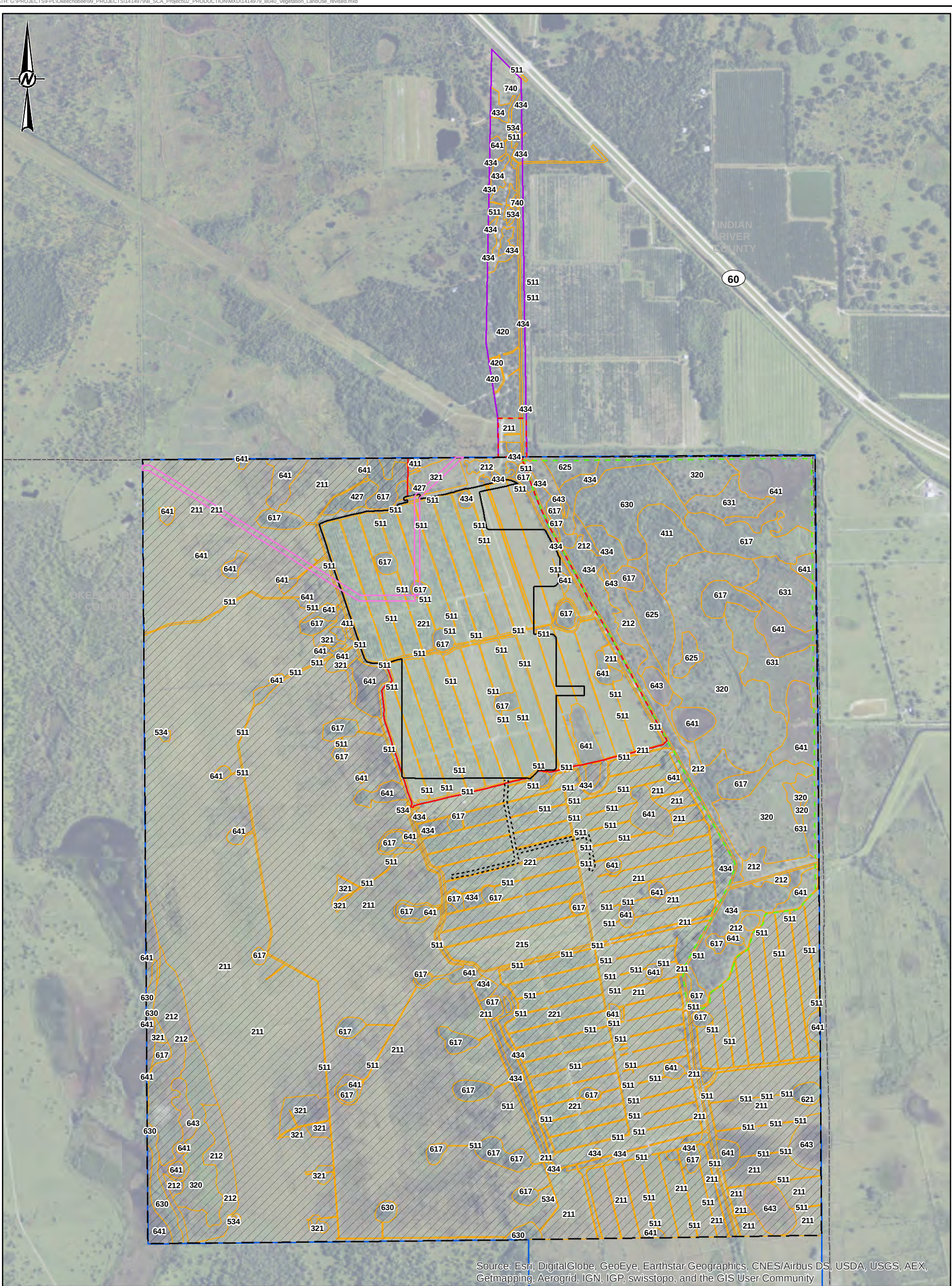
CONTROL
B032

REV.
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FIGURE
3.3-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

28mm



- Certified Site Boundary
- Mitigation Area
- FPL Owned Property
- Linear Facility Corridor
- Transmission
- Interconnection Corridor
- On-Site Gas Pipeline Alternatives
- OCEC Unit 1
- Open Space
- UFA Well Delivery Pipeline
- Future Solar Area

Vegetation / Land Use

- 211 - Improved Pastures
- 212 - Unimproved Pastures
- 215 - Field Crops
- 221 - Citrus Groves
- 320 - Shrub And Brushland
- 321 - Palmetto Prairies
- 411 - Pine Flatwoods

420 - Upland Hardwood
Forests
427 - Live Oak
434 - Hardwood-Coniferous
Mixed
511 - Ditches
534 - Reservoirs Less Than
10 Acres (4 Hectares) Which
Are Dominant Features

617 - Mixed Wetland
Hardwoods
621 - Cypress
625 - Hydric Pine Flatwoods
630 - Wetland Forested
Mixed
631 - Hydric Pine Flatwoods
641 - Freshwater Marshes
643 - Wet Prairies
740 - Disturbed Land

TITLE
**VEGETATION / LAND USE
(FLUCCS LEVEL III)**



YYYY-MM-DD	2015-09-17
DESIGNED	NRL
PREPARED	GFD
REVIEWED	KAB
APPROVED	KFK

PROJECT NO.
1414979

CONTROL
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FIGURE
3.3.5-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

PATH: G:\PROJECTS\FPL\Okeechobee\99_PROJECTS\141479\B_SCA_Project\2_PRODUCTION\X0141479\B037_NGCCPowerBlock_LandUse.mxd



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LEGEND

- Certified Site Boundary
- Mitigation Area
- FPL Owned Property
- Linear Facility Corridor
- Transmission Interconnection Corridor
- On-Site Gas Pipeline Alternatives
- OCEC Unit 1
- Open Space
- UFA Well Delivery Pipeline
- Future Solar Area
- Vegetation / Land Use
 - 211 - Improved Pastures
 - 212 - Unimproved Pastures
 - 221 - Citrus Groves
 - 321 - Palmetto Prairies
 - 411 - Pine Flatwoods
 - 427 - Live Oak
 - 434 - Hardwood-Coniferous Mixed
 - 511 - Ditches
 - 617 - Mixed Wetland Hardwoods
 - 641 - Freshwater Marshes

REFERENCE(S)

PROPERTY, LINEAR FACILITY CORRIDOR, CERTIFIED SITE BOUNDARY, FUTURE SOLAR AREA, OPEN SPACE, MITIGATION AREA, FPL & GOLDER ASSOCIATES INC., 2015
VEGETATION / LAND USE, SJRWMD & GOLDER ASSOCIATES INC., 2009-2015

CLIENT

FPL

PROJECT

OKEECHOBEE ENERGY CENTER

TITLE

**VEGETATION / LAND USE
OCEC UNIT 1 AND OPEN SPACE
(FLUCCS LEVEL III)**



YYYY-MM-DD	2015-09-17
DESIGNED	NRL
PREPARED	NRL
REVIEWED	KAB
APPROVED	KFK

PROJECT NO.
1414979

CONTROL
B037

REV.
0

FIGURE
3.3.5-1a

1in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

PATH: G:\PROJECTS\FPL\Okeechobee\99_PROJECTS\141479\B_SCA_Project\2_PRODUCTION\X0141479\B036_SolarArea_LandUse.mxd



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LEGEND

- Certified Site Boundary
- Mitigation Area
- FPL Owned Property
- Linear Facility Corridor
- Transmission Interconnection Corridor
- On-Site Gas Pipeline Alternatives
- Future Solar Area
- OCEC Unit 1
- Open Space
- UFA Well Delivery Pipeline
- Vegetation / Land Use
 - 211 - Improved Pastures
 - 212 - Unimproved Pastures
 - 215 - Field Crops
 - 221 - Citrus Groves
 - 320 - Shrub And Brushland
 - 321 - Palmetto Prairies
 - 411 - Pine Flatwoods
 - 427 - Live Oak
 - 434 - Hardwood-Coniferous Mixed
 - 511 - Ditches
 - 534 - Reservoirs Less Than 10 Acres (4 Hectares) Which Are Dominant Features
 - 617 - Mixed Wetland Hardwoods
 - 621 - Cypress
 - 630 - Wetland Forested Mixed
 - 641 - Freshwater Marshes
 - 643 - Wet Prairies
 - 740 - Disturbed Land



REFERENCE(S)

PROPERTY, LINEAR FACILITY CORRIDOR, CERTIFIED SITE BOUNDARY, FUTURE SOLAR AREA, OPEN SPACE, MITIGATION AREA, FPL & GOLDER ASSOCIATES INC., 2015
VEGETATION / LAND USE, SJRWMD & GOLDER ASSOCIATES INC., 2009-2015

CLIENT

FPL

PROJECT

OKEECHOBEE ENERGY CENTER

TITLE

**VEGETATION / LAND USE
FUTURE SOLAR AREA
(FLUCCS LEVEL III)**



YYYY-MM-DD	2015-09-17
DESIGNED	NRL
PREPARED	NRL
REVIEWED	KAB
APPROVED	KFK

PROJECT NO.
1414799

CONTROL
B036

REV.
0

FIGURE
3.3.5-1b

1in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND

- Certified Site Boundary
- Mitigation Area
- FPL Owned Property
- Linear Facility Corridor
- Transmission Interconnection Corridor
- On-Site Gas Pipeline Alternatives
- OCEC Unit 1
- Open Space
- UFA Well Delivery Pipeline
- Future Solar Area
- Vegetation / Land Use
 - 211 - Improved Pastures
 - 212 - Unimproved Pastures
 - 320 - Shrub And Brushland
 - 411 - Pine Flatwoods
 - 434 - Hardwood-Coniferous Mixed
 - 511 - Ditches
 - 617 - Mixed Wetland Hardwoods
 - 625 - Hydric Pine Flatwoods
 - 630 - Wetland Forested Mixed
 - 631 - Hydric Pine Flatwoods
 - 641 - Freshwater Marshes
 - 643 - Wet Prairies

0 412.5 825 1,650

Feet

REFERENCE(S)

PROPERTY, LINEAR FACILITY CORRIDOR, CERTIFIED SITE BOUNDARY, FUTURE SOLAR AREA, OPEN SPACE, MITIGATION AREA, FPL & GOLDER ASSOCIATES INC., 2015

VEGETATION / LAND USE, SJRWMD & GOLDER ASSOCIATES INC., 2009-2015

CLIENT

FPL

PROJECT

OKEECHOBEE ENERGY CENTER

TITLE

VEGETATION / LAND USE

MITIGATION AREA

(FLUCCS LEVEL III)



FPL

YYYY-MM-DD	2015-09-17
DESIGNED	NRL
PREPARED	NRL
REVIEWED	KAB
APPROVED	KFK

PROJECT NO.

1414979

CONTROL

B038

REV.

0

FIGURE

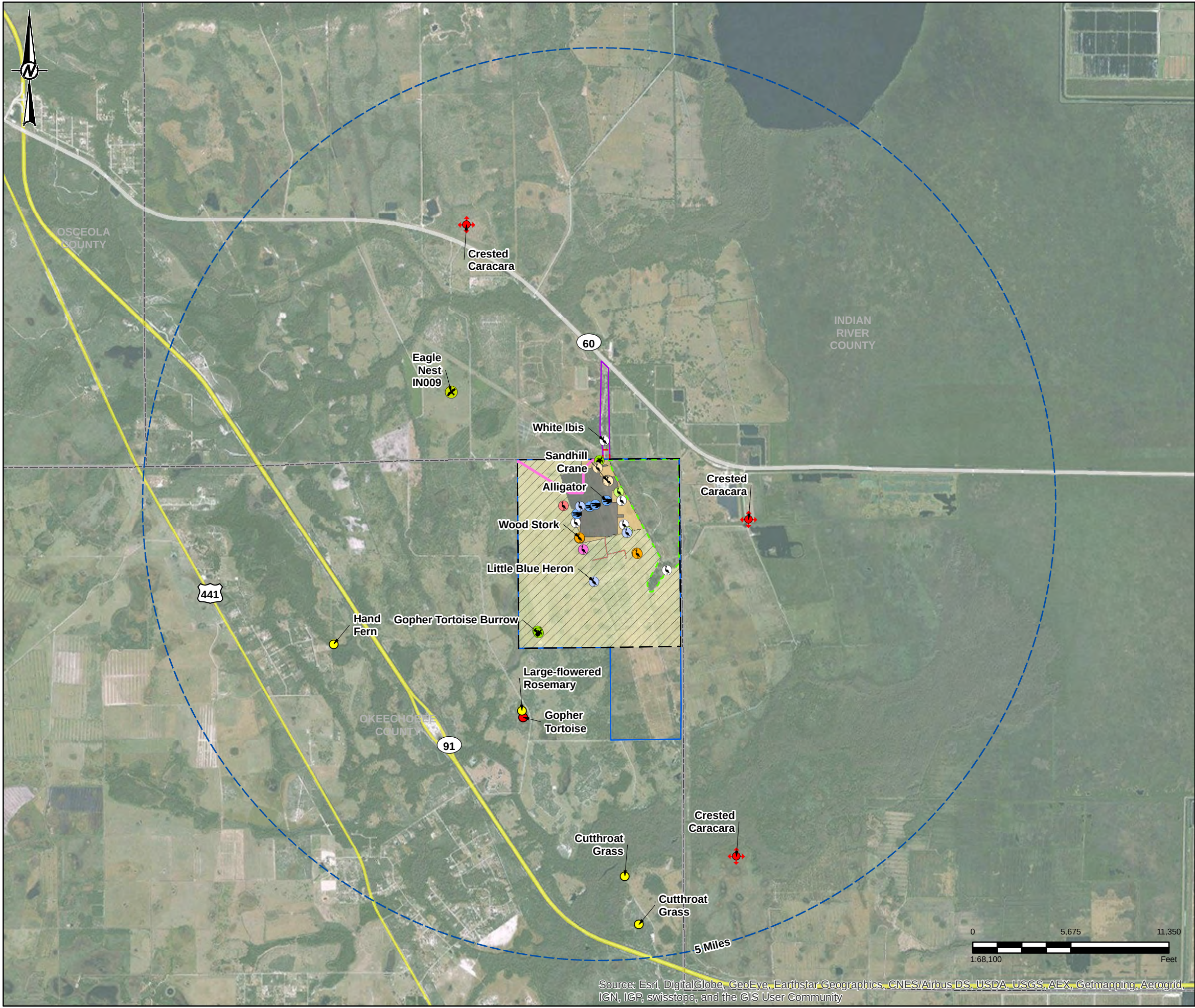
3.3.5-1c

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

PATH: G:\PROJECTS\FPL\Okeechobee\99_PROJECTS\141479\B_SCA_Project\02_PRODUCTION\X0141479\B035_TrimE_Species.mxd



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LEGEND

- 5-Mile Radius
- Certified Site Boundary
- Mitigation Area
- FPL Owned Property
- Linear Facility Corridor
- Transmission Interconnection Corridor
- On-Site Gas Pipeline Alternatives
- OCEC Unit 1
- Open Space
- UFA Well Delivery Pipeline
- Future Solar Area
- FWC Eagle Nest
- Gopher Tortoise Burrow
- Alligator
- Crested Caracara
- Limpkin
- Little Blue Heron
- Sandhill Crane
- Tricolored Heron
- White Ibis
- Wood Stork

FNAI Element Occurrences

- Animals
- Plants
- Communities
- Other
- Data Sensitive

Point Indicates General Vicinity of Element

REFERENCE(S)

PROPERTY, LINEAR FACILITY CORRIDOR, CERTIFIED SITE BOUNDARY, FUTURE SOLAR AREA, OPEN AREA, MITIGATION AREA, FPL & GOLDER ASSOCIATES INC., 2015
FACILITY LAYOUT, BLACK & VEATCH, 2015
EAGLE NEST LOCATION, FWC, 2015
GOPHER TORTOISE BURROW, GOLDER ASSOCIATES INC., 2015
FNAI ELEMENT OCCURRENCES, FNAI, 2007-2011

CLIENT

FPL

PROJECT

OKEECHOBEE CLEAN ENERGY CENTER

TITLE

LISTED AND OBSERVED SPECIES OCCURRENCES WITHIN 5-MILES



YYYY-MM-DD	2015-09-17
DESIGNED	NRL
PREPARED	NRL
REVIEWED	KAB
APPROVED	KFK

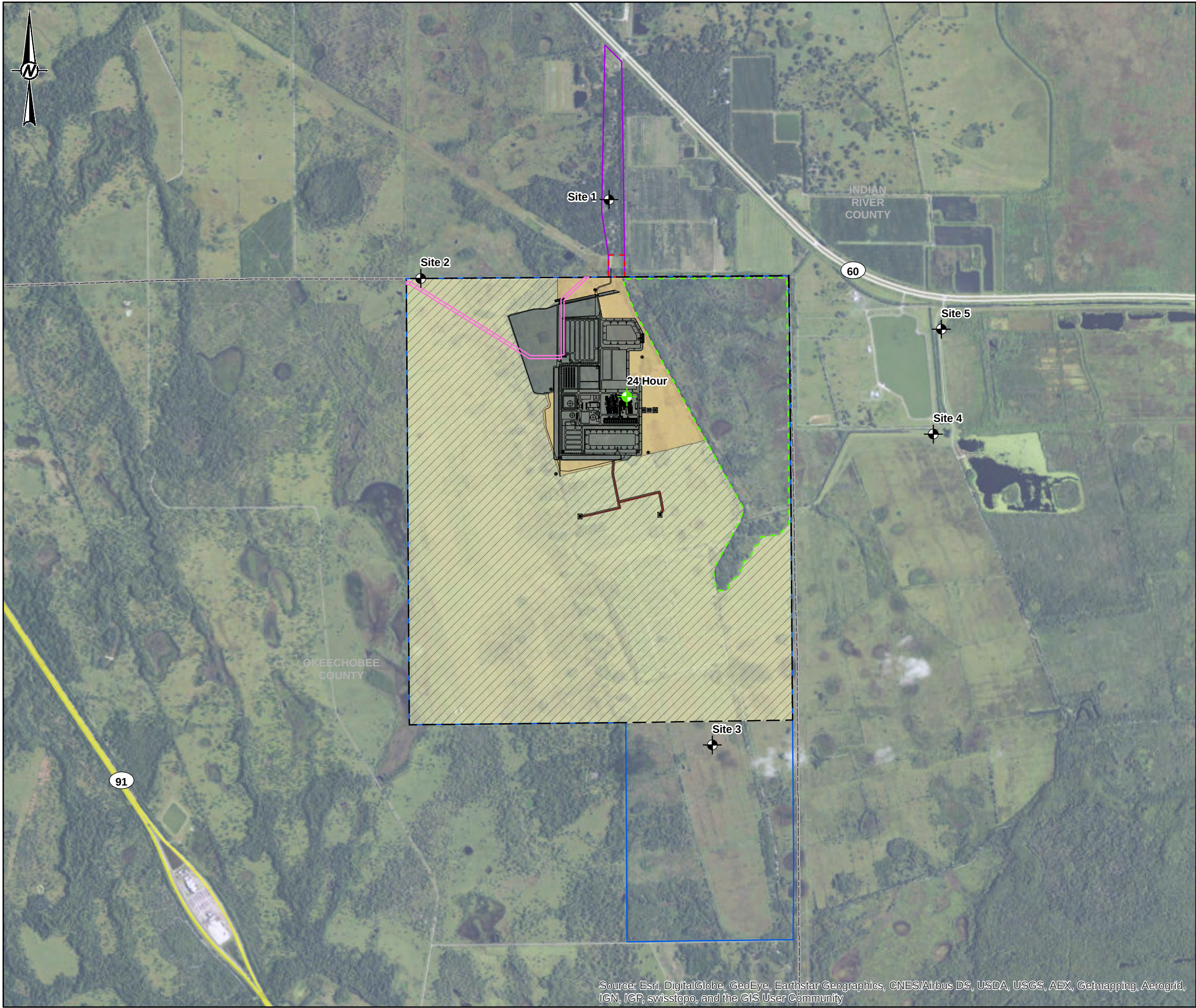
PROJECT NO.
1414799

CONTROL
B035

REV.
0

FIGURE
3.3.6-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B 22mm



LEGEND

- Noise and Light Monitoring Locations (Sites 1-5)
- 24-Hour Noise Monitoring Location
- Certified Site Boundary
- Mitigation Area
- FPL Owned Property
- Linear Facility Corridor
- Transmission Interconnection Corridor
- On-Site Gas Pipeline Alternatives
- OCEC Unit 1
- Open Space
- UFA Well Delivery Pipeline
- Future Solar Area

0 2,400 4,800
1:28,800 Feet

REFERENCE(S)
PROPERTY, LINEAR FACILITY CORRIDOR, CERTIFIED SITE BOUNDARY, FUTURE SOLAR AREA, OPEN SPACE, MITIGATION AREA. FPL & GOLDER ASSOCIATES INC., 2015
FACILITY LAYOUT, BLACK & VEATCH, 2015
NOISE AND LIGHT MONITORING LOCATIONS, GOLDER ASSOCIATES INC., 2015

CLIENT
FPL

PROJECT
OKEECHOBEE CLEAN ENERGY CENTER

TITLE
NOISE AND LIGHT MONITORING LOCATIONS



YYYY-MM-DD	2015-09-17
DESIGNED	NRL
PREPARED	NRL
REVIEWED	KAB
APPROVED	KFK

PROJECT NO. 1414979 CONTROL B034 REV. 0

FIGURE 3.3.7-1

PATH: G:\PROJECTS\FPL\Okeechobee\99_PROJECTS\1414979\B_SCA_Project\02_PRODUCTION\X01414979_B034_NoiseAndLight.mxd

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

28mm

4.0 THE PLANT AND DIRECTLY ASSOCIATED FACILITIES

4.1 Background

This chapter provides a description of the Project, a layout, key components and their operation, and proposed controls for air emissions and water discharges. Fuel specifications are provided for natural gas and ULSD oil. Estimates of the expected character, quality, and quantity of discharges and emissions from the OCEC Unit 1 are provided.

FPL is seeking to certify the following facilities on the Site: OCEC Unit 1 (including electrical generating equipment, cooling tower, on-Site roadways, parking and laydown areas, a temporary spoils area, administration building, warehouse, stormwater management system, gas metering station, and ancillary structures), a linear facilities corridor (to construct the transmission interconnection and access road improvements), and potential future solar of up to 200 MW. The OCEC Unit 1 major components are identified on Figure 4.1-1. OCEC Unit 1 will be a nominal 1,600 MW (net) “3-on-1” combined cycle unit. The “3-on-1” unit will consist of three nominal 350 MW advanced CTs and three HRSGs, which will utilize the waste heat from the CTs to produce steam to be utilized in a single nominal 550 MW steam turbine generator.

The CTs for the Project will be the General Electric (GE) Frame 7HA.02(H). The GE “H” CT has a gross capacity of approximately 350 MW at an inlet air temperature of 75°F. The HRSGs will not have duct firing.

Each CT will utilize inlet air cooling that will consist of evaporative cooling. Evaporative cooling systems achieve adiabatic cooling using water evaporated from a treated media. The evaporated water extracts the latent heat of vaporization from the inlet air stream when the water droplet is converted to water vapor. The result is a cooler, denser air stream. This allows additional power to be produced. The GE 7HA.02 CT also includes a wet compression feature which introduces water into the CT compressor inlet to enhance the CT capability during warm ambient conditions.

The CTs will use natural gas as the primary fuel, with ULSD oil used as the backup fuel. Natural gas for OCEC Unit 1 will be transported to the Site via pipeline. The natural gas will be provided by an independent supplier and the supply pipeline will be owned, permitted separately, and operated by the supplier. OCEC Unit 1 will include installation of a new on-Site natural gas yard and on-Site natural gas connection. Two on-Site gas pipeline route alternatives from the gas yard to the Site boundary are identified on Figure 3.1-2. Depending upon the location from which the pipeline originates off-Site, one of the two alternatives will be used. The ULSD oil will be delivered to the Site by truck and will be stored in a new fuel oil tank. When firing natural gas, emissions of nitrogen oxides (NO_x) will

be controlled using dry low NO_x (DLN) combustion technology and selective catalytic reduction (SCR). When firing ULSD oil, emissions of NO_x will be controlled using water injection and SCR.

Primary water uses for OCEC Unit 1 will be for cooling water and process water. Cooling water is required for condenser cooling and auxiliary equipment cooling. Condenser cooling for the steam cycle portion of the 3-on-1 unit will be accomplished using a mechanical draft cooling tower. Process water is required for CT inlet air evaporative cooling, wet compression, NO_x injection water when firing ULSD oil, steam cycle makeup, service water, and fire protection. Other minor uses will include potable water for employee use and water for landscape irrigation.

The OCEC Unit 1 stormwater management system design will handle a 25-year, 24-hour storm event. Contact stormwater runoff from the power block and equipment areas will be treated through an oil/water separator and routed to the onsite stormwater wet detention ponds. Non-contact stormwater from outside the power block will also be collected and routed to the stormwater ponds. The OCEC Unit 1 stormwater management system is designed to meet all federal, state, regional, and local requirements (see Subsection 4.8.1). The construction support area and construction parking and laydown areas will meet stormwater management requirements through Best Management Practices (BMPs) (see Subsection 4.8.2). Stormwater runoff that is collected in the wet detention ponds will be managed by a combination of detention, percolation, and evaporation.

OCEC Unit 1 will connect to the FPL transmission network through an on-Site 500 kV switchyard. An approximately 396-ft wide and 535-ft long off-Site transmission interconnection corridor will be required to connect the switchyard to the existing transmission network. Power during construction will be provided by diesel generators.

Within the 2,341-acre Site proposed for certification, approximately 1,629 acres are designated for potential 200 MW of future solar generation. A supplemental SCA describing the solar facility layout, engineering design, drainage system, and construction specifications would be submitted prior to development of the future solar generation area of the Site.

4.2 Site Layout

The site layout for OCEC Unit 1 is presented in Figure 4.2-1. Typical profiles of a CT/HRSG train are shown in Figures 4.2-2 (north-south) and 4.2-3 (east-west). Figure 4.2-4 shows alternative power block arrangements that change the location of the steam turbine generator (STG) relative to the CT/HRSG trains.

4.3 Fuel

The primary fuel used by the CTs will be natural gas, delivered to the Site via a natural gas pipeline to the on-Site gas metering station. The natural gas pipeline will be owned and separately permitted by the natural gas supplier. Depending upon the location from which the pipeline originates, two alternative on-Site pipeline routes have been identified from OCEC Unit 1 to the edge of the Site (Figure 3.1-2). Typical properties of natural gas are shown in Table 4.3-1. The heat content is typically approximately 20,566 British thermal units per pound (Btu/lb) [low heating value (LHV); approximately 22,828 Btu/lb higher heating value (HHV)] with a maximum sulfur content of 2 grains per 100 standard cubic feet (gr/100 scf) of natural gas.

ULSD oil will be used as a backup fuel for an equivalent of 500 hours per year (hr/yr) per CT at baseload conditions. Typical properties of ULSD oil are shown in Table 4.3-2. The heat content is typically approximately 18,300 Btu/lb [(LHV); approximately 19,398 Btu/lb (HHV)] with a maximum sulfur content of 0.0015 percent by weight.

No onsite storage will be provided for natural gas. ULSD oil will be delivered to the Site by truck and stored in a new approximately 7 million gallon (MG) fuel oil storage tank (165,000 barrels) with secondary containment.

The generating capacity of a combined cycle plant is affected by ambient temperature, machine specific performance and features unless wet compression is in operation when firing natural gas. Generally, greater overall fuel consumption will occur at lower ambient temperatures when ULSD oil is used. Wet compressions when firing natural gas allows nearly level fuel consumption over the ambient range. For the purpose of calculating maximum hourly fuel use quantities representative of the nominal 1,600 MW (net) combined cycle unit, the following specific operating conditions for the CTs were used (see SCA Appendix 10.2.5, Air Construction Permit):

- 35°F dry bulb ambient temperature;
- 60 percent relative humidity;
- Approximately 20,566 Btu/lb and 918 British thermal units per standard cubic foot (Btu/scf), LHV, of natural gas (approximately 22,828 Btu/lb and 1,019 Btu/scf, HHV); and
- Approximately 18,300 Btu/lb and 129,900 Btu/ gallon, LHV, for ULSD oil (approximately 19,398 Btu/lb and 137,700 Btu/gallon, HHV).

The heat input for CTs being used for OCEC Unit 1 is 3,028 MMBtu/hr (LHV) (3,361 MMBtu/hr, HHV) when firing natural gas at 100 percent capacity and an ambient temperature of 35°F. When using wet compression, the heat input is 3,095.7 MMBtu/hr (LHV) (3,436.2 MMBtu/hr, HHV) at an

ambient temperature of 75 °F. The corresponding fuel usage is approximately 3.37 million cubic feet per hour (MMcf/hr) for each CT. The fuel usage at 75°F ambient temperature with wet compression is approximately 8.86×10^{10} cf/yr of natural gas for OCEC Unit 1 operating 8,760 hr/yr on gas.

ULSD oil use will be based on the equivalent of 500 hr/yr per CT at full load. The maximum fuel use is approximately 23,500 gallons per hour per CT at 35°F ambient temperature, with an annual usage rate of approximately 33 MG for 3 CTs, each operating for 500 hours, and turbine inlet temperature of 75°F and evaporative cooling.

4.4 Air Emissions and Controls

4.4.1 Air Emissions Units

Air pollutants will be emitted from the CT/HRSGs when firing natural gas and ULSD oil. Air emissions result from either the combustion process or impurities in the fuel. Tables 4.4.1-1 and 4.4.1-2 present the performance and estimated emission rates of regulated pollutants when firing natural gas and ULSD oil, respectively. The maximum estimated emission rates for the conditions stated when firing natural gas and ULSD oil were determined using the manufacturer's information for the equipment proposed for OCEC. The design parameters are provided in Tables 4.4.1-1 and 4.4.1-2 for the range of operating loads and turbine inlet temperatures. Appendix 10.2.5, the Air Construction Permit Application, presents the basis for the emission rates and maximum annual emissions of regulated and non-regulated pollutants.

During combustion, two primary types of NO_x are formed: fuel NO_x and thermal NO_x. Fuel NO_x emissions are formed through the oxidation of a portion of the nitrogen contained in the fuel. Thermal NO_x emissions are generated through the oxidation of a portion of the nitrogen contained in the combustion air. NO_x formation can be limited by lowering combustion temperatures (through water or steam injection) and/or staging combustion (a reducing atmosphere followed by an oxidizing atmosphere, known as DLN control). The proposed NO_x stack emissions rates for the CTs associated with OCEC Unit 1 are 2 parts per million by volume dry (ppmvd), corrected to 15 percent oxygen (O₂) or less when firing natural gas, and 8 ppmvd corrected to 15 percent O₂ or less when firing ULSD oil.

Carbon monoxide (CO) is formed by incomplete combustion of fuel. High combustion temperatures, adequate excess air, and good fuel/air mixing during combustion will minimize CO formation. CO formation is limited by ensuring complete efficient combustion of the fuel in the turbines. Recent improvements in CT combustor technology allow for both reduced NO_x emissions and low CO emissions. The proposed CO stack emission rates for the CTs when firing natural gas and ULSD oil

at full load are 4.3 ppmvd corrected to 15 percent O₂ and 10 ppmvd corrected to 15 percent O₂, respectively.

Similarly, volatile organic compound (VOC) emissions are formed by incomplete combustion of fuel. High combustion temperatures, adequate excess air, and good fuel/air mixing during combustion will minimize VOC formation. VOC formation is limited by ensuring complete efficient combustion of the fuel in the CTs. Recent improvements in CT combustor technology allow for both reduced NO_x emissions and low VOC emissions. The VOC stack emission rates for the CTs when firing natural gas and ULSD oil at full load are 1.0 ppmvd corrected to 15 percent O₂ and 2.0 ppmvd corrected to 15 percent O₂, respectively.

PM, sulfur dioxide (SO₂), and sulfuric acid mist (H₂SO₄) emissions are controlled and minimized by the use of clean fuels, which include natural gas with a sulfur content of no greater than 2 gr/100 scf of sulfur and ULSD oil with a sulfur content of no greater than 0.0015 percent sulfur by weight.

GHG emissions are minimized through the use of highly efficient combined cycle technology and the primary use of natural gas, the lowest GHG emitting fossil fuel.

OCEC Unit 1 will be equipped with three large emergency generators to support the plant and transmission system. Two 3,298 kilowatt (kW-brake) emergency generators will be installed to support the plant. One emergency generator, not to exceed 3,298 kW, will be installed to support transmission and other emergency power needs, such as the gas yard, that are outside the main power block area. These emergency generators will be used when electric power is not available. This would primarily occur during catastrophic events such as hurricanes. In addition to the larger emergency generators, there are small 25 kW propane fired emergency generators associated with the OCEC hurricane shelter. SCA Appendix 10.2.5, PSD/Air Construction Permit Application, contains emissions and manufacturer's information for the emergency generators, hurricane shelter generators and fire pump engine proposed for OCEC. Normally, these generators would be operated 1 to 2 hours per month for maintenance and reliability testing.

The 3-on-1 combined cycle unit may also include one natural gas-fired fuel heater and a spare. These heaters will have a heat input of 10 MMBtu/hr (HHV) or less and will be used as necessary to heat natural gas above the dew point. Only one fuel heater may be necessary for the operation of OCEC Unit 1. SCA Appendix 10.2.5 contains performance and emissions information for the fuel heater.

The auxiliary boiler will be used as necessary for startup. The limited use auxiliary boiler will have a maximum heat input of 99.8 MMBtu/hr (HHV) firing natural gas. SCA Appendix 10.2.5 contains

performance and emissions information for the auxiliary boiler. For construction, temporary boilers will be required for steam blows and cleaning. Temporary construction generators may also be used to provide electric power for construction equipment. These temporary air emission sources are discussed in Section 5.5 and described in detail in Appendix 10.2.5.

A new, approximately 7 million gallons (MG) fuel oil storage tank will be used to store the ULSD oil at the Site. Appendix 10.2.5 contains VOC emissions information for the new fuel oil storage tank to be constructed at the Site to store ULSD oil.

OCEC Unit 1 will be equipped with a 422 horsepower (hp) fire pump engine. This engine would be used when necessary during catastrophic events such as fires. SCA Appendix 10.2.5 contains emissions and manufacturer's information for the fire pump engine. Normally, this fire pump engine would be operated only 1 to 2 hours per month for maintenance and reliability testing.

OCEC Unit 1 will have a mechanical draft cooling tower for steam cycle cooling. PM will be emitted from the mechanical draft cooling tower in the form of drift. Cooling tower drift will be controlled through the use of mist eliminators that will be designed to limit drift to 0.0005 percent of the circulating water rate of the cooling tower.

The total annual emissions from OCEC Unit 1 include air emissions from the CTs, fuel heater, emergency generators, auxiliary boiler, fire pump engine, hurricane shelter generators, mechanical draft cooling tower and fuel oil tank. Table 4.4.1-3 presents the annual potential emissions for OCEC Unit 1. Annual emissions were based on maximum emissions for baseload operation and ambient temperatures of 75°F. The maximum CT emissions are based on 8,760 hr/yr with 8,260 hr/yr firing natural gas and 500 hr/yr firing oil. The potential emissions are based on the 75°F turbine inlet temperature at 100 percent load condition.

Table 4.4.1-3 presents the potential emissions resulting from the Project and the Prevention of Significant Deterioration (PSD) significant emission rates, which are thresholds for PSD review for specific pollutants and new major stationary sources. PSD review is required for emissions of a pollutant greater than the listed PSD significant emission rate. As shown in this table, the potential emissions for OCEC are greater than the PSD significant emission rates for all regulated air pollutants except lead.

On June 3, 2010, the U.S. Environmental Protection Agency (EPA) promulgated regulations related to PSD and Title V Greenhouse Gas (GHG) Tailoring Rule (75 Federal Register 31514-31608). In EPA's promulgation, GHGs are defined to include an aggregate group of six classes of compounds



that have been determined to have GHG properties: CO₂, methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Each of these GHGs has a specific Global Warming Potential (GWP) that is calculated as “CO₂ equivalent emissions” or CO₂e that is equivalent to the GHG properties of one ton of CO₂. In 2014 the Supreme Court issued a decision that indicated that GHG alone could not trigger PSD review. Rather, PSD for GHGs could only be triggered if PSD were required for other air pollutants (Supreme Court Case No. 12-1146).

For the OCEC Unit 1, the GHGs emitted are CO₂, CH₄, and N₂O, with one ton of CH₄ equivalent to 25 tons of CO₂e and one ton of N₂O equivalent to 298 tons of CO₂e. Table 4.4.1-3 presents the potential emissions resulting from the Project and the PSD significant emission rate for CO₂e, which is a threshold for PSD review.

Since PSD review is triggered for the Project for several regulated air pollutants, PSD review is required for GHG emissions if they are greater than 75,000 tons per year (TPY) CO₂e. As shown in Tables 4.4.1-3, the maximum potential annual CO₂e emissions of the Project will exceed the PSD threshold for GHGs.

As shown in Table 4.4.1-3, potential emissions from the Project will trigger PSD review for SO₂, PM (TSP), PM₁₀, PM_{2.5}, NO_x, CO, VOC, sulfuric acid mist and GHGs. SCA Appendix 10.2.5 contains the PSD/Air Construction Permit Application for all air pollutants triggering PSD review including GHGs.

4.4.2 Air Emission Controls

The use of clean fuels (natural gas and ULSD), highly efficient combined-cycle technology, combustion controls, and air pollution control equipment will minimize air emissions such as SO₂, PM_{2.5}/PM₁₀, and other fuel bound contaminants, and ensure compliance with applicable emission limiting standards. Combustion controls will minimize the formation of NO_x and the formation of CO and VOCs by combustor design. Further NO_x reduction will be achieved by SCR. The combination of these techniques has been determined to be BACT on previous combined cycle projects based on an evaluation of economic, energy, and environmental impacts. The following subsection presents a summary of the air pollution control technology proposed for OCEC Unit 1, which is presented in detail in the PSD/Air Construction Permit Application (Appendix 10.2.5).

OCEC Unit 1, among other measures, will continue FPL’s substantial progress in reducing CO₂ emissions in its system. OCEC Unit 1 will be among the most efficient natural gas-fired generating units in FPL’s system and will displace generation that would otherwise be produced by less efficient units thereby reducing system CO₂ emissions.



4.4.3 Control Technology Description

FDEP has adopted PSD rules in FDEP Rule 62-212.400, F.A.C. BACT review is part of the evaluation of control technology under the Florida PSD rules, and is required only for those specific pollutants that trigger PSD review. A determination of BACT is required for emissions of SO₂, PM (TSP), PM₁₀, PM_{2.5}, NO_x, CO, VOC, sulfuric acid mist and GHGs from the Project. BACT is an emission limitation that is based on the maximum degree of reduction for each regulated pollutant, determined after taking into account the energy, environmental, and economic impacts and other costs. The emission limits proposed for OCEC Unit 1 are reflective of BACT.

The EPA updated the New Source Performance Standards (NSPS) for stationary CTs that will commence construction after February 18, 2005. Subpart KKKK applies to units with a gross capacity greater than 1 MW. The Subpart KKKK requirements applicable to CTs greater than 30 MW apply to the CT/HRSG trains associated with OCEC Unit 1. The NO_x emissions are limited to 15 parts per million (ppm) corrected to 15 percent O₂ or 0.43 lb/MW-hr for natural gas firing, and 42 ppm corrected to 15 percent O₂ or 1.3 lb/MW-hr for ULSD firing. For SO₂ emissions, Subpart KKKK requirements limit emissions to 0.9 lb/MW-hr or a potential total sulfur content equivalent to 0.06 lb/MMBtu (HHV) if multiple fuels are fired.

EPA recently approved NSPS for GHG emissions from new, modified, and reconstructed electric utility generating units (40 CFR Part 60, Subpart TTTT; Signed 8/3/15). The NSPS applies to new stationary combustion turbines that commence construction after January 8, 2014, have a heat input rating of over 250 MMBtu/hr, and serve a generator capably selling more than 25 MW of electricity to a utility distribution system. New baseload CTs that combust more than 90 percent natural gas are required to meet a CO₂ emissions rate of 1,000 lb/MW (gross) or 1,030 lb/MWh (net) on a 12-month rolling average basis. The monitoring requirements for natural gas fired units are based on 40 CFR Part 75 requirements.

NSPS are also applicable to the auxiliary boiler, fuel heaters, fire pump engine, and emergency generators. The EPA NSPS Subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, applies to the auxiliary boilers and fuel heaters. For the emergency generators and fire pump engine, NSPS Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, is applicable.

EPA has promulgated maximum achievable control technology (MACT) standards under the National Emissions Standards for Hazardous Air Pollutants (NESHAP) regulations. As presented in SCA Appendix 10.2.5, OCEC Unit 1 will not be a major source of hazardous air pollutant (HAP) emissions since the combined potential emissions from OCEC Unit 1 will be less than the major source



thresholds for HAPs. The NESHAP Subpart YYYYY would only apply to OCEC Unit 1 if the Site has potential HAPs emission exceeding the major source thresholds and the aggregate use of oil by existing and new turbines exceeds 1,000 hours during any calendar year. However, information available from the CT vendors indicate that OCEC Unit 1 CTs will meet the proposed MACT of 91 parts per billion by volume dry (ppbvd) corrected to 15 percent O₂ for formaldehyde. NESHAP Subpart ZZZZ that applies to reciprocating internal combustion engines (RICE) is applicable to both major and area sources of HAPs. Therefore, Subpart ZZZZ addressing applies to the diesel engines associated with the Project. However, the method of compliance under this provision would be to demonstrate compliance with 40 CFR 60, Subpart IIII.

Appendix 10.2.5 of the SCA contains the PSD/Air Construction Permit Application for OCEC Unit 1. The application describes the air pollution control technology proposed for OCEC Unit 1 and addresses air quality impacts for compliance with Ambient Air Quality Standards (AAQS). The remainder of this section briefly describes those control technologies that are proposed for OCEC Unit 1.

4.4.3.1 Nitrogen Oxides

When firing natural gas, NO_x emissions will be controlled using DLN combustors. DLN combustor technology has been offered and installed by CT manufacturers to reduce NO_x emissions by inhibiting thermal NO_x formation through pre-mixing fuel and air prior to combustion and providing pre-mix combustion to reduce flame temperatures. The DLN combustors have premixed fuel zones plus a standard diffusion flame pilot burner for startup. Low NO_x levels are achieved by introducing fuel primarily to the pre-mix zones and reducing the amount of fuel being combusted from the pilot nozzle.

NO_x emissions will be further controlled by SCR systems when firing either natural gas or ULSD oil. SCR is a post-combustion process where NO_x in the gas stream has reacted with ammonia in the presence of a catalyst to form nitrogen and water vapor. The reaction occurs typically between approximately 320 and 400 degrees Celsius (°C) (600 and 750°F). These temperatures occur within the HRSG where the SCR catalyst and ammonia injection grid is installed. Ammonia will be stored onsite in one or more tanks. If applicable, a risk management plan required under Section 112(r) of the Clean Air Act and implemented by EPA regulations in 40 CFR Part 68 will be prepared for the ammonia storage. Flue gas NO_x emissions when firing natural gas will be reduced to 2 ppmvd, corrected to 15 percent O₂. When firing ULSD, SCR can reduce NO_x emissions by 80 percent or more to 8 ppmvd, corrected to 15 percent O₂ or less.

The NO_x control technology and emission limits proposed for OCEC Unit 1 are consistent with emission limits established as BACT in Florida and EPA Region IV for similarly-designed projects. The use of DLN combustors and SCR for OCEC Unit 1 will reduce NO_x emission levels to 2 ppmvd corrected to 15 percent O₂ when firing natural gas, and 8 ppmvd corrected to 15 percent O₂ when firing ULSD. These NO_x emission levels are proposed as BACT for OCEC Unit 1 and are consistent with recently established BACT emission limits for other combined cycle units.

The NO_x emissions from the auxiliary boiler, fuel heater, emergency generators, and fire pump engine will be limited using combustion techniques. The auxiliary boiler will be equipped with low NO_x burners to reduce NO_x emissions to 0.05 lb/MMBtu (HHV). The fuel heater will use combustion controls to reduce NO_x emissions to 0.095 lb/MMBtu (HHV). The emergency generators will meet the NSPS Subpart IIII NO_x emission requirements of 6.4 grams per kilowatt-hour (g/kW-hr). These NO_x emission rates are proposed as BACT for the auxiliary boiler, natural gas heaters, and emergency generators and have been established as BACT in previous PSD permits.

4.4.3.2 Carbon Monoxide

The OCEC CTs will utilize advanced combustion technology to reduce CO emissions in the range proposed for natural gas and ULSD firing. Advanced combustion technology is used to achieve low CO emission rates in CTs that have been determined to be technologies that meet BACT emission limits. The CO emission rates proposed as BACT for the GE “H” CTs when firing natural gas are 4.3 ppmvd corrected to 15 percent O₂ at baseload operation. When firing ULSD oil, the CO emissions proposed as BACT from the GE “H” CTs are 10 ppmvd corrected to 15 percent O₂.

Combustion techniques will be used to reduce the CO emissions from the auxiliary boiler, fuel heaters, fire pump engine, and emergency generators. The auxiliary boiler will be equipped with low NO_x burners designed to reduce CO emissions to 0.08 lb/MMBtu (HHV). The fuel heaters will use combustion controls to reduce CO emissions to 0.08 lb/MMBtu (HHV). The emergency generators will meet the NSPS Subpart IIII CO emission requirements of 3.5 g/kWh. The CO emission rates are proposed as BACT for the auxiliary boiler, fuel heater, and emergency generators have also been established as BACT in previous PSD permits.

4.4.3.3 Sulfur Oxides (SO₂ and H₂SO₄ Mist)

Combustion of clean fuels is the only feasible SO₂ control for the combined cycle unit, auxiliary boilers, fuel heaters, emergency generators, hurricane shelter generators, and fire pump engine. Natural gas and ULSD oil are the cleanest fuels available with maximum sulfur contents of 2 gr/100 scf for natural gas and 0.0015 percent sulfur for ULSD oil proposed for OCEC Unit 1. H₂SO₄ emissions will also be minimized by the use of low sulfur fuels. SO₂ and H₂SO₄ mist emissions will



be limited by the use of natural gas and ULSD; these clean fuels have been established as BACT in previous PSD permits.

4.4.3.4 Particulate Matter and Other Regulated Pollutants

The use of clean fuels, characterized by low PM and trace contaminant contents, coupled with advanced combustion techniques, results in negligible PM, PM₁₀, and PM_{2.5} emissions from the combined cycle unit, auxiliary boiler, fuel heaters, emergency generators and fire pump engine. Emission limits based on the use of clean fuels (i.e., natural gas and ULSD oil) have been established as BACT for PM/PM₁₀ emissions in previous PSD permits.

A small amount of PM is emitted from the mechanical draft cooling tower in the form of solution aerosols referred to as drift. Cooling tower drift is controlled by drift eliminators that separate solution aerosols from the mechanical induced air flow in the cooling tower by inertial impaction. The use of high-efficiency drift eliminators with a design drift rate of 0.0005-percent is proposed as a BACT work practice standard for PM emissions from the OCEC Unit 1 cooling tower.

4.4.3.5 Volatile Organic Compounds

Combustion techniques will be used to reduce the VOC emissions from the combined cycle unit, auxiliary boiler, fuel heater, emergency generators, and fire pump engine. The CTs will utilize advanced combustion technology, and the proposed BACT emission rates are consistent with those established as BACT for these turbines. The VOC emission rate proposed as BACT for the CTs when firing natural gas is 1 ppmvd corrected to 15 percent O₂ at baseload operation. When firing ULSD oil at baseload operation, the VOC emission rate proposed as BACT from the CTs are 2 ppmvd corrected to 15 percent O₂.

The auxiliary boiler is designed with proper combustion techniques to reduce VOC emissions to 0.005 lb/MMBtu (HHV). The fuel heater will use combustion controls to reduce VOC emissions to 0.005 lb/MMBtu (HHV). The emergency generators will meet the NSPS Subpart IIII VOC emission requirements of 0.2 g/kWh as non-methane hydrocarbons. These emission rates are proposed as BACT.

4.4.3.6 Greenhouse Gases

FPL operates one of the cleanest generating fleets in the nation. Use of natural gas as the primary fuel at OCEC Unit 1, along with the most efficient combined cycle technology, will result in one of the lowest CO₂ emission rates on a pound-per-megawatt-hour (lb/MW-hr) basis of any fossil fuel-fired units in the country. Moreover, OCEC Unit 1 will be among the most efficient natural gas-fired generating units in FPL's system. As a result, the electricity generated by OCEC will displace



generation produced by less efficient units in FPL's system and will thereby reduce the amount of CO₂ emissions from FPL's system.

The Project's emissions of GHGs above the PSD threshold require a BACT analysis. In November 2010, EPA issued guidance on the determination of BACT for GHGs ("*PSD and Title V Permitting Guidance for Greenhouse Gases*", November 2010). EPA believes that it is important in BACT reviews for permitting authorities to consider options that improve the overall energy efficiency of the source or modification – through technologies, processes, and practices at the emitting unit. In general, a more energy efficient technology burns less fuel than a less energy efficient technology on a per unit of output basis. Considering the most energy efficient technologies in the BACT analysis helps reduce the products of combustion, which includes not only GHGs but other regulated New Source Review (NSR) pollutants (e.g., NO_x, SO₂, PM/PM₁₀/PM_{2.5}, CO, etc.), EPA emphasizes that energy efficiency should be considered in BACT determinations for all regulated NSR pollutants (not just GHGs).

The efficiency of the generation technology in producing electricity and the type of fuel utilized are the most important aspects of GHG emissions from electric generation projects. Together, efficiency and fuel type dictate the amount of GHG emissions per unit of generation.

An important measure of the efficiency for an electrical generating facility is the unit's heat rate. Heat rate is a measurement of how efficiently a unit uses heat energy. It is expressed as the number of Btus of heat required to produce a kilowatt-hour of energy (Btu/kWh)¹. A heat rate of 3,413 Btu/kWh reflects a conversion efficiency of 100 percent from thermal energy to electrical energy, and efficiency is based on the high heating value of the fuel.

The proposed combined cycle units' net heat rate and energy efficiency were compared to data obtained from the U.S. Energy Information Administration (EIA). Based on data provided in the Annual Energy Review 2012, the approximate heat rate for electricity for fossil fueled power plants in the U.S. in 2011 was 9,756 Btu/kWh net (HHV) (35.0 percent efficiency) (<http://www.eia.gov/totalenergy/data/annual/showtext.cfm?t=ptb1206>).

Based on US EIA's 2014 annual review of the electrical power industry, the reported average net heat rate (HHV) for natural gas firing was 8,185 Btu/kWh net (HHV) (41.7 percent efficiency) including all types of generation (http://www.eia.gov/electricity/annual/html/epa_08_02.html). Of the generation types, the average tested heat rates when firing natural gas are:

- Steam turbine generator – 10,354 Btu/kWh net (HHV) (33.0 percent efficiency),

¹ All Btu/kWh are calculated on a HHV basis.

- Natural gas turbine – 11,371 Btu/kWh net (HHV) (30.0 percent efficiency),
- Internal combustion – 9,573 Btu/kWh net (HHV) (35.7 percent efficiency), and
- Combined cycle – 7,667 Btu/kWh net (HHV) (44.5 percent efficiency).

The average base heat rate of OCEC Unit 1 when firing natural gas is anticipated to be 6,304 Btu/kWh net (HHV) based on an average ambient temperature of 75° F. For the same amount of generation, the efficiency of OCEC will result in almost one million fewer tons of GHGs than existing combined cycle plant in the U.S.

OCEC Unit 1 will be more efficient than other existing combined cycle plants in FPL's system. This is a result of utilizing the latest CT technology that results in greater efficiency in the CT generated power and increased exhaust energy through the HRSG to produce more steam electric generation. Together this significantly improves the efficiency over earlier generation combined cycle plants.

As part of EPA's clean energy initiatives, EPA developed the Emissions & Generation Resource Integrated Database (eGRID) as a resource tool in assessing GHG emissions. eGrid is a comprehensive source of data on the environmental characteristics of almost all electric power generated in the United States with data available based on a variety of geographic regions and locations. Data is also available for units, plants, power control areas (system), states, National Electric Reliability Council (NERC) regions and subregions, and the U.S. Based on the latest available eGrid data, the following are the emissions of CO₂ on a generation basis for generation facilities located in the same subregion as the project (accessed 8/25/15: <http://www.epa.gov/cleanenergy/energy-resources/egrid/>; gross heat rate as HHV):

- Florida Reliability Coordination Council – 1,196.7 lb CO₂/MWh gross (HHV) for all generation (including nuclear); 1,342.0 lb CO₂/MWh for total combustion generation.
- FPL – 787.1 lb CO₂/MWh for all generation (including nuclear); 1,030.8 lb CO₂/MWh gross (HHV) for total combustion generation.

When firing natural gas, the GHG emissions for OCEC Unit 1 at baseload and new and clean condition are expected to be less than 750 lb CO₂/MWh (gross, HHV) based on an average base heat rate of 6,304 Btu/kWh net (HHV) and ambient air temperature of 75 °F. The proposed long-term BACT emission rate covering all potential operating conditions including load operation and variable CT operation is 850 lb CO₂/MWh (gross, HHV) for natural gas. When compared to the existing generation facilities in FPL's system for fossil combustion, the OCEC Unit 1 GHG emissions on a generation basis are lower and, when operated, will displace less efficient generation resulting in overall GHG reduction in FPL's system.

4.4.4 Design Data For Control Equipment

Design data for the air pollution control equipment are presented in SCA Appendix 10.2.5 (Air Construction Permit Application).

4.4.5 Design Philosophy

OCEC Unit 1 will be an advanced, natural gas-fired combined cycle plant that minimizes air pollutant emissions by using the most fuel-efficient and pollution-preventing technology. This concept has been incorporated with the selection of a combined cycle process utilizing advanced GE “H” CTs. Advanced combined cycle plants can be expected to achieve fuel conversion rates of 6,800 Btu/kWh or less (50 percent efficiency at 75°F, baseload, HHV, gross) when new and clean. Pollution prevention is incorporated in the design by the use of clean fuels and advanced combustion technology. Natural gas and ULSD oil will be used. Moreover, advanced DLN combustion technology will be used to minimize NO_x emissions while ensuring that CO and VOC emissions are within accepted limits. SCR will be installed to further reduce NO_x emissions. Taken together, the design of OCEC Unit 1 will incorporate features that will make it one of the most efficient and cleanest fossil fuel-fired units in Florida.

4.5 Plant Water Use

Primary water uses for OCEC Unit 1 will include cooling, process, service, irrigation, and potable water. The primary water source will be the UFA, with potable water coming from the surficial aquifer depending upon water quality. The annual average withdrawal from the UFA will be 9 MGD (3,287 MGY) and the maximum daily withdrawal will be 11 MGD. The annual average withdrawal from the surficial aquifer will be 0.046 MGD (16.8 MGY) and the maximum daily withdrawal will be 0.0806 MGD. Cooling water is required for condenser cooling, auxiliary cooling, and cooling pump seal water. Process water is required for CT inlet air cooling, wet compression, NO_x injection water when firing ULSD, steam cycle makeup and fire protection. Other water uses will include service water for internal plant uses such as equipment washing landscape irrigation and potable water for employee use. Condenser cooling for the steam cycle portion of OCEC Unit 1 and auxiliary cooling will be accomplished using a mechanical draft cooling tower. Water storage will be by a 2 million gallon raw water storage tank, a 4 million gallon service water/fire water storage tank, and a 6.6 million gallon demineralized water storage tank. The OCEC consumptive use from the UFA, on an annual average basis, is 9 MGD (3,287 MGY) and the maximum daily consumptive use is 11 MGD. The water balance for OCEC is shown in Figure 4.5-1.

The stormwater management system for OCEC Unit 1 will be designed to meet local, regional, state, and federal nonprocedural requirements, which include the rules of Okeechobee County, SJRWMD,



FDEP, and EPA. SCA Section 4.8 discusses the stormwater for construction and operation of OCEC Unit 1 and SCA Appendix 10.8 Stormwater Management Plan provides detailed stormwater calculations.

Section 6.3 presents a discussion of alternative water sources.

Subsections 4.5.1 through 4.5.4 provide detailed descriptions of OCEC Unit 1 water uses.

4.5.1 Heat Dissipation System

A rectangular wet mechanical draft cooling tower, located adjacent to the power block, will be used to reject the heat load of about 2.7 billion Btu/hr to the atmosphere. The design is based on 5 cycles of concentration using UFA water with an expected average TDS of 1,740 ppmw. Figure 4.5-1 provides a description of the plant water balance. Table 4.5.1-1 presents the design information for the mechanical draft cooling tower. Makeup water will be pre-treated if necessary to remove scale-causing constituents (e.g., calcium, magnesium, and sulfate). Cooling tower blowdown, water released from the circulating water system to maintain proper water quality, will be routed to the UIC well system (refer to Figure 4.2-1 for locations of injection wells and the dual-zone monitoring well). The Draft Class V Exploratory Well permit is provided in Appendix 10.2.8. The permit describes the construction requirements, including well bore diameters, casing depths and casing materials, and the drilling and testing programs for wells EW-1 and the DZMW-1. The non-hazardous wastewaters to be injected through the injection wells will include cooling tower blowdown, water treatment system effluents and process and service water effluents, as discussed below.

Operation of OCEC Unit 1 during periods of startup and shutdown, steam turbine shutdowns, or other atypical/emergency operating conditions where steam is being produced in the HRSGs and discharged directly into the condenser before passing through the steam turbine, is defined as steam turbine bypass or “Bypass Operation”. During the majority of the operating scenarios while in Bypass Operation, the thermal energy discharged to the condenser falls within the design full load thermal discharge.

4.5.2 Domestic/Sanitary Wastewater

Restroom facilities will be constructed to accommodate approximately 30 full-time OCEC employees. There are no regional sewage collection systems within 10 to 20 miles of OCEC Unit 1, and none are likely to be available in the foreseeable future. Therefore, connecting to a regional system is not feasible. If a regional collection system becomes available at OCEC Unit 1, FPL will evaluate the feasibility of connecting to the system at that time. The sanitary wastewater from OCEC Unit 1 will be routed to an onsite sewage treatment and disposal system consisting of septic tanks and

a drain field designed to meet all applicable nonprocedural requirements, including the performance standards of Chapter 64E-6. The location of the onsite sewage treatment and disposal system is shown as item 33 in Figure 4.2-1. The average (2 gpm) and peak (6 gpm) sanitary flows are shown in the plant water balance (Figure 4.5-1). This wastewater system will be used only for domestic sanitary wastes; it will not be used to process any industrial, hazardous or toxic sewage wastes.

4.5.3 Potable Water Systems

Potable water for human consumption at OCEC Unit 1 will be obtained from the surficial aquifer and/or from the Floridan Aquifer. The potable water system will be designed, constructed and operated to meet all applicable nonprocedural requirements, including Chapter 62-550 and Chapter 62-555, F.A.C. Permanent safety shower/eyewash stations will be installed. Wastewater from the water treatment system will be routed to the injection wells. Sanitary wastewaters will be routed to the onsite sewage treatment and disposal system.

4.5.4 Process Water Systems

The Project will install filtration or other necessary treatment and demineralizer systems for process water treatment using water from the Upper Floridan Aquifer. Any reject water will be mixed with the cooling tower blowdown for disposal in the UIC well system (see Figure 4.5-1), while any required regeneration of ion exchanger systems will be performed off-Site.

4.5.4.1 Demineralized Water

OCEC Unit 1 will require the use of demineralized water [i.e., conductivity < 0.1 microsiemen per centimeter ($\mu\text{S}/\text{cm}$)]. Demineralized water is required for:

- Makeup water to replace HRSG and evaporative cooler water use to maintain water quality;
- Makeup water to replace miscellaneous steam losses in the steam cycle; and
- Water injection into the CTs for NO_x control when firing ULSD and for power enhancement using the wet compression process.

FPL will use demineralizer technology for OCEC Unit 1 process water treatment using water from the Upper Floridan surficial aquifers. The demineralized water will be pumped into a 6.6 million gallon on-Site storage tank. Effluent from the water treatment system will contain the constituents that are found in the well water. Based on the water balance, the constituent concentrations in the reject water will be approximately 6 times higher than the well water concentration. Reject water (average flow of approximately 78 gpm) will be mixed with the cooling water blowdown and routed to the injection wells or recycled to the cooling tower basin depending upon water quality. The HRSG and

evaporative cooler blowdown (average flow of approximately 65 gpm) will be reused to the greatest extent practicable as makeup water for the cooling tower.

4.5.4.2 General Service Water

General service water uses, including cleaning and flushing water and fire protection water, will be provided by the service water system using water from the Floridan and/or surficial aquifers following treatment, if necessary. The average flows will be approximately 30 gpm. Water quality requirements in this water system are similar to the raw water requirements for a potable water system (TDS < 500 mg/l).

4.6 Chemical and Biocide Waste

The wastewaters generated by OCEC Unit 1 will include cooling tower blowdown, HRSG and evaporative cooler blowdown, process water treatment system wastewater, wash water, and equipment area stormwater. HRSG and evaporative cooler blowdown will be reused to the greatest extent practicable or routed to the injection wells. Contact stormwater will be treated in an oil/water separator and then routed to the stormwater ponds. Water treatment wastewaters and non-hazardous, low volume wastewaters (e.g., wash water and equipment drains) will be treated if necessary and routed to the injection wells.

The principal uses of chemicals and biocides will be for steam cycle and cooling water quality control and chemical cleaning of the HRSGs and pre-HRSG piping systems.

Table 4.6-1 presents a list of the waste streams associated with OCEC Unit 1, their characterization, and proposed method of disposal. The following sections provide further information on the characteristics of these waste streams (see also Section 4.7).

4.6.1 Cooling System Water Chemical Treatment

Intermittent shock chlorination or other oxidizing or non-oxidizing biocides will be used to prevent biofouling of the heat rejection system. A chlorine solution will be fed into the cooling tower.

A scale inhibitor will be fed to the circulating water system to control the formation of calcium carbonate scales. These scales can adhere to heat transfer surfaces and impair cooling condenser performance. Sulfuric acid will be added to the circulating water system to reduce alkalinity in the circulating water makeup, thus reducing the likelihood of scale formation. In addition, a polymer may be added to the circulating water system to help hold suspended solids in solution. An anti-foam agent may be used to reduce the potential for foam generation.

4.6.2 Steam Cycle Water Treatment

The steam/condensate feedwater will be chemically treated to prevent corrosion or scaling of the equipment. The steam cycle water will be treated with ammonia or an amine for pH control. Other chemicals such as oxygen scavengers will be utilized to maintain water quality. Sodium phosphate will be fed to the HRSGs for control of pH and hardness. Residual phosphate in the HRSG will react with hardness to form a non-adherent precipitate that will be permanently removed through HRSG boiler blowdown.

4.6.3 Sanitary Wastewater Treatment

As stated in Subsection 4.5.2 above, the sanitary system for OCEC Unit 1 will use an onsite sewage treatment and disposal system consisting of septic tanks and a drain field designed to meet the non-procedural performance standards of Chapter 64E-6. The system is based on biological treatment. Only additives approved by the Florida Department of Health, as listed on their website, will be added to this treatment system (www.floridahealth.gov/environmental-health/onsite-sewage/products/additives/index.html#heading_1).

4.6.4 Makeup Water Demineralization

As discussed in Subsection 4.5.4.1, the makeup water to the steam cycle will be demineralized, and the resulting reject water will be routed to the injection wells or recycled to the cooling tower basin depending upon water quality. Regeneration of the MB ion exchange units will be performed offsite.

4.6.5 Chemical Cleaning

The HRSG and feedwater piping will be chemically cleaned initially during commissioning and also periodically during the life of OCEC Unit 1. Prior to application, the chemicals will not be stored onsite but will be delivered to the Site by a licensed contractor at the time of the scheduled periodic cleanings. The chemical cleaning solutions to be used for acid and alkaline cleaning of the HRSG must be consistent with the HRSG manufacturer's recommendations. Chemicals typically used in HRSG and feedwater pipe cleaning may include the following:

- Inhibited citric acid
- Ammonia
- Organic chelates, such as ethylene diamine tetra-acetic acid (EDTA)
- Disodium phosphate
- Trisodium phosphate
- Nonfoaming wetting agents
- Foam inhibitors

Wastewaters will consist of the cleaning solutions and material removed during the cleaning process. Chemical cleaning is an infrequent maintenance operation; it does not contribute to the liquid wastes produced by the normal operation of OCEC Unit 1.

Chemical cleaning wastes will be maintained onsite and tested and, if meeting the requirements as non-hazardous, will be routed to the injection wells. Chemical cleaning wastes not meeting the UIC permit requirements will be managed according to applicable local, state, and federal rules and regulations.

4.6.6 *Miscellaneous Drains*

Wastewater can result from draining a water storage tank or from cleaning and maintenance operations. Wastewater from these processes will be routed to the injection wells, the stormwater management system, or otherwise managed according to applicable local, state, and federal rules and regulations. Flows from the miscellaneous drains will be intermittent and will not normally contribute to the wastewater flows. Periodic offline washes of the CTs, using water or a detergent-water solution, will also produce wastewaters. CT offline wash wastewater will be managed by draining these wastewaters into a tank and transferring by a portable pump to tank trucks and managed according to applicable local, state, and federal rules and regulations.

4.7 Solid and Hazardous Wastes

All non-hazardous and hazardous wastes associated with the operation of OCEC Unit 1 will be managed according to federal, state, and local regulations and FPL's "Waste Guidelines" (see Table 4.7-1). OCEC Unit 1 may periodically generate hazardous waste [typically less than 100 kilograms (kg) per month], including spent solvents, boiler chemical cleaning wastes, and other wastes. Potentially hazardous wastes will be collected and managed as hazardous waste until tested to determine their characteristics.

Solvent rags will be separated and either laundered or disposed of appropriately. If aerosol cans are punctured prior to disposal, the residual will be collected and managed as hazardous waste. Paint waste, polyvinyl chloride (PVC) cleaner, and PVC cement wastes will be minimized.

4.7.1 *Solid Wastes*

Solid wastes will be generated by the operation of OCEC Unit 1, but generally in small quantities. Such solid wastes will be limited to municipal solid waste (MSW), infrequent replacement of inlet air filters, operations and maintenance wastes, and solids from the water pretreatment process. An approved solid waste disposal contractor will dispose of all solid wastes. Solid waste management facilities subject to Chapters 62-701 or 62-702, F.A.C., or solid waste combustor ash management



facilities are not proposed. As a result, information pertaining to waste containment design, leachate control, surface water control, geotechnical investigations, water quality monitoring plan, closure plan and long-term care, and financial assurance are not applicable to the Project.

4.7.2 Hazardous Wastes

FPL will operate OCEC Unit 1 to minimize, if not eliminate, the generation of hazardous waste. Any hazardous waste associated with OCEC Unit 1 will typically be less than 100 kg per month and may include spent solvents, HRSG chemical cleaning wastes, and other wastes. Hazardous wastes, if any, will be collected onsite and disposed of by a licensed hazardous waste contractor. Hazardous waste will be managed according to applicable rules and regulations.

4.8 On-Site Drainage System

4.8.1 Design Criteria and Applicable Regulations

The surface water management system for OCEC Unit 1 will be designed to meet the nonprocedural requirements of applicable local, regional, State, and federal requirements, which include the rules of the SJRWMD, Okeechobee County, FDEP, and EPA, with the variances described below. The required design rainfall event, based on a 25-year 24-hour storm, is 9.0 inches. The basic design philosophy is that the required water quality treatment volume of runoff from OCEC Unit 1 will be treated by on-Site wet detention. The OCEC Unit 1 drainage system of catch basins, pipes, channels, swales, and culverts will convey runoff to stormwater detention ponds (see Figure 4.1-1). Surface water and stormwater management calculations are presented in SCA Appendix 10.8 Stormwater Management System Design, Dewatering Plans, and Calculations.

FPL is seeking a variance from the specific requirements of Section 8.8 and Section 8.9 of the Environmental Resource Permit Applicant's Handbook Volume II for use within the geographic limits of the St. Johns River Water Management District (SJRWMD ERP Applicant's Handbook Vol II) (incorporated by reference in Rule 62-330.010, F.A.C.) regarding the 12 foot pond depth and the 2:1 length to width ratio for a wet detention stormwater pond system. The proposed stormwater pond depth and configuration design will fulfill the stormwater treatment requirements of the SJRWMD ERP Applicant's Handbook Vol II, based on the following:

Section 8.8 of the SJRWMD ERP Applicant's Handbook Vol II indicates that "wet detention systems shall provide for a maximum pond depth of 12 feet..". The wet detention system pond depths for Pond 4-1 and Pond 4-2 are proposed to have depths greater than 12 feet to obtain fill material needed to level the Site. While the maximum depth of Ponds 4-1 and 4-2 is greater than 12 feet, FPL's stormwater treatment calculations only consider the treatment provided by depths of 12 feet or less

consistent with prior agency practice and interpretation of Section 8.8 based on consultation with SJRWMD, and ponds are commonly dug deeper to obtain fill material. In addition, soil borings taken in the vicinity of Ponds 4-1 and 4-2 indicate that no confining layer will be breached when the ponds are excavated to the proposed design depths, which further supports the requested variance.

Section 8.9 of SJRWMD ERP Applicant's Handbook Vol II states "The average length to width ratio of the pond must be at least 2:1." The 2:1 length to width ratio is part of the best management practices for demonstrating sufficient residence time to provide the required treatment. Pond 4-1 does not have a 2:1 length to width ratio because the pond will be enlarged in both depth and width to obtain fill material needed to level the Site. However, the pond as designed provides for over two times the required treatment time using only the first 12 feet of depth. The treatment volume required could be met with a pond width of only 267 feet, however, the width was increased to 563 feet to obtain additional site fill material; therefore if the pond dimensions were limited to only what is required for treatment volume the 2:1 requirement would have been met and exceeded (W of 267'/ L of 943' = 3.53:1). Section 8.9 also states that "If short flow paths are unavoidable, the effective flow path can be increased by adding diversion barriers such as islands, peninsulas, or baffles to the pond." The point of discharge into Pond 4-1 is located on the far opposite side of the pond compared to the outfall structure to maximize the distance and treatment time. Since the treatment volume provided (above 12 feet in depth) in Pond 4-1 is over two times the amount required, increasing the flow paths further per Section 8.9 of SJRWMD ERP Applicant's Handbook Vol II is not necessary. In addition, a 21-day average residence time is provided per Section 8.5 and 8.7 of SJRWMD ERP Applicant's Handbook Vol II (Pond 4-1 does not include a littoral zone so 1.5 times the 14 day average residence time is required as a littoral zone alternative) as shown in Appendix 10.8, Calculation No. 58.5406.1102, Section 7.5. The recovery time required by Section 8.3 of SJRWMD ERP Applicant's Handbook Vol II is still being met ($\frac{1}{2}$ required treatment volume within 24 and 30 hours but no more than $\frac{1}{2}$ of the volume discharged in first 24 hours). Pond 4-1 draws down half of the treatment volume at 26.82 hours, and Pond 4-2 draws down half of the treatment volume at 28.21 hours. See Appendix 10.8, Calculation No. 58.5406.1102, Section 7.8. Consultation with FDEP Southeast District confirmed that the design basis outlined above is appropriate.

Overall, the proposed OCEC wet detention stormwater treatment system satisfies the stormwater quality treatment requirements of SJRWMD ERP Applicant's Handbook Vol II sufficient to maintain the presumption of compliance with state water quality standards (see Section 4.1.3, SJRWMD ERP Applicant's Handbook Vol II). Extensive unnecessary cost would be added to the construction of OCEC and, in turn, to FPL's customers to import fill from off-Site to attain the necessary final level elevation for plant construction rather than increase the size of the stormwater detention pond. This



justifies the variance from the SJRWMD ERP Applicant's Handbook Vol II, Section 8.8 requirement of a maximum wet detention system pond depth of 12 feet and the Section 8.9 requirement of a 2:1 length to width ratio for a wet detention stormwater pond system.

Pursuant to Rule 62-17.051(3)(a), F.A.C., FPL requests that the following condition of certification, or such other similar condition as may be deemed appropriate, be included as part of any final certification for the Project: *"FPL is granted a variance from SJRWMD ERP Applicant's Handbook Vol. II, Section 8.8 (Pond Depth) and 8.9 (Pond Configuration)."*

4.8.2 Construction Site Drainage

Prior to commencement of construction, FPL will seek coverage for the construction of OCEC Unit 1 under FDEP's Generic Permit for Stormwater Discharge from Large and Small Construction Activities. Since May 1, 2003, construction sites in Florida that will result in a disturbance of 1 acre or more are required to seek coverage under the [Generic Permit for Stormwater Discharge from Large and Small Construction Activities](#) [FDEP Rule 62-621.300(4)(a), F.A.C.]. The Notice of Intent (NOI) will be submitted to FDEP prior to commencement of construction.

Prior to submitting the NOI for the construction permit, FPL will prepare a comprehensive Storm Water Pollution Prevention Plan (SWPPP), as required under the Generic Permit, addressing the construction of OCEC Unit 1.

Prior to construction activities, silt fences or equivalent will be installed in accordance with the SWPPP along the perimeter of construction areas, those areas to be used for construction support, and where offsite runoff may occur. Stormwater detention ponds will be installed and will serve as sedimentation ponds during the construction of OCEC Unit 1.

During construction, the extent of earth disturbances will be minimized as much as is practical in accordance with the SWPPP. Areas outside of cut and fill operations will be protected against unnecessary equipment traffic. Aggregate surfaced areas may be provided for roads, while limerock surfacing may be provided for the construction support areas.

Stormwater ponds will be installed prior to construction to intercept and store runoff from earth disturbing activities. The material removed from the ponds will be stored on-Site in temporary staging areas and then used as fill for OCEC Unit 1. Temporary erosion and sedimentation control measures will be designed to prevent sediment from being displaced. Construction personnel and equipment will enter the Site over paved roads. Within the construction support areas, temporary swales, ditches, silt fences, and hay bales will be provided as necessary to divert runoff to detention



areas and/or temporary sedimentation ponds. All temporary sediment and erosion control measures will be removed at the end of construction or when areas have been stabilized or incorporated into the permanent facilities.

4.8.3 Operational Site Drainage

A detailed description of the pre-construction and post-construction site drainage features and associated modeling of design stormwater runoff is presented in Appendix 10.8 Stormwater Management Plan. At the completion of construction, disturbed areas surrounding OCEC Unit 1 will be seeded where necessary, and their runoff will be in managed accordance with the stormwater management plan.

OCEC Unit 1 runoff that is unaffected by industrial activity (non-contact stormwater) will be handled by the new stormwater management system. This stormwater management system will provide the required water quality and quantity treatment in wet detention areas located on the OCEC Unit 1 area. Stormwater outfalls will release to swale areas.

Contact stormwater runoff from the OCEC Unit 1 equipment and containment areas (containment areas for transformers, oil tanks, and other oil containing or handling equipment) will be routed through an oil/water separator and then reused or routed to the stormwater management system or UIC well system.

4.9 Heavy Equipment and Materials

4.9.1 Construction Materials and Equipment

Construction materials and equipment will be delivered to the Site, including the construction parking and laydown areas (see Figure 4.1-1), by existing roadways. State Road 60 and a connected access driveway (226th Court) will be used during construction of the Project.

Construction parking and laydown areas associated with the Project will be cleared and then graded where necessary and brought to working grade with additional fill, as needed. Limestone and aggregate will be used as necessary for stabilization of the construction parking and laydown areas associated with the Project.

Equipment and component parts of the combined cycle unit will be unloaded and moved around the Site using portable cranes and trucks. Some of the heaviest items, such as the new CTs, steam turbine, electric generators, HRSGs, and transformers, may require special transport. Pollution control measures for the laydown areas will include runoff collection as discussed above in Section 4.8. As necessary, additional temporary access required for the construction support areas and the

construction parking and laydown areas may be surfaced with aggregate/limerock, with reasonable precautions taken to control fugitive dust (see Subsection 5.5.2).

4.9.2 Roads

Trucks and equipment associated with the construction of the Project will travel to the Site by using SR 60 and 226th Court. Analysis of construction traffic impacts is presented in greater detail in Subsection 5.7.2 and SCA Appendix 10.7.4, Traffic Information. Operational traffic is discussed in greater detail in Subsection 6.9.1. The Site's access road is discussed below in Section 4.10.

4.9.3 Rail/Ship

Equipment that cannot be transported to the area by highway may be transported by rail or ship to an appropriate location for transport to the Site by road. This may include heavy components such as turbine sections, transformers, and generators. Existing rail and waterway/port facilities are adequate to allow for potential transport of heavy components.

4.10 Associated Linear Facilities

Linear facilities associated with the Project consist of the improvements to the existing access road from SR 60 and the transmission interconnection between the Site and the existing Martin-Poinsett transmission line right-of-way. Both the transmission interconnection and access road are contained within the linear facilities corridor. The transmission interconnection is discussed in Chapter 9. The existing access road is discussed below.

The existing paved access road (226th Court) is approximately 22 feet in width and extends approximately 1 mile south from SR 60 to the Site (Figure 4.10-1). The road is contained within an approximately 58.6 acre easement (Figure 4.10-2), 4.86 acres of which consist of the transmission interconnection corridor discussed in Chapter 9.

The existing land use and vegetation cover types within the linear facilities corridor are identified on Figure 4.10-3, classified in accordance with the FDOT's Florida Land Use, Cover, and Forms Classification System (FLUCFCS). The vegetative community composition and ecological characteristics for each habitat type within the corridor are consistent with those described in Sections 3.3.6.1, 3.3.6.2, 3.3.6.3, and 3.3.6.4. No threatened or endangered species have been observed within the linear facilities corridor.

No improvements are required for the access road with the exception of the following, as illustrated on Figure 4.10-4:

- Approximately 300 feet of repaving to remove dip in existing road near SR 60;



- Relocation of existing guardrail at entrance to 226th Court from SR 60;
- Increase radius of the entrance from SR 60 and extension of existing culvert within roadside swale adjacent to SR 60;
- Upgrade of one access road culvert located approximately 4,650 ft south of SR 60;
- Removal of trees/limbs within 6 feet of the edge and 20 feet above existing pavement.

The access road improvements will be conducted within the existing road footprint, with the exception of approximately 0.02 acres of fill within the roadside swale adjacent to SR 60 and 0.01 acres of temporary impact associated with culvert improvements. Detailed construction drawings are provided in Appendix 10.4, Environmental Resource Permit, Attachment B – Construction Plans.

4.11 Emergency Disaster Preparedness Plans

FPL has comprehensive emergency disaster preparedness plans for both operational emergencies and natural disasters that can occur in Florida (e.g., hurricanes). FPL has been an industry leader in the preparation for hurricanes and in the recovery after a storm. FPL will continue with these efforts in the future, and enhance emergency preparedness plans for new projects like OCEC. An Emergency Action Plan will be prepared prior to the commercial operation of OCEC Unit 1 that will be similar to FPL's existing combined cycle plants.

For OCEC Unit 1, a hurricane shelter and emergency generators will be located in the power block area. The OCEC Unit 1 Emergency Action Plan will include descriptions of the hurricane shelter and emergency generators.

TABLES

TABLE 4.3-1
TYPICAL NATURAL GAS COMPOSITION

Composition	Mole %
Nitrogen (N ₂)	0.27 - 0.45
Helium (He)	0.01
Carbon Dioxide (CO ₂)	0.44 - 0.88
Methane (CH ₄)	96 - 97.0
Ethane (C ₂ H ₆)	1.8 - 2.6
Propane (C ₃ H ₈)	0.16 - 0.29
Butane (C ₄ H ₁₀)	0.011 - 0.017
Pentanes (C ₅ H ₁₂)	0.007 - 0.03
Hexanes (C ₆ H ₁₄)	0.03
Heptanes (C ₇ H ₁₆)	0.01
Octanes (C ₈ H ₁₈)	0.0
Argon, Oxygen (Ar, O ₂)	0.0
Sulfur (S)	2 grains per 100 scf
Water Vapor (H ₂ O)	0.6 lb/MMscf
Low Heating Value (LHV) = 20,566 Btu/lb; 918 Btu/scf (approximate). High Heating Value (HHV) = 22,828 Btu/lb; 1,019 Btu/scf (approximate). Note: scf = standard cubic feet. MM = million.	

TABLE 4.3-2
TYPICAL ULTRA LOW SULFUR LIGHT OIL COMPOSITION

Elements	Maximum
Carbon Residue	0.35 % on 10% Bottoms
Water and Sediment	0.05 %
Ash	0.01 %
Vanadium	0.5 ppm
Sodium and potassium	0.5 ppm
Lead	1 ppm
Calcium	2 ppm
Sulfur	0.0015 wt. %
Low Heating Value (LHV) = 18,300 Btu/lb; 129,900 Btu/gallon (approximate). High Heating Value (HHV) = 19,398 Btu/lb; 137,700 Btu/gallon (approximate).	
Note: ppm = parts per million.	

**TABLE 4.4.1-1
STACK, OPERATING, AND EMISSION DATA FOR
COMBUSTION TURBINES/HRSGS FOR
NATURAL GAS COMBUSTION**

Parameter	Units	Operating and Emission Data ^a for Ambient Temperature			
		Combustion Turbine/ HRSG			
		35 °F	59 °F	75 °F	95 °F
<u>CT/HRSG Stack Data</u>					
Height	ft	149	149	149	149
Diameter	ft	25.6	25.6	25.6	25.6
<u>100 Percent Load</u>					
Temperature	°F	177	180	182	184
Velocity	ft/sec	49.9	50.8	50.3	50.1
Maximum Hourly Emissions per Unit					
SO ₂	lb/hr	18.8	19.1	19.3	19.3
PM/PM ₁₀ /PM _{2.5}	lb/hr	15.4	15.5	15.5	15.6
NO _x	lb/hr	24.4	24.7	24.9	25.0
CO	lb/hr	36.0	37.4	37.8	38.2
VOC (as methane)	lb/hr	4.8	5.0	5.0	5.1
Sulfuric Acid Mist	lb/hr	3.7	3.7	3.7	3.8
<u>75 Percent Load</u>					
Temperature	°F	171	171	176	182
Velocity	ft/sec	39.9	39.4	39.4	39.1
Maximum Hourly Emissions per Unit					
SO ₂	lb/hr	14.8	14.3	14.0	13.4
PM/PM ₁₀ /PM _{2.5}	lb/hr	14.4	14.2	14.2	14.0
NO _x	lb/hr	19.2	18.5	18.1	17.4
CO	lb/hr	41.5	40.0	39.1	37.5
VOC (as methane)	lb/hr	3.3	3.2	3.1	3.0
Sulfuric Acid Mist	lb/hr	2.89	2.78	2.72	2.61
<u>50 Percent Load</u>					
Temperature	°F	168	169	172	178
Velocity	ft/sec	32.8	32.3	32.2	31.9
Maximum Hourly Emissions per Unit					
SO ₂	lb/hr	11.3	10.9	10.7	10.3
PM/PM ₁₀ /PM _{2.5}	lb/hr	13.5	13.4	13.3	13.2
NO _x	lb/hr	14.6	14.1	13.8	13.3
CO	lb/hr	31.7	30.5	29.8	28.7
VOC (as methane)	lb/hr	2.5	2.5	2.4	2.3
Sulfuric Acid Mist	lb/hr	2.20	2.12	2.07	1.99

^a Refer to Appendix 10.2.5, Subappendix A for detailed information on basis of pollutant emission rates and operating data

Source: GE, 2015; Golder Associates, 2015.



TABLE 4.4.1-2
STACK, OPERATING, AND EMISSION DATA FOR
COMBUSTION TURBINES/HRSGS FOR
ULTRA LOW SULFUR DISTILLATE OIL COMBUSTION

		Operating and Emission Data ^a for Ambient Temperature			
		Combustion Turbine/ HRSG			
Parameter	Units	35 °F	59 °F	75 °F	95 °F
CT/HRSG Stack Data					
Height	ft	149	149	149	149
Diameter	ft	25.6	25.6	25.6	25.6
100 Percent Load					
Temperature	°F	205	204	208	213
Velocity	ft/sec	55.3	53.8	53.9	54.6
Maximum Hourly Emissions per Unit					
SO ₂	lb/hr	5.0	4.8	4.8	4.7
PM/PM ₁₀ /PM _{2.5}	lb/hr	70.0	70.0	70.0	69.9
NO _x	lb/hr	101.5	98.0	96.8	95.8
CO	lb/hr	77.2	74.6	73.6	72.9
VOC (as methane)	lb/hr	8.8	8.5	8.4	8.3
Sulfuric Acid Mist	lb/hr	0.97	0.94	0.93	0.92
Lead	lb/hr	0.045	0.044	0.043	0.043
75 Percent Load					
Temperature	°F	191	188	193	194
Velocity	ft/sec	42.3	40.8	41.6	39.1
Maximum Hourly Emissions per Unit					
SO ₂	lb/hr	3.9	3.8	3.8	3.5
PM/PM ₁₀ /PM _{2.5}	lb/hr	69.3	69.3	69.3	69.2
NO _x	lb/hr	79.9	76.7	76.8	71.4
CO	lb/hr	82.7	79.3	79.5	73.9
VOC (as methane)	lb/hr	7.0	6.7	6.7	6.2
Sulfuric Acid Mist	lb/hr	0.77	0.74	0.74	0.69
Lead	lb/hr	0.036	0.034	0.034	0.032
50 Percent Load					
Temperature	°F	175	174	177	180
Velocity	ft/sec	32.3	31.0	31.2	29.6
Maximum Hourly Emissions per Unit					
SO ₂	lb/hr	3.1	2.9	2.9	2.7
PM/PM ₁₀ /PM _{2.5}	lb/hr	69.1	69.1	69.1	69.0
NO _x	lb/hr	62.5	59.6	59.3	55.5
CO	lb/hr	64.6	61.7	61.4	57.5
VOC (as methane)	lb/hr	5.4	5.2	5.2	4.8
Sulfuric Acid Mist	lb/hr	0.60	0.57	0.57	0.53
Lead	lb/hr	0.028	0.027	0.026	0.025

^a Refer to Appendix 10.2.5, Subappendix A for detailed information on basis of pollutant emission rates and operating data.

Source: GE, 2015; Golder Associates, 2015.



**TABLE 4.4.1-3
SUMMARY OF MAXIMUM POTENTIAL ANNUAL EMISSIONS FOR OCEC**

Pollutant	OCEC Project Maximum Potential Annual Emissions (TPY)									PSD Significant Emission Rate (TPY)
	3 CTs/HRSGs Circuit Breakers	1 Auxiliary Boiler ^a	2 Emergency Generators	1 Natural Gas Heater	1 Fire Pump Engine	1 Hurricane Shelter	1 Cooling Tower	Fuel Oil Storage Tank	TOTAL	
SO ₂	253	0.56	0.004	0.24	0.00016	4.41E-05	--	NA	254	40
PM	245	0.74	0.14	0.32	0.005	2.20E-04	178.67	NA	425	25
PM ₁₀	245	0.74	0.14	0.32	0.005	2.20E-04	7.84	NA	254	15
PM _{2.5}	245	0.74	0.14	0.32	0.01	2.20E-04	0.011	NA	254	10
NO _x	382	4.99	4.37	4.25	0.10	0.05	--	NA	395	40
CO	524	7.98	2.39	3.57	0.090	0.124	--	NA	538	100
VOC (as methane)	68.6	0.54	0.14	0.23	0.017	0.109	--	?	69.7	40
Sulfuric Acid Mist	49.2	Neg.	Neg.	Neg.	Neg.	Neg.	--	NA	49.2	7
Lead	0.032	Neg.	Neg.	Neg.	Neg.	Neg.	--	NA	0.032	0.6
Greenhouse Gases (CO ₂ e)	5,512,969	11,671	949	5,072	15.2	2.8	--	NA	5,530,679	75,000

^a Based on oil-firing for: 500 hours (maximum).

^b An auxiliary boiler is only required to supply steam during startup.

Note: Neg. = negligible; NA = not applicable

Source: Golder, 2015.

TABLE 4.5.1-1
PHYSICAL AND PERFORMANCE DESIGN DATA FOR THE
MECHANICAL DRAFT COOLING TOWER

Parameter	3 x 1
<u>Physical Data</u>	
Number of Cells	30
Deck Dimensions, ft	
Length	815
Width	102
Height	37.8
Stack Dimensions	
Height, ft	51.5
Stack Top Effective Inner Diameter, per cell, ft	30
Effective Diameter, all cells, ft	164.3
<u>Performance Data</u>	
Discharge Velocity, ft/min	1,337
Circulating Water Flow Rate (CWFR), gal/min	465,815
Design hot water temperature, °F	90.8
Design cold water temperature, °F	78.9
Heat Rejected, million Btu/hr	2,771
Design Air Flow Rate per cell, acfm	945,069
Liquid/ Gas (Air Flow) (L/G) Ratio	1.13
Hours of operation	8,760
Temperature of Exit Air, °F	86.0

Sources: FPL, 2015.

TABLE 4.6-1
OCEC Unit 1 WASTE STREAMS, CHARACTERIZATION AND DISPOSAL METHOD (Page 1 of 2)

Waste Streams (Process Water Systems)	Non Hazardous Basis for Characterization	Hazardous Basis for Characterization	Disposal Management Process
Sanitary Wastewater	Based on analytical characterization of historical data	--	Disposed of in septic tank system.
Water Treatment Wastewater (includes RO Reject)	Based on analytical characterization of historical data	—	Disposed of as industrial wastewater into the UIC well(s)
Heat Recovery Steam Generator Blowdown	Based on analytical characterization of historical data	—	Reused in wastewater process or disposed of as industrial wastewater into the UIC well(s).
Steam Cycle Water Treatment Chemicals (Hydrazine, Ammonia, Sodium Phosphate)	Based on analytical characterization by historical data		Chemicals breakdown in steam cycle [any residual chemicals are disposed of by HRSG blowdown into the UIC well(s)].
Cooling System Blowdown (Biocide Addition Chlorine, Scale Inhibitor, Pretreatment Chemicals)	Based on analytical characterization by vendor supplying chemical	—	Disposed of as industrial wastewater into the UIC well(s).
Heat Recovery and Steam Generator as Well as Pre-boiler Piping Chemical Cleaning	Based upon analytical waste stream characterization.	Based upon analytical waste stream characterization	If non-hazardous, will be disposed into circulating water system. If hazardous, then disposed of by a licensed approved contractor.
Plant and Equipment Drains	Based on analytical characterization of historical data	—	Disposed of as industrial wastewater into the UIC well(s).



TABLE 4.6-1
OCEC WASTE STREAMS, CHARACTERIZATION AND DISPOSAL METHOD (Page 2 of 2)

Waste Streams (Construction and Operations)	Non Hazardous Basis for characterization	Hazardous Basis for characterization	Disposal Management Process
Construction-Related Waste Water (e.g., ammoniated process water for hydrostatic testing and backfilling, groundwater from dewatering and steam blow quench water, etc.)	Based on historical data	—	Disposed of depending on source. Refer to Chapter 5.
Construction-Related Solid Waste	Based on historical data	—	Materials recycled to the extent practicable or disposed of using a licensed waste contractor.
Water Pretreatment Solid Waste	Based on analytical results	—	Disposed of by an approved disposal contractor.
Oily Rags	As per EPA in 40 CFR 279	—	Recycled via laundering by FDEP-approved vendor or disposed of in landfill.
Punctured Aerosol Cans	As per EPA characterization letter	—	Disposed of by an approved scrap metal contractor.
Captured Paint Residuals from Punctured Aerosol Cans	—	Analytical data from waste characterization	As hazardous waste in accordance with 40 CFR, Part 261.
X-ray Weld Testing	—	—	Process does not generate waste chemicals onsite. Vendor is responsible for their waste generation.
Florescent Bulbs and Batteries	—	As per 40 CFR 273 EPA determination	Recycled as universal waste.
Oily Separated Waste Water	Based on analytical results	—	Separated water is routed to onsite ponds. Oil is disposed of by an approved waste disposal contractor.
Oily Solid Wastes	As per EPA in 40 CFR 279	—	Disposed of by an approved waste disposal contractor.



TABLE 4.7-1
FPL GENERAL WASTE HANDLING GUIDELINES (Page 1 of 2)

GENERAL WASTE HANDLING GUIDELINES

1. All effort should be taken to reduce and/or eliminate waste generation.
2. All effort should be taken to reuse and/or recycle wastes.
3. Label all containers so that contents can easily be determined and products used.
4. If waste is hazardous due to a hazardous constituent in the original product, try to substitute with a non-hazardous product, if feasible.
5. If waste is generated, see attached list for disposal options and instructions.
6. If waste is hazardous and is required to be placed into satellite accumulation drums, contact Environmental Plant Leader.
7. If waste cannot be identified, contact Environmental Plant Leader.

WASTE HANDLING INSTRUCTIONS

Recycling

1. Cardboard: flatten and place in designated area.
2. Pallets (poor condition) and scrap wood: place in designated area.
3. White paper and file stock: place in designated bin.
4. Aluminum cans: place in designated bin marked "Aluminum Cans".
5. Metal scrap: place in "metal" designed dumpster.
6. Empty drums (poor condition): empty, crush and place in "metal" dumpster.
7. Fluorescent bulbs (intact): place into original box and store in Universal Waste Storage Area.
8. Lead acid batteries: place on pallet in Hazardous Waste Area.
9. Dry alkaline cell batteries: place in appropriate designated universal waste bin.
10. Ni Cad batteries (includes all communication type batteries, i.e., cell phone/pager batteries): place in appropriate bin.
11. Empty aerosol cans: puncture with can puncturing device and place can into scrap metal drum designated for this purpose. Residual materials in drum are managed as Hazardous Waste.

TABLE 4.7-1
FPL GENERAL WASTE HANDLING GUIDELINES (Page 2 of 2)

Recycling (continued)

12. Used oil filters: drain filters for at least 24 hours and place drained oil filters into appropriate drums. Do not put plastic bags into drum.
13. Metal shavings: place in designated scrap metal drum.
14. Mercury liquid: notify Environmental Plant Leader.

Non-Regulated Waste Disposal

1. Normal trash: minimize and dispose, place into Plant dumpster.
2. Used oil: place into Accumulation Area designated for this purpose.
3. Solid oily waste: place into Solid Oily Waste Dumpster designated for this purpose.
4. Parts cleaning solution: use parts cleaner for all parts cleaning. For special parts cleaning applications, see Environmental Plant Leader for instructions. Also contact Environmental Plant Leader when parts cleaning fluid is spent.

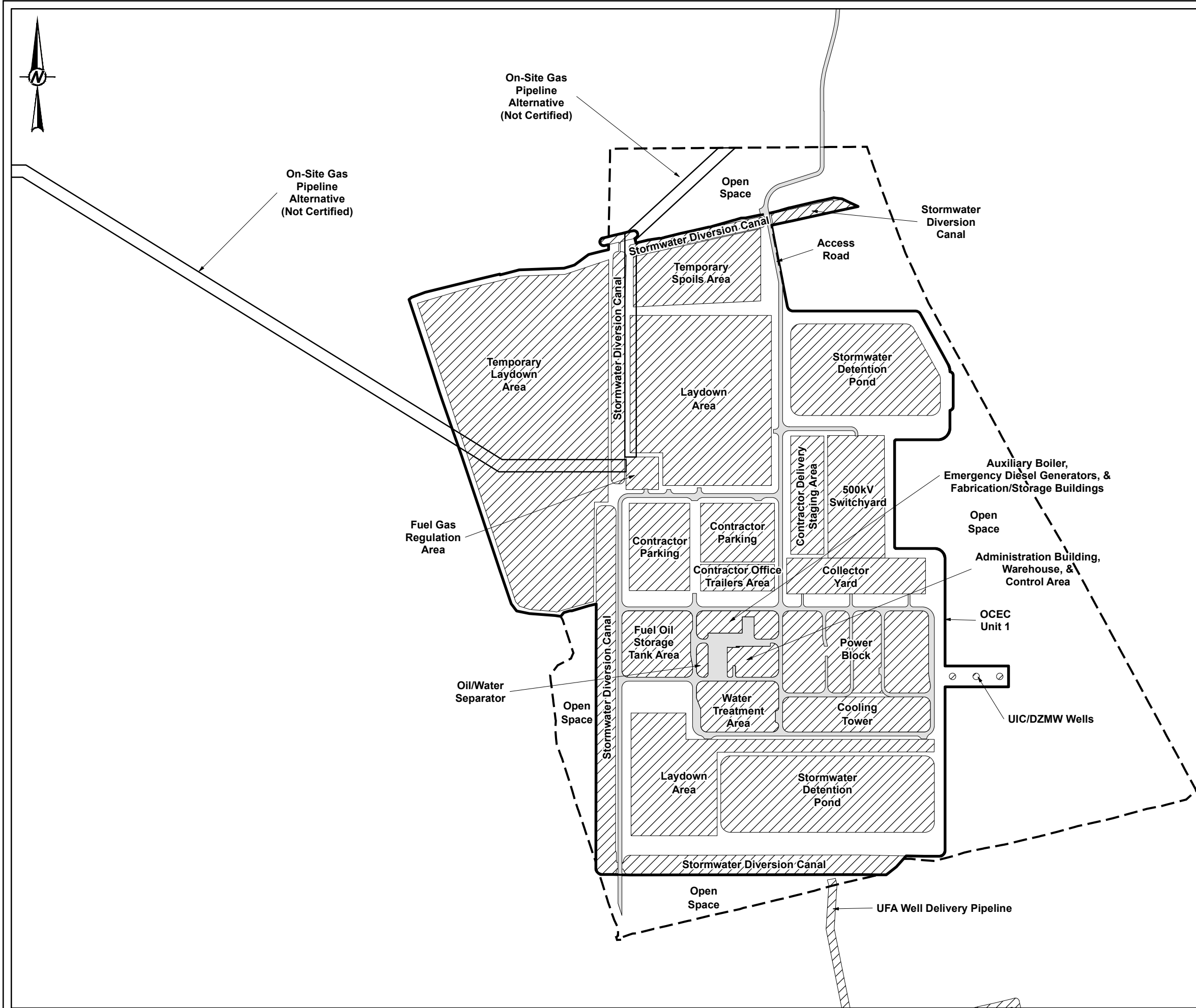
Hazardous Waste Disposal *

1. Solvent-contaminated rags: place into “Solvent Rag” Satellite Accumulation Drum Area. When full, place in Hazardous Waste Area unless rag laundering program has been implemented. Where rag laundering program has been implemented, place rags into designated bins.
2. Solid paint cleanup material: place into Satellite Accumulation Drum Area. When full, place in Hazardous Waste Area.
3. Laboratory waste: place in Satellite Accumulation Drum Area. This drum is for use by on-shift production personnel performing water chemistry. When full, place in Hazardous Waste Area.
4. Outdated lab chemicals: these chemicals will be lab packed by the Environmental Plant Leader.
5. Aerosol can waste (punctured and non-punctured): collect in Satellite Accumulation Drum Area. When full, place in Hazardous Waste Area.
6. Waste paint-related material: place in Satellite Accumulation Drum Area. When full, place in Hazardous Waste Area.
7. Bead blasting material: place in drum designated for this purpose. When full, place in Hazardous Waste Area.

*** While accumulated onsite, hazardous waste drums must include the words “Hazardous Waste” and the accumulation start date. Drums used for satellite accumulation of hazardous waste may use words that identify the contents until moved to storage for disposal and then the words “Hazardous Waste” and the accumulation date(s) must be added.**

FIGURES

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LEGEND

- OCEC Unit 1
- Open Space



REFERENCE(S)

PROPERTY, LINEAR FACILITY CORRIDOR, CERTIFIED SITE BOUNDARY, FUTURE SOLAR AREA, OPEN SPACE, MITIGATION AREA. FPL & GOLDER ASSOCIATES INC., 2015
FACILITY LAYOUT, BLACK & VEATCH, 2015

CLIENT

FPL

PROJECT

OKEECHOBEE CLEAN ENERGY CENTER

TITLE

OCEC UNIT 1
MAJOR COMPONENTS



YYYY-MM-DD	2015-09-17
DESIGNED	NRL
PREPARED	NRL
REVIEWED	KAB
APPROVED	KFK

PROJECT NO.
1414799

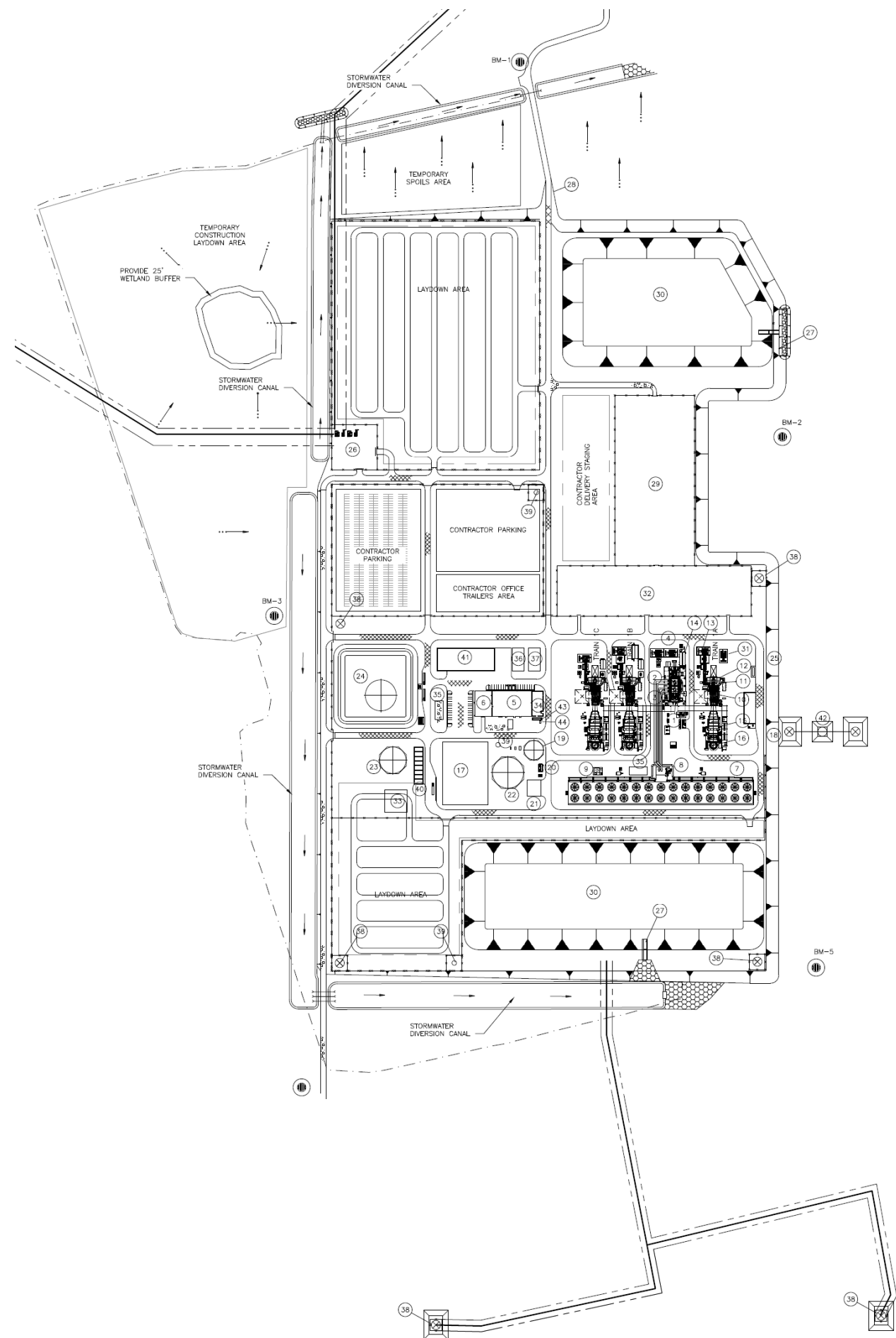
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FIGURE
4.1-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

28mm



FACILITIES LEGEND				
ID	FACILITY	FOUNDATION	TIEDOWN LOCATION	
			NORTH	EAST
1	STEAM TURBINE	—	—	—
2	STEAM TURBINE GENERATOR	—	—	—
3	SURFACE CONDENSER (BELOW)	—	—	—
4	ST GENERATOR STEP-UP TRANSFORMER	—	—	—
5	ADMINISTRATION BUILDING	—	—	—
6	WAREHOUSE	—	—	—
7	COOLING TOWER	—	—	—
8	CIRCULATING WATER PUMP STRUCTURE	—	—	—
9	COOLING TOWER CHEMICAL FEED	—	—	—
10	COMBUSTION TURBINE	—	—	—
11	COMBUSTION TURBINE GENERATOR	—	—	—
12	INLET AIR FILTER (ABOVE)	—	—	—
13	CT GENERATOR STEP-UP TRANSFORMER	—	—	—
14	POWER CONTROL MODULE	—	—	—
15	HEAT RECOVERY STEAM GENERATOR	—	—	—
16	HRSG EXHAUST STACK	—	—	—
17	WATER TREATMENT AREA	—	—	—
18	AMMONIA STORAGE AREA	—	—	—
19	FIRE/SERVICE WATER STORAGE TANK	—	—	—
20	FIRE PUMP ENCLOSURE	—	—	—
21	DEMINERALIZATION AREA	—	—	—
22	DEMINERALIZED WATER STORAGE TANK	—	—	—
23	RAW WATER SORAGE TANK	—	—	—
24	FUEL OIL STORAGE TANK	—	—	—
25	HYDROGEN STORAGE AREA	—	—	—
26	FUEL GAS REGULATING AREA	—	—	—
27	POND OUTFALL STRUCTURE	—	—	—
28	MAIN ENTRANCE ROAD	—	—	—
29	500kV SWITCHYARD	—	—	—
30	STORMWATER DETENTION POND	—	—	—
31	SPARE STG GSU TRANSFORMER	—	—	—
32	COLLECTOR YARD	—	—	—
33	LEACH FIELD	—	—	—
34	CONTROL AREA	—	—	—
35	OIL/WATER SEPARATOR	—	—	—
36	AUXILIARY BOILER	—	—	—
37	EMERGENCY DIESEL GENERATORS	—	—	—
38	MAKE-UP WATER WELL (FLORIDIAN)	—	—	—
39	POTABLE WATER WELL (SURFICIAL)	—	—	—
40	ROLL-OFF AREA AND MISC STORAGE FACILITY	—	—	—
41	FABRICATION/STORAGE BUILDING	—	—	—
42	UIC/DZMW WELLS	—	—	—
43	HURRICANE SHELTER	—	—	—
44	HURRICANE SHELTER GENERATORS	—	—	—

LEGEND	
	ASPHALT ROAD
	AGGREGATE ROAD
	PLANT FENCING
	CONTRACTOR FENCING

REFERENCES
FACILITY LAYOUT TAKEN FROM BLACK & VEATCH PLOT PLAN, DRAWING No. 185922-DS-1000, REV. 2, DATED 09-22-2015

CLIENT
FPL

PROJECT
OKEECHOBEE CLEAN ENERGY CENTER

YYYY-MM-DD
2015-09-23

PREPARED
NRL

DESIGN
NRL

REVIEW
KAB

APPROVED
KFK

TITLE
CONCEPTUAL SITE PLAN

PROJECT No.
1414979

CONTROL
B039

Rev.
0

FIGURE
4.2-1

1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

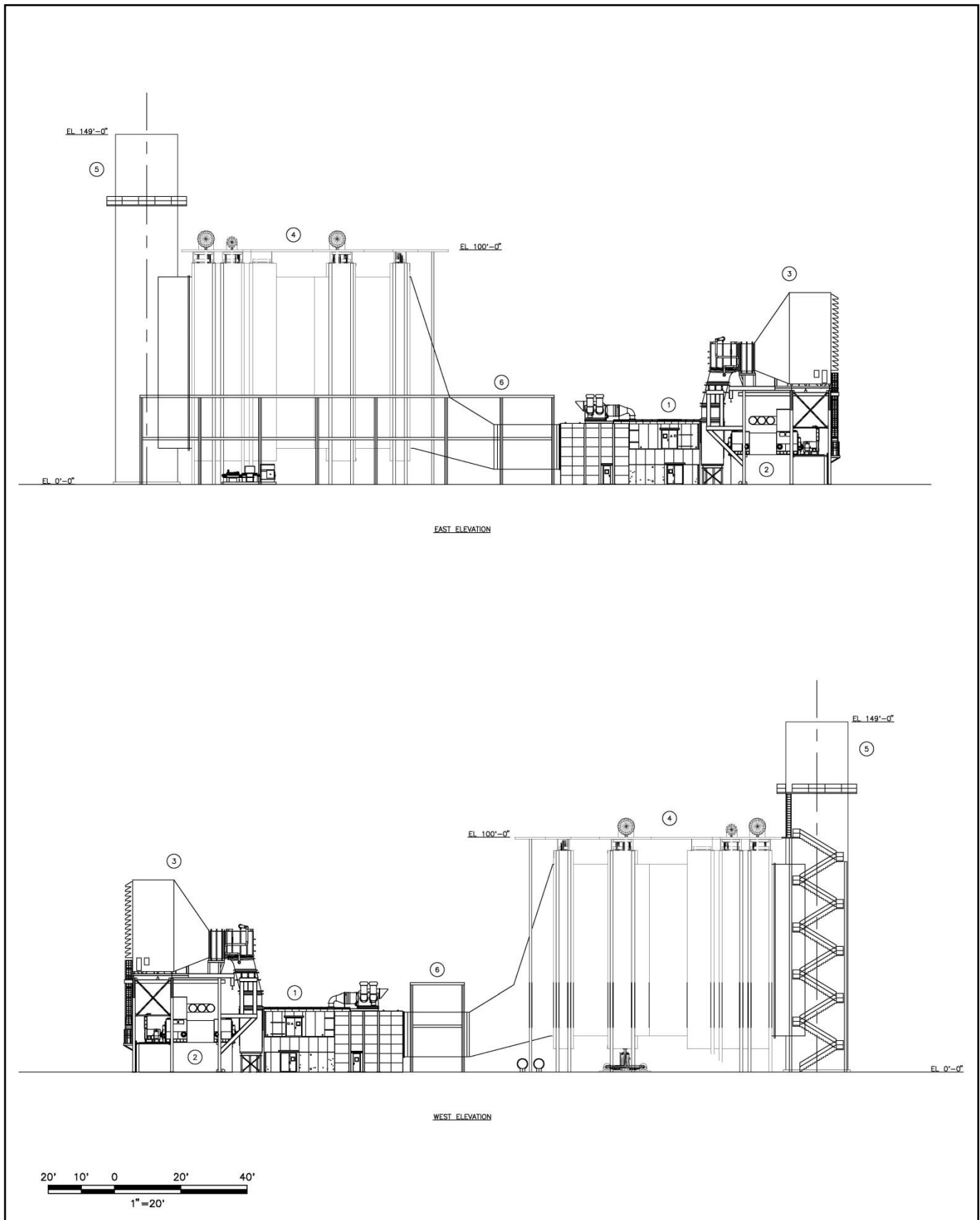


Figure 4.2-2
East-West Profile of Combustion Turbines and HRSGs

Source: Black & Veatch, 2015.

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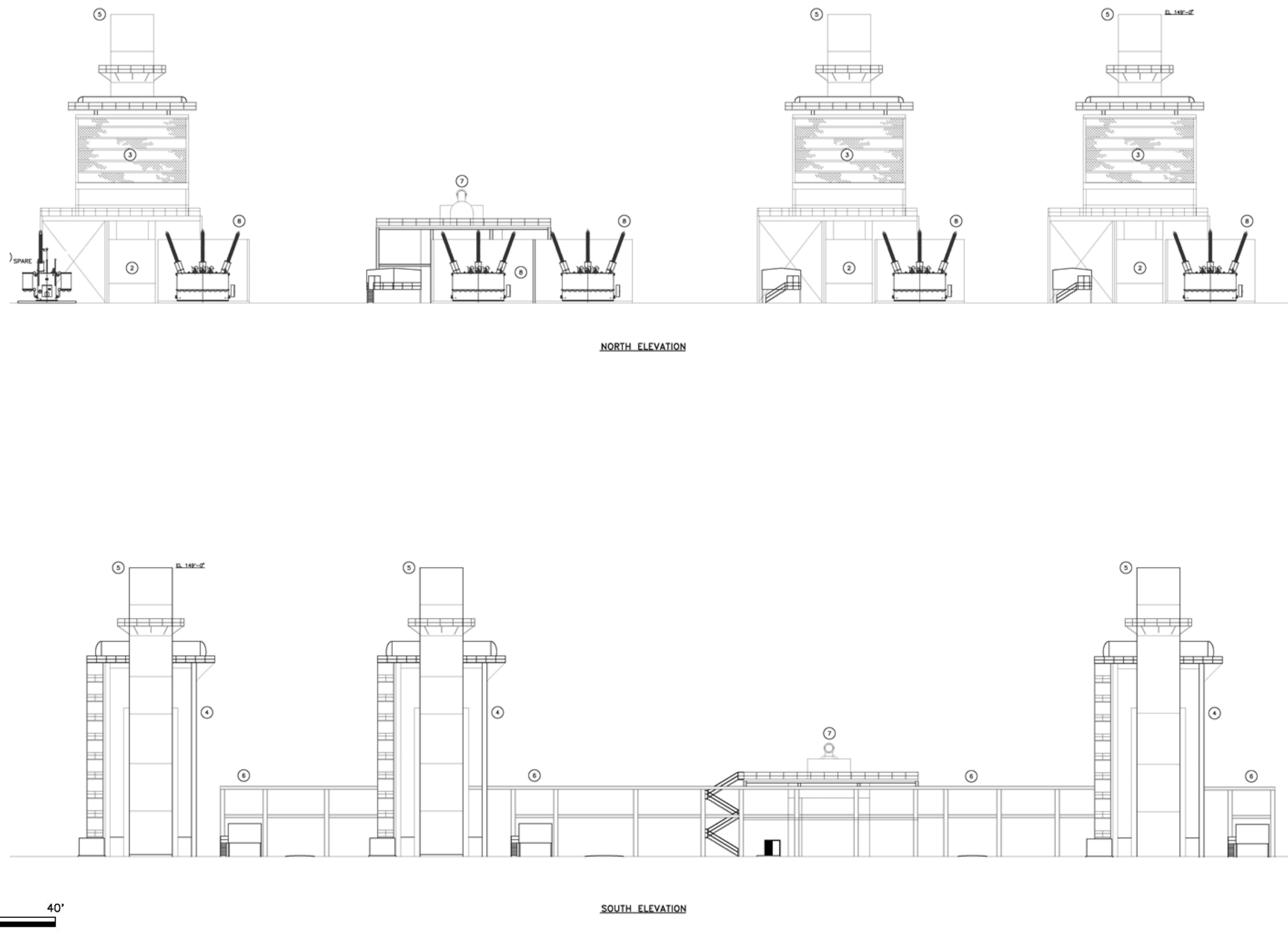
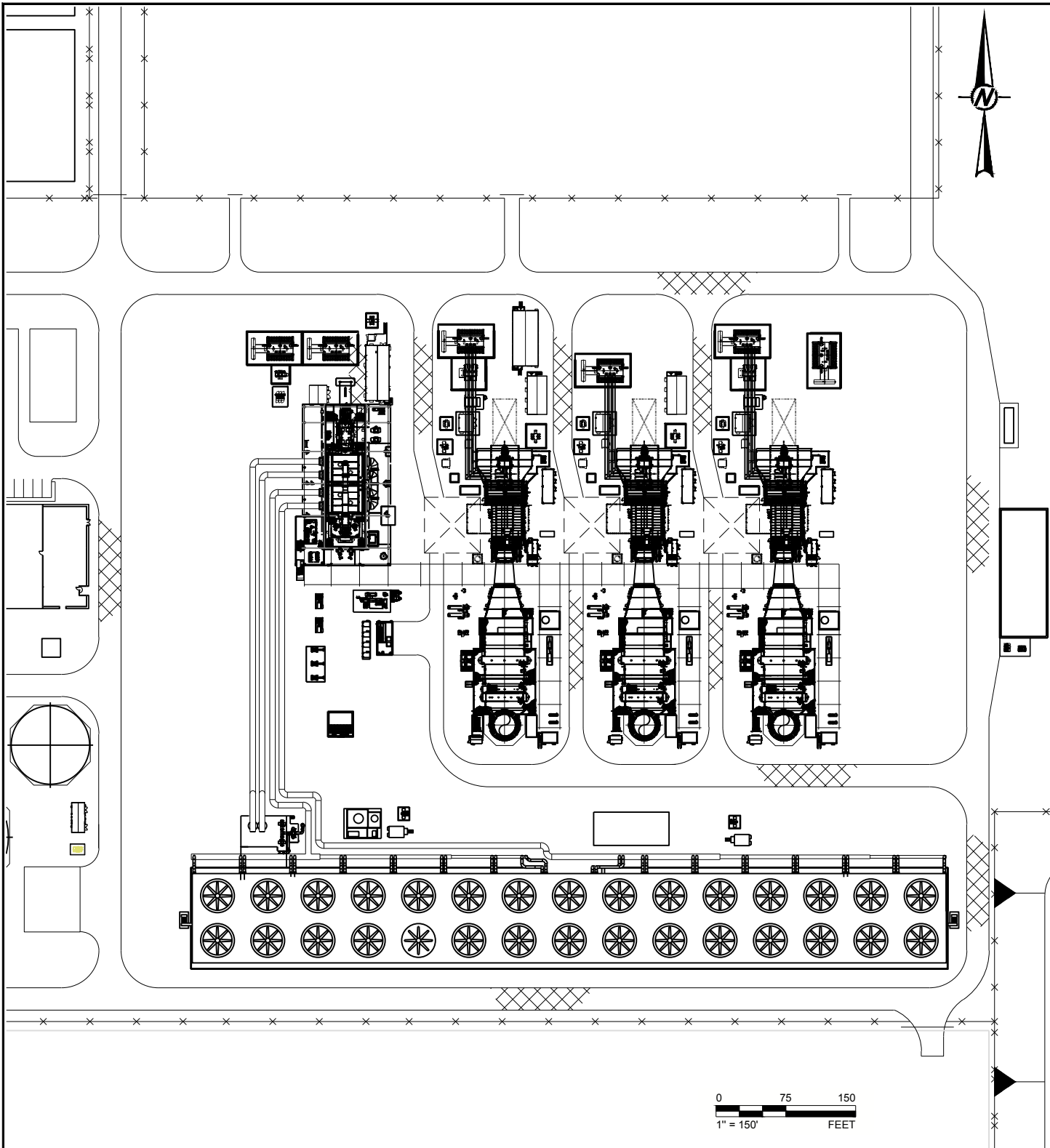


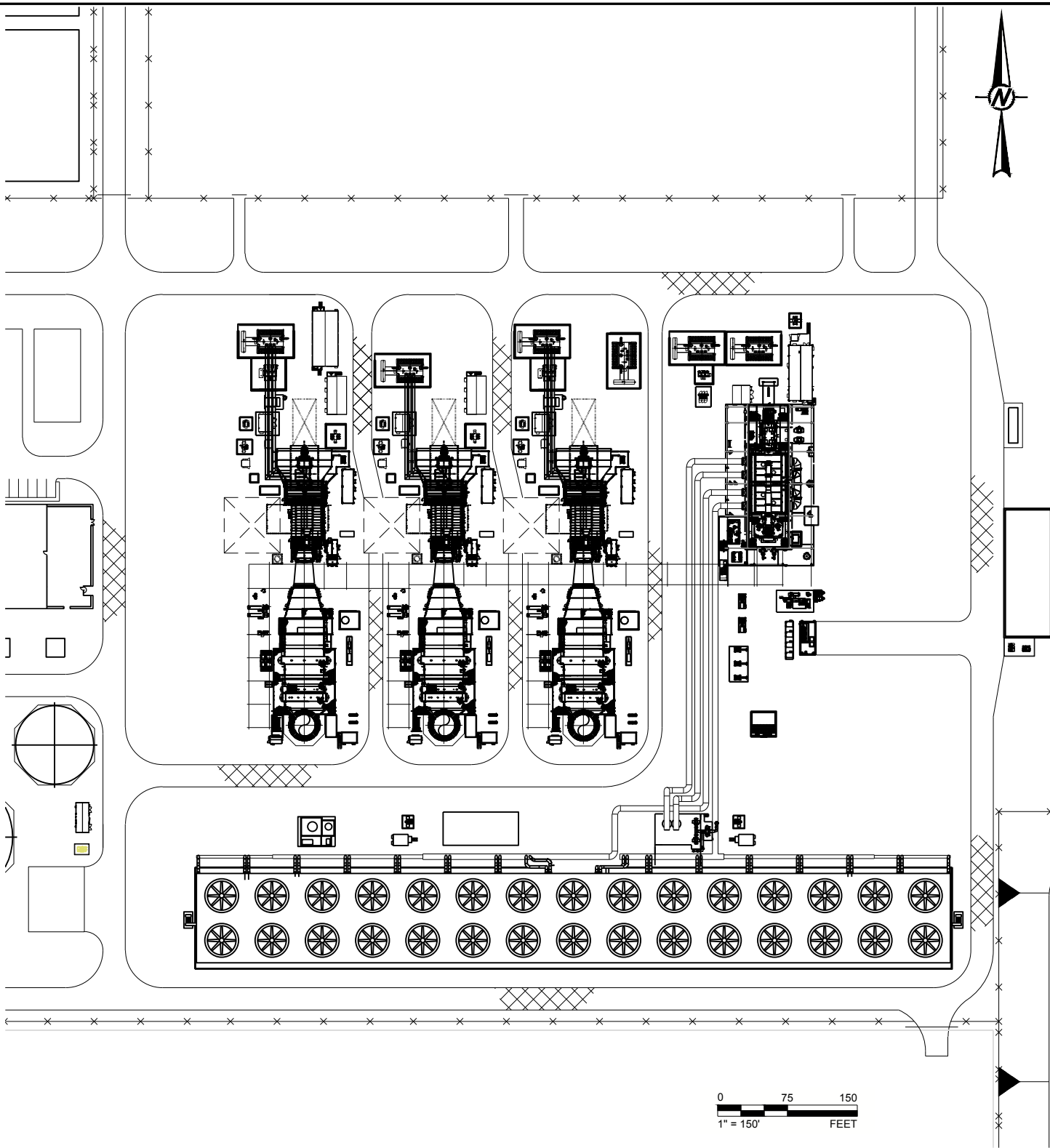
Figure 4.2-3
North-South Profile of Combustion Turbines and HRSGs
Source: Black & Veatch, 2015.
Y:\Projects\2014\14-14979 FPL Okeechobee SCA\Figures\Chapter 4\Figure 4.2.0-3.docx



Path: \\gpr1-61\GIS\PROJECTS\FPL\Okeechobee\08_PROJECTS\1414979B_SCA_Project\02_PRODUCTION\AKD - File Name: 1414979B_B058_Alternative Power Block Arrangements.dwg



STG LOCATED WEST OF CT/HRSG TRAINS



STG LOCATED EAST OF CT/HRSG TRAINS

- NOTE(S)
- STG = STEAM TURBINE GENERATOR
 - CT = COMBUSTION TURBINE
 - HRSG = HEAT RECOVERY STEAM GENERATOR

CLIENT
FPL

PROJECT
OKEECHOBEE CLEAN ENERGY CENTER



YYYY-MM-DD	2015-08-25
DESIGNED	NRL
PREPARED	NRL
REVIEWED	KAB
APPROVED	KFK

TITLE
**ALTERNATIVE POWER BLOCK
ARRANGEMENTS**

PROJECT NO.
1414979

CONTROL
B058

REV.
0

FIGURE
4.2-4

1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

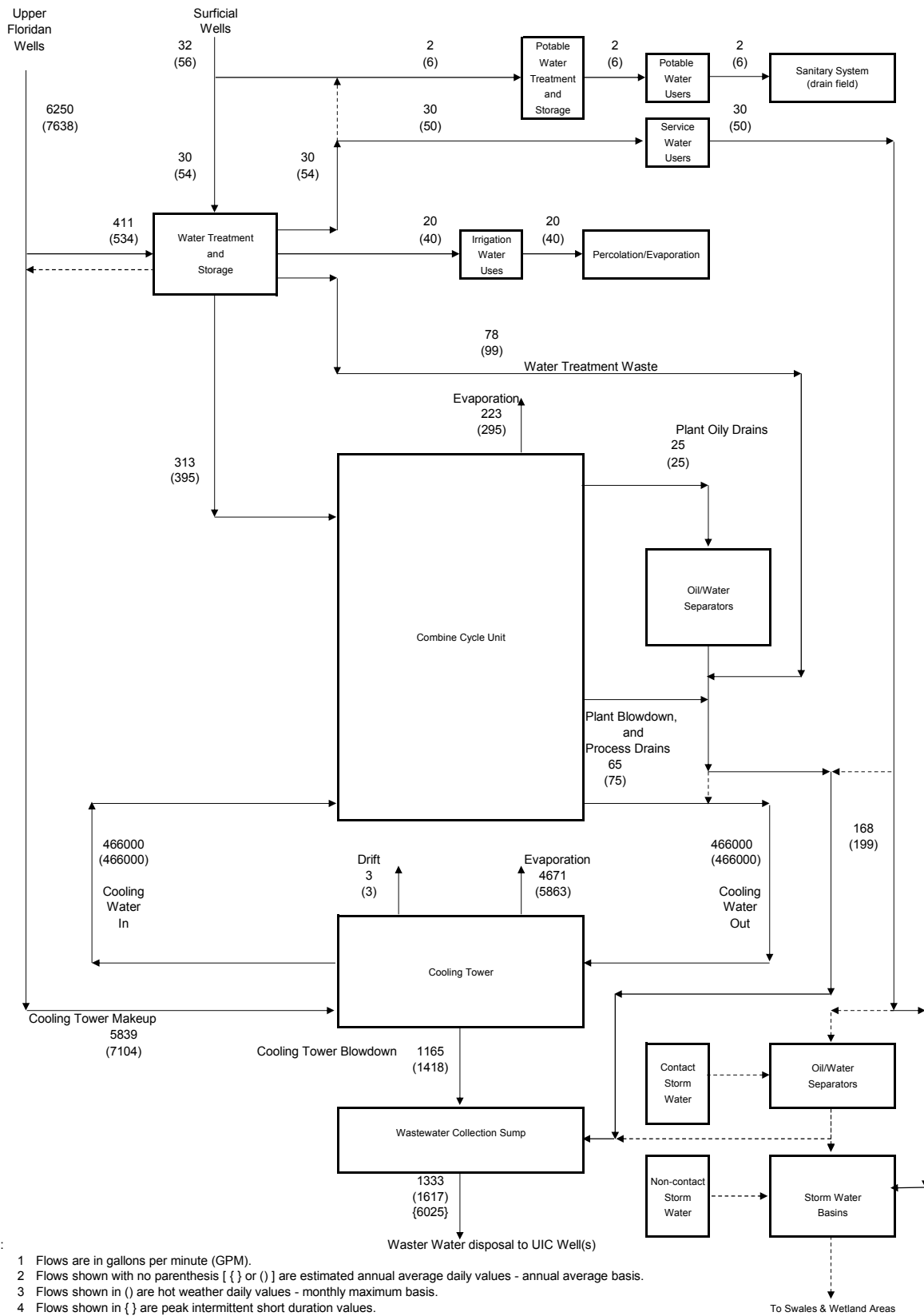


Figure 4.5-1
Water Balance for OCEC Unit 1

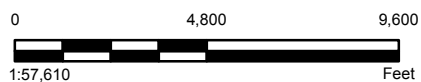
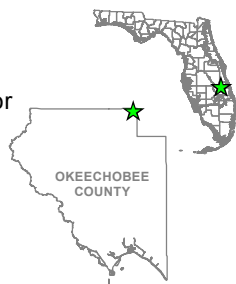
Source: FPL, 2015





LEGEND

- FPL Owned Property
- Linear Facility Corridor
- Transmission Interconnection Corridor
- Certified Site Boundary
- County Boundary



REFERENCE(S)

PROPERTY, LINEAR FACILITY CORRIDOR, CERTIFIED BOUNDARY, FPL & GOLDER ASSOCIATES INC., 2015

CLIENT
FPL

PROJECT
OKEECHOBEE CLEAN ENERGY CENTER

TITLE
**LINEAR FACILITIES CORRIDOR
LOCATION MAP**



YYYY-MM-DD	2015-08-24
DESIGNED	NRL
PREPARED	NRL
REVIEWED	KAB
APPROVED	KFK

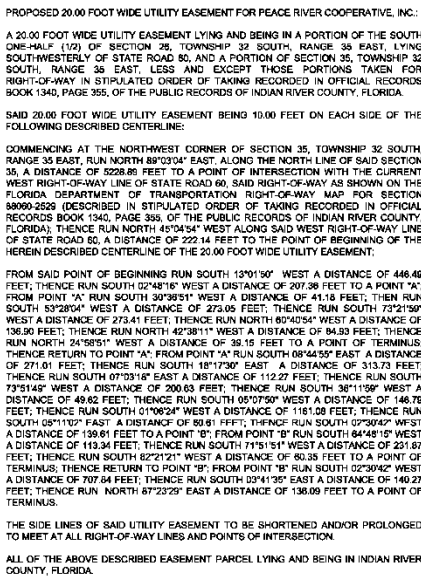
PROJECT NO.
1414979

CONTROL
B053

REV.
0

FIGURE
4.10-1

SECTIONS 26 AND 35, TOWNSHIP 32 SOUTH, RANGE 35 EAST,
INDIAN RIVER COUNTY COUNTY, FLORIDA



SECTION 36, TOWNSHIP 32
SOUTH, RANGE 35 EAST

ROONEY DANIEL M CASSA L
32-35-38-00000300000005.0

NORTHEAST CORNER SECTION 2 AND
NORTHWEST CORNER SECTION 1,
TWP. 33 SOUTH, RGE. 35 EAST AND
SOUTHEAST CORNER SECTION 35
TWP. 32 SOUTH, RGE. 35 EAST
FOUND 4"x4" CONCRETE MONUMENT WITH
ALUMINUM DISC STAMPED "CARTER
ASSOC. 18 205 88M"

FORT DRUM VENTURES, LLC

CLIENT
FPL

PROJECT
OKFEECHOBEE CLEAN ENERGY CENTER

TITLE
**LINEAR FACILITIES
CORRIDOR EASEMENT**

PROJECT No.
1414979

CONTROL
B055

Rev.
0

FIGURE
4 10-2

REFERENCE: DRAWING OBTAINED FROM CARTER ASSOCIATES, INC. CONSULTING ENGINEERS AND LAND SURVEYORS. DRAWING NO. 19062-C. REF. NO. 17474C. DATED MAY 2011



YYYY-MM-DD 2015-08-24

PREPARED NRI

DESIGN	NRI
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REVIEW KAB

APPROVED KFK



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LEGEND

- Facility Layout
- OCEC Unit 1
- Open Space
- Certified Site Boundary
- Mitigation Area
- FPL Owned Property
- Linear Facility Corridor
- Transmission Interconnection Corridor

- Habitat Classification
- 211 - Improved Pastures
- 420 - Upland Hardwood Forests
- 434 - Hardwood-Coniferous Mixed
- 511 - Ditches
- 534 - Reservoirs Less Than 10 Acres (4 Hectares) Which Are Dominant Features
- 641 - Freshwater Marshes
- 740 - Disturbed Land

CLIENT
FPL

PROJECT
OKEECHBOEE CLEAN ENERGY CENTER

TITLE
**LINEAR FACILITIES CORRIDOR
LAND USE (FLUCFCS) MAP**



YYYY-MM-DD	2015-08-24
DESIGNED	NRL
PREPARED	NRL
REVIEWED	KAB
APPROVED	KFK

REFERENCE(S)
PROPERTY, LINEAR FACILITY CORRIDOR, CERTIFIED SITE BOUNDARY, OPEN SPACE, MITIGATION AREA, FPL & GOLDER ASSOCIATES INC., 2015
FACILITY LAYOUT, BLACK & VEATCH, 2015
LAND USE, GOLDER ASSOCIATES INC., 2015



PROJECT NO.
1414979

CONTROL
B054

REV.
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FIGURE
4.10-3

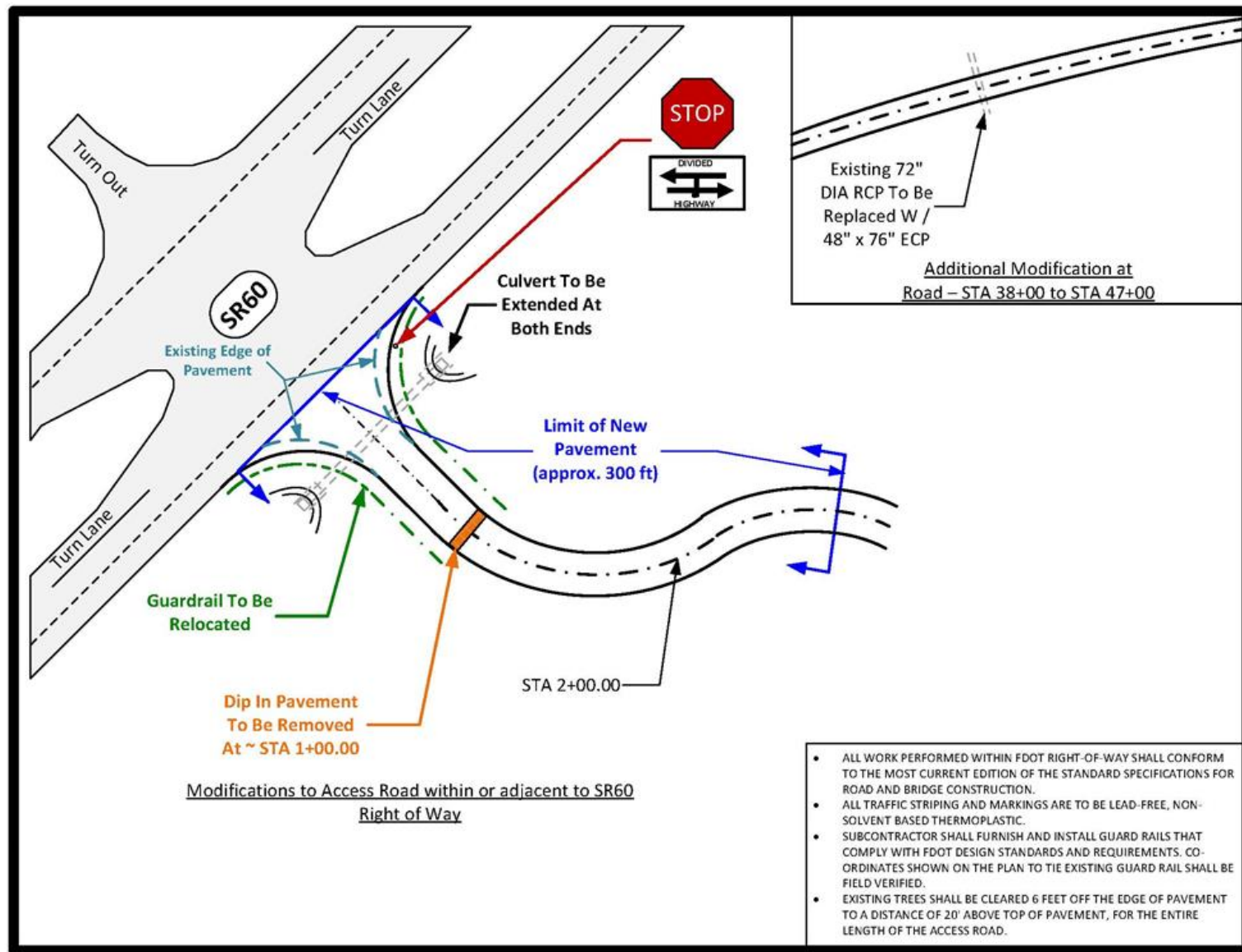


Figure 4.10-4.
Access Road Improvements

Source: FPL, 2015.

5.0 ENVIRONMENTAL EFFECTS OF SITE PREPARATION, AND PLANT AND ASSOCIATED FACILITIES CONSTRUCTION

The following sections address the environmental effects of site preparation and construction of the Project, including the construction support area, construction parking, and laydown areas. The environmental effects are discussed with respect to impacts on land, surface water, groundwater, ecology, air quality, solid waste, landmarks and sensitive areas, and impacts on archaeological and historic sites. If construction activities require monitoring programs, descriptions of the programs are identified.

5.1 Land Impacts

The portions of the Site that will be affected by the construction activities are shown on Figure 5.1-1. Areas of land impacts include the approximately 220-acre plant area where the OCEC Unit 1, including construction laydown areas, parking, stormwater ponds, and associated infrastructure will be located; clearing and grading within the approximately 104-acre open space area surrounding Unit 1; and temporary impacts associated with installation of the on-Site natural gas pipeline between Unit 1 and the edge of the certified Site.

Land impacts within the linear facilities corridor will be limited to approximately 4.86 acres of clearing and grading within the transmission interconnection corridor, described in Chapter 9, and minimal acreage of temporary impact and fill associated with culvert improvement along the existing access road, described above in Section 4.10.

Areas of land disturbance associated with the approximately 1,629-acre potential future solar generation area will be identified upon preparation of the solar facility layout and engineering design. Prior to development of the solar generation facility at the Site, this information would be submitted as a supplemental SCA. In general, future development of solar generation at the Site would maximize utilization of upland pasture and citrus grove areas, avoiding wetlands and areas of natural habitat in accordance with applicable state and federal regulations.

5.1.1 General Construction Impacts

Assuming all necessary permits and approvals are obtained, it is anticipated that onsite construction activities for the Project will begin in 2017 and conclude in the summer of 2019. Demobilization and cleanup will extend to the fall of 2019. The peak construction workforce (2018) is estimated to be approximately 650 people, with an average construction workforce estimated at 290 people.

The Site will require clearing of vegetation and substantive filling for the Project's requirements. Construction laydown and parking areas will require stabilization with rock for heavy equipment and



activities. Other, less travelled areas may be seeded or sodded with grass to prevent erosion as necessary. No explosives or blasting will be used during construction. The existing land surface elevation across the Site rises from approximately 31 feet in the east to approximately 36 feet in the west of the Site, with respect to North American Vertical Datum of 1988 (NAVD88). Areas will be graded and fill will be used to help support the plant foundations, piping, electrical duct banks, trenches, and manholes. Foundations required to support heavy loads (i.e., such as building columns, CTs, and generators) are planned to be spread foundations but may be supported by pilings. The finished grade of OCEC Unit 1, which includes the power block and the equipment, as well as most of the construction laydown and parking areas, will be at an elevation of approximately 37 ft NAVD88.

During construction, the labor force will use portable chemical toilets and/or permitted holding tanks. A licensed contractor will pump all sanitary sewage from the portable toilets and holding tanks as needed, and will transport the waste to an approved disposal facility.

Potable water for consumption during construction will be obtained from the surficial and/or Floridan aquifers, meeting all applicable nonprocedural requirements, including Chapter 62-550 and Chapter 62-555, F.A.C., and Okeechobee County regulations. Potable water for emergency eyewash and shower stations will be obtained initially from temporary systems and subsequently connected permanently to the potable water system.

5.1.2 Roads

Access to the Site is from SR 60, approximately 7.5 miles east of Florida's Turnpike and about 17 miles west of Interstate (I)-95. SR 60 is a four-lane principal arterial roadway oriented in an east-west direction with connections to U.S. Highway (US) 441, Florida's Turnpike and I-95. The access road from SR 60 is 226th Court, a full-access roadway that aligns with an existing SR 60 median opening which includes a westbound left-turn lane.

Fugitive dust generation from traffic and/or excavation/construction activities will be minimized through paving, seeding or placing of sod in areas not utilized for construction, water sprinkling, or other dust-suppressant techniques.

Appendix 10.7.4 presents the construction traffic analysis performed for the Project, summarized in Section 5.7.2. Land impacts associated with the proposed minor improvements to the existing access road (226th Court) are illustrated in Figure 4.10-4 and discussed in Section 4.10.

5.1.3 Flood Zones

The majority of OCEC Unit 1 will be constructed in areas designated by FEMA as Flood Zone X (Figure 3.1.2-1), which by definition is outside the 100-year floodplain (< 1 -percent annual probability) and the 500-year floodplain (< 0.2 -percent annual probability). However, some construction will be in areas designated by FEMA as Flood Zone A, which is within the 100-year flood zone. FEMA has not determined base flood elevations (BFEs) within either of these zones. Based on existing land surface elevations along the boundary between Zones X and A, the 100-year flood elevation in the vicinity of OCEC Unit 1 is 34 feet NAVD88. OCEC Unit 1 has been designed such that compensatory floodplain storage to mitigate for any floodplain encroachment is not necessary (see Appendix 10.8). Therefore, construction activities will comply with SJRWMD flood regulations and will have no adverse impact on any off-site flood zones or on the base flood elevations.

5.1.4 Topography and Soils

Current topographic features and soils reflect the historic agricultural activities at the Site. The existing grade at OCEC Unit 1 is generally flat, with elevations typically between 31 and 36 feet NAVD88. The finished grade for OCEC Unit 1 will be approximately 37 feet NAVD88. Fill material will be obtained from on-Site excavations, including the two wet detention ponds to be constructed. As a result, no significant changes in topography will be observable from off-Site locations.

The OCEC Unit 1 power block will be located approximately one mile from the nearest highway. While cranes will be used during construction, these structures will be temporary. Consequently, impacts of construction on the view shed will be temporary and will not be significant.

No adverse impact is anticipated to soil stability or bearing strength because spread foundations, pilings or stone columns will be used, as necessary, to support heavy equipment and buildings; therefore, overall settling of the land area will be negligible. Slight settling may occur in areas of construction, but this will be minor and localized in extent.

Dewatering will be required for equipment foundations and other construction activities. Such dewatering will be localized and will last less than 1 year. Preliminary dewatering plans for the power block, cooling tower sump pit excavation and underground utility corridor trench excavations are contained in Appendix 10.8. As discussed in Section 3.3.2.2, OCEC is located in an area where sinkholes are few, shallow and small, and no karst topological features have been encountered in the region (Ardaman, 2015). Therefore, adverse subsidence or sinkhole formation is not likely due to site preparation and construction activities.



While there may be some changes in percolation and runoff rates during construction, construction stormwater will be managed in accordance with the Project's stormwater management plan (Appendix 10.8) following best management practice requirements of the NPDES Generic Permit for Stormwater Discharge from Large and Small Construction Activities (Chapter 62-621.300(4)(a), F.A.C.). Therefore, construction stormwater released from the Site should not cause soil erosion, flooding or have an adverse impact on off-Site water quality.

During construction, the extent of earth disturbances will be minimized as much as is practicable in accordance with the SWPPP as described in Subsection 4.8.2. Areas outside of cut and fill operations will be protected against unnecessary equipment traffic. Aggregate surfaced areas may be provided for access, while limerock surfacing may be provided for the construction support areas.

5.2 IMPACT ON SURFACE WATER BODIES AND USES

5.2.1 Impact Assessment

Construction stormwater will be managed following best management practice requirements of the NPDES Generic Permit for Stormwater Discharge from Large and Small Construction Activities and the Project's stormwater management plan. Therefore, site preparation and construction activities should have no adverse impact on off-site surface water bodies. As discussed in Section 3.3.4, there are no large natural lakes, rivers or streams on or adjacent to the Site. The closest lake is Blue Cypress approximately 4.5 miles northeast of OCEC Unit 1.

The stormwater ponds located in the northern and southern portions of the Site will be excavated to provide fill for the Site. These excavated areas will serve as sediment control basins during construction. Off-Site impacts will be prevented and controlled through the proper design and placement of runoff control features such as sediment traps, filter berms, straw bales and other applicable devices, as appropriate. Construction contractors also will be required to implement environmental control practices to minimize the potential for spills and the impacts from any spill, including designating specific areas for fueling and maintenance. These areas will be located so that spills, if they occur, will not be adjacent to surface waters. If spills occur, cleanup will be expedited with ultimate disposal in an approved facility.

The north and south stormwater ponds will be excavated in the wet by drag line excavators without dewatering the surficial aquifer. Water removed with the excavated material will be drained from the excavated material and returned to the excavation. Therefore, aquifer drawdowns will be minimal. The pond construction process is estimated to take approximately 90 days and the estimated flow rate for this operation is 745,000 gpd. Construction in the power block, around the cooling tower pump



pit and the oil/water separator and along the underground utilities will require dewatering. The dewatering calculations for these elements are provided in Appendix 10.8. Localized impacts to the surficial aquifer will occur during dewatering for a period of less than one year. The drawdown area of influence for power block dewatering will extend beyond the power block approximately 350 feet in all directions. The estimated dewatering rate is 1.8 MGD. The drawdown area of influence for the underground utility corridors will extend beyond the corridor centerline between 175 feet and 200 feet. Dewatering rates for the underground utility trenches are estimated to be less than 0.8 MGD per 500 feet of trench. The trenching will be done sequentially; not all at once. The drawdown areas of influence for the cooling tower pump pit and the oil/water separator are contained mostly within the power block dewatering area of influence. Consequently, there will be no significant additional impact from these dewatering activities. Dewatering effluent will be routed through the construction stormwater/sedimentation ponds before release to local drainage, where necessary. Dewatering impacts will be confined to the OCEC Unit 1 area and will not adversely impact off-Site surface waters or wetlands. Dewatering impacts will be temporary and will be in an area already impacted by construction of OCEC Unit 1.

Construction water supply requirements will be met using one of the existing on-Site wells (the 10" well), the proposed surficial, and/or Floridan aquifer wells. The existing on-Site wells have been used for agricultural purposes at an estimated pumping rate of 163.75 MGY. The 10" well will be used for water supply during construction of Unit 1, up to the current allocated amount. After construction is complete, this well will continue to be used for agricultural purposes only.

During construction of Unit 1, pumping rates from the proposed new surficial and Floridan aquifer wells will not exceed the operational limits discussed in Sections 4.5 and 6.3. Since the existing wells and the new wells were included in the modeling impact analysis, there will be no adverse impacts to the surficial aquifer, wetlands, or other environmental features from the construction water supply. No adverse impacts to other existing users are anticipated, with the potential exception of two nearby artesian wells, which FPL will mitigate, as necessary, pursuant to SJRWMD Rule 40C-2.381(2)(a)5, F.A.C.

OCEC Unit 1 will use groundwater from the surficial aquifer and the Floridan Aquifer system for water supply; and wastewater will be released through deep injection wells. Therefore, there will be no need to construct a cooling water reservoir or any associated intake or discharge structures.

5.2.2 Measuring and Monitoring Programs

The construction stormwater management system will be monitored as required by both the SWPPP that will be developed and the applicable BMPs under the generic stormwater construction permit.



Dewatering effluent, if released off-Site, will be monitored as required by FDEP applicable regulations or the applicable generic permit.

5.3 GROUNDWATER IMPACTS

5.3.1 *Impact Assessment*

Dewatering of the surficial aquifer will have no adverse impact on water levels or water supplies in the Upper Floridan Aquifer because the two aquifer systems are hydrologically separated by almost 300 feet of a clay-rich confining unit.

Dewatering impacts on the surficial aquifer will be localized and will last less than 1 year. Based on the dewatering calculations provided in Appendix 10.8, measureable water level declines will be confined to the OCEC Unit 1 area and will not adversely impact off-Site water supplies, surface waters or wetlands. On-Site dewatering impacts will be temporary and will be in an area already impacted by construction, as described in Section 5.2.1.

As discussed above in Section 5.2.1, construction water supply requirements will be met using one existing 10" on-Site well, the new surficial aquifer wells, and/or the new Floridan Aquifer wells. Pumping from the surficial and Floridan aquifer wells will not exceed the operational limits shown in the water balance diagram (Figure 4.5-1). Impacts associated with pumping from these wells are discussed in Section 6.3 and in Appendix 10.9. Consequently, there will be no adverse impact to the surficial aquifer or the Floridan Aquifer from the construction water supply. No adverse impacts to other existing users are anticipated, with the potential exception of two nearby artesian wells, which FPL will mitigate, as necessary, pursuant to SJRWMD Rule 40C-2.381(2)(a)5, F.A.C.

If no chemicals are added, hydrostatic test water and non-hazardous construction generated wastewaters will be routed to either the sedimentation stormwater ponds, the UIC system for disposal, allowed to percolate and/or evaporate on-Site, or sent to an approved off-Site disposal facility. If chemicals are added, testing will be performed to determine the appropriate method of disposal and/or treatment in accordance with all applicable non-procedural requirements. There will be no adverse impacts to groundwater from these wastewaters.

During construction, the labor force will use portable chemical toilets and/or permitted holding tanks. A licensed contractor will pump all sanitary sewage from the portable toilets and holding tanks as needed and transport the waste to an approved disposal facility.

Solid waste materials generated during construction will be disposed of in accordance with applicable nonprocedural requirements (see Section 5.6). Recyclable construction wastes, such as scrap wood

and metal, will be transferred to a specified storage area on the Site where they will be separated and stockpiled for salvage and recycling. General waste materials (i.e., typical of MSW) will be collected in appropriate waste collection containers for disposal at an approved off-site location. Hazardous waste will be collected and transported to an approved off-site hazardous waste treatment, storage and disposal facility. Therefore, there will be no adverse impact to groundwater due to solid wastes produced during construction.

5.3.2 *Measuring and Monitoring Programs*

Wastewater discharged to the deep injection wells will be monitored as required by the UIC permit. Temporary shallow monitoring wells may be installed around water supply and injection wells that are being drilled, and groundwater will be monitored as required by applicable regulations.

5.4 ECOLOGICAL IMPACTS

5.4.1 *Impact Assessment*

Construction on the Site and associated linear facilities corridor will impact terrestrial (upland) and/or aquatic (wetland) systems. The ecological impacts of each feature are discussed below.

5.4.1.1 Terrestrial Systems

The following subsections include descriptions of potential ecological impacts on terrestrial systems resulting from Project construction activities at the Site and in the associated linear facilities corridor. Existing land use/land cover of the Site and the associated facilities are shown in Figures 3.3.5-1a through 3.3.5-1c. The extent of land impacts is illustrated in Figure 5.1-1.

Terrestrial Systems – Site

The Site comprises approximately 2,341 acres, of which approximately 199 acres of uplands will be used for the construction of OCEC Unit 1, and approximately 77 acres of uplands will be cleared and graded in the open space area surrounding Unit 1. These uplands are limited to areas historically cleared and altered for agricultural uses, specifically citrus groves and cattle pasture.

These areas do not contain unique wildlife species and are not considered important wildlife habitats because of their disturbed nature. No significant adverse impacts to wildlife resources will occur as a result of construction in these areas. No adverse impacts upon federal- or state-listed terrestrial plants and animals are expected, due to the existing agricultural nature of the terrestrial habitat within the Site, which does not provide preferred habitat for listed plants or animals.

Fugitive dust generated by construction activities on-Site will be minimized through BMPs (see Subsection 4.5.2). Localized fugitive dust will not adversely affect the terrestrial systems surrounding the Site.

Noise from construction activities is not anticipated to significantly affect wildlife surrounding the Site. Wildlife that occurs in the vicinity of the area is accustomed to noise from SR 60, and wildlife is expected to acclimate to the temporary noise associated with construction activities from the Site.

Terrestrial Systems – Linear Facilities Corridor

Terrestrial systems within the linear facilities corridor include mixed hardwood-conifer forest, improved pasture, the existing access road, and transmission right-of-way. Minor improvements to the existing access road described in Section 4.10 (culvert replacement, repaving near intersection with SR 60, relocation of guard rail) will not impact any natural terrestrial habitats.

The transmission interconnection between OCEC Unit 1 and the existing Martin-Poinsett transmission line right-of-way include approximately 3 acres of improved pasture and 1.4 acres of mixed hardwood-conifer forest. Construction within the transmission interconnection corridor will require removal of canopy species and small areas of temporary disturbance to install transmission structures.

Construction in the linear facilities corridor will not impact any significant areas of terrestrial wildlife habitat and is not anticipated to result in any adverse impacts to terrestrial ecological resources.

5.4.1.2 Aquatic Systems/Wetlands

Construction at the Site and associated linear facilities will result in dredge/fill impacts to approximately 4.71 acres of hydrologically-altered mixed wetland hardwoods within citrus groves and 19.99 acres of man-made drainage and irrigation ditches. Installation of the on-Site natural gas pipeline from OCEC Unit 1 to the northwest edge of the site and access road culvert improvements would incur 0.11 acre of temporary wetland impact within ditches. Areas of unavoidable wetland impact are illustrated in Figure 5.4.1.2-1. Secondary wetland impacts will be minimized through implementation of erosion control best management practices and maintenance of 15 ft minimum and 25 ft average upland buffers around all undisturbed wetlands.

As described in the mitigation plan included in the attached Environmental Resource Permit application, the mitigation for these wetland impacts consists of a 376 acre on-site mitigation area that provides high quality undisturbed upland and wetland wildlife habitat adjacent to the approximately 20,862 acre Fort Drum Marsh Conservation Area. The mitigation area will provide habitat for several



threatened or endangered species and species of special concern. Due to its size and proximity, the 376 acre mitigation area will provide regional and sustainable long term benefits.

The ecological functional values provided by the wetlands and other surface waters proposed to be impacted are low due to their historical use and drainage, and the proposed mitigation, due to its size, location, enhancement and maintenance, will provide greater long term ecological value than the wetlands and other surface waters proposed to be impacted.

Nevertheless, the Project design reflects an effort to avoid and minimize, and reduce and eliminate, wetland impacts to the greatest extent practicable. The Project has been designed with a minimal footprint to reduce the area of impact, and the proposed location for construction of OCEC Unit 1 maximizes utilization of disturbed upland areas through its location upon citrus groves and cattle pasture.

Erosion, sedimentation, and runoff control measures will mitigate the potential for water quality degradation; therefore, associated impacts to adjacent aquatic biological communities are not expected to be significant.

Project construction impacts to aquatic systems within the Site and associated linear facilities corridor are described in the following sections. Additional information regarding wetland impacts of the Project and proposed mitigation are provided in Appendix 10.4, Environmental Resource Permit application.

5.4.1.3 Wetland Mitigation

In accordance with regulatory guidelines of the FDEP and U.S. Army Corps of Engineers (USACE), FPL proposes that the loss of wetland habitat be mitigated through a combination of wetland enhancement and preservation within the headwaters of the Upper St. Johns River Basin. The Project's 376-acre mitigation site (Figure 3.3.5-1c) is adjacent to and hydrologically connected to the Fort Drum Marsh Conservation Area, part of the USACE and SJRWMD's Upper St. Johns River Basin Project.

The calculation of mitigation requirements typically involves use of a wetland functional assessment value multiplied by the acreage of impact to determine the required number of mitigation credits. Wetland functional assessments typically involve ranking the subject wetland relative to several variables, such as vegetation, wildlife utilization, hydrology, and surrounding landscape conditions. The goal of the functional assessment is to determine the ecological value of the wetland prior to disturbance to ensure that mitigation is designed to replace the wetland's ecological functions rather

than merely the acreage of fill. Using this rationale, a two-acre wetland dominated by exotic vegetation with altered hydrology and little wildlife utilization would have a lower functional value and, thus, require fewer mitigation credits than a two-acre wetland supporting a diverse assemblage of native flora and fauna and unaltered hydrologic regime. Alternatively, some mitigation banks use mitigation ratios to calculate the number of credits required to offset wetland impacts, in accordance with the SFWMD Basis of Review for Environmental Resource Permits.

The functional assessment methodology, acreage of impact, resulting mitigation credits required to offset the loss of wetlands within the Site and associated linear facilities, and a description of FPL's proposed wetland mitigation plan are described in Appendix 10.4, Environmental Resource Permit application, and summarized below.

Wetland Functional Assessment Methodology

The amount of mitigation needed to offset the Project's unavoidable wetland impacts was determined using the Uniform Mitigation Assessment Method (UMAM) set forth in chapter 62-345, F.A.C. Per Section 373.414(18), F.S., UMAM is the methodology to use when determining mitigation needs in Florida. Information was collected to prepare wetland functional assessments utilizing UMAM. The UMAM is used to quantify the units of functional loss associated with impacts, as well as to calculate the amount of functional lift (number of mitigation credits) generated through wetland restoration, preservation, creation, or enhancement activities.

FDEP's UMAM quantifies wetland quality or health through the evaluation of several variables, including location and landscape support, water environment, and community structure. The variables are defined in Rule 62-345, F.A.C., and are summarized in the following sections.

Location and Landscape Support – The value of functions provided by an assessment area to fish and wildlife are influenced by the landscape position of the assessment area and its relationship with surrounding areas. Many species that nest, feed, or find cover in a specific habitat or habitat type are also dependent in varying degrees upon other habitats, including upland, wetland, and other surface waters that are present in the regional landscape. The location of the assessment area shall be considered to the extent that fish and wildlife utilizing the area have the opportunity to access other habitats necessary to fulfill their life history requirements. The availability, connectivity, and quality of off-site habitats and off-site land uses that might adversely impact fish and wildlife utilizing these habitats are factors to be considered in evaluating the location of the assessment area. The location of the assessment area shall be considered relative to off-site and upstream hydrologic contributing areas and to downstream and other connected waters to the extent that the diversity and abundance of fish

and wildlife and their habitats is affected in these areas. The opportunity for the assessment area to provide off-site water quantity and quality benefits to fish and wildlife and their habitats downstream and in connected waters is assessed based on the degree of hydrologic connectivity between these habitats and the extent to which off-site habitats are affected by discharges from the assessment area.

Water Environment – The quantity of water in an assessment area, including the timing, frequency, depth, and duration of inundation or saturation, flow characteristics, and the quality of that water may facilitate or preclude its ability to perform certain functions and may benefit or adversely impact its capacity to support certain wildlife. Hydrologic requirements and tolerance to hydrologic alterations and water quality variations vary by ecosystem type and the wildlife utilizing the ecosystem. Hydrologic conditions within an assessment area, including water quantity and quality, must be evaluated to determine the effect of these conditions on the functions performed by area and the extent to which these conditions benefit or adversely affect wildlife. Water quality within wetlands and other surface waters is affected by inputs from surrounding and upstream areas and the ability of the wetland or surface water system to assimilate those inputs.

Community Structure (Vegetation and Structural Habitat) – The presence, abundance, health, condition, appropriateness, and distribution of plant communities in surface waters, wetlands, and uplands can be used as indicators to determine the degree to which the functions of the community type identified are provided. Vegetation is the base of the food web in any community and provides many additional structural habitat benefits to fish and wildlife. Overall condition of a plant community can often be evaluated by observing indicators such as dead or dying vegetation, regeneration and recruitment, size and age distribution of trees and shrubs, fruit production, chlorotic or spindly plant growth, structure of the vegetation strata, and the presence, coverage, and distribution of inappropriate plant species. Human activities such as mowing, grazing, off-road vehicle activity, boat traffic, and fire suppression constitute more direct and easily observable impacts affecting the condition of plant communities. Although short-term environmental factors such as excessive rainfall, drought, and fire can have temporary impacts, human activities such as flooding, drainage via groundwater withdrawal and conveyance canals, or construction of permanent structures such as seawalls in an aquatic system, can permanently damage these systems. The plant community should be evaluated to consider whether natural successional patterns for the community type are permanently altered. Inappropriate plants, including invasive exotic species, other invasive species, or other species atypical of the community type being evaluated, do not support the functions attributable to that community type and can out-compete and replace native species. Native upland and wetland vegetation, such as wax myrtle, pines, and willow, which are not typically considered as invasive, can occur in numbers and coverage not appropriate for the community type and can serve as

indicators of disturbance. The relative degree of coverage by inappropriate species, inappropriate vegetation strata, condition of vegetation, and both biotic and abiotic structure all provide an indication of the degree to which the functions anticipated for the community type identified are being provided.

Functional Assessment Results

The UMAM functional assessment methodology was used to quantify the relative quality of wetland habitats impacted by the Project and the resulting number of mitigation credits required to replace the loss of wetland functions associated with unavoidable wetland impacts. A detailed description of the individual scores for each parameter and UMAM calculations for wetland habitat types within the Site and associated linear facilities is included in the Environmental Resource Permit application (Appendix 10.4); a summary of impacts and proposed mitigation are provided below:

The Project will result in dredge/fill impacts associated with construction of the OCEC Unit 1, transmission interconnection, access road improvements, and the on-Site natural gas pipeline (northwest alternative). The majority of wetland impacts are proposed within man-made agricultural and drainage ditches, with limited wetland functional value. Areas of mixed wetland hardwoods proposed to be impacted have been hydrologically altered through perimeter ditching, thereby reducing the depth and duration of inundation and facilitating colonization by exotic species of vegetation. As detailed in Appendix 10.4, the Project's wetland impacts result in a total of 12.6 units of functional loss.

The loss of wetland functions associated with construction of the Project will be replaced through onsite mitigation in the form of enhancement and preservation of an approximately 376 acre undeveloped parcel adjacent to the Fort Drum Marsh Conservation Area. Mitigation focused upon removal of nuisance/exotic species of vegetation and preservation of significant acreage of enhanced habitat through a conservation easement would provide a regional increase in the functional value of wetland and upland habitats to offset the functional loss associated with construction of the Project. As detailed in Appendix 10.4, the proposed wetland and upland enhancement and preservation will generate 14.4 credits, resulting in an overall net increase in wetland functions compared to the Project's unavoidable wetland impacts.

5.4.1.4 Endangered and Threatened Species

Threatened and endangered species or species of special concern that have a possibility of occurrence within the Site or associated linear facilities corridor are identified and discussed in Subsection 3.3.6.

Construction of the Project is not likely to affect any state or federally-listed species due to the lack of preferred habitat for nesting, roosting, or significant foraging areas within the Site.

5.4.2 Measuring and Monitoring Programs

5.4.2.1 Terrestrial Systems

No monitoring programs will be undertaken because no important terrestrial systems will be affected by construction activities proposed for the Site or associated linear facilities.

5.4.2.2 Aquatic Systems/Wetlands

Wetland impacts will be mitigated through wetland enhancement and preservation consistent with the regional restoration goals of the Upper St. Johns River Basin Project. Details of the proposed mitigation plan are included in Appendix 10.4.

To assess the success of the enhancement of wetlands and uplands under FPL's proposed mitigation plan, monitoring will be performed to document the vegetative and hydrologic conditions within the mitigation areas.

5.5 AIR IMPACTS

5.5.1 Air Emissions

Construction activities will result in the generation of fugitive PM₁₀ emissions and vehicle exhaust emissions. Fugitive PM₁₀ emissions will result primarily from onsite vehicular travel over paved and unpaved roads. On-Site construction traffic will include heavy equipment traffic and traffic due to construction workers entering and leaving the Site. Construction personnel and equipment will enter the Site, including the construction support area, primarily over paved surfaced roadways. Exposed land areas may also generate fugitive dust due to wind erosion.

Emissions of fugitive PM₁₀ from these activities are difficult to quantify because of their variable nature. They can only be estimated since emissions are dependent upon a number of factors, including specific activities conducted, level of activity, meteorological conditions, and control measures utilized.

Table 5.5.1-1 shows the estimated maximum air emissions during site preparation and construction of OCEC Unit 1.

During the construction period, fugitive PM₁₀ emissions will result from site preparation by fill and grading of the construction area and development of the power block area. The PM₁₀ emissions for

these activities are estimated to be approximately 0.08 ton for soil unloading, 1.67 tons for transport of soils, and 0.46 ton for grading.

Emissions will also result from exhaust of construction equipment such as trucks and graders. Construction equipment will produce emissions of CO, NO_x, VOC, PM₁₀, and SO₂. Estimated exhaust emissions were based on EPA emission factors for non-road diesel engines. CO, NO_x and VOC emissions were estimated using EPA Tier 3 non-road emission standards (40 CFR 89). EPA's Tier 3 emission standards were phased in from 2006 to 2008 and apply to engines from 11 to 750 hp. On June 29, 2004, EPA established Tier 4 non-road emission standards that will be phased in from 2008 to 2015 (69 Federal Register 38958-39273). Tier 4 establishes lower emission standards for PM and NO_x and the requirement to use ULSD fuel. Some of the construction equipment will likely include engines meeting EPA Tier 4 emissions standards. EPA non-road diesel engine rules required the use of ULSD fuel in non-road engines starting in 2010 (EPA, 2008). The use of ULSD fuel will minimize SO₂ and PM₁₀ emissions from any Tier 3 engines. Based on the EPA emission factors and the estimated maximum number of vehicles, the CO, NO_x, VOC, PM₁₀, and SO₂ emissions during site preparation are estimated to be 0.74, 0.76, 0.08, 0.04, and <0.01 tons, respectively, for dismantlement and site preparation.

Fugitive PM₁₀ emissions may occur from wind erosion from open areas. The areas subject to wind erosion will generally be small due to the nature of construction activities and control measures taken, such as seeding. Fugitive PM₁₀ emissions from wind erosion have been estimated to be a total of 1.92 tons/year during the construction period.

Fugitive PM₁₀ emissions will also result from onsite construction traffic. Based on the average construction workforce, PM₁₀ emissions from paved and unpaved roads have been estimated to be a total of 4.58 tons during the construction period. Reasonable precautions pursuant to FDEP Rule 62-296.320(4)(c)3., F.A.C., will be used to reduce the amount of fugitive emissions from onsite paved and unpaved roads (e.g., watering).

Once site preparation is complete, the construction of the 3-on-1 combined cycle unit and associated facilities will be initiated. Emissions will also result from construction equipment operating onsite with diesel and gasoline engines including cranes, trucks, compressors, etc. The CO, NO_x, VOC, PM₁₀, and SO₂ emissions are estimated to be 1.47, 1.80, 0.17, 0.9, and <0.01 TPY, respectively, during the erection of the component parts of the combined cycle unit.

Two temporary boilers may be used during construction of OCEC for chemical cleaning and steam blow activities. A description of the temporary and auxiliary boilers is contained in Appendix 10.2.5. The maximum emissions from the boilers are 18.5, 30.9, 1.2, 3.3, and 0.4 TPY for CO, NO_x, VOC, PM₁₀, and SO₂, respectively.

Temporary diesel powered electric generators may be used for construction power to support various types of electric powered construction equipment. The temporary generators will consist of one-450 kW unit that will be operated in 2017 (3,600 hr/yr), 2018 (3,600 hr/yr) and 2019 (1,440 hr/yr) and two 1,800 kW units operated in 2017 (2,880 hr/yr/unit average) and 2018 (3,600 hr/yr/unit). One 1,800 unit will be required in 2019 (1,440 hr/yr). The air emissions for the temporary construction generators shown in Table 5.5.1-1 are for the highest annual operation in 2018. The maximum emissions from the boilers are 56.3, 98.6, 3.2, 3.2, and 0.1 TPY for CO, NO_x, VOC, PM₁₀, and SO₂, respectively. Information regarding operation and emissions for the construction boilers and diesel generators is included as temporary emission units in the application form (Appendix 10.2.5).

Table 5.5.1-1 includes emission estimates for construction activities at the construction support area and parking and laydown areas. Reasonable precautions pursuant to FDEP Rule 62-296.320(4)(c)3, F.A.C., will be used to minimize fugitive particulate emissions.

5.5.2 Control Measures

A number of control measures will be implemented during the construction period to minimize air emissions and potential impacts pursuant to FDEP Rule 62-296.320(4)(c)3, F.A.C. The Site consists of compacted soils that are difficult for wind to pick up, thereby reducing fugitive emissions due to wind. After grading, the untraveled or lightly used areas may be paved, provided with an erosion resistant covering, or vegetated to minimize fugitive PM and wind erosion. Watering on an as-needed basis will control fugitive dust from highly traveled areas.

5.6 SOLID WASTES

Solid waste materials generated during Project construction will be disposed of in accordance with applicable state and local rules and regulations. Recyclable construction wastes, such as scrap wood and metal, will be transferred to a specified storage area on the Site where they will be separated and stockpiled for salvage and recycling. General waste materials (i.e., typical of MSW) will be collected in appropriate waste collection containers for disposal at an approved offsite location.

As listed in Table 4.6-1, there are a variety of potential solid waste streams resulting from the construction and operation of the Project. During construction, the solid waste streams will be

managed as presented in Table 4.6-1. Solvent rags will be separated and either laundered or disposed appropriately. If aerosol cans are punctured prior to disposal, the residual contents will be collected and managed as hazardous waste. Paint waste, PVC cleaner, and PVC cement wastes will be minimized by implementation of programs requiring use of all material prior to issuance of additional material. All hazardous wastes will be collected onsite and disposed of by a licensed hazardous waste contractor. All non-hazardous waste will be managed according to the Waste Handling Guidelines identified in Table 4.7-1, with appropriate modifications to accommodate the construction of the Project.

Used oil from construction vehicles and equipment will be collected in appropriate containers and transported offsite for recycling or disposal at an approved facility. The approved disposal facility will be an existing facility that has been previously permitted for commercial recycling or disposal of used oils.

Individual contractors will be responsible for handling any hazardous materials used or created as part of their work. This responsibility includes the proper recordkeeping, transportation, storage, handling, and offsite disposal of such wastes. Contractors will be required to coordinate with FPL and provide documentation of all activities related to hazardous material and/or wastes.

5.7 IMPACT ON HUMAN POPULATIONS

Construction projects have potential to affect human populations by altering demographic patterns; by placing demands on infrastructure elements such as housing, transportation, and educational facilities; by contributing noise to the environment; and by creating inconveniences due to the movement of workers, materials, and machinery.

Construction activities will be contained within the designated Site and associated linear facility corridor boundaries and will follow applicable regulations; FPL will maintain practices to reduce potential disruption to surrounding areas and eliminate unnecessary air, noise, and traffic impacts. Chapter 7.0 provides information on income, employment, tax revenue, and service needs associated with the construction workforce.

This section focuses on workforce requirements and the impacts of construction-related traffic, housing, education, and noise.

5.7.1 Construction Workforce

The construction workforce for the Project is expected to average approximately 290 workers over the 2-year construction period. Assuming all necessary approvals are obtained, construction is



anticipated to commence in 2017 and conclude in the summer of 2019. Peak construction is estimated at approximately 650 workers in 2018 and will result in necessary workforce skills as follows:

Trade	Percent	Trade	Percent
Laborers	12	Pipefitters	19
Carpenters	6	Insulators	2
Operators	5	Electricians	22
Ironworkers	4	Painters	1
Millwrights	10	Supervision	13
Boilermakers	6		

FPL will promote employment of local workers by distributing Project information to the community about types of jobs and skills required and local training opportunities. Notice of Project employment opportunities will appear in local media and FPL will sponsor or participate in area job fairs. Contractors will be solely responsible for hiring the construction workforce.

5.7.2 Transportation and Traffic

The majority of the construction workers are expected to commute to the Site from within Indian River, Martin, Okeechobee, and Saint Lucie Counties (e.g. workforce region 20) as well as skilled labor from outside the area. Contractors will be responsible for hiring the construction workforce. A more detailed discussion of the workforce, payrolls, and economic impacts of the workforce is found in Chapter 7.0.

A detailed traffic analysis is contained in Appendix 10.7.4. This section summarizes the results of the construction traffic impacts.

Peak construction is estimated at approximately 650 workers in 2018. The potential impact from construction traffic was based on all construction workers arriving to the construction parking areas by automobile with an occupancy rate of 1.3 workers per vehicle. This occupancy rate results in approximately 500 vehicles anticipated during the peak construction period. In addition, 20 miscellaneous trips per hour area expected to typically occur. With 500 inbound during the a.m. peak hour, 500 outbound during the p.m. peak hour period, and 20 miscellaneous trips per hour (during 12 daytime hours), the total daily traffic volume of approximately 1,240 (workforce) trips per day. The traffic was assigned based on existing traffic patterns as follows:

- 85 percent entering and leaving the Site via the access road on SR 60 from the east (to and from I-95 and Vero Beach)
- 15 percent entering and leaving the Site via the access road on SR 60 from the west (to/from Florida's Turnpike)



The construction work-force and miscellaneous trips were evaluated for the peak morning (a.m.) and evening (p.m.) periods using the existing peak construction and existing traffic. The results of this evaluation are presented in Table 5.7.2-1. The results show that the SR 60 acceptable levels of service will be maintained and the additional peak construction traffic will not degrade the operating conditions on SR 60.

A capacity/level of service analysis was also performed to evaluate the intersection of SR 60 and the Site access road (226th Court). The analysis was undertaken following the capacity/level of service procedures outlined in the Highway Capacity Manual. The intersection was analyzed with an existing 600 ft long left-turn lane for westbound SR 60 entering the Site access road and northbound left-turn and right-turn from a single exit lane when leaving the Site. The result of the intersection capacity analysis for the future traffic with construction trips is presented in the following table:

Intersection Movements	LOS AM Peak	LOS PM Peak
<i>State Road 60 & Main Project Entrance</i>		
-WB Left-Turn	A	A
- NB Exit Lane (for left and right turns)	A	C

The intersection capacity analysis determined that an eastbound right-turn lane from SR 60 was not warranted since SR 60 is a multi-lane roadway, the existing traffic volume on SR 60 is low and the eastbound right-turn lane is excessive. A 50-ft curved approach/exit (radius) on 226th Court is proposed to assist with traffic volume (Figure 4.10-4).

5.7.3 Housing

Impacts on housing will depend on the number of workers that could potentially relocate and the type of housing the workers would desire. The number of construction employees will average approximately 290 people, with a peak of approximately 650 people. The labor force in Okeechobee County and Indian River County was reported as 17,887 and 62,289, respectively, as of December 2014, with approximately 16,754 and 58,577 residents, respectively, listed as employed (Florida Department of Economic Opportunity, Labor Market Statistics Center, 2015).

Assuming that 50 percent of the Project's construction and operation workers were to relocate to the immediate area, 325 workers would migrate during the peak construction period and require either temporary or permanent housing. The majority of workers are expected to live in temporary housing (e.g., renting), although some of these workers could select permanent housing for the duration of their stay. Still others could elect to reside in transitional housing, such as residential hotels, motels,

rooms in private homes, or to bring their own housing in the form of campers and mobile homes.

The number of unoccupied housing units in Okeechobee County has been estimated at 29 percent (Indian River County; 26 percent), with 71.1 percent unoccupied rental units (Indian River County; 74 percent). Within Workforce Region 20, the number of available total lodging units was estimated as 22,888 in 2013. This total number of units is broken down into 1,369 vacation rental units, 431 apartment units, 3,153 motel units, 3,652 hotel units, and approximately 8,605 rooming houses and bed and breakfast units. In addition, the available recreational vehicle parks and recreational camps within the region were estimated at five establishments within 25 miles of the Project area (Gocampingamerica.com, 2015).

5.7.4 Education

Because of the short duration of employment (based on anticipated skill requirements and construction activities), few workers are anticipated to permanently relocate with their families. As a result, there will be little in-migration of school-aged children resulting from Project construction. Therefore, no significant adverse effects on local elementary, middle, or high school enrollment are anticipated. The closest public or private educational facility to the Site is located in Indian River County, approximately 14 miles to the northeast of the Site (Fellsmere Elementary School).

5.7.5 Construction Noise Impacts

The impacts of noise on human populations are dependent upon the proximity of institutional and residential land uses to construction activities and the type and extent of noise sources. There are no residential land uses in the immediate area of the power block. The nearest residential locations that could potentially be impacted by the construction activities are north and east of the Site boundary at distances exceeding 0.5 kilometers.

Construction will require land clearing and site preparation activities, installation of foundations, and erection of major components of the combined cycle unit such as the CTs, HRSGs, cooling tower, and steam turbine generator and associated linear facilities. The use of construction equipment such as dump trucks, cranes, bulldozers, graders, front end loaders, and air compressors will be required. These sources have maximum noise levels ranging from approximately 70 to 85 dBA (measured at a distance of 50 ft).

The evaluation of noise impacts from Project construction activities was performed using results from a noise propagation computer program (Computer Aided Noise Abatement, CadnaA) to estimate noise source levels. Noise source levels are entered as octave band SPLs. The user can specify

coordinates, either rectangular or polar. All noise sources are assumed to be point sources; line sources can be simulated by several point sources. Sound propagation is calculated by accounting for hemispherical spreading and three other user identified attenuation options: atmospheric attenuation, path specific attenuation, and barrier attenuation. Atmospheric attenuation is calculated using International Organization for Standards, ISO 9613-1, *Attenuation of Sound During Propagation Outdoors – Part 1: Calculation of the Absorption of Sound by the Atmosphere*. Path specific attenuation can be specified to account for the effects of vegetation, foliage, and wind shadow. Direction source characteristics and reflection can be simulated using path specific attenuation. Attenuation due to barriers can be calculated using the coordinates and height of the barrier. Barrier attenuation is calculated by assuming an infinitely long barrier perpendicular to the source-receptor path. No barriers were included during construction modeling. Total and A-weighted SPLs (filtered to approximate human hearing) are calculated. Background noise levels are used to calculate overall SPLs.

The model was performed to predict the maximum noise levels produced by a combination of likely noise sources with and without background noise levels. A conservative estimate of the numbers and types of construction equipment was assumed to calculate construction noise levels. Two types of construction activities were modeled; one included typical equipment used for land clearing activities over the entire Project area and the other include typical construction activities associated with erecting the turbines, HRSGs, and other structures at or near the power block. To be conservative, the above construction activities were modeled to be occurring simultaneously.

Table 5.7.5-1 lists the major categories of equipment that will be used during the construction of OCEC and their associated noise characteristics. A total of 14 land clearing and 39 construction noise sources were used to predict maximum SPLs from construction at the Site and the construction parking and laydown areas. This included a full array of construction equipment from bulldozers to forklifts that would be used for Site preparation to cranes and welders used to assemble Plant components. Most of the heavy construction activities are expected to occur during the daytime hours, but some nighttime activities are expected and were included in the modeling results.

The noise levels resulting from these combinations of equipment were input as multiple sources into the model. Octave bands were estimated from *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances* (EPA, 1971). Only the atmospheric attenuation and ground absorption options were enabled during the noise modeling runs.

Figure 5.7.5-1 presents the estimated daytime noise levels associated with the construction of the Project. This figure represents the average SPLs with all the construction equipment operating at the



same time. The modeling results are extremely conservative, because the model assumes that all of the equipment would operate at the same time. This would not likely occur because construction equipment operates intermittently based on the type of activity. For example, a bull dozer typically only operates 40 percent of the time during a shift (EPA, 1971). The noise levels shown in Figure 5.7.5-1 were evaluated along with the L_{10} and L_{90} noise levels observed during the noise monitoring conducted in January 2015. The observed L_{10} at each noise monitoring location would represent the type of noise that is intermittent such as traffic on a highway and the operation of construction equipment. The L_{10} is the measured noise level exceeded 10% of the time and represents intermittent operation of construction equipment associated with the Project. The L_{90} is an appropriate background noise as it represents the noise sources that are occurring relatively continuously over the monitoring period. The overall noise levels included the noise determined from the CadnaA modeling results plus the L_{90} background. The L_{90} is the measured noise level exceeded 90% of the time. This eliminates all transient noise sources from highway traffic, air craft noise, and sounds of nature that would not be included in assessing the noise levels generated from OCEC. Table 5.7.5-2 presents the existing, background, modeled, and overall sound levels during construction. The properties in the vicinity of OCEC are primarily agricultural, with some associated residences within the agricultural properties.

There are no noise regulations that are applicable to the construction or operation of OCEC Unit 1. The OCEC Unit 1 location is, however, in close proximity to Indian River County. Indian River County has a noise ordinance in Chapter 974, Indian River County Code, which is useful for comparison with the potential noise impacts of Project construction for illustrative purposes only. This noise ordinance was discussed in detail in Section 3.3.7. For construction noise, the numerical noise values that would be appropriate for comparison is the L_{10} , representing noise from sources that occur intermittently such as construction equipment and traffic. The L_{10} noise limit in the Indian River County noise ordinance for residential zoned districts is 65 dBA during the daytime and 60 dBA during the nighttime.

As shown in Figure 5.7.5-1 and Table 5.7.5-2, the modeled SPLs from OCEC construction activities are not predicted to exceed 65 dBA during the daytime or 60 dBA during the nighttime. When background sound levels are added to the sound levels determined from the modeling, Table 5.7.5-2 also shows that the overall sound levels are not predicted to exceed noise levels of 65 dBA during the daytime or 60 dBA during the nighttime. The modeling results presented in Figure 5.7.5-1 also show that noise levels at the Site boundary do not exceed 55 dBA, which is below the daytime or nighttime noise limit for any receiving Zoning District in the Indian River County noise ordinance. The construction noise at the nearest residence is estimated to be 44.9 dBA, with lower noise levels at

greater distances as shown in Figure 5.7.5.2. Noise levels much less than 45 dBA are predicted at the nearest recreational facilities (camping areas and trails) located in the Fort Drum Marsh Conservation Area.

The results of the conservative evaluation of potential noise impacts from the construction of OCEC determined that the maximum overall sound levels will not result in unreasonably loud noise as compared with the Indian River County noise ordinance. Construction equipment for the Project will be operated in accordance with manufacturers' specifications and the equipment will be in good repair and utilize noise baffling methods specified by the manufacturer.

During the initial startup of the Project, steam blows will be conducted to clean piping. Steam blows used during construction to clean out new piping and equipment will result in elevated noise levels for short durations (i.e., minutes) over several weeks, including nighttime events. Prior to these events, notification will be made to those locations that may be able to notice elevated noise levels.

5.7.6 Lighting

The majority of construction activities will occur during the daytime. Some nighttime construction activities may occur that are related to specific construction/equipment installation tasks that must continue until completion. Nighttime lighting will be localized and specific to each task. Security lighting will be required in some areas, including the Site entrance, construction trailers, and laydown areas. Cranes may require visual aircraft lighting. The lighting associated with construction will be localized and confined to areas requiring specific task and security lighting. As a result, adverse impacts from construction lighting are not expected to occur off-Site.

5.8 IMPACT ON LANDMARKS AND SENSITIVE AREAS

As discussed in Subsection 3.2.5 Regional, Scenic, Cultural, and Natural Landmarks, there are no regional, scenic, cultural or natural landmarks under federal jurisdiction within five miles of the OCEC Unit 1.

The SJRWMD's Fort Drum Marsh Conservation Area is located adjacent to the Site, on the eastern boundary. The SJRWMD's Blue Cypress Conservation Area is located approximately 1.5 miles to the northeast of the OCEC Unit 1. These conservation areas are the closest facilities that offer visitor recreational services, such as wildlife viewing, biking, hiking, camping, and water activities. Hunting is also permitted within designated areas.

As discussed in Subsection 3.2.8.1 (Education) there are no educational facilities within 5 miles of the Site and as discussed in Subsection 3.2.8.6 (Recreational Facilities), there are no Okeechobee County or Indian River County parks or recreational facilities within five miles of the Site.

Project construction activities will be contained within the designated Site boundaries and will meet all regulatory requirements for the activities and associated equipment. Construction activities will not result in changes to the accessibility or use of area recreational facilities.

No adverse noise, light, or viewshed-related impacts are anticipated at any public recreational facilities during construction of OCEC Unit 1.

5.9 IMPACT ON ARCHAEOLOGICAL AND HISTORIC SITES

Archaeological and Historical Conservancy, Inc., conducted both a Phase I cultural resource assessment of the OCEC Unit 1 and access road and a desktop cultural resource assessment of the remainder of the Site in March 2015 (Appendix 10.7.2). Based on these assessments, it was determined that the Site contains no significant archaeological or historic resources that would be eligible for listing in the National Register of Historic Places.

A consistency determination letter from the Florida Department of State, Division of Historical Resources will be provided upon receipt.

5.10 SPECIAL FEATURES

There will be no unusual products, raw materials, solid waste disposal, incinerator effluents, or residues produced during construction of the Project that will have influence on the environment or ecological systems of the Site or adjacent areas.

5.11 BENEFITS FROM CONSTRUCTION

The construction phase of the Project will contribute both short- and long-term economic benefits to the surrounding region. Construction benefits will include construction employment that will average several hundred over the 2-year construction period. Construction wages will increase the demand for goods and services in the region. Direct purchases of construction materials will have both direct and indirect economic benefits. This includes construction materials (e.g., concrete and steel for foundations), rental equipment (e.g., construction cranes, pumps), food services, and transportation services. Chapter 7 provides a detailed description of Project benefits.

TABLES

**TABLE 5.5.1-1
ESTIMATED AIR EMISSIONS DURING SITE PREPARATION AND CONSTRUCTION OF PROJECT**

Construction Activity	Type Operation	Amount	Units	Pollutant	Emissions	Units	Controls
Demolition/Site Preparation							
Soil and Fill Placement	Batch Drop	253,333 tons		PM ₁₀	0.08 tons		High moisture material
Soil and Fill Movements	Unpaved Roads	7,382 VMT		PM ₁₀	1.67 tons		Watering as necessary
Grading	Unpaved Roads	4,627 VMT		PM ₁₀	0.46 tons		Chemical dust suppressant
Equipment Emissions	Diesel Engines	13,604 gallons		PM ₁₀	0.04 tons		EPA Non-Road Tier 3
				NO _x	0.76 tons		EPA Non-Road Tier 3
				SO ₂	< 0.01 tons		EPA Non-Road Tier 3
				CO	0.74 tons		EPA Non-Road Tier 3
				VOC	0.08 tons		EPA Non-Road Tier 3
Open Areas	Wind Erosion	12 acres		PM ₁₀	1.92 TPY		Watering as necessary
Construction Worker On-site Traffic	Paved Roads	95,831 VMT/yr		PM ₁₀	4.58 TPY		Watering/Sweeping as necessary
Facilities Construction	Diesel Engines	37,440 gal/yr		PM ₁₀	0.09 TPY		EPA Non-Road Tier 3
				NO _x	1.80 TPY		EPA Non-Road Tier 3
				SO ₂	0.00 TPY		EPA Non-Road Tier 3
				CO	1.47 TPY		EPA Non-Road Tier 3
				VOC	0.17 TPY		EPA Non-Road Tier 3
Construction Boilers	Construction steam (2 boilers, 1,500 hours)	150 MMBtu/hr		PM ₁₀	5.5 tons		Good combustion practices
				NO _x	11.0 tons		Good combustion practices
				SO ₂	0.4 tons		Good combustion practices
				CO	18.5 tons		Good combustion practices
				VOC	1.2 tons		Good combustion practices
Construction Generators	Construction Power			PM ₁₀	3.2 tons/year		EPA Non-Road Tier 2/Tier 3
	One 450 kW	4.21 MMBtu/hr		NO _x	98.6 tons/year		EPA Non-Road Tier 2/Tier 3
	Two 1,800 kW	17 MMBtu/hr/unit		SO ₂	0.1 tons/year		EPA Non-Road Tier 2/Tier 3
				CO	56.3 tons/year		EPA Non-Road Tier 2/Tier 3
				VOC	3.2 tons/year		EPA Non-Road Tier 2/Tier 3

Note: VMT = vehicle miles traveled; acres based on open areas at any one time.

The following EPA emission factors were used to estimate emissions.

EPA, 1992 Fugitive Dust Background and Technical Information Document for Best Available Control Measures;

Section 2.3.1.3.3, Wind Emissions from Continuously Active Piles.

EPA, 2006a; AP-42, Section 13.2.1 Paved Roads.

EPA, 2006b; AP-42, Section 13.2.2 Unpaved Roads.

EPA, 2006c; AP-42, Section 13.2.4 for Aggregate Handling and Storage Piles.

EPA, 2006d; AP-42, Section 13.2.5 Industrial Wind Erosion.

EPA, 2008; 40 CFR Part 89 Control of Emissions of New and In-use Compression Engines.

TABLE 5.7.2-1
OCEC CONSTRUCTION TRAFFIC
EXISTING AND FUTURE TRAFFIC CONDITIONS

Peak Hour	S.R. 60 Roadway Direction	From	To	No. of Lanes	Existing Hourly Volume	Existing LOS	Future Hourly Volume	Future LOS
AM	Eastbound	Turnpike	Site	2	130	B	205	B
AM	Westbound	Site	Turnpike	2	90	B	90	B
AM	Eastbound	Site	I-95	2	130	B	130	B
AM	Westbound	I-95	Site	2	90	B	515	B
PM	Eastbound	Turnpike	Site	2	166	B	166	B
PM	Westbound	Site	Turnpike	2	195	B	270	B
PM	Eastbound	Site	I-95	2	166	B	591	B
PM	Westbound	I-95	Site	2	195	B	195	B

Source: Traf Tech Engineering, Inc., 2015

Note: 85% assigned to and from the east, or 425 vehicles per hour (vph). 15% assigned to and from the west, or 75 vehicles per hour. FDOT Capacity Tables: LOS "B" threshold is 1,340 vph, LOS "C" is 2,100 vph, LOS "D" is 2,660 vph, and LOS "E" is 3,020 vph.

***Level of Service (LOS) Descriptions (FDOT)**

- LOS A = Completely free flow conditions. The operation of vehicles is virtually unaffected by the presence of other vehicles and operations are constrained only by the geometric feature of the highway and by driver preferences.
- LOS B = Free flow, although the presence of other vehicles becomes noticeable. Average travel speeds are the same as LOS A, but drivers have slightly less freedom to maneuver. Minor disruptions are easily absorbed, although local deterioration will be more obvious.
- LOS C = Influence of traffic density on operations becomes marked. The ability to maneuver within the traffic stream is clearly affected by other vehicles. Minor disruptions can cause serious local deterioration on service.
- LOS D = Ability to maneuver is severely restricted due to traffic congestion. Travel speed is reduced by the increasing volume. Only minor disruptions can be absorbed.
- LOS E = Operations at or near capacity, an unstable level. Disruptions cannot be dissipated readily.
- LOS F = Forced or breakdown flow. Vehicles arrive at a rate greater than the rate at which they are discharged. The demand exceeds the computed capacity of the planned facility.



Table 5.7.5-1. Construction Equipment Noise Sources

Equipment ID	Source Height	Levels at Octave Band Center Frequencies									dBA	Source
		31.5	63	125	250	500	1000	2000	4000	8000		
Land Clearing Equipment												
Heavy Equipment Operations - 770 Hp	2	32	112	119	117	114	110	105	99	94	115	Vendor Supplied - Cat_D10/D11/D7 LGPa
Heavy Equipment Operations - 770 Hp	2	32	112	119	117	114	110	105	99	94	115	Noise from Construction, EPA 1971 (Const_5)
Heavy Equipment Operations - 770 Hp	2	32	112	119	117	114	110	105	99	94	115	Noise from Construction, EPA 1971 (Const_4)
Heavy Equipment Operations - 770 Hp	2	32	112	119	117	114	110	105	99	94	115	Noise from Construction, EPA 1971 (Const_8)
Road Truck	2	85	91	93	94	90	88	83	78	65	93	Spectrum Accoustics database
Road Truck	2	85	91	93	94	90	88	83	78	65	93	Spectrum Accoustics database
Road Truck	2	85	91	93	94	90	88	83	78	65	93	Spectrum Accoustics database
Road Truck	2	85	91	93	94	90	88	83	78	65	93	Spectrum Accoustics database
Estimated for 170 HP Grader	2		105	108	109	107	105	99	94	88	109	Spectrum Accoustics database
Estimated for 170 HP Grader	2		105	108	109	107	105	99	94	88	109	Noise from Construction, EPA 1971 (Const_1)
Volvo A25E Dump Truck	2	67	72	86	92	98	99	98	94	88	104	Noise from Construction, EPA 1971 (Const_1)
Volvo A25E Dump Truck	2	67	72	86	92	98	99	98	94	88	104	Field Measurement @ Wolf Creek Landfill 102/20/11_gbm
Bulldozer	2		107	104	102	103	100	97	95	97	105	Noise from Construction, EPA 1971 (Const_1)
Bulldozer	2		107	104	102	103	100	97	95	97	105	Field Measurement 12/20/11 @ Wolf Creek_gbm
Total Land Clearing Sound Power		91.1	118.7	125.0	123.1	120.3	116.7	111.9	106.6	103.2	122	
Unit Construction Equipment												
Diesel Gen_1000kw	2		115	120	117	118	116	115	111	109	121.6	ASHRAE TC Study_Generators
Diesel Gen_500kw	2		111	118	110	112	111	113	108	107	117.9	ASHRAE TC Study_Generators
Forklift Cat 93 HP 7.5Ton	2	31.6	101.6	104.6	103.6	102.6	101.6	95.6	89.6	84.6	105.2	Noise from Construction, EPA 1971
Forklift Cat 93 HP 7.5Ton	2	31.6	101.6	104.6	103.6	102.6	101.6	95.6	89.6	84.6	105.2	Noise from Construction, EPA 1971
Forklift Cat 93 HP 7.5Ton	2	31.6	101.6	104.6	103.6	102.6	101.6	95.6	89.6	84.6	105.2	Noise from Construction, EPA 1971
Forklift Cat 93 HP 7.5Ton	2	31.6	101.6	104.6	103.6	102.6	101.6	95.6	89.6	84.6	105.2	Noise from Construction, EPA 1971
Impact Wrench	1	31.6	101.6	106.6	107.6	109.6	114.6	119.6	117.6	114.6	124	Noise from Construction, EPA 1971
Impact Wrench	1	31.6	101.6	106.6	107.6	109.6	114.6	119.6	117.6	114.6	124	Noise from Construction, EPA 1971
Impact Wrench	1	31.6	101.6	106.6	107.6	109.6	114.6	119.6	117.6	114.6	124	Noise from Construction, EPA 1971
Impact Wrench	1	31.6	101.6	106.6	107.6	109.6	114.6	119.6	117.6	114.6	124	Noise from Construction, EPA 1971
Impact Wrench	1	31.6	101.6	106.6	107.6	109.6	114.6	119.6	117.6	114.6	124	Noise from Construction, EPA 1971
Impact Wrench	1	31.6	101.6	106.6	107.6	109.6	114.6	119.6	117.6	114.6	124	Noise from Construction, EPA 1971
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93	78	97.4	calculation_djc_09,2014
Power Tools	1		83	68	70	83	83	93	93</			

TABLE 5.7.5-2
EXISTING BACKGROUND, MODELED, AND OVERALL SOUND PRESSURE LEVELS FOR THE
CONSTRUCTION OF OCEC UNIT 1

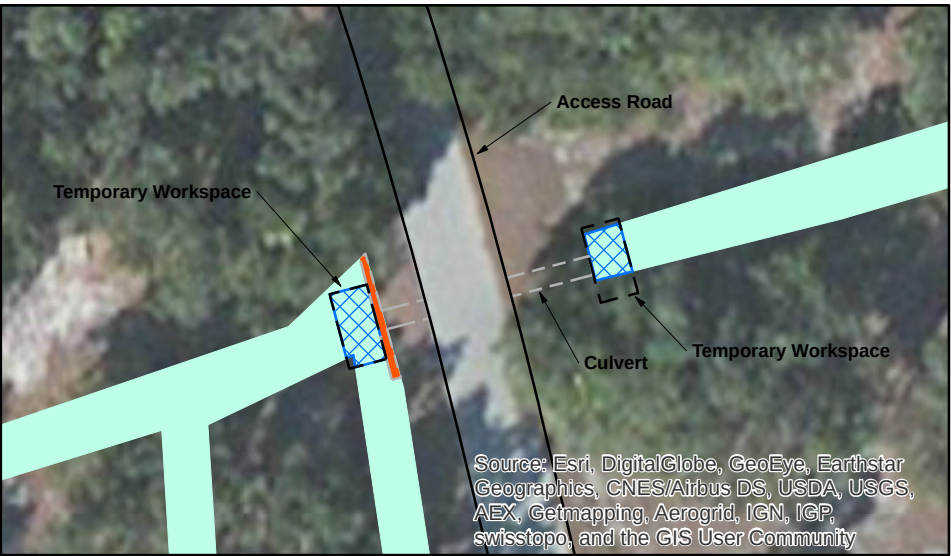
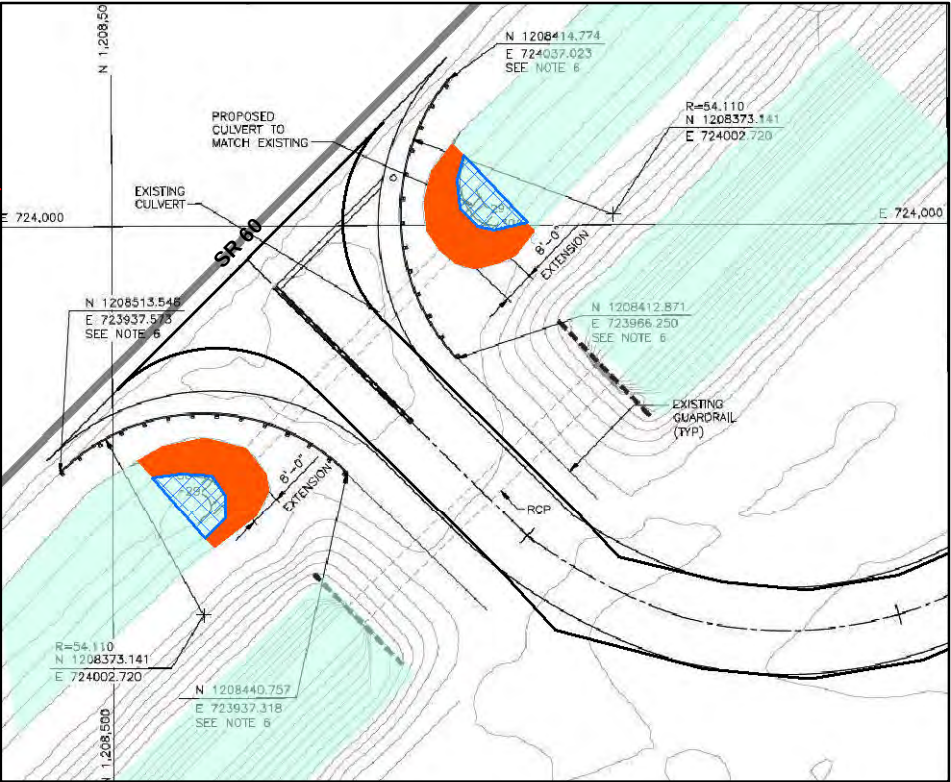
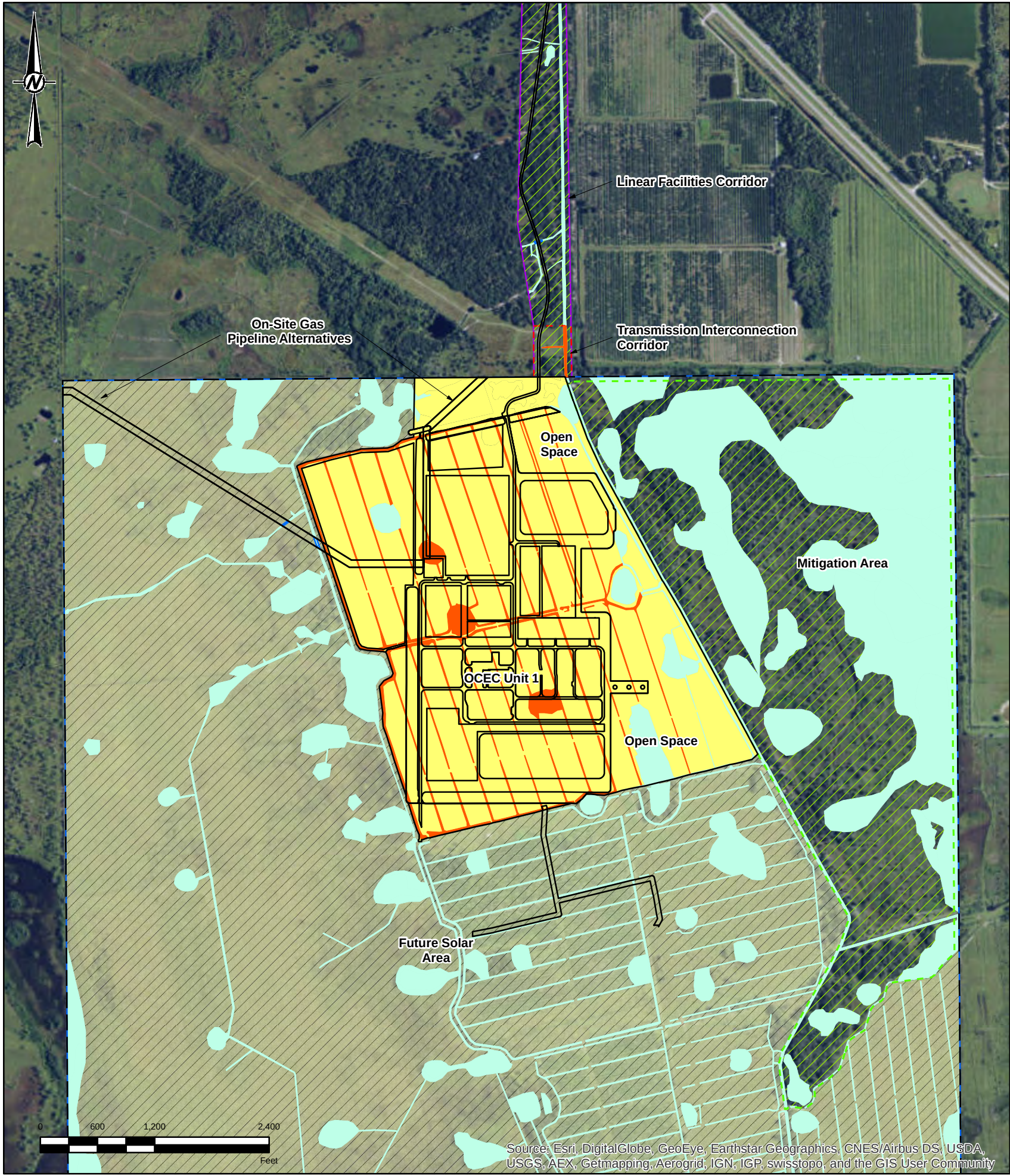
Monitoring Location	Time	Sound Levels (dBA)			
		Existing ^a	Background ^b	Modeled	Overall ^c
1 - Indian River County	Daytime	41.8	35.1	46.2	46.5
	Night	43.1	32.7	45.2	45.4
2 - Indian River County	Daytime	39.4	34.8	44.5	44.9
	Night	37.6	34.0	44.5	44.9
3 - Okechobee County	Daytime	47.5	39.3	38.7	42.0
	Night	37.7	36.1	38.7	40.6
4 Indian River County	Daytime	44.8	37.2	39.2	41.3
	Night	48.5	37.9	39.2	41.6
5 Indian River County	Daytime	52.1	41.6	38.5	43.3
	Night	54.4	35.6	38.5	40.3
24-Hour - Okechobee County	24-hour	40.5	28.5	79.2	79.2

^a L₅₀ sound levels collected on January 21-22, 2015. The highest L₁₀ of the morning and afternoon measurements was used at each site to represent noise from intermittent sources.

^b L₉₀ sound levels collected on January 21-22, 2015. The highest L₉₀ of the morning and afternoon measurements was used at each site to represent continuous background noise.

^c Modeled results logarithmically added to the existing baseline measurements.

FIGURES



LEGEND

- | | | | |
|--|---------------------------------------|--|-----------------------------------|
| | Certified Site Boundary | | On-Site Gas Pipeline Alternatives |
| | Mitigation Area | | Future Solar Area |
| | FPL Owned Property | | Area of Land Impact |
| | Linear Facility Corridor | | Area of Un-Impacted Land |
| | Transmission Interconnection Corridor | | Wetland Impacts Direct |
| | Project Features | | Wetland Impacts Temporary |

REFERENCE(S)

COORDINATE SYSTEM: NAD 1983 STATEPLANE FLORIDA EAST FIPS 0901 FEET
PROJECTION: TRANSVERSE MERCATOR
DATUM: NORTH AMERICAN 1983

CLIENT

FPL

PROJECT

OKEECHOBEE CLEAN ENERGY CENTER

TITLE

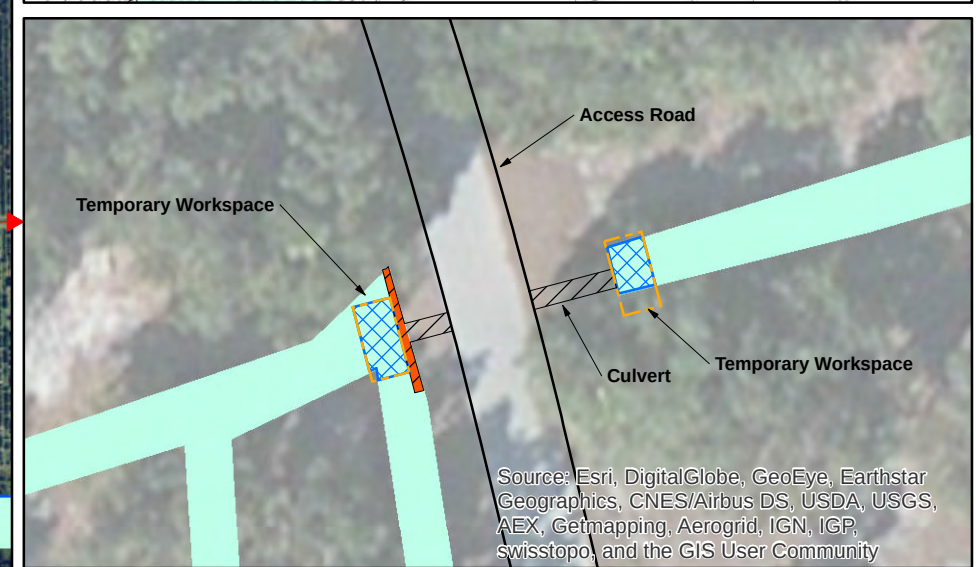
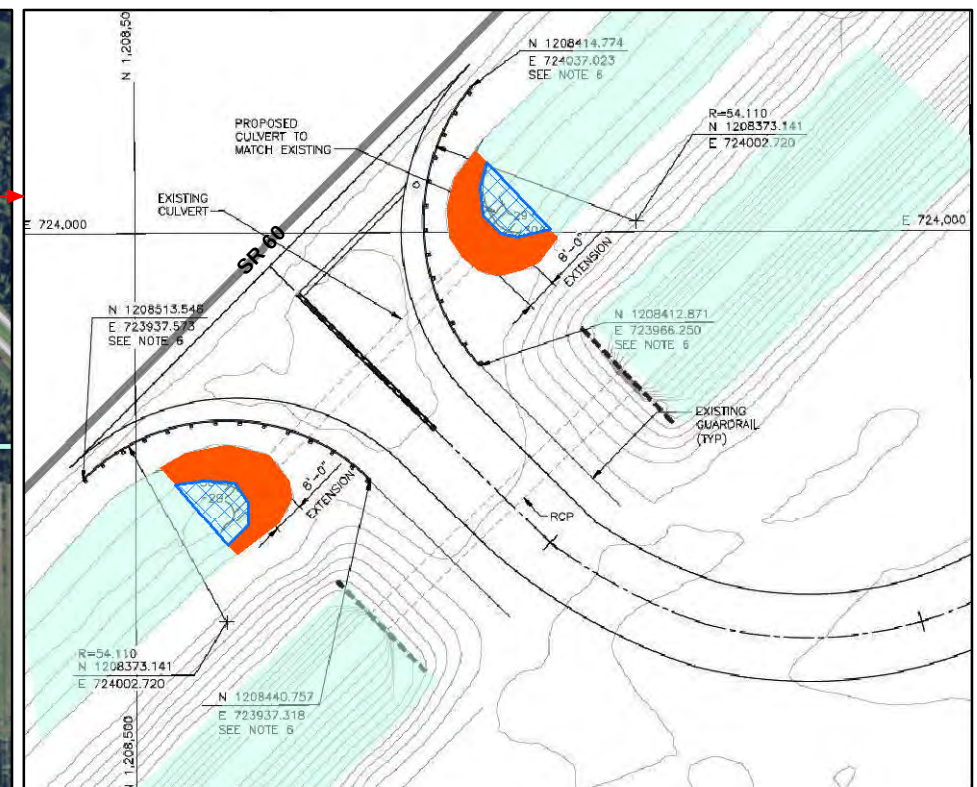
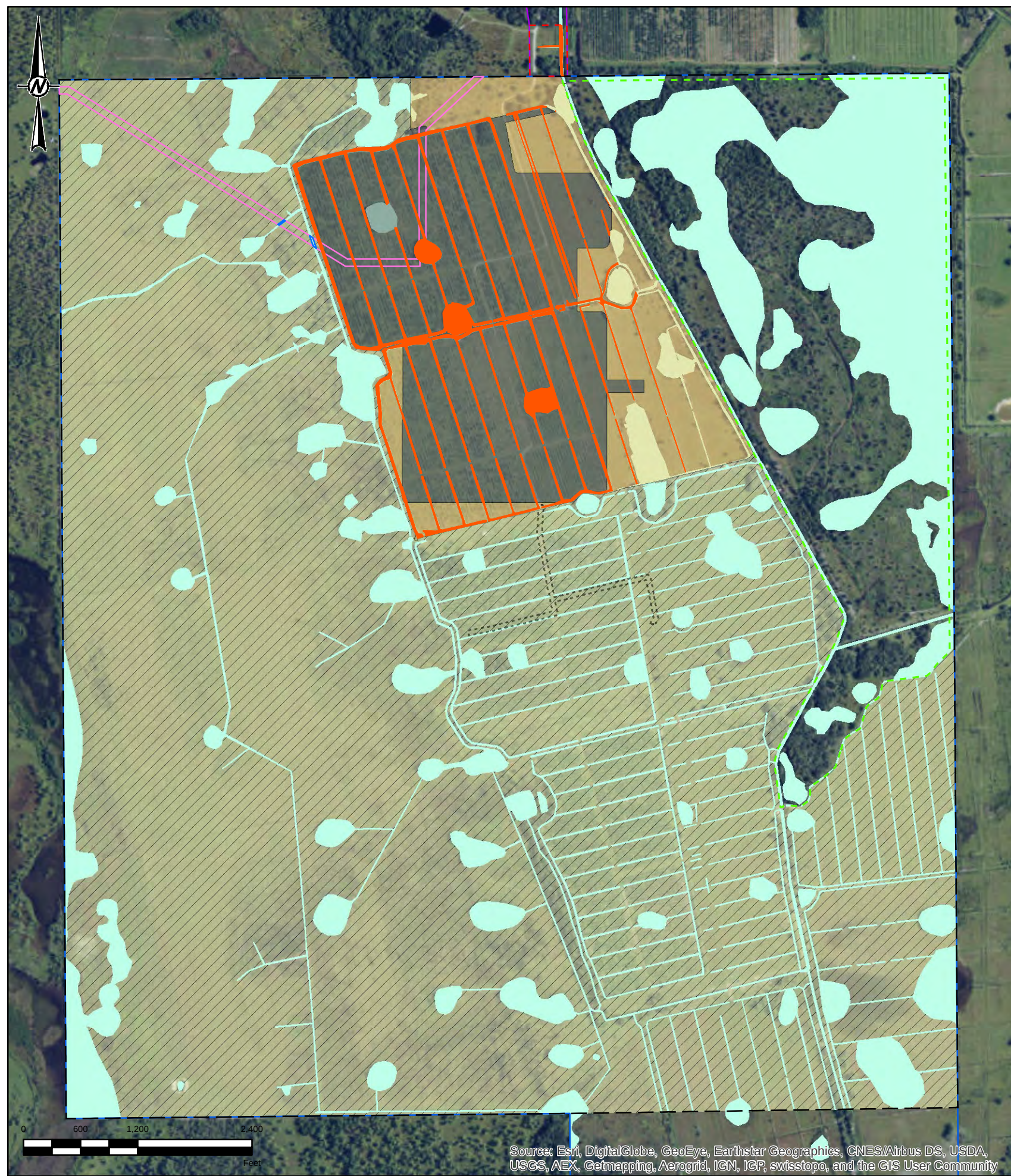
AREA OF PROPOSED LAND IMPACTS

FLUCFCS CODE	HABITAT DESCRIPTION	WETLAND IMPACTS	
		Direct	Temporary
511	Ditches	19.99	0.11
617	Mixed Wetland Hardwoods	4.71	
GRAND TOTAL		24.70	0.11



PROJECT NO.	CONTROL	REV.	FIGURE
1414979	B060	0	5.1-1

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LEGEND

- Facility Layout
- Certified Site Boundary
- Mitigation Area
- FPL Owned Property
- Linear Facility Corridor
- Transmission Interconnection Corridor
- OCEC Unit 1
- Open Space
- UFA Well Delivery Pipeline
- On-Site Gas Pipeline Alternatives
- Future Solar Area
- Wetland Impacts**
 - Direct
 - Temporary

WETLAND IMPACTS

FLUCFCS CODE	HABITAT DESCRIPTION	ACREAGE	
		Direct	Temporary
511	Ditches	19.99	0.11
617	Mixed Wetland Hardwoods	4.71	
GRAND TOTAL		24.70	0.11

REFERENCE(S)

COORDINATE SYSTEM: NAD 1983 STATEPLANE FLORIDA EAST FIPS 0901 FEET
PROJECTION: TRANSVERSE MERCATOR
DATUM: NORTH AMERICAN 1983

CLIENT
FPL

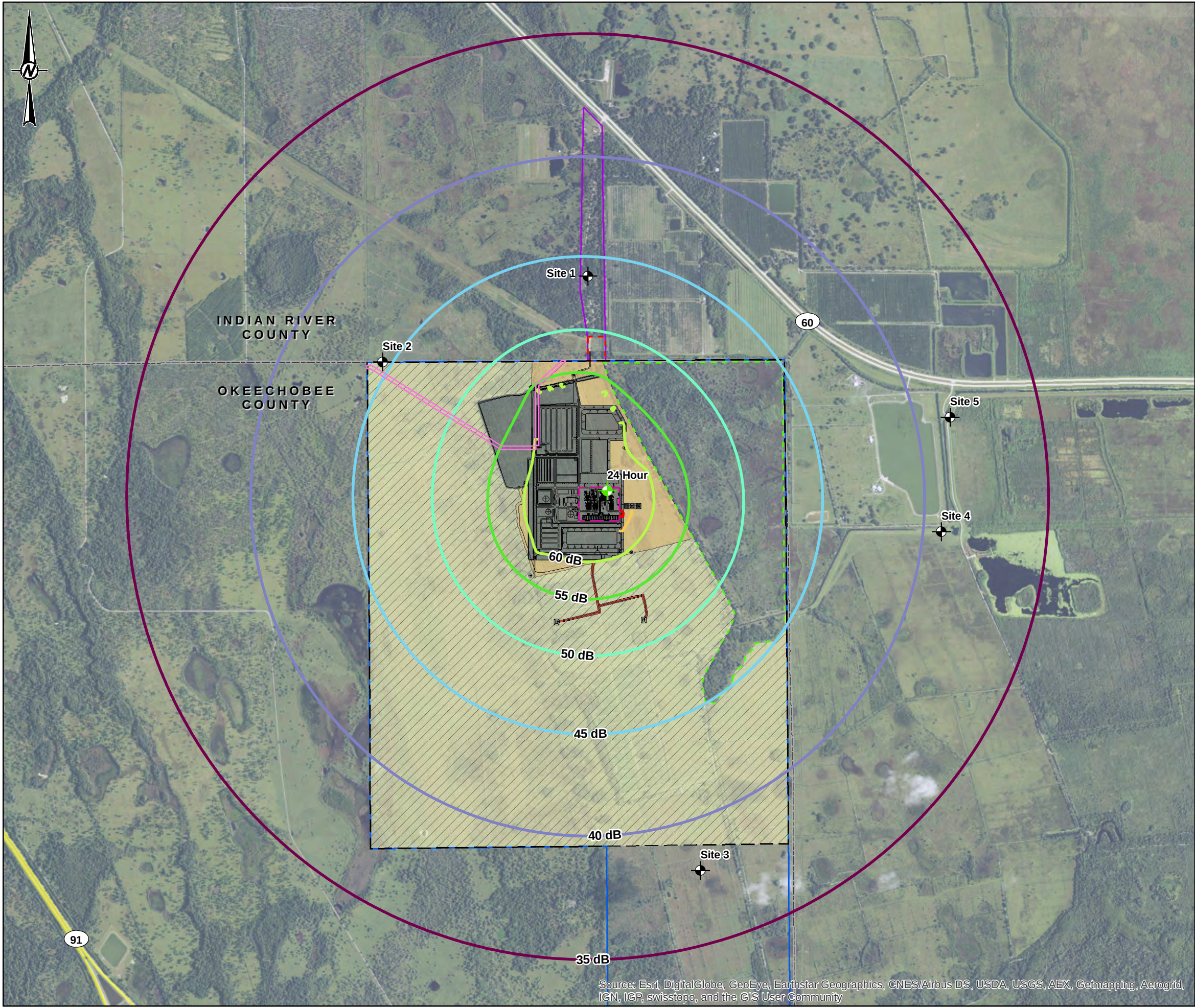
PROJECT
OKEECHOBEE CLEAN ENERGY CENTER

TITLE
WETLAND IMPACTS

	YYYY-MM-DD	2015-09-17
	DESIGNED	JW
	PREPARED	NRL
	REVIEWED	KAB
	APPROVED	KAB

PROJECT NO. 1414979 CONTROL B057 REV. 0 FIGURE 5.4.1.2-1

1in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B



LEGEND

- Noise and Light Monitoring Locations (Sites 1-5)
- 24-Hour Noise Monitoring Location
- Facility Layout
- Certified Site Boundary
- Mitigation Area
- FPL Owned Property
- Linear Facility Corridor
- Transmission Interconnection Corridor
- On-Site Gas Pipeline Alternatives
- OCEC Unit 1
- Open Space
- UFA Well Delivery Pipeline
- Future Solar Area
- OCEC Generating Units

Construction Noise Contours

- 35 dB
- 40 dB
- 45 dB
- 50 dB
- 55 dB
- 60 dB
- 65 dB
- 70 dB

0 2,200 4,400
1:26,400 Feet

REFERENCE(S)
PROPERTY, LINEAR FACILITY CORRIDOR, CERTIFIED SITE BOUNDARY, FUTURE SOLAR AREA, OPEN SPACE, MITIGATION AREA. FPL & GOLDER ASSOCIATES INC., 2015
FACILITY LAYOUT, BLACK & VEATCH, 2015
CONSTRUCTION NOISE CONTOURS, GOLDER ASSOCIATES INC., 2015

CLIENT
FPL

PROJECT
OKEECHOBEE CLEAN ENERGY CENTER

TITLE
CONSTRUCTION NOISE IMPACT CONTOURS

YYYY-MM-DD	2015-09-17
DESIGNED	NRL
PREPARED	NRL
REVIEWED	KAB
APPROVED	KFK

PROJECT NO. 1414979 CONTROL B047 REV. 0

FIGURE 5.7.5-1

G:\PROJECTS\FPL\Okeechobee\B047_PROJECT\02_PRODUCTION\MXD\1414979_B047_ConstructionContours_HallMediaBuffers.mxd

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

25mm

6.0 EFFECTS OF PLANT OPERATION

6.1 Effects Of The Operation Of The Heat Dissipation System

Heat is a necessary byproduct of the generation of electricity. While a significant portion of the thermal energy produced from the fuel is converted to electrical energy by the combustion turbine generators, a portion is absorbed by cooling water flowing through the condenser tubes in the steam turbine. OCEC Unit 1 will have a closed-cycle recirculating heat dissipation system, utilizing a rectangular wet mechanical draft cooling tower. Water from the UFA will be used for Unit 1 cooling system makeup. Stormwater runoff that collects in onsite detention ponds may be recycled by pumping the water to the cooling towers, thus eliminating runoff to surface waters and minimizing water demands on other sources. Blowdown from the cooling towers will be discharged to the Boulder Zone of the Lower Floridan Aquifer (LFA) through the UIC well system. Since there will be no surface water intake or discharge for cooling water, Section 316 of the Clean Water Act (CWA) is not applicable.

6.1.1 *Temperature Effect On Receiving Body Of Water*

There will be no discharge of heated water to any surface water body from operation of the heat dissipation system with the use of an UIC well system for industrial wastewater. As noted in Section 6.1, cooling tower blowdown will be routed to the Boulder Zone through the UIC well system.

6.1.2 *Effects On Aquatic Life*

Since water from the UFA will be the primary water source used for cooling and there will be no surface water discharge, no adverse effects upon aquatic life will occur due to the cooling system during operation of OCEC Unit 1.

6.1.3 *Biological Effects Of Modified Circulation*

The primary water source for OCEC Unit 1 will be from the UFA, with no surface water withdrawals potentially affecting circulation. No impingement and/or entrainment of aquatic organisms will occur as a result of the operation of OCEC Unit 1.

6.1.4 *Effects Of Off-Stream Cooling*

The potential impacts of off-stream cooling using the circulating water cooling towers were addressed by performing plume dispersion analyses that predicted impacts with respect to:

- Plume length;
- Plume height;
- Plume fogging;

- Plume icing; and
- Salt (from TDS) deposition.

Two air quality dispersion models were used in these analyses to address the effects of off-stream cooling for the Project. These models are the California Puff (CALPUFF) model and the American Meteorological Society and EPA Regulatory Model (AERMOD) dispersion model.

The CALPUFF model (version 5.8) was used to determine the fogging and icing potential due to the cooling tower. The CALPUFF model can be configured to analyze the fogging and icing impacts due to emissions from sources, such as the cooling towers, with the use of a pre-processor program called the Cooling Tower Emissions Processor (CTEMISS) and post-processor programs.

The AERMOD dispersion model (version 14134) was used to determine potential mineral deposition due to the cooling towers.

Both air dispersion models were also used to predict ambient pollutant concentrations for the Project and are described in more detail in Subsection 6.6 and Appendix 10.2.5. These dispersion models are approved by EPA for determining ambient air pollutant concentrations and have capabilities to assess fogging impacts (CALPUFF) and solids deposition (AERMOD).

The following sections present the methods and assumptions used in these models to address the effects of off-stream cooling due to the cooling towers.

6.1.4.1 Cooling Tower Visibility

The visible plume from a cooling tower is a result of the mixing of the saturated exhausts from the cooling tower with the ambient air, and the resultant mixture is beyond the atmosphere's ability to accommodate the entrained moisture as a gas. At this point, the moisture in the mixture condenses and forms a visible water vapor plume. The ability for air to accommodate water as a gas depends on the temperature and barometric pressure. For example, at an ambient temperature of 90°F, the air is capable of accommodating almost six times more water vapor (as mass) than at 40°F. With the cooling tower proposed for the Project, plumes are typically more visible and at greater plume lengths during the winter months than during the summer.

The CTEMISS program was used to create a variable emission rate file for CALPUFF for water vapor within the plume from the cooling tower. The CTEMISS program reads fixed inputs, such as emissions characteristics (exit velocity, exit temperature, and water emission rate) and building data.



Meteorological data in the format used by the Industrial Source Complex Short-term (ISCST) model are used. CALPUFF models the dispersion of the water contained in the plume and provides cloud information in a specialized format for further analysis. CALPUFF output is provided to the FOG.DAT file and can be run in either 'plume mode' or 'receptor mode.'

Five years of surface meteorological data from St. Lucie County International Airport (FPR) for 2009 through 2013 were used in the CTEMISS program. The surface and mixing height data were first processed using EPA's PCRAMMET processor to create ISCST model-compatible meteorological data, which are read by the CTEMISS program. The meteorological data for FPR are the same data approved by FDEP for determining air pollutant concentrations using these models.

The stack data and meteorological data used to determine potential fogging and icing impacts are identical to those used in the air dispersion modeling and presented in Subsection 6.6.

The emission rate file created by the CTEMISS program was used and the CALPUFF model was run in both plume and receptor modes. The CALPUFF model created a FOG.DAT file, which was then input to the post-processor programs, POSTPM and SUMPOST, which operate on the fog plume-mode output to characterize visible plume height and length statistics. The post-processor program POSTRM operates on the fog receptor-mode output to characterize the frequency of possible fogging and icing events at specific locations.

In the plume mode, information on the plume heights and plume lengths are generated for each hour. The program provides output that excludes hours when fog, clouds, and/or precipitation are occurring. In the receptor mode, discrete receptors are located in a receptor grid covering the Plant Site and adjacent areas.

The CALPUFF model's plume mode results are presented in Table 6.1.4-1 for all hours and daylight hours, except those when fog, heavy cloud conditions, and/or precipitation are occurring. In such meteorological conditions, visible vapor plumes are obscured by natural weather conditions. This table presents the information seasonally and annually. The primary factors in the visible appearance of the plume are the height and length of the plume.

The modeling results indicate that visible vapor plumes from the cooling tower are predicted to be confined to an area that is very close to the tower throughout the year. The results for both all hours and daylight-only hours indicate that, for the majority of the time (>90%), plume heights will be less

than 200 meters and plume lengths will be less than 100 meters. As shown in Table 6.1.4-1 for daylight hours, plume heights greater than 200 meters are predicted to occur only 52 hours per year, while plume lengths greater than 100 and 300 meters are predicted to occur only 370 and 60 hours per year, respectively.

Neither ground-level fogging nor any other plume effect is predicted to occur at the Site property boundary or on the nearest roadways to the Site.

6.1.4.2 Cooling Tower Deposition

Deposition from the proposed cooling tower will depend upon the quality of water used as makeup to replace the water evaporated through cooling and the cycles of concentration within the circulating water system. The source of makeup water to the circulating water cooling tower will be the upper Floridan Aquifer (UFA). The estimated TDS for the circulating water is assumed to be 25,000 ppmw based on 5 cycles-of-concentration in the cooling tower and a worst case water quality of 5,000 ppmw. This represents a worst case using the water supply from the UFA as cooling tower makeup and envelopes the potential cooling tower deposition impacts. Water quality from the UFA is estimated to range from 900 to 2,100 ppmw TDS with an expected average TDS of 1,740 ppmw. Lower TDS concentrations will proportionally decrease cooling tower drift deposition rates. For example, at the expected average TDS concentration of 1,740 ppmw, the deposition impacts will be almost 3 times less than the predicted deposition impacts using the worst case makeup water quality of 5,000 ppmw TDS. Therefore, a TDS concentration in the circulating water of 25,000 ppmw and five years of meteorological data provide a conservative estimate of cooling tower deposition rates. Table 6.1.4-2 presents the size distribution of the drift particles.

The maximum monthly deposition predicted from the cooling towers to locations at varying distances is presented in Table 6.1.4-3. The table shows the monthly deposition over the five-year period for which the analysis was performed. The average predicted deposition of an area within a radius of five km from the circulating water cooling towers and the maximum predicted salt deposition over several distances are presented in Table 6.1.4-3.

The monthly deposition rate from the cooling towers averaged over an area within five km of the cooling towers is approximately 1.9 kilograms per hectare per month (kg/ha/month). The maximum predicted monthly deposition rate of 14.3 kg/ha/month occurs about 1,300 meters (0.8 mile) from the cooling towers when assuming a worst case TDS in the circulating water of 25,000 ppmw. When using the expected average TDS of 1,740 ppmw, deposition rates are between 2.6 and 6 kg/ha/month



within 2,000 meters of the cooling towers. The deposition rates are predicted to decrease rapidly beyond this distance. At a distance of 3,000 meters (1.9 miles), the maximum monthly deposition rate decreases to 1.4 kg/ha/month.

Several studies have been conducted to determine deposition, including the Florida Acid Deposition Study (FADS) conducted in the mid-1980s and the Florida Atmospheric Mercury Study (FAMS) conducted in the mid-1990s. FADS measured major anions and cations in dry and wet deposition, while FAMS measured the major anions and cations in wet deposition. According to data collected as part of FADS (1986), which measured deposition over many locations in Florida, background mineral deposition in the southern peninsula of Florida is about 4 kg/ha/month. The maximum predicted deposition within three km of the circulating water cooling towers, as shown in Table 6.1.4-3, is less than the natural background deposition.

Potential impacts to vegetation and soil may result from deposition of cooling tower drift. A majority of available research on the impacts of deposition from cooling towers is from the use of makeup water that contains appreciable quantities of salt [i.e., sodium (Na^+) and chloride (Cl^-)]. Several plant species are considered to have very low resistance to salt. These species are flowering dogwood (*Cornus florida*), American sycamore (*Platanus occidentalis*), sassafras (*Sassafras albidum*), and arrowwood (*Viburnum dentatum*). Several studies have been conducted with dogwood because it is a reliable bioindicator of salt damage. The leaf injury threshold of dogwood has been calculated to be 750 kg/km²/month (7.5 kg/ha-mo; Curtis *et al.*, 1976), 517 kg/km²/month (5.17 kg/ha/month; Davis, 1979), and 375 kg/km²-mo (3.75 kg/ha/month; Freudenthal and Beals, 1978). In addition to flowering dogwood, Townsend (1980) found that American sycamore was equally sensitive to sodium chloride. McCune *et al.* (1977) found that white ash was more susceptible than dogwood to saline cooling tower drift. Susceptibility to foliar injury from saline aerosols also varies with the developmental stage of the leaf. McCune *et al.* (1977) found that younger leaves of deciduous woody species were more sensitive to saline aerosols than older leaves; whereas, year-old needles of conifers were more susceptible to saline aerosols. Grattan *et al.* (1981) reported that young tomato and pepper leaves (<3 cm in length) were more severely injured than older, fully developed leaves. OCEC Unit 1 will utilize water from the UFA, with the expected water quality resulting in deposition ranging between 2.6 and 6 kg/ha/month within 2,000 meters of the cooling towers. These values are within the range of natural background deposition and are not anticipated to result in any adverse impacts to vegetation in the vicinity.

Environmental factors, other than salt drift concentration, can affect species response to cooling tower drift. Temperature influences ion absorption rates, with absorption rates decreasing as temperature decreases (Smith and Robinson, 1971). Rainfall amounts also influence symptomatic response of plants to salt drift. Mulchi and Armbruster (1981) observed that above-normal amounts of rainfall delayed the onset of foliar symptoms, whereas below normal amounts of rainfall tended to promote the onset of symptoms and to enhance the magnitude of symptom expression for both corn and soybeans.

As noted above, the frequency of rainfall is an important component in the potential impacts to vegetation. For the Site, the average number of days per year with precipitation greater than 0.01 inch is 122 days per year based on meteorological data from the closest NWS station. This frequency of a measurable amount of precipitation would reduce the potential impact from cooling tower deposition.

Vegetation can also be affected by absorbing salts that accumulate in the soil. Accumulation will occur if the annual deposition rate of salt exceeds the rate at which salt is leached from the soil by rainfall. Cooling tower drift deposition from OCEC Unit 1 would be greatly diluted by rainfall. The maximum predicted off-Site deposition (which assuming a worst case circulating water TDS concentration of 25,000 ppmw is 6 kg/ha-month) would result in an increase in the average TDS concentration of 7.1 mg/L when dilution from rainfall is taken into account. This concentration is less than the TDS concentration in surficial groundwater and surface waters. At locations farther from the cooling tower any soil accumulation would be even less since deposition rates drop significantly with distance. At a distance of 3 km the concentration would be 1.6 mg/L. However, these predictions are conservative with cooling tower drift deposition rates at least two times lower than those presented above using the expected TDS concentrations from the UFA.

When taken together, based on the expected UFA water quality, low deposition rates, area of deposition impact, frequency of rainfall, and quality of the drift particles, no adverse effect to vegetation from cooling tower drift or accumulation in the soils is anticipated.

6.1.5 Measurement Program

Since no significant impact to surface water quality is expected, no additional monitoring of surface water is proposed. Because there are no significant adverse ecological impacts due to the proposed heat dissipation system, no biological monitoring is proposed.

6.2 Effects Of Chemical and Biocide Discharges

6.2.1 Industrial Wastewater Discharges

The only industrial wastewater that will be released to surface waters is stormwater associated with industrial activity. Stormwater will be managed following the requirements of the Multi-Sector General Permit (MSGP) for steam electric plants (Category vii). Stormwater from equipment contact areas (potential sources of oil or grease) will be routed through oil/water separators, then to stormwater treatment basins.

All other industrial wastewaters, including water treatment system effluent, cooling tower blowdown, and plant drain systems, will be routed through oil/water separators, as necessary, and collected in the wastewater sump. Wastewater will be pumped from the sump to the Boulder Zone through the permitted injection wells.

6.2.2 Cooling Tower Blowdown

Chemicals will be added to the cooling towers to control water quality, scaling and biological growth. These chemicals will have no adverse impact on the environment because the cooling tower blowdown will be discharged, along with other non-hazardous wastewater, to the Boulder Zone through deep injection wells; no cooling tower blowdown will be released to surface waters.

6.2.3 Measurement Programs

Flow and effluent water quality pumped to the injection wells will be monitored and reported as required by the UIC permit. The DZMW will be monitored as required by the UIC permit.

6.3 Impacts On Water Supplies

OCEC Unit 1 will use groundwater withdrawn from the Upper Floridan Aquifer (UFA) and the surficial aquifer for water supply. The impact evaluations of the proposed withdrawals are provided in Appendix 10.9 and summarized in Section 6.3.2, below.

The use of the UFA and SAS meet the nonprocedural SJRWMD consumptive use regulatory criteria. FPL performed groundwater flow modeling using the ECFS model (see Appendix 10.9), which shows that the aquifers are capable of producing the requested quantity of water without causing harmful water quality impacts to the water source, saline water intrusion or upconing, hydrologic alterations to natural systems, and without otherwise adversely impacting the environment or the resource.

The evaluations identified potential drawdown in the SAS beyond the OCEC Site of <0.1 feet and in the UFA beyond the OCEC Site of <1.0 feet. No adverse impacts are anticipated to occur to the environment, the resource, or existing legal users due to the drawdowns in the SAS. Limited potential

impacts to existing legal users were identified due to drawdowns in the UFA which, if interference occurs, will be mitigated by FPL.

The sections below discuss FPL's evaluation of lower quality water sources and the OCEC Water Conservation Plan.

Alternative Water Source Evaluation

FPL investigated the use of lower quality water sources for cooling, but at this time no other sources beside the UFA are technically, environmentally or economically feasible. The use of reclaimed water was investigated, but at the present time, reclaimed water is not available at the OCEC Site. Reclaimed water is not technically or economically feasible due to the site location, which is approximately 20 miles from any significant population center capable of providing even a small portion of the required water. Based on the 2014 Reuse Inventory Report (FDEP, 2014) and conversations with representatives from the City of Vero Beach utility, no single reuse facility or system within approximately 20 miles could supply more than a small portion of the process and cooling water required for OCEC Unit 1.

Other water sources, including the Avon Park Producing Zone (APPZ), local surface waters and the Grove Land Reservoir and Stormwater Treatment Area (a.k.a. C-25 Reservoir and STA; Feasibility Study of the Grove Land Utilities, LLC; Prepared by Hazen and Sawyer in association with Frederico, Lamb and Associates, and AMEC, August 27, 2014) were also considered by FPL, but were not found to be feasible or practicable water supplies for OCEC Unit 1.

The ability to use lower quality groundwater sources was investigated. Chloride concentrations in the APPZ are likely to be higher than in UFA. Use of groundwater from the APPZ with these higher chloride concentrations could increase environmental impacts from cooling tower drift and increase capital and operating costs for the Project. Additionally, using groundwater with higher chloride concentrations could reduce acceptable cooling tower cycles of concentration which in turn would increase the amount of groundwater withdrawals required for makeup and increase the discharge rate to the injection wells. Finally, the groundwater modeling (Appendix 10.9) shows that when water is pumped from the UFA, more than half the water originates in the APPZ. Therefore, when the UFA is used as the primary source, the APPZ contributes significantly. However, if the APPZ were pumped as the primary source, more water, with much higher chlorides, would come from the LFA, potentially inducing saltwater intrusion and causing harmful water quality impacts. Thus, the use of lower quality groundwater sources is not environmentally feasible.

Local surface water resources were also evaluated. As discussed in Sections 3.3.3 and 3.3.4, the annual average runoff in the vicinity of OCEC Unit 1 is approximately 11.9 inches/year (0.88 cfs per square mile). During one in ten drought years, the runoff could be less than 2 inches/year (0.15 cfs/sq.mi.). OCEC Unit 1 requires an annual average water allocation of approximately 9 MGD (13.9 cfs). Therefore, to produce the required water from surface resources would require a catchment basin of approximately 100 square miles. Since most of the runoff would be produced during the 4 month wet season, a storage reservoir capable of holding approximately 7,000 ac-ft of water would be required. If the reservoir held 10 feet of water, it would require approximately 700 acres of land. In addition, during very dry years, a surface reservoir may produce little or no water. Therefore, a backup well supply system also would be required to maintain reliability. Consequently, surface water sources were found to be inadequate and unreliable without a significant investment in land, pumping and storage facilities, and groundwater wells with significant withdrawal quantities still would be required to provide a reliable source during prolonged droughts. This option would likely cause significant environmental impacts and have high capital and operating costs that would limit the economic viability of OCEC Unit 1. Because of the low yields, low reliability, and significant transmission and storage costs relative to the potential yield, the use of local surface water resources is not technically or economically feasible.

FPL also investigated the possibility of using surface water from the proposed Grove Land Reservoir and Stormwater Treatment Area (GLRSTA), which is a proposed water storage and water resource development project to be located in northern Okeechobee and Southern Indian River Counties on land owned by Evans Properties. GLRSTA is approximately 8.5 miles southeast of OCEC Unit 1. However, GLRSTA is currently in the conceptual evaluation phase and there are a number of environmental, financial, technical, and regulatory issues requiring resolution before the GLRSTA project would become available to potential users. FPL's investigation indicated that if all of the foregoing issues are resolved, the design and construction schedule for the GLRSTA is estimated to be at least six years. This time period does not include the time that would be required to fill the reservoir/stormwater treatment area before water would be available for potential use at OCEC. Consequently, the GLRSTA is not a technically feasible lower quality source for OCEC Unit 1.

OCEC Water Conservation Plan

Combined cycle technology will be used at OCEC Unit 1. With this technology, steam electric generation is only about 35 to 40 percent of the total generating capacity. The remaining 60 to 65 percent is produced by combustion turbines, which do not use water for condenser cooling. Consequently, this technology significantly reduces the requirement for cooling water. Because the



combined cycle technology reduces the steam electric portion of the generating facility, it also reduces the amount of water required to make steam, thus reducing the requirements for process water.

OCEC Unit 1 will use demineralized water for makeup to replace blowdown from the Heat Recovery Steam Generators (HRSGs), which is necessary to maintain low dissolved solids in the HRSGs. The required makeup water to the HRSGs will be minimized by using good engineering design and best operating practices that reduce the required blowdown and by the recovery and reprocessing of water for reuse. When feasible, and depending on the water quality from the UFA, wastewater from the water treatment system and other plant blowdown and plant drains will be recycled for use in the cooling towers. When available, excess stormwater in the detention ponds may be used as makeup for the cooling towers.

All systems that involve the use of water will be designed and operated to minimize water loss. This will include an in-service leak test, inspection, or hydro-test to ensure the system is leak tight. After commissioning, procedures will be in place to ensure that the systems are inspected on a regular basis and that a program is in place to repair any leaks quickly. Other features in the design will include the following:

- Automatic shutoff valves
- Flow restrictors
- Low-volume sanitary facilities with an onsite sewage treatment and disposal system
- Drought-resistant landscape design

FPL will implement an awareness program for both construction and operational employees on water conservation for the Project. The awareness program will educate employees on water conservation methods, techniques, and requirements for in-place construction and operation procedures. Procedures for conservation during plant operation will be developed prior to commissioning OCEC, reviewed on a periodic basis, and updated as necessary.

6.3.1 Surface Water

The stormwater management system at OCEC Unit 1 has been designed to meet all applicable SJRWMD nonprocedural requirements while maintaining surface flows that have historically flowed across the property. Furthermore, the groundwater modeling (Appendix 10.9) shows that off-site drawdowns in the surficial aquifer and surface water features connected to the surficial aquifer



resulting from the Project will not be significant. Consequently, there will be no adverse impact to off-Site surface water supplies resulting from construction and operation of the OCEC facility.

Additionally, because wastewater will be disposed of via deepwell injection authorized by a UIC permit, the use of groundwater for OCEC facilities will not cause or contribute to a violation of state water quality standards in waters of the state.

6.3.2 Groundwater

OCEC Unit 1 will utilize groundwater from the UFA and SAS for cooling, potable, process, irrigation, and service water use. The quantity of water needed from the UFA is 9 million gallons per day (mgd) on an annual basis (3,287 million gallons per year) with a peak day usage of 11 mgd. A small component of water (0.08 mgd peak day, 0.046 mgd annual average) will also be withdrawn from the SAS.

As detailed in Appendix 10.9, FPL developed a conceptual model of the OCEC Site in accordance with standard groundwater modeling guidance and determined the most appropriate model code that would meet the objectives of the Project and accurately represent the conceptual model. Following consultation with SJRWMD staff, FPL and SJRWMD determined that an existing groundwater flow model, the East Central Florida Steady (ECFS) model, was appropriate for impact assessment at the OCEC Site. FPL applied the model according to SJRWMD rule criteria, staff specifications, and prior SJRWMD consumptive use permitting practice, and determined that the May water level conditions (lowest) and peak day usage of 11 mgd (higher than annual average) provided the most conservative estimate of impact (maximum drawdown relative to available head).

Three scenarios were evaluated: (1) the current permitted cumulative drawdown, (2) proposed FPL OCEC Unit 1 only drawdown, and (3) new cumulative drawdown with FPL's proposed new use. Per SJRWMD rule criteria, a threshold of 10% reduction in flow in artesian wells was used as an indicator of potential interference with prior existing legal users. Because flow through a well is proportional to the square root of the head loss, for artesian wells in this area a 10% reduction in flow corresponds to a 19% reduction in head, or drawdown. Scenario (1), the current permitted cumulative drawdown (all permitted uses not including FPL's proposed withdrawal) does not indicate a drawdown in neighboring wells of greater than 19% of artesian head. For scenario (2), drawdown due to FPL's proposed 11 mgd max day pumping ranged from 0.33 to 0.79 ft at neighboring permitted wells. These drawdowns, when combined with the current permitted drawdown in scenario (3), indicated that two wells, well "E" and "60 Pens" may be impacted by FPL's proposed pumping of 11 mgd. If actual interference occurs, FPL will mitigate pursuant to SJRWMD Rule 40C-2.381(2)(a)5, F.A.C. for the interference the Project's pumping causes to these wells.



As described in Appendix 10.9, other drawdown analyses show no adverse impact:

- SAS drawdown due to pumping from the UFA is 0.00015 ft, which will not cause any measurable change in any surface water feature;
- SAS drawdown due to pumping 0.08 mgd from the SAS is restricted to less than 0.1 ft outside the OCEC Site, which will not impact existing legal users and is not significant enough to impact on-Site or off-Site wetlands or surface waters; and
- Drawdown in water bodies with established minimum flows and levels (MFLs) is insignificant, ranging from 0.00002 to 0.0002 ft, and will not violate any established MFLs.

The potential of the UFA to produce the requested amount of water was assessed using the water balance from the ECFS model. The water balance indicated that approximately half of the water pumped by FPL will originate from the APPZ. However, this aquifer has been shown to have water quality similar or better than the UFA. Induced flow from the LFA was minimal. Thus, this water balance analysis indicates that water quality degradation in the UFA due to FPL's proposed pumping will be minimal and will not (a) move a particular saline water interface a greater distance inland or toward a wellfield than has historically occurred as a consequence of seasonal fluctuations or drought; and (b) will not result in detrimental change in the geochemistry of the groundwater at the base of the aquifer or producing zone within the area of influence of the wellfield toward a saline water composition.

6.3.3 Drinking Water

The OCEC facility will not impact any underground source of drinking water and there are no existing potable supply wells within one-half mile of the injection wells (see Figures 3.3.3-1, 4.1-1 and 4.2-1). The injection zone for the industrial wastewater will remain confined from any underground source of drinking water. Stormwater will be treated, as required by applicable FDEP/SJRWMD nonprocedural requirements, before it is released to local drainage. Sanitary wastewater will be released to an onsite sewage treatment and disposal system designed to meet non-procedural performance requirements of Chapter 64E-6 F.A.C. and located more than ½ mile from any OCEC Site boundary (see Figure 4.2-1, ID number 33). There are no other OCEC waste disposal systems. OCEC withdrawals from the surficial and the UFA will not cause an adverse impact to any public supply wells. No adverse impacts to other existing users are anticipated, with the potential exception of two nearby artesian wells, which FPL will mitigate as necessary. The public supply well fields for the City of Vero Beach are approximately 20 miles to the east. The groundwater modeling shows that there will be no adverse impact to these Public supply wells.



6.3.4 Leachate and Runoff

The OCEC facility will not have material storage piles or unlined wastewater ponds that would be potential sources of leachate or seepage plumes.

6.3.5 Measurement Programs

All groundwater withdrawals and deep well injection flows will be monitored and reported as required by applicable FDEP and SJRWMD non-procedural requirements. The DZMW will be monitored as required by the UIC permit. Aquifer water levels and groundwater quality will be monitored and reported as required by applicable SJRWMD nonprocedural requirements.

6.4 Solid/Hazardous Waste Disposal Impacts

As discussed in Section 4.7, the potential solid and hazardous waste associated with the operation of OCEC Unit 1 will be handled according to the waste-handling guidelines presented in Table 4.7-1.

6.4.1 Solid Waste

Operation of OCEC Unit 1 will generate only minor amounts of solid wastes (e.g., used turbine inlet filters, operations and maintenance wastes, MSW, and water pretreatment solids). As explained in Section 4.7, all solid wastes generated during operation would be recycled for on-Site reuse, disposed of in appropriately licensed offsite landfills, or disposed of by other approved methods. There will be no adverse impacts resulting from solid waste generated by the Project.

6.4.2 Hazardous Waste

The handling of any hazardous wastes resulting from the operation of OCEC Unit 1 is described in Section 4.7. FPL will contract with an approved and licensed disposal company to transport and dispose of small quantities of hazardous waste at licensed facilities in a manner that complies with all federal, state, and local environmental regulations. There would be no adverse impacts resulting from hazardous wastes generated by the Project.

6.5 Sanitary and Other Waste Discharges

A regional sanitary wastewater system is not available in the area of the Project. As described in Section 4.5.2, the sanitary wastewater from OCEC Unit 1 will be routed to an onsite sewage treatment and disposal system designed to meet all applicable nonprocedural requirements, including the performance standards of Chapter 64E-6. The location of the onsite sewage treatment and disposal system is shown as item 33 in Figure 4.2-1. The system is located more than ½ mile from any OCEC Site boundary. The average (2 gpm) and peak (6 gpm) sanitary flows are shown in the plant water balance (Figure 4.5-1). This wastewater system will be used only for domestic sanitary wastes; and will not be used to process any industrial, hazardous or toxic sewage wastes. Waste streams, their

characterization, and disposal method are presented in Table 4.6-1. There will be no adverse impacts due to sanitary wastewater disposal during the Project operations

6.6 Air Quality Impacts

6.6.1 Impact Assessment

An air quality impact analysis meeting the requirements of FDEP's PSD rules and EPA/FDEP modeling guidance was performed. EPA/FDEP requirements, modeling methodology, and results are presented in the Air Construction Permit Application in Appendix 10.2.5. The air quality impact assessments are required for NO₂, SO₂, CO, PM₁₀, and PM_{2.5} emissions from the Project, since the increase in emissions for these pollutants exceed the respective significant emission rates. The analyses for the Project only must demonstrate that the air quality impacts of these pollutants do not exceed the significant impact levels or, alternatively, cumulative source impact analyses are performed to demonstrate compliance with AAQS and PSD Increments. The air quality model used to calculate air quality impacts for the Project was based on the model's ability to simulate impacts in areas surrounding the Site, as well as at the PSD Class I areas of the Everglades National Park (ENP) and Chassahowitzka National Wilderness Area (CNWA), located approximately 207 and 211 km, respectively, from the Site. The EPA-approved and FDEP-recommended AERMOD dispersion model was used to address air quality impacts within 50 km of the Project. AERMOD was approved as part of the Guideline on Air Quality Models in 40 CFR Part 52, Appendix W, as the preferred general purpose dispersion model (70 FR 68218-68260; November 9, 2005). The AERMOD model calculates hourly concentrations based on hourly meteorological data. The AERMOD model is valid for most applications, since it contains the latest scientific algorithms for simulating plume behavior in all types of terrain. The predicted concentrations are compared to the applicable AAQS and PSD Class II Increments.

Because the nearest parts of the ENP and CNWA are located well beyond 50 km of the Site, EPA and FDEP modeling guidelines require the use of a long-range dispersion model for predicting pollutant impacts. The California Puff (CALPUFF) modeling system is the preferred long-range dispersion model and was used to perform the significant impact analysis at both the ENP and CNWA PSD Class I areas.

Meteorological data used in the AERMOD model to determine air quality impacts consisted of a concurrent five-year period of hourly surface weather observations from the NWS office located at the St. Lucie County International Airport (FPR) and upper air sounding data collected at the Florida International University (FIU) in Miami. The five-year period of the meteorological data was from

FDEP for the period 2009 through 2013. The NWS office at FPR is located approximately 44 km (27 miles) east-southeast of the Site and is considered by FDEP to have meteorological data appropriate for the air quality impact analysis of the Project.

A comparison of the average land use parameters at FPR and the Site was performed using the EPA AERSURFACE program. AERSURFACE reads land use files developed by the U.S. Geological Survey and provides average land use values for albedo, Bowen ratio, and surface roughness within a specified radius. The comparison determined similarities between the land use parameters at FPR and the Site indicating that these data are representative and appropriate for the modeling analysis.

The three combustion turbines (CTs), with associated heat recovery steam generators (HRSGs), and the cooling tower will operate continuously and were included in the impact assessment. The auxiliary boiler and natural gas heater will be used intermittently for CT startup while generators and diesel engines associated with the emergency generators, fire pump and hurricane shelter will be operated only intermittently for routine testing and maintenance. The sources operated intermittently were not incorporated into the modeling analysis since their operation will not be either concurrent with the operation of the CTs or they will operate only a few hours per year. The CT/HRSG units will be fired with natural gas as the primary fuel with up to 500 hours/year/CT of ultra-low sulfur diesel (ULSD) fuel oil as a backup fuel. The maximum predicted short-term impacts (i.e., for averaging times of 24-hour hours or less) for the Project are based on the highest predicted impacts when firing either natural gas or ULSD fuel oil, whichever results in the higher predicted short-term impacts for a given pollutant. The maximum predicted annual impacts for the Project are based on highest predicted impacts when firing either natural gas for a full year or when firing natural gas for 8,260 hours per year and ULSD fuel oil for 500 hours per year, whichever results in the higher predicted annual average impacts for a given pollutant.

All significant building structures were identified on the plot plan. The building structures were processed in the EPA Building Profile Input Program (BPIP-PRIME, Version 04274) to determine direction-specific building parameters for each 10-degree azimuth direction for each source included in the air modeling analysis.

A Cartesian receptor grid was used to predict maximum concentrations in the vicinity of the Site. The receptor grid included receptors located on and beyond the proposed OCEC Site boundary at the following receptor spacing: along the property boundary – 50 meters; beyond the property boundary to 2 km – 100 meters; from 2 to 5 km – 250 meters and from 5 km to 10 km – 500 meters. The

Project's impacts at the PSD Class I areas of the ENP and CNWA were predicted with an array of 901 and 113 discrete receptors and elevations, respectively, covering the boundary and internal sections of these Class I areas that were obtained from the NPS Class I extraction program.

The maximum SO₂, NO₂, CO, PM₁₀ and PM_{2.5} concentrations predicted for the Project in the vicinity of the Site are presented in Table 6.6.1-1. Significant impact levels (SIL) are threshold concentrations used to determine if additional, more detailed, evaluation of pollutants requiring PSD review is necessary. The modeling results indicate that the maximum concentrations from the Project are predicted to be less than the SIL for all pollutants except for NO₂ for the 1-hour averaging period, PM₁₀ for the 24-hour averaging period and PM_{2.5} for the 24-hour averaging period. For the pollutant/averaging period concentrations predicted to be greater than the SIL, the maximum concentrations are also compared to the AAQS and PSD Class II Increments. When compared to the AAQS and PSD Class II Increments, the maximum predicted concentrations from the emission units associated with the Project are less than these standards. The predicted AAQS concentrations presented in Table 6.6.1-1 include background concentrations that are based on existing air quality measurements from the most recently available three years to account for all emission sources that are not explicitly included in the modeling analysis.

A modeling analysis was also performed for the alternative arrangement of the CT/HRSGs and STG as shown in Figure 4.2-4. These arrangements group the CT/HRSG trains together rather than having a STG separating some CT/HRSG trains. The results of these analyses are presented in Appendix 10.2.5. The results show that there are only very minor differences in the air quality impacts between the primary power block arrangement and the alternate arrangement. There is no change in the air quality impacts of OCEC Unit 1 power block arrangements as compared to the SILs.

The maximum SO₂, NO₂, PM₁₀, and PM_{2.5} concentrations predicted for the Project at the ENP and CNWA are presented in Table 6.6.1-2. These maximum concentrations are compared to the PSD Class I SIL. If the maximum predicted concentration is greater than the SIL additional detailed analyses are required to determine compliance with the allowable PSD Class I increments. The modeling results demonstrate that the maximum concentrations from the Project are predicted to be less than the SIL except for PM_{2.5} for the 24-hour averaging period. An analysis of the 24-hour PM_{2.5} increment consumption indicated predicted concentrations well below the allowable PSD Class I increment.

The air modeling analysis demonstrates that the air emissions from the proposed Project will not have a significant effect on air quality and will comply with all applicable AAQS and allowable PSD increments.

6.6.2 Monitoring Programs

Measurements of meteorology, ambient air quality, or visibility are not required for OCEC Unit 1 based on FDEP PSD Rules (see Section 3.0 of Appendix 10.2.5). Proposed compliance conditions are contained in the Air Construction/PSD Application (See Appendix 10.2.5). Continuous emissions monitoring or stack monitoring will be installed as required by FDEP in the issuance of the air construction/PSD permit and EPA regulations.

6.7 Noise Impacts

6.7.1 Methodology

The methodology for determining the potential noise impacts for the operation of OCEC Unit 1 were developed using the CadnaA computer model, a computerized software program for calculation, presentation, assessment and prediction of environmental noise (DataKustik, 2008).

CadnaA is an environmental noise propagation computer program that was developed to assist with noise propagation calculations for major noise sources and projects. Noise sources are entered as octave band sound power levels (L_w). Locations of the noise sources, structures, and receptors are input directly on the base map and can be edited throughout the modeling process. All noise sources are assumed to be a point, line, area, or vertical area source, and can be specified by the user. Sound propagation is calculated by accounting for hemispherical spreading and three other user identified attenuation options: atmospheric attenuation, path specific attenuation, and barrier attenuation. Atmospheric attenuation is calculated using International Organization for Standardization, ISO 9613-1 *Attenuation of Sound During Propagation Outdoors - Part 1: Calculation of the Absorption of Sound by the Atmosphere*. The CadnaA path specific attenuation can be specified to account for the effects of soil, vegetation, foliage, and wind shadow. Directional source characteristics and reflection can be simulated using path specific attenuation. Barrier attenuation is calculated by assuming an infinitely long barrier perpendicular to the source-receptor path. Total and A-weighted SPLs are calculated.

The noise impacts of OCEC Unit 1 operations were evaluated using the sound power levels for the various types of sources associated with the Project. The noise resulting from the operation of OCEC Unit 1 includes noise sources associated with the three CTs and associated electric generators; three HRSGs; one steam turbine generator; transformers; one cooling tower; and associated pumps,



modules, and accessories. The sound power levels used in the analysis for the 3-on-1 combined cycle unit were based on information developed from manufacturers that was field verified using actual field measurements of similar units. These sound power levels conservatively represent the actual noise levels seen in field measurements. The location of each noise source was based on its location in the computerized site plan. The computerized drawing was imported into the CadnaA model for the noise analysis. The heights of the major structures were also input into CadnaA, developing a three dimensional representation. Sources were input into CadnaA as point, area, and vertical area sources with appropriate dimensions.

The design of OCEC Unit 1 includes components that mitigate noise from being emitted to the surrounding environment, and the orientation of these components on the OCEC Unit 1 area further attenuates noise. The majority of the noise sources, such as the steam turbines, gas turbines, electric generators, and compressors, are located within enclosures that mitigate sounds emitted by equipment.

The L_w used in the analysis are presented in Table 6.7.1-1. There were 43 point sources, 8 line sources, and 24 vertical area sources input to CadnaA that represented the noise sources associated with OCEC. Noise sources such vent fans and transformers were input as point sources. The sources listed in Table 6.7.1-1 are identified by the source name, type, number and height including horizontal and vertical areas. Sources inside structures were input as vertical area sources that represent sides of structures such as the HRSG sides from which interior noise generated by the CT exhaust can be emitted. The atmospheric attenuation for the model was set to 20°C (68°F) and 90 percent relative humidity. The ground attenuation for the area was set to represent soft ground adsorption to reflect rural nature of the area. The topography was assumed to be flat and no added vegetative barriers were included in the model.

6.7.2 Impact Analysis

Figure 6.7.2-1 presents the modeled noise levels for the operation of OCEC Unit 1 for both onsite areas and extending offsite onto adjacent properties. This figure shows the modeled noise levels at the six locations where background noise levels were measured. The modeled noise levels predicted from CadnaA (Figure 6.7.2-1) do not include background, which can be variable depending upon the activities in the area. Table 6.7.2-1 presents existing background, modeled OCEC Unit 1, and overall sound pressure levels (SPLs) at each noise monitoring location. The background noise levels are presented in Subsection 3.3.8 and Appendix 10.7.3. A comparison of sound levels from typical noise sources and the noise resulting from operation of OCEC Unit 1 is provided in Figure 6.7.2-1. The L_{90} background noise levels were used in the analysis since the L_{90} excludes the majority of the transient

noise sources, such as highway traffic, aircraft, and sounds of nature (dogs, etc.). Since the operation of OCEC Unit 1 would result in continuous noise, the L_{90} background noise levels with the predicted noise impacts best reflects the noise that would occur as a direct result of operation. In contrast, the L_{10} background noise level represents transient noise sources such as traffic and aircraft, while the L_{eq} or the average sound pressure level represents all the noise observed over the sampling period.

As described in Section 3.3.8, the background noise levels for the Project were obtained over a two day period that included two daytime measurements and one nighttime measurement. Existing noise sources are typical for rural areas.

A noise modeling analysis was also performed for the alternative arrangement of the CT/HRSGs and STG as shown in Figure 4.2-4. These arrangements group the CT/HRSG trains together rather than having a STG separating some CT/HRSG trains. The results of these analyses are presented in Table 6.7.2-2. The results show that there are only very minor differences (0.2 dBA or less) in the predicted noise levels at the monitoring stations between the primary power block arrangement and the alternate arrangement.

There are no noise regulations that are applicable to the operation of OCEC Unit 1. The OCEC Unit 1 location is, however, in close proximity to Indian River County. Indian River County has a noise ordinance in Chapter 974, Indian River County Code, which is useful for comparison with the potential noise impacts of Project operation for illustrative purposes only. This noise ordinance was discussed in detail in Section 3.3.7. For operational noise, the numerical noise value that would be appropriate for comparison is the L_{50} . The L_{50} noise limit in the Indian River County noise ordinance for residential zoned districts is 60 dBA during the daytime and 55 dBA during the nighttime.

As described above, the operational modeling assumes that all equipment is operating all the time. This eliminates time weighed percentiles, therefore modeled results will be compared to the most restrictive noise limit outlined above, the L_{50} noise standard. The overall noise levels included the noise determined from the CadnaA modeling results plus the L_{90} background.

As shown in Figure 6.7.2-1 and Table 6.7.2-1, the modeled SPLs from the normal operation of OCEC Unit 1 will not exceed 60 dBA during the daytime or 55 dBA during the nighttime at any monitoring location or residence. When background sound levels are added to the sound levels determined from the modeling, Table 6.7.2-1 also shows that the overall sound levels are not predicted to exceed 60 dBA during the daytime or 55 dBA during the nighttime. The modeling results presented in Figure

6.7.2-1 also show that noise levels at the Site boundary do not exceed 55 dBA, which is below the nighttime noise Indian River County noise standard for any receiving Zoning District.

6.8 Changes In Non-Aquatic Species Populations

6.8.1 Impacts

Potential impacts to on-Site and regional flora and fauna due to plant operation are anticipated to be negligible. Based on the Project's proposed location within a previously-disturbed agricultural area, no significant impacts to wildlife or vegetative communities are anticipated during operation of OCEC Unit 1. No significant impact to vegetative communities is expected as a result of cooling tower drift (see Subsection 6.1.4.2). Noise generated during operation of OCEC Unit 1 is not anticipated to result in significant impacts or changes in wildlife populations in the vicinity. Due to the previously-disturbed nature of the area proposed for construction and operation of OCEC Unit 1, lack of impact to significant wildlife habitat, and preservation of large areas of natural habitat in the Project's mitigation area, no significant change in floral or faunal populations, including recreational or commercially important species, is anticipated as a result of operation of OCEC Unit 1.

6.8.2 Monitoring

Because no significant impacts to plant and animal populations are anticipated, no monitoring program is proposed during operation of OCEC Unit 1, with the exception of vegetative monitoring within the Mitigation Area to demonstrate compliance with wetland and upland enhancement success criteria, as described in Appendix 10.4.

6.9 Other Plant Operation Effects

6.9.1 Operations Traffic

After the OCEC Unit 1 is operational, approximately 30 full time positions will be generated. In addition, intermittent deliveries will be required. Based on information from a similar 3-on-1 combined cycle unit, the estimated traffic volumes during normal operation include approximately 60 daily trips. As described in Section 3.2.8.2, SR 60 has low traffic volumes, with sufficient capacity to handle increased traffic volumes. In addition, construction traffic intersection analysis of SR 60 summarized in Section 5.7.2, determined that no adverse impacts would occur as a result of an additional 500 vehicles during peak hours. As a result of the low operational traffic volume, SR 60 and the Site access road (226th Court) intersection are anticipated to operate without any degradation of LOS and at the FDOT's LOS B designation (i.e., free flow with some vehicles noticeable and average speeds same as LOS A). No improvements are required to accommodate the traffic impacts from operation traffic from OCEC Unit 1.

6.9.2 Lighting

Outdoor lighting will be necessary to satisfy FERC and OSHA requirements for security, worker and plant safety, including lighted walkways, parking areas and various equipment areas. Unconstrained lighting can cause light pollution and light trespass (see Subsection 3.3.9). Light pollution or sky glow is the term used to describe sky brightness caused by scattering of light in the atmosphere. Light trespass is the term used to describe light that strays from its intended purpose and becomes an annoyance.

Light pollution and light trespass will be addressed when designing the outdoor lighting systems. Guidelines specifically addressing potential lighting issues are available from the Illuminating Engineering Society of North America (IESNA). These guidelines will be incorporated into the outdoor lighting design to the extent possible while meeting FERC and OSHA requirements. Typical practices to be incorporated are: minimize upward light from luminaries; minimize upward light in general so that light reaches its intended target; and contain light within its intended target area by suitable choice of luminaries for light distribution, by selection of mounting height and physical location, and by minimizing glare in the horizontal or vertical directions.

While light from the OCEC Unit 1 will be observed at locations in proximity to the plant, the illuminance will be localized. This was observed in lighting studies performed at FPL's Turkey Point Plant with five existing operating units some of which were designed in the 1960s' (FPL, 2009). While illuminance was observed near the Turkey Point Plant, there was not an influence at distances greater than about 1-mile. The use of the IESNA guidelines to the extent practicable, while meeting FERC and OSHA security and safety requirements, will result in low lighting impacts from OCEC Unit 1 and no significant adverse sky glow beyond the FPL-owned property is anticipated.

6.10 Archaeological Sites

No sites of historic or archaeological significance will be directly or indirectly impacted due to operation of OCEC Unit 1. Based on the cultural resource assessments (Appendix 10.7.2), no sites listed or eligible for listing in the *National Register of Historic Places* are located in close proximity to the existing Site, and no significant archaeological sites are expected to be found on the Site. Therefore, no on-Site post-construction monitoring is planned or required for the Project. FPL will coordinate with the Florida Division of Historical Resources (DHR) and State Historic Preservation Office (SHPO) to determine the appropriate scope of work to meet applicable federal and state guidelines.

6.11 Resources Committed

The major irreversible and irretrievable commitments of national, state, and local resources due to operation of OCEC Unit 1 are: use of the land, consumptive use of water, loss of wetlands, and the use of fuels that include natural gas and ULSD oil.

The proposed use of land for the Project, while irreversible, will have a minimal impact on Okeechobee County and the region. The use of the Site is consistent with the existing adjacent land uses. The use of the land for an electrical power plant, rather than agricultural use, will not impact the availability of agricultural lands given the vast amounts of same in the region. Any impact to Okeechobee County will be more than offset by the Project's benefits in terms of job opportunities, local business expenditures, and tax revenues.

Consumption of water is necessary for operation of an electrical power plant, including for condenser cooling, pollution control equipment (NO_x control when firing ULSD oil), process water requirements, and potable water. However, the cooling water requirements for combined cycle units are less than one half that of a conventional steam unit. In addition, the design of the Project is highly efficient and will minimize the consumptive use of water where practicable.

Natural gas and ULSD oil will be consumed during the operation of OCEC Unit 1. With the use of advanced combined cycle technology, however, the consumption of fossil fuels will be approximately 35 percent lower than conventional steam units. This increased efficiency through the use of advanced combined cycle technology and natural gas will result in low GHG emissions for the amount of electric generation produced. The emission rate of GHGs from OCEC Unit 1 will be among the lowest in the U.S. and 18 percent lower than EPA-proposed New Source Performance Standards for electric utility units.

Ammonia will be required for the operation of OCEC Unit 1's SCRs. While some ammonia will be consumed, emissions of NO_x will be substantially reduced as a result. The use of ammonia in the SCR system, and the increased efficiency, will result in the lowest NO_x emission rate in terms of lb/MWh compared to other FPL fossil fuel units.

Construction of the Project will result in unavoidable impacts to wetlands, the vast majority of which are comprised of man-made agricultural ditches. FPL has made significant efforts to avoid and minimize those impacts. As a result, only 4.71 acres of mixed wetland hardwoods within citrus groves and 19.99 acres of low-quality irrigation/drainage ditches will be permanently impacted.



These impacts will be offset by the Project's proposed mitigation that will preserve and improve 376 acres of high quality wetlands and natural upland communities adjacent to the Fort Drum Marsh Conservation Area.

OCEC Unit 1's use of resources will be minimal given the production of efficient electric power, low environmental impacts, and substantial benefits to the local economy.

TABLES

**TABLE 6.1.4-1
PREDICTED VISIBLE WATER VAPOR PLUME HEIGHT AND LENGTH FOR
FPL OCEC UNIT 1 COOLING TOWER**

Conditions	<u>Winter</u>		<u>Spring</u>		<u>Summer</u>		<u>Fall</u>		<u>Annual ^a</u>	
	hours/year	%	hours/year	%	hours/year	%	hours/year	%	hours/year	%
ALL HOURS EXCEPT										
EXISTING FOG/CALM ^{a,b,c}	2022	24.4%	2117	25.5%	2088	25.2%	2064	24.9%	8291	100.0%
Plume Height (m)										
>0 200	1949	96.40%	2074	98.00%	2043	97.83%	2018	97.74%	8084	97.50%
>200 400	73	3.59%	41	1.96%	45	2.16%	47	2.26%	206	2.48%
>400 600	0	0.01%	1	0.05%	0	0.01%	0	0.00%	1	0.02%
>600 1000	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
>1000 3000	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Plume Length (m)										
>0 100	1802	89.11%	1836	86.75%	1814	86.87%	1758	85.16%	7210	86.96%
>100 300	144	7.1%	224	10.58%	183	8.75%	216	10.48%	767	9.25%
>300 500	17	0.8%	29	1.39%	59	2.82%	54	2.62%	159	1.92%
>500 1000	21	1.0%	14	0.68%	32	1.55%	31	1.51%	99	1.20%
>1000 3000	34	1.7%	12	0.55%	0	0.02%	4	0.21%	50	0.60%
>3000 5000	4	0.2%	1	0.04%	0	0.00%	0	0.02%	5	0.06%
>5000	1	0.03%	0	0.01%	0	0.00%	0	0.00%	1	0.01%
ALL DAYLIGHT HOURS EXCEPT EXISTING										
FOG/CALM ^{a,b,c}	1112.8	22.4%	1314	26.5%	1341	27.1%	1189	24.0%	4957	100.0%
Plume Height (m)										
>0 200	1094	98.35%	1303	99.16%	1329	99.08%	1178	99.11%	4905	98.94%
>200 400	18	1.64%	10	0.76%	12	0.91%	11	0.89%	51	1.03%
>400 600	0	0.02%	1	0.08%	0	0.01%	0	0.00%	1	0.03%
>600 1000	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
>1000 3000	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Plume Length (m)										
>0 100	1027	92.3%	1202	91.46%	1270	94.68%	1088	91.54%	4587	92.53%
>100 300	68	6.1%	101	7.67%	59	4.41%	82	6.91%	310	6.25%
>300 500	7	0.6%	6	0.49%	9	0.64%	12	0.98%	33	0.67%
>500 1000	4	0.4%	3	0.23%	4	0.27%	6	0.49%	17	0.34%
>1000 3000	6	0.6%	2	0.14%	0	0.00%	1	0.07%	9	0.18%
>3000 5000	1	0.05%	0	0.02%	0	0.00%	0	0.02%	1	0.02%
>5000	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%

^a Annual average of the 5-year period from 2009 to 2013.

^b Also removed are hours with both a predicted plume height and plume length of zero.

^c Percentage listed under season and annual is the percent of total visible plumes.

TABLE 6.1.4-2
ESTIMATED DRIFT EMISSION SPECTRUM FOR
FPL OCEC CIRCULATING WATER
COOLING TOWER

Particle Size Range (micrometers)	Total in Size Range (percent)
0 - 40	0.5
40 - 50	1.3
50 - 60	3.9
60 - 70	15.6
70 - 90	28.5
90 - 110	20.7
110 - 130	11.5
130 - 150	6.0
150 - 210	4.5
210 - 350	4.5
350 - 600	3.0

Source: "Calculating Realistic PM Emissions from Cooling Towers",
Frisbie and Gordon, 2001.

TABLE 6.1.4-3

**MONTHLY MINERAL CIRCULATING WATER DEPOSITION PREDICTED
FOR FPL UNIT 1 OCEC COOLING TOWER**

Period		Deposition		Location	
		$\text{g/m}^2/\text{year}$	kg/ha/month	Distance (m)	Direction (degree)
2009-2013	Average	2.3	1.9	Area within 5 km	
	Maximum	17.1	14.3	0~2000	103
		5.2	4.3	2000~3000	124
		1.6	1.4	3000~4000	299
		1.0	0.8	4000~5000	295

**TABLE 6.6.1-1
MAXIMUM PREDICTED CONCENTRATIONS FOR THE PROJECT COMPARED TO EPA SIL
AAQS, AND PSD CLASS II INCREMENTS**

Pollutant / Averaging Time	Project Only Concentration^a (µg/m³)	EPA SIL (µg/m³)	Concentration^b (µg/m³)	AAQS (µg/m³)	Concentration^c (µg/m³)	PSD Class II Increments (µg/m³)
<u>SO₂</u>						
Annual	0.2	1	-	na	-	20
24-Hour	2.4	5	-	na	-	91
3-Hour	4.6	25	-	1,300	-	512
1-Hour	4.4	7.86	-	196.5	-	na
<u>NO₂^d</u>						
Annual	0.2	1	-	100	-	25
1-Hour	17.6	7.52	84.7	188.1	-	na
<u>CO</u>						
8-Hour	16.9	500	-	10,000	-	na
1-Hour	27.2	2000	-	40,000	-	na
<u>PM₁₀</u>						
Annual	0.3	1	-	na	-	17
24-Hour	15.1	5	61.6	150	7.6	30
<u>PM_{2.5}</u>						
Annual	0.2	0.3	-	12	-	4
24-Hour	8.2	1.2	20.2	35	7.6	9

Notes: na = not applicable.

SIL = Significant Impact Level

AAQS = Ambient Air Quality Standard

Concentrations from AERMOD and surface and upper air meteorological data from St. Lucie County Int'l AP/FIU Miami, 2009 to 2013.

^a Based on maximum predicted concentration over period

^b Based on maximum predicted total concentration including background for non-modeled emissions

^c Based on maximum predicted PSD increment increase over period

^d NO_x to NO₂ conversion factors of 75% and 80% applied to annual and 1-hour predictions based on EPA's ARM (Tier 2) Method

**TABLE 6.6.1-2
MAXIMUM PREDICTED CONCENTRATIONS FOR THE PROJECT COMPARED TO
CLASS I SIL AND PSD CLASS I INCREMENTS**

Pollutant / Averaging Time	Project Only Concentration (µg/m ³) ^a		CLASS I SIL (µg/m ³)	Concentration (µg/m ³) ^b		PSD Class I Increments (µg/m ³)
	at ENP	at CNWA		at ENP	at CNWA	
<u>SO₂</u>						
Annual	0.001	0.001	0.1	-	-	2
24-Hour	0.03	0.02	0.2	-	-	5
3-Hour	0.07	0.08	1	-	-	25
<u>NO₂</u>						
Annual	0.0003	0.001	0.1	-	-	2.5
<u>PM₁₀</u>						
Annual	0.001	0.002	0.2	-	-	4
24-Hour	0.15	0.10	0.3	-	-	8
<u>PM_{2.5}</u>						
Annual	0.001	0.002	0.06	-	-	1
24-Hour	0.15	0.10	0.07	0.29	0.41	2

Notes:

SIL = Significant Impact Level

ENP = Everglades National Park PSD Class I area

CNWA = Chassahowitzka National Wilderness area PSD Class I Area

Concentrations from CALPUFF Modeling System with Wind Domain Data from 2001 to 2003.

^a Based on maximum predicted concentration over period^b Based on maximum predicted PSD increment increase over period

TABLE 6.7.1-1
SOUND POWER LEVELS FOR NOISE SOURCES ASSOCIATED WITH THE OPERATION OF OCEC

Sources	Interior Noise Source	Source Type	Number of Sources	Source Height (m)	Sound Power Level (dB) for Octave Band Center Frequency (Hz)									Overall Sound Power Level (dBA)
					31.5	63	125	250	500	1000	2000	4000	8000	
HRSG Stack 1A	No	Point	1	45.0	49.0	55.0	68.0	71.0	80.0	106.5	100.0	74.0	56.0	107.6
HRSG Stack 1B	No	Point	1	45.0	49.0	55.0	68.0	71.0	80.0	106.5	100.0	74.0	56.0	107.6
HRSG Stack 1C	No	Point	1	45.0	49.0	55.0	68.0	71.0	80.0	106.5	100.0	74.0	56.0	107.6
Turbine Vent Fan 1A	No	Point	1	24.0	104.0	104.0	109.0	102.0	99.0	93.0	104.0	106.0	107.0	111.2
Turbine Vent Fan 1B	No	Point	1	24.0	104.0	104.0	109.0	102.0	99.0	93.0	104.0	106.0	107.0	111.2
Turbine Vent Fan 1C	No	Point	1	24.0	104.0	104.0	109.0	102.0	99.0	93.0	104.0	106.0	107.0	111.2
Boiler Feed Pump 1A	No	Point	1	2.0	103.0	100.0	97.0	96.0	97.0	96.0	97.0	89.0	77.0	101.7
Boiler Feed Pump 1B	No	Point	1	2.0	103.0	100.0	97.0	96.0	97.0	96.0	97.0	89.0	77.0	101.7
Boiler Feed Pump 1C	No	Point	1	2.0	103.0	100.0	97.0	96.0	97.0	96.0	97.0	89.0	77.0	101.7
CT Transformer 1A	No	Point	1	2.0	96.0	102.0	104.0	103.0	99.0	93.0	88.0	83.0	76.0	100.1
CT Transformer 1B	No	Point	1	2.0	96.0	102.0	104.0	103.0	99.0	93.0	88.0	83.0	76.0	100.1
CT Transformer 1C	No	Point	1	2.0	96.0	102.0	104.0	103.0	99.0	93.0	88.0	83.0	76.0	100.1
Steam Turbine Transformer	No	Point	1	2.0	99.0	105.0	107.0	106.0	102.0	96.0	91.0	86.0	79.0	103.1
Combustion Turbine A	No	Line	1	4.1	111.0	113.0	107.0	106.0	103.0	101.0	106.0	102.0	97.0	110.2
Combustion Turbine B	No	Line	1	4.1	111.0	113.0	107.0	106.0	103.0	101.0	106.0	102.0	97.0	110.2
Combustion Turbine C	No	Line	1	4.1	111.0	113.0	107.0	106.0	103.0	101.0	106.0	102.0	97.0	110.2
CT Generator A	No	Vert_Area	3	3.0	105.0	105.0	104.0	101.0	103.0	102.0	101.0	96.0	87.0	107.0
CT Generator B	No	Vert_Area	3	3.0	105.0	105.0	104.0	101.0	103.0	102.0	101.0	96.0	87.0	107.0
CT Generator C	No	Vert_Area	3	3.0	105.0	105.0	104.0	101.0	103.0	102.0	101.0	96.0	87.0	107.0
HRSG Wall A	No	Vert_Area	2	30.0	111.0	116.0	112.0	104.0	94.0	93.0	81.0	61.0	31.0	100.7
HRSG Wall B	No	Vert_Area	2	30.0	111.0	116.0	112.0	104.0	94.0	93.0	81.0	61.0	31.0	100.7
HRSG Wall C	No	Vert_Area	2	30.0	111.0	116.0	112.0	104.0	94.0	93.0	81.0	61.0	31.0	100.7
Exhaust Duct A	No	Line	1	4.1 - 8.1	113.0	110.0	108.0	101.0	100.0	98.0	96.0	95.0	92.0	104.0
Exhaust Duct B	No	Line	1	4.1 - 8.1	113.0	110.0	108.0	101.0	100.0	98.0	96.0	95.0	92.0	104.0
Exhaust Duct C	No	Line	1	4.1 - 8.1	113.0	110.0	108.0	101.0	100.0	98.0	96.0	95.0	92.0	104.0
Air Inlet A	No	Vert_Area	1	23.0	96.0	100.0	93.0	88.0	80.0	72.0	68.0	76.0	71.0	84.7
Air Inlet B	No	Vert_Area	1	23.0	96.0	100.0	93.0	88.0	80.0	72.0	68.0	76.0	71.0	84.7
Air Inlet C	No	Vert_Area	1	23.0	96.0	100.0	93.0	88.0	80.0	72.0	68.0	76.0	71.0	84.7
Steam Turbine	No	Line	1	24.0	124.0	124.0	120.0	119.0	117.0	112.0	106.0	103.0	102.0	118.0
Steam Turbine Generator	No	Line	1	24.0	124.0	124.0	120.0	119.0	117.0	112.0	106.0	103.0	102.0	118.0
Condenser Walls	No	Vert_Area	4	10.0	115.0	116.0	115.0	113.0	114.0	108.0	103.0	98.0	94.0	114.1
Cooling Tower	No	Vert_Area	2	11.0	123.8	120.7	117.6	111.4	107.1	105.0	103.7	102.2	97.3	111.7
Cooling Tower Fans	No	Point	30	15.5	123.8	120.7	117.6	111.4	107.1	105.0	103.7	102.2	97.3	111.7

TABLE 6.7.2-1
EXISTING, BACKGROUND, MODELED, AND OVERALL SOUND PRESSURE LEVELS FOR THE
OPERATION OF OCEC AT NOISE MONITORING LOCATIONS

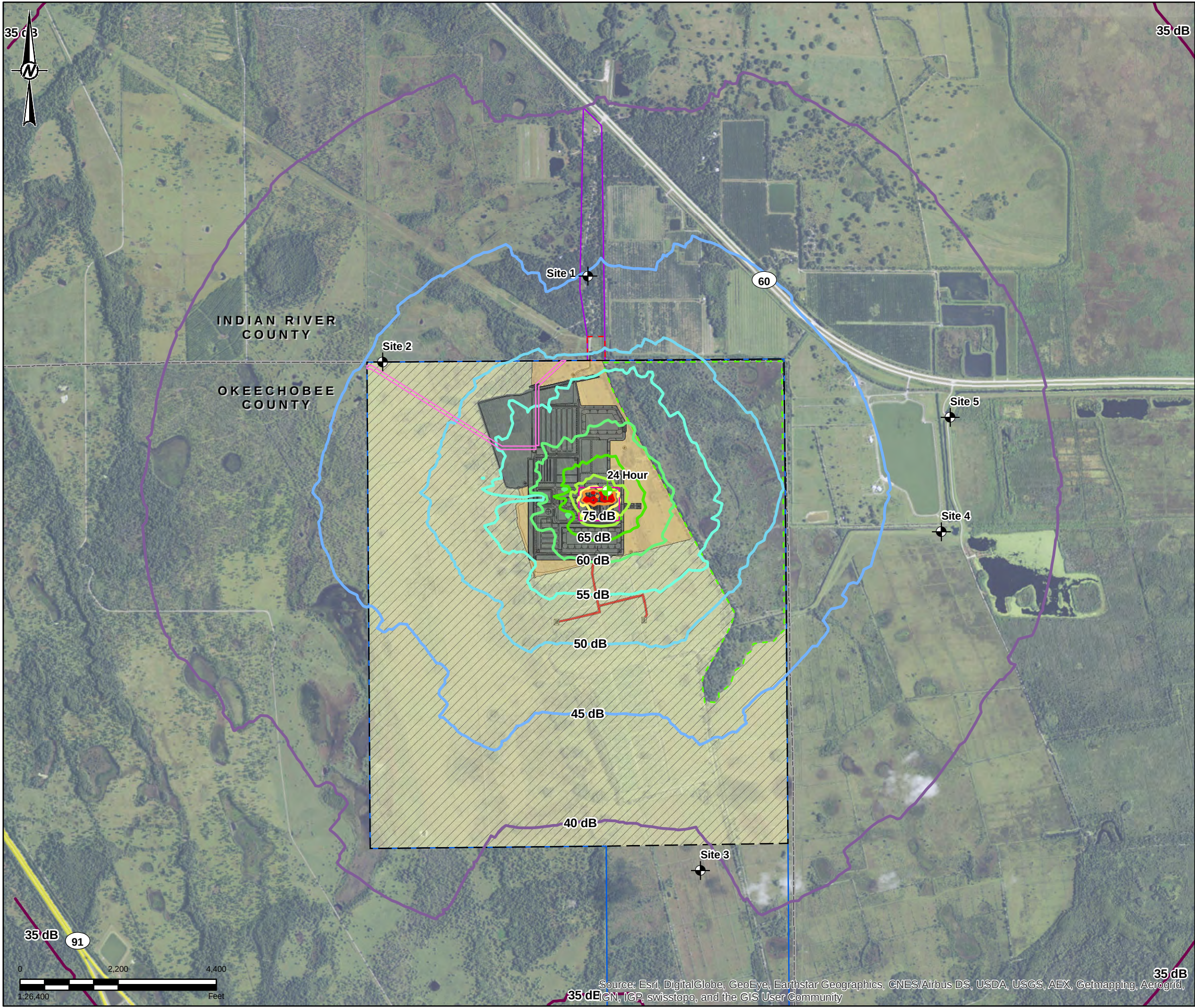
Monitoring Location	Time	Sound Pressure Levels (dBA)			
		Existing ^a	Background ^b	Modeled	Overall ^c
1 - Indian River County	Daytime	41.8	35.1	45.2	45.6
	Night	43.1	32.7	45.2	45.4
2 - Indian River County	Daytime	39.4	34.8	45.6	45.9
	Night	37.6	34.0	45.6	45.9
3 - Okechobee County	Daytime	47.5	39.3	38.7	42.0
	Night	37.7	36.1	38.7	40.6
4 Indian River County	Daytime	44.8	37.2	43.0	44.0
	Night	48.5	37.9	73.0	73.0
5 Indian River County	Daytime	52.1	41.6	42.7	45.2
	Night	54.4	35.6	42.7	43.5
24-Hour - Okechobee County	24-hour	40.5	28.5	78.7	78.7

^a L₅₀ sound levels collected on January 21-22, 2015. The highest L₅₀ of the morning and afternoon measurements was used at each site to represent noise from intermittent sources.

^b L₉₀ sound levels collected on January 21-22, 2015. The highest L₉₀ of the morning and afternoon measurements was used at each site to represent continuous background noise.

^c Modeled results logarithmically added to the existing baseline measurements.

FIGURES



LEGEND

- Noise and Light Monitoring Locations (Sites 1-5)
- 24-Hour Noise Monitoring Location
- Facility Layout
- Certified Site Boundary
- Mitigation Area
- FPL Owned Property
- Linear Facility Corridor
- Transmission Interconnection Corridor
- On-Site Gas Pipeline Alternatives
- OCEC Unit 1
- Open Space
- UFA Well Delivery Pipeline
- Future Solar Area
- OCEC Generating Units

Operations Noise Contours

- 35 dB
- 40 dB
- 45 dB
- 50 dB
- 55 dB
- 60 dB
- 65 dB
- 70 dB
- 75 dB
- 80 dB
- 85 dB

REFERENCE(S)

PROPERTY, LINEAR FACILITY CORRIDOR, CERTIFIED SITE BOUNDARY, FUTURE SOLAR AREA, OPEN SPACE, MITIGATION AREA. FPL & GOLDER ASSOCIATES INC., 2015
FACILITY LAYOUT, BLACK & VEATCH, 2015
OPERATIONS NOISE CONTOURS, GOLDER ASSOCIATES INC., 2015

CLIENT

FPL

PROJECT

OKEECHOBEE CLEAN ENERGY CENTER

TITLE

OPERATIONS NOISE IMPACT CONTOURS



FPL

YYYY-MM-DD	2015-09-17
DESIGNED	NRL
PREPARED	NRL
REVIEWED	KAB
APPROVED	KFK

PROJECT NO.
1414979

CONTROL
B046

REV.
0

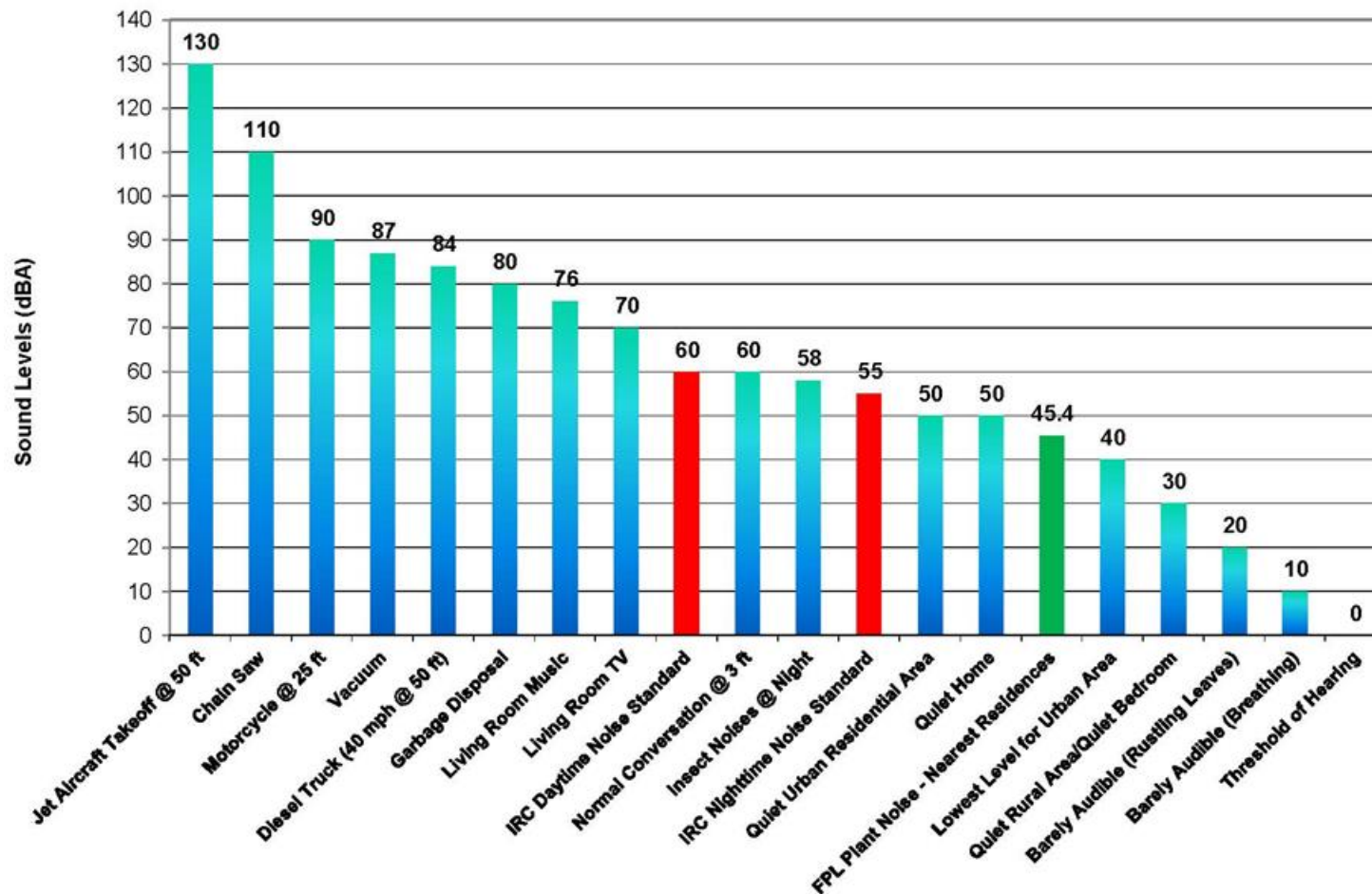
FIGURE
6.7.2-1

G:\PROJECTS\FPL\Okeechobee\09_PROJECTS\1414979\B_SCA_Project\02_PRODUCTION\MXD\1414979_B046_OperationsContours_half\MapInfo.mxd

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

25mm

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Sound Level Comparisons - Typical Noise Sources, Indian River County Standards and FPL Okeechobee Clean Energy Center Maximum Impacts at Nearest Residence
Sources: Golder, 2015; Temple University, 2000; Simon Frazer University, 2008; Sengpieaudio, 2008

Figure 6.7.2-2
Sound Level Comparisons and Noise Impacts of OCEC Unit 1 Operation at Nearest Residence

Source: Golder, 2015.

7.0 ECONOMIC AND SOCIAL EFFECTS OF PLANT CONSTRUCTION AND OPERATION

This chapter identifies the direct and indirect economic and social benefits and costs of the Project based on both temporary (construction) and long-term (operation) time periods, with an emphasis on effects not directly concerned with the generation of electricity.

Socioeconomic impacts may occur when a project or construction directly or indirectly changes a population, housing stock, or economic activities within a given area. In addition, an indirect effect upon a project area could result from the potential significant impacts involving land use/neighborhood character, traffic, and noise.

Direct effects are those that are the result of the construction or operation of a project. Indirect effects are those that are the result of changes in the livelihood of the people and business interests in the vicinity of the project, which, because of their proximity, may experience changes in their local environment, such as increased spending by project construction and operations personnel. Many of these effects are difficult to measure and, on many projects of this size, qualitative assumptions are often made to assess the relative values of anticipated costs and benefits.

This chapter is divided into two parts: benefits and costs. Section 7.1 addresses the economic and social benefits of the Project, including analyses of the direct and indirect effects of OCEC Unit 1 construction and operation. Section 7.2 addresses the economic and social costs of the Project and includes analyses of the temporary and long-term indirect costs involving OCEC Unit 1 construction and operation. All costs and benefits are based on 2015 dollar values unless otherwise indicated.

7.1 Economic and Social Benefits

The Project is expected to provide both economic and social benefits to Okeechobee County, Indian River County and the State of Florida. Due to the proximity of the Site to the large labor markets in the region, there is a sufficient number of workers living in the region of the Site (Workforce Region 20: Indian River, Martin, Okeechobee, and St. Lucie Counties) to meet the labor demand. Due to the nature of the Project, both regional as well as skilled labor from outside the region will be required.

Direct economic benefits from construction include construction workforce jobs and the purchase and rental of equipment and materials. Direct economic benefits from OCEC Unit 1 operation include capital expenditures, operation and maintenance expenditures, employment and property tax revenues.

7.1.1 *Direct Economic and Social Benefits*

FPL estimates that the total Project capital costs will be approximately \$1.196 billion. Principal components include the power block (\$1,031.5 million); transmission interconnection and integration (\$52 million); and Allowance for Funds Used During Construction (AFUDC; \$112.5 million).

7.1.1.1 Temporary Benefits (Construction)

On-Site construction activities are anticipated to begin in 2017 and conclude in the summer of 2019. Based on similar construction projects (FPL, 2012), OCEC Unit 1 construction activities are anticipated to have a regional economic benefit of more than \$500 million during the construction period, including direct, indirect, and induced benefits.

The peak construction workforce is estimated to be approximately 650 people, with an average construction workforce estimated at 290 people. The categories of expected construction workers are presented below. The construction payroll for the Project is estimated to be \$58 million during the peak year (2018), with an annual average of \$33 million for the period 2017 through 2019.

Trade Category	Percent
Laborers	12
Carpenters	6
Operators	5
Ironworkers	4
Millwrights	10
Boilermakers	6
Pipefitters	19
Insulators	2
Electricians	22
Painters	1
Supervisors	13
Total	100

It is anticipated that the majority of the Project's construction expenditures, excluding major equipment, will be made within Okeechobee County, Indian River County, and the surrounding region. These expenditures will create additional demands for goods and services, creating a multiplier effect in the area – generating additional jobs, earnings and tax revenues. Other businesses would benefit from the increased economic activity generated by the Project. For example, sales could increase for commercial services, including gas stations, convenience stores and restaurants. Area merchants would further benefit from construction workers frequenting their establishments before, during and after their workday. During the construction period, area suppliers could also benefit by supplying the Project with needed materials such as concrete, stone, drainage piping, and

other building materials that are normally manufactured or produced in the region. In addition, construction equipment may be rented locally.

These indirect effects would induce an increase in demand for products and services in the region. Value-added effects are the portions of business revenues that are available to pay compensation to workers, capital income and indirect business taxes. Value-added effects are also the principal source of income for households and a key measure of the Project's contribution to the regional economy.

7.1.1.2 Long-Term Benefits (Operation)

Operating revenues to government entities include *ad valorem* tax revenue, occupational licenses, building permit fees, utility taxes, and State revenue proceeds paid by FPL. Services are required for all residents who are working or living in the County. As a result, Okeechobee County and Indian River County would incur some costs for these services related to the Project and its employees.

Operating costs to government entities include services such as financial and administrative expenses, emergency and disaster relief, legislative and executive expenses, and comprehensive planning. The County government will both receive capital revenues and incurs capital expenses. Capital revenues are based on impact fees, and capital expenses are costs related to purchases for roads, fire rescue, law enforcement, and other services.

The net economic impact of the Project on the Okeechobee County and other governmental entities, from years 2019 to 2048, is the difference between the total benefits and costs. For OCEC Unit 1, annual property taxes would accrue to Okeechobee County, Okeechobee County School District, and other taxing authorities. It is anticipated that these entities would, at their discretion, distribute the funds to various entities within their jurisdictions. OCEC Unit 1 operations will be expected to generate cumulative *ad valorem* tax revenue of \$238.8 million from 2019 to 2048. This would be comprised of approximately \$124.1 million to Okeechobee County, approximately \$104.5 million to the School District, and approximately \$10.2 million to other taxing authorities (SJRWMD, County Bond, and Children's Council). Together, these economic benefits far outweigh the services that would be required by OCEC Unit 1 operations and employees.

OCEC Unit 1 is scheduled to become operational in mid-2019. The total direct employment for OCEC Unit 1 operations would be similar to FPL's other existing modernized facilities (*i.e.*, Cape Canaveral Plant, Riviera Beach Plant and Port Everglades Plant) -- approximately 30 full-time jobs. Total fixed and variable operation and maintenance costs of OCEC Unit 1, excluding fuel costs, are estimated to be approximately \$6.5 million starting 2019 and approximately \$400 million for the period 2019-2049 (FPL, 2015).



In addition, the operation of the Project would have an indirect effect in the area through the potential increase in area commercial services, such as gas stations, convenience stores and restaurants. The new facility would bring long-term employees, deliveries, and services that could attract new activity to the area and these indirect effects would induce an increase in demand for products and services. These value-added effects would contribute to the economy and offer benefits both within and outside of the immediate area.

7.1.1.3 Social Benefits

In addition to providing clean, safe, and reliable power for FPL customers, the Project would result in significant social and environmental benefits. Social benefits accrue from construction and operational employment, direct local purchases during construction and operation, and indirect generation of jobs, services and taxes. Social benefits occur as a result of property taxes generated by the Project, which are estimated at \$224.7 million and would accrue to Okeechobee County, Okeechobee County School District, and other taxing authorities over the years 2019-2048. An estimated \$210.2 million of these funds would be available to Okeechobee County's general fund and to Okeechobee County schools.

The Project has been designed to minimize environmental impacts and optimize the use of the 2,341-acre Site, including approximately 20 percent dedicated to mitigation/conservation area and buffers and about 70 percent dedicated for potential future solar energy. Only approximately 10 percent of the Site will be used for OCEC Unit 1. The OCEC Unit 1 power block will have a much sleeker profile than many of FPL's older or former power plants, with the height of the new structures (stacks) less than 150 feet. Further, it would be fueled by clean, U.S.-produced natural gas, which produces the lowest air emissions compared to any other fossil fuel and will reduce the rate of GHG emissions by approximately 50 percent. This will result in air quality impacts far less than the EPA and FDEP air quality standards and one of the lowest GHG emission rates of any fossil fuel plant in the U.S. OCEC Unit 1 will be the most efficient unit in FPL's system in terms of reducing fuel cost and GHG emissions. The cooling water usage is optimized by the use of water from the UFA and recycling this water 5 times to minimize water consumption. The industrial wastewater generated by OCEC Unit 1 will be primarily cooling tower blowdown discharged to injection wells, a proven technology to eliminate surface water discharges.

7.2 Economic and Social Costs

7.2.1 Temporary External Costs

The number of construction employees will average approximately 290 people. Over the Project construction period, the peak number of construction employees will be approximately 650 people.



The labor force in Okeechobee County and Indian River County was reported as 17,887 and 62,289, respectively, as of December 2014, with approximately 16,754 and 58,577 residents listed as employed, respectively (Florida Department of Economic Opportunity, Labor Market Statistics Center, 2015). The construction workforce within the region consists of approximately 11,542 people (based on 2014 estimates) and is expected to increase by 36 percent between 2014 and 2022 (Florida Department of Economic Opportunity, Labor Market Statistics Center, 2015). Therefore, labor demand for the Project is small relative to the size of the regional construction workforce and some workers are within commuting distance of the Site.

Based on skilled laborer requirements for certain aspects of Project construction, workers could commute longer distances or may choose to utilize temporary or transient accommodations (i.e., motels and hotels) on an intermittent or temporary basis. Assuming 50 percent of the Project construction and operation workers will relocate to the immediate area, 325 workers could migrate during the peak construction period and require either temporary or permanent housing. The majority is expected to live in temporary housing (e.g., renting), although some of these workers could select permanent housing, generally owner occupied for the duration of their stay. Still others could elect to reside in transitional housing, such as residential hotels, motels, and rooms in private homes, or to bring their own housing in the form of campers and mobile homes.

Transient accommodations are ample in the region, with approximately 22,888 units in vacation rental properties including motels/hotels, and rooming houses (BEHR, 2015) with a majority of the capacity available in St. Lucie County. In addition, area camping and RV facilities are available at five establishments within 25 miles of the Site (Gocampingamerica.com, 2015).

Construction-related activities will be contained within the Site and linear facilities corridor. Temporary external social costs of the Project could include construction-related traffic and noise. The public roadways utilized for construction traffic would continue to operate at an acceptable level of service. Level of service deficiencies could be experienced during peak hours at the intersection of the Site access road and SR 60. The Project will develop a traffic management plan, which may include using traffic management specialists during peak construction periods.

Although the local community may experience some temporary impacts during the construction period, overall socioeconomic impacts associated with the construction of the Project will be substantially favorable.

7.2.2 Long-Term External Costs

Any impacts from external social costs from the OCEC Unit 1 operation will be minimal and localized. The Site provides access to FPL's existing transmission system, which minimizes interconnection requirements. OCEC Unit 1 operations will not cause any adverse impacts to public or private facilities used for recreational purposes or impairment to recreational values. Further, OCEC Unit 1 will not result in any deterioration of aesthetic and scenic values or restrict access to areas of scenic values.

OCEC Unit 1's operational workforce and local expenditures is anticipated to stimulate the local economy as well as the region. Operations will not adversely impact local services (*e.g.*, schools, police, and transportation); rather, the economic and social community would benefit through property taxes as well as induced growth opportunities for commercial services and facilities.

OCEC Unit 1 will introduce new tax revenue to Okeechobee County, the School District, and other taxing authorities that will provide a significant increase to the current tax base. Long term, the operational practices will remain consistent, with a minimal increase in costs to the local government for public services.

FPL will minimize OCEC's impacts on the environment and the community through the design, construction and operation of the Project. The OCEC Unit 1 layout and design will incorporate features that maximize areas for buffers and mitigation/conservation, minimize wetland impacts, and reduce visual and other impacts. The features proposed include noise attenuation in the design and utilization of the cleanest fossil fuels and air pollution control equipment to minimize impacts.

8.0 SITE AND DESIGN ALTERNATIVES

This optional Chapter of the SCA is not included in this application because it is not anticipated that an Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA) will be required for the Project.

9.0 ELECTRICAL TRANSMISSION LINES

Two new 500-kV transmission lines approximately 0.1 mile (535 feet) in length are required between the OCEC switchyard and the existing Martin-Poinsett transmission line right-of-way to “loop” the new transmission lines into and out of the on-Site switchyard.

9.1 Maps

The proposed transmission interconnection corridor is approximately 396 ft wide and 535 ft in length (4.86 acres) located within the roadway improvement easement between the Site and the northern edge of the Martin-Poinsett right-of-way (Figure 9.1-1). Approximately 3 acres of the corridor are located within the existing transmission line right-of-way and 1.86 acres are located between the existing transmission right-of-way and the Site.

9.2 Project Description

The two proposed 500-kV transmission lines are to be constructed within the corridor. Where the transmission lines turn large angles, guyed, multi-pole structures will be used - typically using 115- to 135-ft-tall, single-circuit, guyed, concrete poles directly embedded into the ground. One or two pairs of tangent structures are proposed between the corridor and the switchyard, consisting of approximately 120 to 150 ft tall, unguyed, tubular steel H-frame poles with span lengths of approximately 750 to 1,250 feet. Typical cross section views of the 500-kV transmission tangent structures are provided in Figures 9.2-1 and 9.2-2.

The conductor to be used for these transmission lines is anticipated to be a three conductor bundle of 1,272-thousand circular mil (kcmil) aluminum conductor, steel-reinforced, alumoweld core. The maximum current rating (MCR) for this conductor is 5,400 amperes. The MCR is the nominal value that would be expected to cause the conductor to reach a design temperature limit of 115 degrees Celsius (°C).

Transmission line conductor vertical clearances will vary along the length of the transmission lines; however, in all instances, the clearances will comply with the National Electrical Safety Code (NESC) (Institute of Electrical and Electronics Engineers, Inc., 2012), as required by Section 366.04, Florida Statutes (F.S.), and Rule 25-6.0345, Florida Administrative Code (F.A.C.).

9.3 Corridor

9.3.1 Corridor Selection

The corridor was selected to co-locate with the roadway improvement easement, minimize conflicts with proposed and existing infrastructure (existing access road, proposed OCEC Unit 1 facilities), minimize cost, and avoid impacts to wetlands or threatened and endangered species.

9.3.2 Corridor Description

The proposed corridor width of approximately 396 ft allows FPL the ability to construct two 500-kV transmission lines with horizontal configuration between the Site and the existing Martin-Poinsett transmission line. The location of the corridor relative to the Martin-Poinsett right-of-way is illustrated in Figure 9.1-1.

9.3.3 Alternate Corridors

No alternate corridors are proposed; the proposed corridor is the shortest distance between the Site and the adjacent Martin-Poinsett right-of-way, co-located with existing access roadways and contained within the roadway improvement easement, and avoids environmental impacts while minimizing costs.

9.3.4 Access Roads

No new transmission access roads are proposed; existing and proposed roadways for OCEC Unit 1 will be utilized for transmission line access. Improvements may be made to these roads, depending on their existing conditions. Structure pads may be constructed at structure locations to provide a level, stabilized work area. They will be unpaved, typically constructed to approximately 6 inches above expected seasonal high water levels and will vary in size depending on the needed work area.

9.3.5 Cost Projections

The estimated cost for the transmission interconnection and integration is \$52 million. Final cost ranges will be developed incorporating right-of-way preparation, pad construction, property rights acquisition, engineering design, and construction costs.

9.3.6 Social and Political Environment of the Corridor Area

The transmission interconnection corridor is contained within the linear facilities corridor; the social and political environment is consistent with the descriptions provided in Sections 3.2.1, 3.2.2, 3.2.4, 3.2.5, and 3.2.6., including governmental jurisdictions, zoning and land use plans, easements, scenic, cultural, and natural landmarks, and archaeological and historic sites.

9.3.7 Biological and Physical Environment of the Corridor Area

The existing land use and vegetation cover types within the transmission interconnection corridor are identified on Figure 9.3.7-1, classified in accordance with the FDOT's Florida Land Use, Cover, and Forms Classification System (FLUCFCS). The corridor contains approximately 3 acres of improved pasture (FLUCFCS Code 211), 1.41 acres of upland hardwood-conifer forest (FLUCFCS Code 434), and 0.45 acres of ditches (FLUCFCS Code 511). The vegetative community composition and ecological characteristics for each habitat type within the corridor is consistent with those described in Sections 3.3.6.1, 3.3.6.2, 3.3.6.3, and 3.3.6.4. No threatened or endangered species have been observed within the transmission interconnection corridor.

Affected waters and wetlands within the transmission interconnection corridor are limited to 0.45 acre of man-made upland-cut ditches between the existing access road and the eastern edge of the corridor (Figure 9.3.7-1). An approximately 0.07 acre segment of ditch is proposed to be filled, while an approximately 0.38 acre segment of ditch along the eastern edge of the corridor will be rerouted or culverted to maintain flow.

9.4 Effects of Right-of-way Preparation and Transmission Line Construction

Construction phases will typically consist of right-of-way clearing, structure pad construction (where necessary), line construction, and right-of-way restoration. The following construction phases generally will be performed sequentially along the right-of-way such that activities in any one area will be short-termed. All activities will conform to applicable state and local regulations. In the event of inadvertent equipment or vehicle fluid release, construction crews will be equipped with spill containment and absorption materials.

9.4.1 Construction Techniques

Right-of-way clearing will be required between the Site and the Martin-Poinsett right-of-way. All trees and shrubs within the right-of-way limits whose mature height could exceed 14 ft and are proximate to the transmission lines will be evaluated for pruning or clearing to ground level consistent with the requirements of American National Standards Institute (ANSI) A300 (Part I)-2000 Pruning Standards and ANSI Z133.1-2000 Pruning, Repairing, Maintaining and Removing Trees, and Cutting Brush-Safety Requirements. Where trees are cut to ground level, stumps will either be cut or ground down to natural grade and treated with an approved herbicide to prevent regrowth, or the entire stump and root mat will be grubbed to at or below grade. Chipped material will be spread uniformly in uplands along the right-of-way, disposed of at an off-site landfill, or piled and burned within the limits of the Site.

Access roads and structure pads are typically needed to provide efficient, safe, and cost-effective ingress and egress to the transmission line structures. Structure pads will be used for initial line construction and will remain for routine maintenance and emergency access. It is anticipated that the existing and proposed roadways for OCEC Unit 1 will be utilized to provide access. In some cases, these existing access roads may need to be improved to accommodate the construction and maintenance equipment. Construction of pads (where required) in uplands is accomplished by first completing the clearing and grubbing of the footprint and then placing, spreading, shaping, and compacting hauled clean fill to the design elevation.

Transmission structures are generally delivered to the work area using semi-trailer trucks, and assembly occurs as close as possible to the design location. The initial step of transmission line construction is installation of foundations. Foundations (for structures that are not directly embedded) may be steel or concrete. If steel caisson foundations are used, the caisson will be vibrated into the ground using a vibratory hammer suspended from a crane. If concrete foundations are used, a hole will be excavated using an augering machine. Reinforcing steel will then be installed, and concrete will be hauled and poured in place by concrete mixing trucks. If precast foundations are used, a backhoe may be used to excavate the hole. Hauled fill will be dumped and compacted before the foundation is laid. Finally, any remaining holes will be backfilled.

Dewatering of the holes during construction, in the unlikely event it is required, may discharge water to catch basins, temporary settling basins, or drainage ditches if the water is sufficiently free of sediments. The concrete single-pole structures will be embedded directly into the hole and backfilled with crushed rock. Excess excavated fill material will be spread evenly onto adjacent uplands, preferably onto existing or recently constructed access roads or pads. Multiple-piece structures can be assembled on the ground prior to lifting in place, or they can be installed in the air one section at a time with the use of a crane.

Structures will be framed and erected using cranes and other support vehicles. After the structures are set, various pieces of wire-pulling equipment will be used to install the conductors and overhead ground wires. Bulldozers, tractors, trailers, and light vehicles may be used to support line construction.

Guys and anchors will be required at heavy angle structure locations. Anchors to be used will typically be either multi-helix screw-in-type anchors or pile-type anchors. Pile anchors provide strength applications by embedding a short reinforced concrete pole section to a required depth with backfill. Guy wires are attached to hardware connected to the pole section extending above the

ground. Multi-helix anchors are installed using truck-mounted equipment to screw the anchor into the ground to the required length or torque to meet design requirements.

Construction will be performed so as to minimize disturbance to natural ground cover. FPL will also use turbidity screens and other erosion control devices (silt fences) where there is erosion potential to minimize any impacts to wetlands and water bodies and ensure that state water quality standards for turbidity are met. Cranes, bucket trucks, flatbed trucks, semi-trailer trucks, front-end loaders, bulldozers, and other support vehicles are typically used in structure erection and anchor/guying installations. Laydown areas for equipment and materials will be located in upland areas of the Site.

Insulator and conductor installation follows structure erection. Installing conductors between structures requires stringing a lead line between each structure's stringing block to form a continuous connection between end points of a conductor stringing pull. The lead line is used to pull the conductors into position. The conductor is then tensioned to design specifications, transferred to the support clamp at the structure, and then clipped into its final position. This operation is repeated for each of the conductors and overhead ground wires on the transmission line. Bucket trucks, wire-pulling equipment, wire reels, trailers, tensioners, and other support vehicles are typically used in conductor and overhead ground wire installation operations.

Once transmission line construction is completed, construction debris, if any, will be removed, and FPL will employ various methods to restore the right-of-way, such as stabilizing potentially erodible areas through seeding and mulching.

9.4.2 Environmental Resource Permit (ERP)

The 0.45-acre area of unavoidable ditch impact associated with the transmission interconnection corridor is included in the OCEC ERP application, Appendix 10.4, which includes a discussion of the proposed compensatory mitigation to offset the loss of wetland functions.

9.4.3 Solid Wastes

Solid waste generated from transmission line right-of-way preparation and line construction typically consists of cleared vegetation and construction-related debris. Solid wastes will be collected and removed for disposal in compliance with state and local landfill regulations, chipped and spread in uplands, or piled and burned within the Site in compliance with state and local regulations.

9.4.4 Changes to Vegetation, Wildlife, and Aquatic Life

Impacts on terrestrial and aquatic systems and species associated with transmission line right-of-way preparation and construction depend primarily on the location of the selected right-of-way and the



clearing and construction techniques. The OCEC transmission interconnection corridor traverses a short distance of agriculturally-altered lands; it is not anticipated that transmission line construction or maintenance will have any significant impact on native vegetation, wildlife, or aquatic life.

9.4.5 Impact on Human Populations

Right-of-way preparation and transmission line construction will result in minimal impacts on human populations, due to the remote rural location of the corridor, limited extent of the proposed transmission interconnection between the Site and the Martin-Poinsett right-of-way, and limited duration of construction.

Construction activities should be largely confined to structure locations. It is anticipated that for heavy angle structures, no foundation will be required, as the structures will be directly embedded into the ground. Concrete foundations are anticipated to be used for tangent locations. Construction at these locations takes approximately 1 day per foundation with a crew of 10 to 12 members.

After foundation construction, if required, a small crew, usually 8 to 12 members with a small crane, will assemble the structure. This activity typically takes only a few hours per structure. The crew will then erect the structure on the foundation with a larger crane. This activity typically also takes only a few hours per structure.

Once a section of structures is erected, the process of stringing (installing) the conductors starts. Various pieces of wire-pulling equipment and support vehicles will be used during this installation of the conductors, requiring approximately 3-5 days.

The final phase of construction involves cleanup and restoration of those areas that were affected by the transmission line construction.

Activities will typically be scheduled during daylight hours, subject to availability of transmission line clearances. Inconvenience to human populations attributable to construction of the Project's transmission lines will be minimal and temporary.

9.4.6 Impact on Regional Scenic, Cultural, and Natural Landmarks

As discussed in Sections 3.2.1 and 3.2.5, there are no regional scenic, cultural, or natural landmarks in the vicinity of the Project; therefore no adverse impacts are anticipated as a result of transmission line construction between the Site and the Martin-Poinsett right-of-way.

9.4.7 *Impact on Archaeological and Historic Sites*

As discussed in Section 3.2.6, it was determined that the Site contains no significant archaeological or historic resources that would be eligible for listing in the National Register of Historic Places. Based on the results of the Phase I cultural resource assessment (Appendix 10.7.2), no areas identified as having a high probability for archaeological sites are located within the transmission interconnection corridor. Construction of the transmission lines is not anticipated to have any impact upon archaeological and historic sites.

9.5 Postconstruction Impacts and Effects of Maintenance

9.5.1 *Maintenance Techniques*

Safe and reliable operation of the new transmission lines will be maintained through regular inspection of the poles, conductors, insulators, hardware, access areas, and vegetation in proximity to the facilities. Electric transmission lines normally require minimal maintenance; however, FPL will inspect the transmission lines on a regular basis to look for problems caused by weather, vandalism, vegetation regrowth, etc.

Vegetation will be maintained in the right-of-way to ensure the safe, reliable operation of the transmission lines. FPL will manage vegetation on the transmission line right-of-way by a variety of methods, including trimming, mowing, and the use of approved growth regulators and herbicides, targeting species that are incompatible with the safe access and operation and maintenance of the transmission system.

Some vegetation maintenance activities outside the right-of-way are occasionally necessary. To enhance the safe, reliable operation of the proposed transmission lines, FPL may trim or remove danger timber outside the FPL right-of-way in coordination with the adjacent property owner(s). Danger timber includes trees in danger of falling or leaning into the conductors or, in areas of wildfire hazard, other vegetation that may provide excessive fuel loading in proximity to the transmission lines.

9.5.2 *Multiple Uses*

Due to the limited distance between the Site and the Martin-Poinsett right-of-way, no reasonable opportunities for multiple uses of the transmission interconnection corridor are anticipated.

9.5.3 *Changes in Species Populations*

Changes in local species populations are not expected as a result of transmission line presence and maintenance. Displacement of individuals from the immediate right-of-way during construction activities will be temporary. These displaced species are expected to reinhabit the right-of-way areas



after construction. No animal or plant species is expected to be permanently displaced from the transmission line right-of-way area. Due to right-of-way preparation and maintenance, approximately 1.4 acres of tree canopy clearing will be necessary. Clearing of overstory vegetation and subsequent maintenance requirements will not result in the loss of entire tracts or significant portions of upland forest or regional wildlife habitat types, and no change in species populations is anticipated.

9.5.4 *Effects of Public Access*

No increased public or vehicle access is anticipated following construction except by FPL personnel performing routine and emergency maintenance.

9.5.5 *Other Postconstruction Effects*

Electric and Magnetic Fields (EMF)

The two proposed 500-kV lines will comply with the Florida EMF regulations specified in Chapter 62-814, F.A.C. (the Florida EMF Rule). The strength of the magnetic field under a transmission line is primarily a function of the amount of current carried by the transmission line and the height of the conductors above the ground. The electric field is primarily a function of the voltage impressed on the transmission line and the conductor height above the ground. Consequently, the electric field near the transmission line is relatively constant over time, but the magnetic field fluctuates depending on customer demand for power.

The EMF produced by the proposed transmission lines was calculated in accordance with the requirements of Section 62-814.460, F.A.C. The fields associated with the new transmission lines comply with the standards set forth in the Florida EMF Rule, as demonstrated in Table 9.5-1. Although the current carried by the transmission lines will vary throughout the day, the value used in the calculations is the maximum quantity of electric current that can be continuously carried on the conductors, as required by Chapter 62-814, F.A.C.

Table 9.5-1 presents the maximum EMF that can be produced by the proposed typical transmission line configuration under maximum operating conditions at various cross-section locations illustrated in Figure 9.5-1. These fields comply with FDEP rule requirements for new 500-kV transmission lines. FPL will provide detailed data and modeling results to FDEP as required, depicting the maximum EMF at maximum operating conditions both on the right-of-way and laterally under the transmission line to demonstrate compliance with the EMF field limits. This submittal is provided as a separate document filed concurrently with this SCA.

Audible Noise

The audible noise associated with a transmission line is generated by either corona from the conductors or from gap-type discharges. Gap noise is typically due to faulty or failed hardware and easily corrected. Corona is a phenomenon that occurs when there is an irregularity on the surface of the conductor, such as buildup from fog, water droplets, or significant particulate matter. Corona activity at the surface of the conductors produces a low-level audible noise that is a slight humming sound. Under wet conditions, higher audible noise levels are experienced than will occur under dry conditions. However, background noise from various sources (inclement weather, traffic, agricultural activity, etc.) has the effect of masking transmission line noise.

Audible noise calculations were performed for the typical transmission line cross-section using corona field effects software produced by the Bonneville Power Administration (BPA), U.S. Department of Energy. This software provides estimated median (L50) noise levels for fair and rainy weather as a function of distance from the edge of right-of-way for the modeled transmission line configurations.

For a small portion of time, when the conductors are wet from rainfall or heavy fog, the transmission line noise will increase. During wet conditions, the median (L50) A-weighted sound pressure level of the transmission line noise will be 47.1 dBA at the edge of the right-of-way. Calculated sound levels are listed in decibels relative to an A-weighted value (dBA) that approximates the frequency response of the human ear. The maximum calculated median audible noise levels at edge of right-of-way during fair or dry weather are significantly lower, in the 20- to 30-dBA range. To provide some perspective on these calculated noise levels, 40 to 50 dBA corresponds to typical noise levels in a suburban living room, and 20 to 30 dBA is comparable to a bedroom at night.

During fair weather and under normal operating conditions, the audible noise levels calculated for the proposed transmission line designs will be less than the ambient outdoor noise levels. Based on these calculations, noise levels produced by the proposed transmission lines will comply with all applicable Indian River County noise limits. The most stringent Indian River County noise limit as an L50 is 55 dBA during the nighttime for residential zoning districts.

Radio and Television Interference

Corona, which can occur on high-voltage transmission lines, produces electromagnetic (EM) noise. When this noise is sufficiently strong, it can cause interference with broadcast radio and television



signals. Since corona is enhanced by water vapor, the magnitude of this noise is greater during wet or rainy periods than during dry or fair weather periods.

Broadcast signals in the amplitude-modulated (AM) radio band and two television bands (very-high frequency [VHF] and ultra-high frequency [UHF] bands) are susceptible to this potential interference. EM noise from corona is not expected to cause interference with frequency-modulated (FM) radio, cable or satellite television systems, cellular telephones, home cordless telephones, or wireless networking.

In general, the EM noise from transmission line corona decreases with increasing distance from the right-of-way and with increasing noise frequencies (shorter wavelengths). Thus, interference effects are greatest immediately adjacent to the right-of-way and at the lower broadcast frequencies.

Due to the rural nature of the transmission line route and the conservative evaluation method, the overall impact to radio or television reception is expected to be minimal with the main potential for impact being the AM radio band. Should any entity experience interference as a result of these transmission lines, FPL will work with the entity to resolve the interference issue.

Induced Currents

Induced currents from EMF produced by the transmission lines are limited to safe levels by meeting the FDEP limits for field magnitudes on the right-of-way and at the edge of the right-of-way. Electric field limits guard against startle shocks that can occur when contacting other objects beneath the line. Furthermore, minimum clearances for the lines are designed to meet the NESC requirements for 5 milliamperes or less of short-circuit current (induced current due to electric field) when the largest anticipated vehicle or equipment is situated directly under the line.

FPL standards require that fences and gates either crossing or parallel to and within the transmission rights-of-way be grounded to mitigate shock hazard. FPL will provide this grounding as part of its construction activities.

Safety

FPL's transmission line facilities are designed to comply with all applicable codes, guidelines, and standards. The primary code used in the design of transmission lines is the NESC, 2012 edition. The NESC is an ANSI standard that covers electrical clearances and loading and strength requirements, including extreme wind. Codes and standards of other agencies and standard organizations that



provide rules, guidelines, and conditions for particulars not specified by the NESC, used to design the proposed transmission lines, include:

- Occupational Safety and Health Administration (OSHA) rules provide requirements for safe minimum approach distances
- American Society of Civil Engineers (ASCE) Manual 74, Guidelines for Electrical Transmission Line Structural Loading, and Standard 48-05, Design of Steel Transmission Pole Structures
- FAA guidelines cover requirements in the vicinity of airports
- FDOT 2010 Utility Accommodation Manual

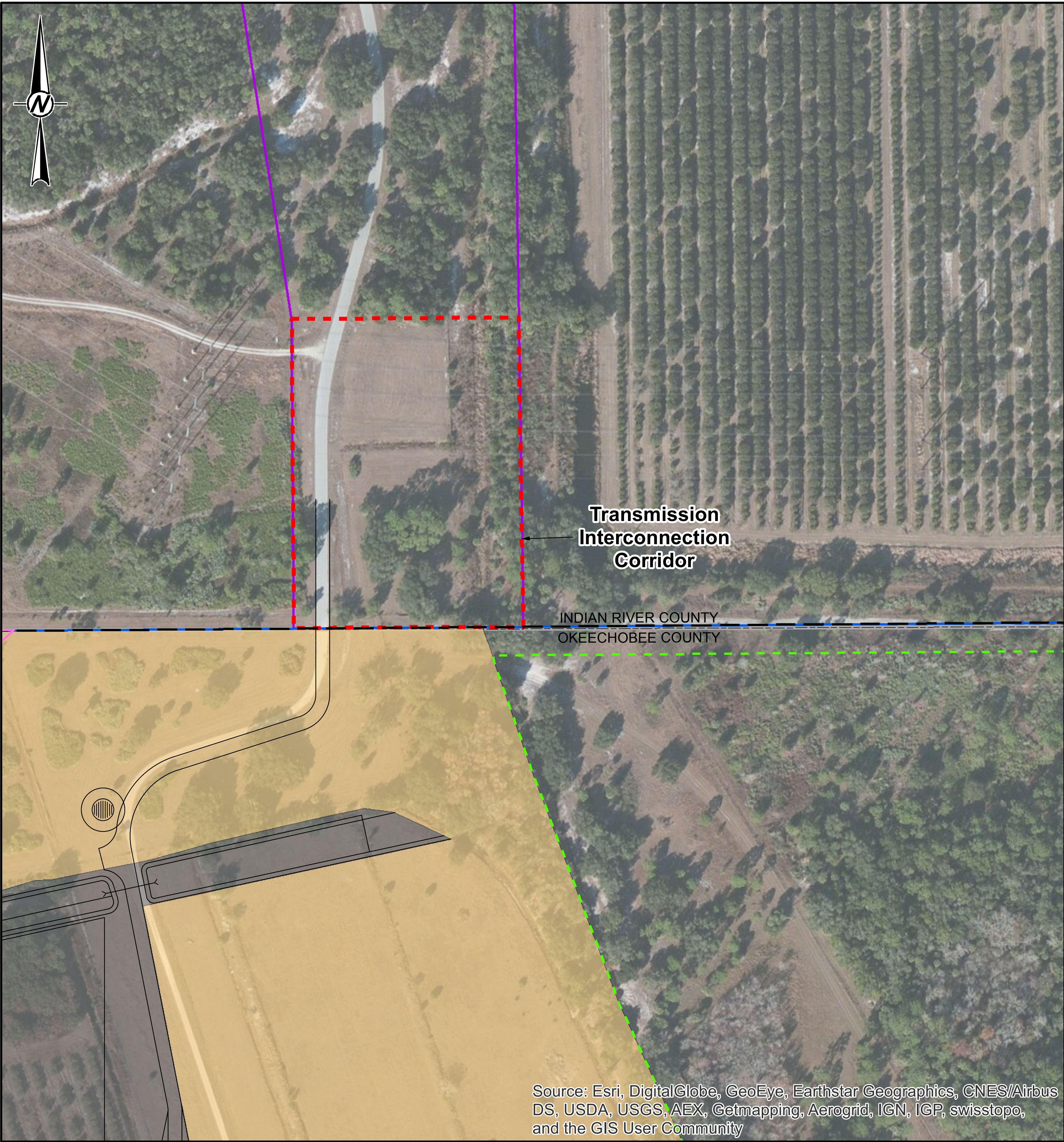
These codes, guidelines, and standards provide design parameters and guidelines with the goal of protecting public safety.

TABLES

TABLE 9.5-1
MAXIMUM EMF CAPABLE OF BEING PRODUCED BY THE TRANSMISSION LINES FOR THE OCEC INTERCONNECTION

Cross-Section Location	Ampacity of new lines (Amps)	Right-of-Way Width (ft)	Electric Field (kV/m)			Magnetic Field (mG)	
			On Right- of-Way (ft)	Left Edge of Right-of-Way	Right edge of Right-of-Way	Left Edge of Right-of- Way	Right edge of Right-of-Way
1-1 (Substation)	5400	9,350	0	0	0	0.16	0.24
2-2	5400	396	5.6	1.02	1.2	133.12	147.8
3-3	5400	330	4.5	1.85	2.43	136.36	196.1
4-4	5400	330	3.3	1.74	1.98	142.45	173.54

FIGURES



LEGEND

- Facility Layout
- ▮ Certified Site Boundary
- ▮ Mitigation Area
- ▮ FPL Owned Property
- ▮ Linear Facility Corridor
- ▮ Transmission Interconnection Corridor
- ▮ OCEC Unit 1
- ▮ Open Space
- ▮ Future Solar Area
- ▮ County Boundary

REFERENCE(S)

COORDINATE SYSTEM: NAD 1983 STATEPLANE FLORIDA EAST FIPS 0901 FEET
PROJECTION: TRANSVERSE MERCATOR
DATUM: NORTH AMERICAN 1983

CLIENT
FPL

PROJECT
OKEECHOBEE CLEAN ENERGY CENTER

TITLE
TRANSMISSION INTERCONNECTION
CORRIDOR

CONSULTANT

YYYY-MM-DD 2015-09-08

DESIGNED NRL

PREPARED NRL

REVIEWED KAB

APPROVED KFK



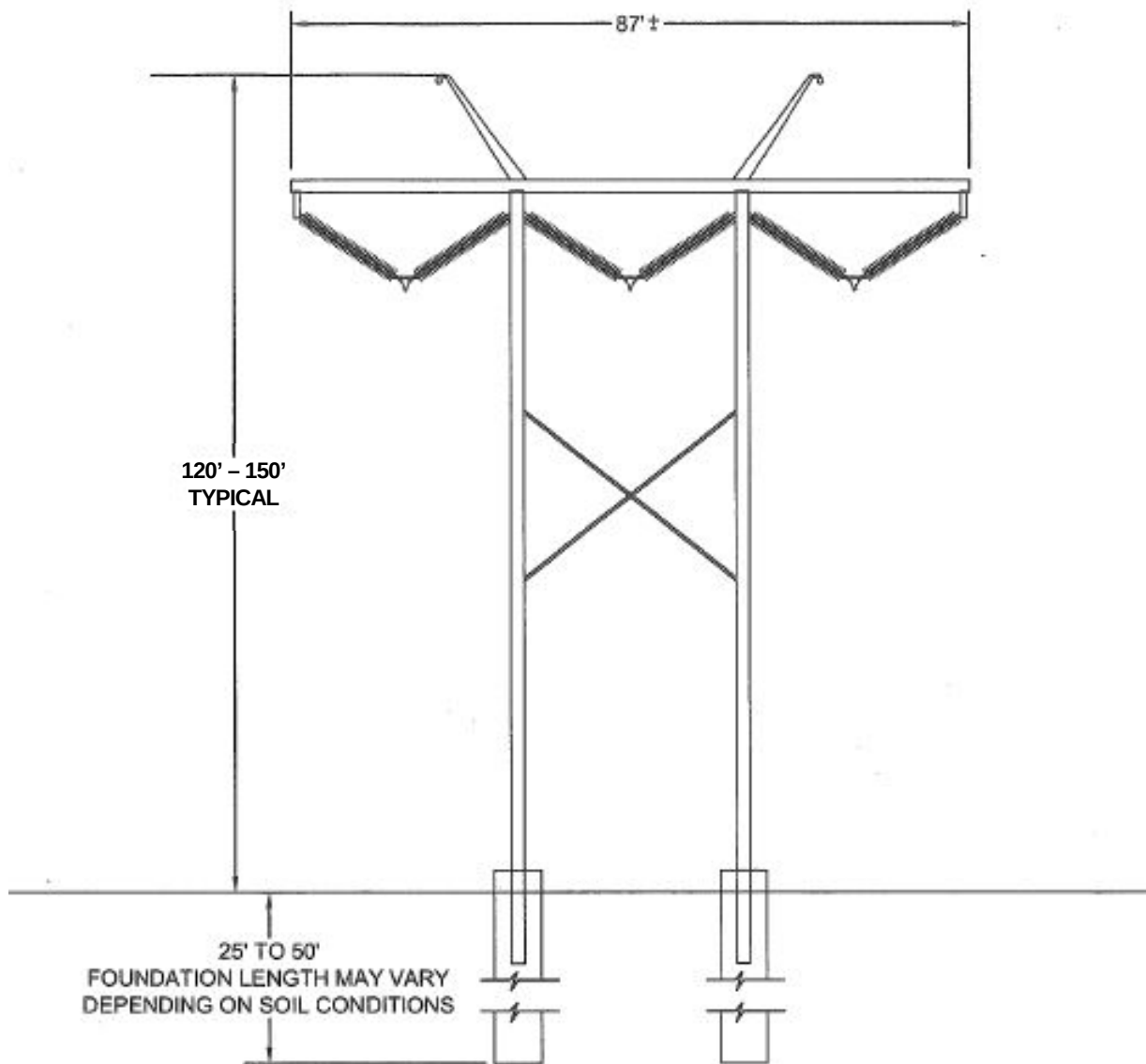
PROJECT NO.
1414979

CONTROL
B050

REV.
0

FIGURE
9.1-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A



CLIENT
FPL

PROJECT
OKECHOBEE CLEAN ENERGY CENTER

CONSULTANT



YYYY-MM-DD 2015-09-17

PREPARED NRL

DESIGN NRL

REVIEW KAB

APPROVED KFK

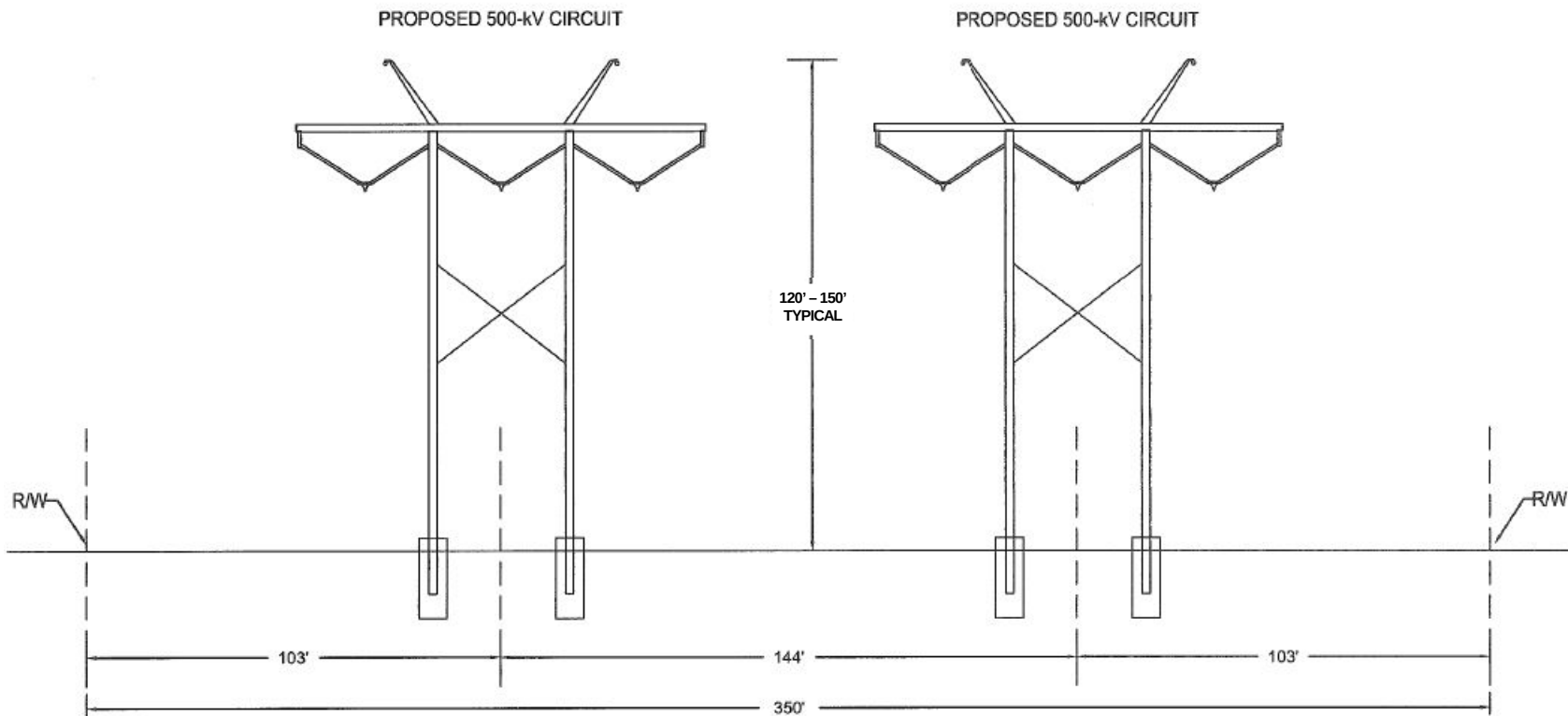
TITLE
TYPICAL H-FRAME TANGENT STRUCTURE DESIGN

PROJECT No.
1414979

CONTROL
4.10-2

Rev.
0

FIGURE
9.2-1



NOTE: FOUNDATION LENGTH WILL VARY DEPENDING ON SOIL CONDITIONS

CLIENT
FPL

CONSULTANT



YYYY-MM-DD 2015-09-17

PREPARED NRL

DESIGN NRL

REVIEW KAB

APPROVED KFK

PROJECT
OKEECHOBEE CLEAN ENERGY CENTER

TITLE
TWO 500-kV CIRCUITS IN A 350-FT RIGHT-OF-WAY

PROJECT No.
1414979

CONTROL
4.10-3

Rev.
0

FIGURE
9.2-2

G:\PROJECTS\FLOheechobee99_PROJECTS\1414979B_SCA_Project02_PRODUCTION\MXD\1414979_B051_TL\onlineconnectCorridorAndUseMap.mxd



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LEGEND

- Facility Layout
- Certified Site Boundary
- - - Mitigation Area
- FPL Owned Property
- Linear Facility Corridor
- - - Transmission Interconnection Corridor
- Open Space
- Vegetation / Land Use
- 211, Improved Pastures
- 434, Hardwood-Coniferous Mixed
- 511, Ditches

REFERENCE(S)

PROPERTY, LINEAR FACILITY CORRIDOR, CERTIFIED SITE BOUNDARY, OPEN SPACE, MITIGATION AREA: FPL & GOLDER ASSOCIATES INC., 2015
FACILITY LAYOUT, BLACK & VEATCH, 2015
LANDUSE, GOLDER ASSOCIATES INC., 2015

CLIENT

FPL

PROJECT

OKEECHOBEE CLEAN ENERGY CENTER

TITLE

**TRANSMISSION INTERCONNECTION
CORRIDOR LANDUSE**

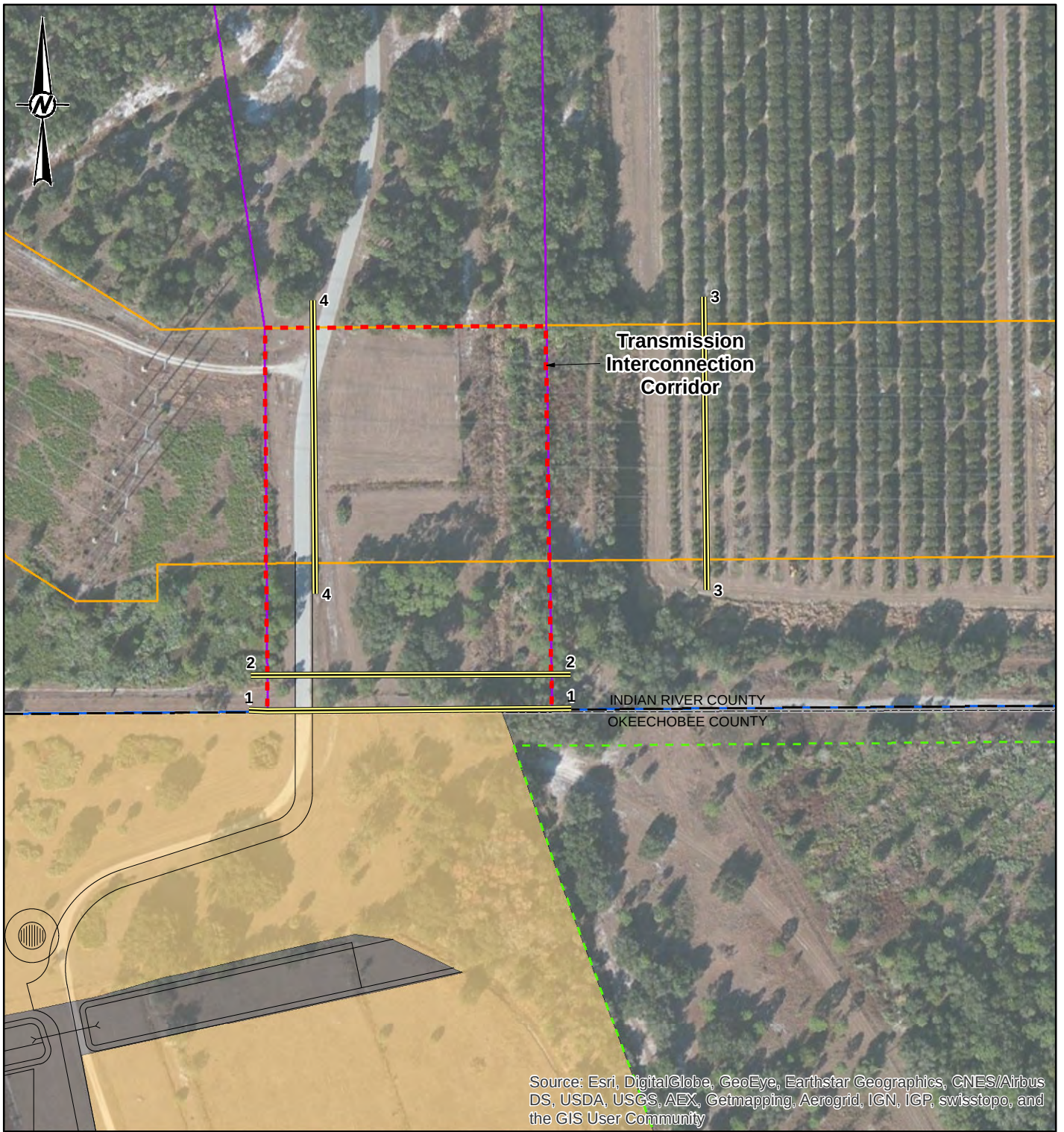


FPL

YYYY-MM-DD	2015-09-06
DESIGNED	NRL
PREPARED	NRL
REVIEWED	KAB
APPROVED	KFK

PROJECT NO. 1414979	CONTROL B051	REV. 0	FIGURE 9.3.7-1
------------------------	-----------------	-----------	--------------------------

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B 28mm



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LEGEND

- Facility Layout
- Certified Site Boundary
- EMF Cross Sections
- Mitigation Area
- FPL Owned Property
- Linear Facility Corridor
- Transmission Interconnection Corridor
- Martin-Poinsett ROW
- OCEC Unit 1
- Open Space
- Future Solar Area
- County Boundary



REFERENCE(S)

COORDINATE SYSTEM: NAD 1983 STATEPLANE FLORIDA EAST FIPS 0901 FEET
PROJECTION: TRANSVERSE MERCATOR
DATUM: NORTH AMERICAN 1983

CLIENT
FPL

PROJECT
OKEECHOBEE CLEAN ENERGY CENTER

TITLE
EMF CROSS SECTIONS



YYYY-MM-DD	2015-09-21
DESIGNED	NRL
PREPARED	GFD
REVIEWED	KAB
APPROVED	KFK

PROJECT NO.
1414979

CONTROL
B073

REV.
0

FIGURE
9.5-1

1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A

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APPENDIX 10.1
COORDINATION

10.1 Coordination

Federal, State, regional, and local agencies were contacted by FPL representatives to inform these agencies about the FPL Okeechobee Clean Energy Center Project and to solicit input regarding the Project. The individuals contacted are listed below. In addition, a list of other groups and organizations that were contacted about the Project is also included.

FEDERAL

U.S. Army Corps of Engineers

Susan Kaynor
Samantha Rice
Garret Lips

U.S. Fish and Wildlife Service

Ashleigh Blackford
Ted Martin
Sandra Sneckenberger
Mary Peterson

STATE

Florida Department of Environmental Protection

Southeast District Office

Paul Wierzbicki
Benny Luedike
John Renfranz
Cindy Lott
Indar Jagnarine
Scott Trainor
Janice Szuflita
Diane Pupa
Diane Piccolo
John Armstrong
Marie Lacroix
Michelle Piccolo
Lee Hoefert

Siting Office

Ann Seiler
Bobby Bull
Justin Green
Cindy Mulkey

Division of Air Resources Management - Tallahassee

Brian Arccardo
David Read
Al Linero
Tom Rogers

Florida Fish and Wildlife Conservation Commission

Jennifer Goff
Marissa Krueger
Scott Sanders

Florida Department of State – Division of Historical Resources

Robert F. Bendus, Director

Florida Department of Transportation

Jim Kerwin
Jasmin Raffington
Bob Crawley
Larry Hymowitz
Walter Spiva

Florida Department of Economic Opportunity

Scott Rogers

St. Johns River Water Management District

Callie Register
Richard Burklew
Scott Laidlaw
Pat Renish
Karen Ferguson
Doug Hearn
Kristian Holmberg
Patrick Burger
Melissa Parsons

Treasure Coast Regional Planning Council

Peter Merritt
Michael Busha

Central Florida Regional Planning Council

Pat Steed

LOCAL

Okeechobee County

Bill Royce
Lee Evett
Jennifer Gerrardo
Mike Owens
Karl Holtkamp (Fire Rescue)
Ralph Franklin (Fire Rescue)
Randy Thomas (Sheriff's Office)
Mitch Smeykal
Tara Rowley (Economic Council)

Indian River County

Kathy Charest
Stan Boling
Chris Mora
John McCoy
Roland Deblois
Bill DeBaal
Vincent Burke
Eric Charest
John King
Pat White
Joe Baird
Arjuna Weragodo
Jeanne Bresett

Elected Officials

City of Okeechobee

Gary Ritter
Dowling Watford

Okeechobee County

Frank Irby
Terry Burroughs
Margaret Helton
Bryant Culpepper

Indian River County

Tim Zorc
Wesley Davis
Joseph Flescher
Peter O'Bryan
Bob Solari

OTHER GROUPS AND ORGANIZATIONS

Florida Audubon

Eric Draper
Paul Grey
Charles Lee

Indian River State College

Dr. Edwin Massey
Andrew Treadwell
Jose Farinos
Dr. Kevin Cooper

Sierra Club

Frank Jackalone

The Nature Conservancy

Lucy Miller
Temperince Morgan

Florida Wildlife Federation

Manley Fuller

Pelican Island Audubon Society

Richard Baker

APPENDIX 10.2

FEDERAL PERMIT APPLICATIONS OR APPROVALS

APPENDIX 10.2.1

316 DEMONSTRATIONS

**[Note: The Project does not require a 316 demonstration.
Refer to Chapter 6 of the SCA.]**

APPENDIX 10.2.2

NPDES APPLICATIONS/PERMITS

**[Note: An NPDES Industrial Wastewater Permit
is not required for the Project. See SCA Chapter 6 and Appendix 10.2.8]**

APPENDIX 10.2.3

HAZARDOUS WASTE DISPOSAL APPLICATION/PERMIT

**[Note: No Federal or State application or permit for
Hazardous waste disposal is required for the Project.]**

APPENDIX 10.2.4

SECTION 10 OR 404 APPLICATIONS/PERMITS

(USACE Application submitted 08/11/15.

See Appendix 10.4 Environmental Resource Permit)

APPENDIX 10.2.5

**PREVENTION OF SIGNIFICANT DETERIORATION
PERMIT APPLICATION
(See Volume II)**

APPENDIX 10.2.6

AIR OPERATION PERMIT

[Note: There are no existing air operating permits for the facility. A Title V Federal Air Operating Permit Application for OCEC Unit 1 will be applied for at least 90 days prior to expiration of the Air Construction/PSD Permit, but no later than 180 days after completing the required work and commencing operation.]

APPENDIX 10.2.7

COASTAL ZONE MANAGEMENT CERTIFICATIONS

[Note: The Coastal Management Act of 1978 (Section 380.21-380.25, Florida Statutes) requires that the Coastal Zone Management Section of FDEP be responsible for certification of consistency with the Florida Coastal Management Program (FCMP) for all federal licenses, permits, activities, and projects listed in Section 380.23(3)(c), Florida Statutes, when such activities are subject to federal consistency review and affect land or water use, are seaward of the jurisdiction of the state, or there is no state agency with sole jurisdiction for such consistency review. For the Project, there are no requirements related to Coastal Zone Management.]

APPENDIX 10.2.8

EXPLORATORY WELL CONSTRUCTION, TESTING, AND MONITOR WELL COMPLETION PERMIT

[Note: This Appendix is an Exploratory Well Permit. This Appendix is being included in the Site Certification Application for information purposes.]



**FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION**

BOB MARTINEZ CENTER
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

RICK SCOTT
GOVERNOR

CARLOS LOPEZ-CANTERA
LT. GOVERNOR

JONATHAN P. STEVERSON
SECRETARY

SENT VIA ELECTRONIC MAIL

In the Matter of an Application for Permit by:

14 April 2015

Mr. Randall R. LaBauve, Vice President
Florida Power & Light Company
700 Universe Boulevard
Juno Beach, Florida 33408
Randall.R.LaBauve@FPL.com

FDEP File No.: 0330373-001-UC/1EX
FDEP WACS No.: 102139
Okeechobee County
Okeechobee Exploratory Well
Class V Exploratory Permit

NOTICE OF PERMIT

Enclosed is Permit Number: [0330373-001-UC/1EX](#) to construct an exploratory Class V well, at the Florida Power & Light Company Okeechobee Exploratory Well site.

Any party to this Order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rules 9.110 and 9.190, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, agency_clerk@dep.state.fl.us; and by filing a copy of the Notice of appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this Notice is filed with the Clerk of the Department.

Executed in Leon County, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

Joseph Haberfeld
Aquifer Protection Administrator

PERMITTEE: Mr. Randall R. LaBauve, Vice President
FP&L Company Okeechobee County
Class V, Injection Well System

WACS ID Number: 102139
Permit Number: 0330373-001-UC/1EX
Date: April 14, 2015

CERTIFICATE OF SERVICE

The undersigned designated clerk hereby certifies that this NOTICE OF PERMIT and all copies were mailed before the close of business on Tuesday, April 14, 2015, to the listed persons.

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to Section.120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged


Clerk

April 14, 2015

Date

Copies Furnished To:

Joseph Haberfeld, FDEP/TLH
Neil Campbell, FDEP/TLH
George Heuler, FDEP/TLH
Len Fishkin, FDEP/WPB
Agnes Ramsey, ES/FPL
Matthew Raffenberg, EM/FPL
Andrea Holtz, P.E./Holtz Eng.
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Mary Genung, FDEP/TLH
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FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

BOB MARTINEZ CENTER
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RICK SCOTT
GOVERNOR

CARLOS LOPEZ-CANTERA
LT. GOVERNOR

JONATHAN P. STEVERSON
SECRETARY

Underground Injection Control Class V Exploratory Well Permit

Permittee:

Florida Power & Light Company

Responsible Official:

Mr. Randall R. LaBauve, Vice President
700 Universe Boulevard
Juno Beach, Florida 33408
Randall.R.LaBauve@FPL.com

Permit/Certification

Permit ID Number: 0330373-001-UC/1EX
WACS ID Number: 102139
Date of Issuance: April 14, 2015
Date of Expiration: April 13, 2020
Permit Processor: Neil I. Campbell

Section/Township/Range: Sec2 / T33S / R35E

Facility

FPL Okeechobee County Site
3193 Northeast 366th Trail
Okeechobee, Florida 34972

Location

County: Okeechobee
Latitude: 27° 38' 00.122" North
Longitude: 80° 47' 42.2749" West

Project: Class V, Exploratory Well

This permit is issued under the provisions of Chapter 403, Florida Statutes, and the rules adopted thereunder. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows.

TO CONSTRUCT: One (1), Class V, exploratory well, identified as "EW-1" and an associated dual-zone monitor well, identified as "DZMW-1" to obtain hydrologic and geologic information to determine the design criteria and feasibility of using an injection well system to dispose of non-hazardous construction-related water during construction of a potential new power plant to be located on the site of EW-1 and non-hazardous industrial wastewater from the operation of this potential power generation plant. The proposed EW-1 will have a tubing and packer design consisting of a pit pipe with a minimum diameter of 64-inches and 54-, 44-, 34-, and 24-inch diameter concentric steel casings and a nominal 18-inch (16.60-inch inside diameter) fiberglass reinforced pipe (FRP) tubing set inside the 24-inch diameter casing on a positive-seal packer. It is anticipated that the 24-inch diameter casing will be installed to a depth of approximately 2,600 feet below land surface (bls) and the well will have an anticipated total depth of approximately 3,200 feet bls. The annulus between the 24-inch casing and the FRP tubing will be filled with Baracor 100 mixed to a 1% solution to provide corrosion protection.

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IN ACCORDANCE WITH: The Application to Construct an exploratory well, DEP Form No. 62-528.900(1) received, October 24, 2014, responses to the Department's November 19, 2014, and December 22, 2014 request for additional information, and supporting information submitted to this agency.

LOCATION: FPL Okeechobee County Site, 3193 Northeast 366th Trail, Okeechobee, Florida 34972 in the county of Okeechobee, Florida.

The exploratory and monitoring wells at this facility are designated as follows:

Exploratory Well:

<i>Well Name</i>	<i>WACS Effluent Testsite ID</i>	<i>Total Well Depth *</i>	<i>Casing Diameter (inches)</i>	<i>Casing or Tubing Type</i>	<i>Casing or Interval*</i>
EW-1	14023	3200	64	Steel	40
			54	Steel	225
			44	Steel	425
			34	Steel	1700
			24	Steel	2600
			18	FRP	2590
			Open hole		From 2600 to 3200

* Estimated Approximate Depth in Feet Below Land Surface (BLS)

Monitoring Well:

<i>Well Name</i>	<i>WACS Testsite ID</i>	<i>Total Well Depth *</i>	<i>Casing Diameter (inches)</i>	<i>Casing Type or Interval</i>	<i>Casing or Interval Depth*</i>
DZMW-1	29465A 29465B	1870	44	Steel	40
			34	Steel	225
			24	Steel	425
			16	Steel	1600
					From 1600 to 1620
			6.625	FRP	1850
			Open Hole		From 1850 to 1870

* Estimated Approximate Depth in Feet Below Land Surface (BLS)

SUBJECT TO: Specific Conditions I-VI and General Conditions 1- 24.

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Specific Conditions

I. CONSTRUCTION REQUIREMENTS

A. General

1. This permit is for FPL Okeechobee County Site to construct one Class V, exploratory well (EW-1), monitoring well (DZMW-1), and water table monitoring wells surrounding the well pads. This permit does not authorize the construction of any other well or wells. *[62-528.440(2)(a)]*
2. No underground injection is allowed that causes or allows movement of fluid into an underground source of drinking water (USDW) if such fluid movement may cause a violation of any Primary Drinking Water Standard or may otherwise affect the health of persons. *[62-528.440(2)(c)]*
3. In the event a well must be plugged or abandoned, the permittee shall obtain a permit from the Department as required by Chapter 62-528, Florida Administrative Code (F.A.C.). When no longer used for their intended purpose, these wells shall be properly plugged and abandoned. Within 180 days of well abandonment, the permittee shall submit to the Department the proposed plugging method, pursuant to Rule 62-528.460, F.A.C. *[62-528.460(1) and 62-528.435(6)]*
4. If construction is to continue beyond the expiration date of this permit the permittee shall apply for, and obtain a construction permit renewal. The permittee shall apply for renewal of the construction permit at least 60 days prior to the expiration date of this permit. *[62-528.307(2)(a)]*

II. SITE REQUIREMENTS

1. A drilling pad shall be provided to collect spillage of contaminants and to support the heaviest load that will be encountered during drilling. *[62-528.410(9)(b)]*
2. No drilling operations shall begin without an approved disposal site for drilling fluids, cuttings, or waste. **It shall be the permittee's responsibility to obtain the necessary approval(s) for disposal prior to the start of construction.** A detailed disposal plan shall be submitted to the Department prior to the commencement of drilling activities for the exploratory and monitoring wells. *[62-528.410(9)(a)]*
3. Specific drilling pad dimensions and design drawings for Department record shall be provided prior to commencing construction and shortly after selection of the drilling contractor. *[62-528.410(9)(b)]*
4. The water table monitoring wells surrounding the well pads shall be sampled and analyzed prior to drilling the test exploratory or monitoring wells and then weekly thereafter. Sampling shall include specific conductance (umhos/cm), pH (standard units), chloride (mg/L), temperature (C) and water level (feet or PSI). *[62-528.410(9)(b)]*

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5. Hurricane Preparedness – Upon the issuance of a “Hurricane Watch” by the National Weather Service, the permittee shall secure the site to prevent damage. Preparations to be made include but are not necessarily limited to the following:
 - a. Secure all on-site salt and stockpiled additive materials to prevent surface and/or groundwater contamination.
 - b. Properly secure drilling equipment and rig(s) to prevent damage to well(s) and on-site treatment process equipment.

[62-528.307(1)(f)]

III. CONSTRUCTION AND TESTING REQUIREMENTS

A. General

1. Any construction, modification, repair, or abandonment of a well shall be performed by a Florida licensed water well contractor, licensed under Chapter 62-532, F.A.C., to engage in the business of construction, modification, repair or abandonment of a well. *[62-532.200]*
2. Well construction shall follow the requirements of Rule 62-532.500 for Water Well Construction Standards. *[62-532.500]*
3. The measurement points for drilling and logging operations shall be surveyed and referenced to the North American Vertical Datum of 1988 (NAVD 88) prior to the onset of drilling activities for the exploratory well and associated dual zone monitoring well. *[62-160.240(2)]*
4. Blow-out preventers or comparable flow control devices shall be installed on the wells prior to penetration of the Floridan aquifer system. *[62-528.410(9)(c)]*
5. The Department shall be notified 7 days prior to the initiation of drilling operations to the site. *[62-528.307(1)(g)]*
6. Waters spilled during construction or testing of the exploratory well system shall be contained and properly disposed. *[62-528.410(9)(b)]*
7. If additives that were not approved in the permit application are used during grouting, for lost circulation or for any other reason, information on their properties shall be submitted to the Department for review and approval prior to their use. *[62-528.410(5)(c)]*

B. Evaluation and Testing

1. The construction, geophysical logging program, and packer testing program shall be implemented in accordance with this permit and as proposed in the following submittals:
 - **October 24, 2014, “Well Construction Application”;**
 - **November 19, 2014 (received December 19, 2014), Response to RFI;**
 - **December 22, 2014 (received December 23, 2014), Response to RFI;***[62.528.307(1)(b)]*
2. Exact depths of casing seats and monitoring intervals will be determined based on field conditions and the results obtained during the construction and testing program, and are subject to the conditions of this permit. The exploratory well will be constructed first followed by the monitoring well. *[62-528.410(4)(c)]*
3. Packer tests shall be conducted in EW-1 and DZMW-1 to identify confinement and the base of the USDW.
 - a. The EW-1 packer testing program shall, at a minimum include seven packer tests, at intervals which are to be field determined.
 - b. At least one packer test shall be conducted in both the proposed upper and lower monitoring intervals of DZMW-1.
 - c. Packer tests shall be conducted in the anticipated confining intervals, between the lowermost zone of the USDW to the top of the potential injection zone. Results from the packer tests will contribute to the demonstration of confinement. To the extent feasible, the packer tests shall be performed over intervals that are sufficiently narrow so as not to include high hydraulic conductivity beds.
 - d. Water samples shall be collected from each packer test, and analyzed for total dissolved solids, chlorides, conductivity, ammonia, total Kjeldahl nitrogen, and sulfate.*[62-528.405(1)(a) and (2)(a)]*
4. Department approval is required for item a. below prior to initiating construction or prior to initiating any changes to Department-approved contract documents and for items b. – g. prior to completing the referenced activity :
 - a. Technical Specifications and spud date
 - b. Intermediate (34-inch) casing seat in the exploratory well
 - c. Final (24-inch) casing seat in the exploratory well
 - d. Final seat for tubing and packer in the exploratory well
 - e. Intermediate (16-inch) casing seat in the monitoring well
 - f. Final (6.625-inch O.D.) casing seat in the monitoring well
 - g. Monitoring zone selection (upper and lower zones)*[62-528.410(4)(c) and 62-528.420(4)(c)]*

5. The depth of the USDW and the background water quality of the monitoring zones shall be determined during drilling and testing using the following information:
 - a. Water samples from packer test data with analysis and interpretation.
 - b. Geophysical logging upon reaching the total depth of the appropriate pilot hole interval including the following logs: caliper, gamma, dual induction, borehole compensated sonic, pumping flowmeter, temperature, and fluid resistivity.
 - c. Plots of sonic porosity and apparent formation fluid resistivity (RWA). Interpretation will include calculation of sonic porosity and RWA. The input parameters used to make this calculation shall be provided.
[62-528.405(1)(a) and 62-528.405(3)(b)]
6. The upper monitoring interval shall be positioned at or slightly below the base of the USDW. This zone must be established within the lowermost portion of the USDW unless it can be demonstrated that no zone is present that can produce adequate water for collection of representative ground water samples. It is acceptable for the total dissolved solids concentration of this zone to be slightly greater than 10,000 mg/L.
[62-528.425(1)(g)4.]
7. The lower monitoring interval shall be positioned in a zone below the base of the USDW that can produce adequate water for collection of representative ground water samples. The purpose of the lower monitor zone is to verify the effectiveness of the confining unit and external mechanical integrity of the potential injection well. This zone shall be placed far enough below the base of the USDW to function as an early warning for fluid movement. *[62-528.425(1)(g)4.]*
8. The data and analysis supporting the selection of the monitoring intervals shall be submitted to the Department after the collection, interpretation, and analysis of all pertinent cores, geophysical logs, packer tests and analysis of fluid samples. The Department shall approve the final selection of the specific upper and lower monitoring intervals prior to monitor well completion. *[62-528.420(3)(c)]*
9. To identify the upper and lower monitoring zones, the following information from the injection well and all available on-site sources of data shall be analyzed, interpreted and submitted for Department review and approval:
 - a. Borehole televiewer or downhole television survey.
 - b. The characteristics of the transition zone (especially regarding total dissolved solids) in the vicinity of the USDW.
 - c. Packer test data including water quality (total dissolved solids, chlorides, sulfate, specific conductance, ammonia, and total Kjeldahl nitrogen, at a minimum).
 - d. The specific capacity of the proposed upper and lower monitoring zones based on packer testing results.
 - e. The identification of the base of the USDW.
[62-528.420(4)(c)]

10. Confinement shall be demonstrated using at a minimum, directly measured lithologic properties, geophysical evidence, and tests performed while pumping the formation. [62-528.405(2)(c)]
11. Test results pertaining to confinement shall include and/or specifically reference the following informational and quality control items:
 - a. Information that documents the calibration of tools, including field checks prior to testing.
 - b. The conditioning/development of the borehole prior to logging, including the techniques used and the time periods in which they were applied, and
 - c. Pertaining to packer/pump testing - recording the pumping rate regularly throughout the test to account for possible variations in the pumping rate, and providing information regarding the detection of packer leaks, if any, during testing.[62-528.405(2)(c)]
12. Representative samples of circulation fluid shall be collected when drilling with water, air, or reverse air during the drilling of the pilot holes of Exploratory Well EW-1 and Dual-Zone Monitoring Well DZMW-1. Representative samples of circulation fluid shall be collected at a minimum of every 90 feet in drilling. The circulation fluid samples shall be analyzed for chloride and specific conductance and any other parameters the Department directs in writing. [62-528.405(3)(b)]
13. If effluent is encountered or suspected during pilot hole drilling and testing, the Department shall be notified immediately by telephone and in writing and immediate appropriate precautionary measures shall be taken to prevent any upward fluid movement. [62-528.440(2)(d)]
14. The Permittee shall obtain Department approval prior to performing the short term injection test to use a groundwater source with total dissolved solids concentration greater than 3,000 mg/L. In such case, the Permittee shall provide documentation to the Department indicating the total dissolved solids concentration of the water to be used.

C. Mechanical Integrity

1. Mechanical Integrity.
 - a. Injection is prohibited until the permittee affirmatively demonstrates that the well has mechanical integrity and a construction permit has been applied for and issued for a Class I injection well. Note that for this Class V exploratory well, injection is not allowed even after demonstrating mechanical integrity.
 - b. If the Department determines that the injection well lacks mechanical integrity, the Department will notify the permittee in writing.[62-528.307(2)(f)]

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2. Mechanical integrity of each potential injection well shall be determined pursuant to Rule 62-528.300(6)(b) and (c), F.A.C. For wells with a fluid-filled casing/tubing annulus, this includes both continuous annular monitoring and a pressure test of the casing/tubing annulus every 5 years.
3. Verification of pressure gauge calibration must be provided to the Department representative at the time of the test and in the certified test report. [62-528.300(6)(f)]
4. **The Department's** Southeast District office must be notified a minimum of seventy-two (72) hours prior to pressure testing of the final casing, annular pressure testing after installation of the FRP tubing, and performance of radioactive tracer testing on the potential injection well. The testing procedure must be approved by the Department before testing begins. All testing must be initiated during daylight hours, Monday through Friday. An evaluation of all test results must be submitted with all test data. [62-528.300(6)(f)]

D. Surface Equipment

1. The integrity of the monitoring zone sampling systems shall be maintained at all times. Sampling lines shall be clearly and unambiguously identified by monitoring zone at the point at which samples are drawn. All reasonable and prudent precautions shall be taken to ensure that samples are properly identified by monitoring zone and that samples obtained are representative of those zones. Sampling lines and equipment shall be kept free of contamination with independent discharges and no interconnections with any other lines. [62-528.307(1)(f) and 62-528.307(3)(b)]
2. The surface equipment and piping for the potential injection and monitoring wells shall be kept free of corrosion at all times. [62-528.307(1)(f) and 62-528.307(3)(b)]
3. Spillage onto the exploratory well pad(s) during construction activities, and any waters spilled during mechanical integrity testing, other maintenance, testing or repairs to the system(s) shall be contained on the pad(s) and discharged to an approved means of disposal. [62-528.307(1)(f) and 62-528.307(3)(b)]
4. The exploratory well pad shall be maintained and retained in service for the life of the well. The exploratory well pad is not, unless specific approval is obtained from the Department, to be used for storage of any material or equipment at any time. [62-528.307(1)(f) and 62-528.307(3)(b)]
5. Four surficial aquifer monitoring wells, identified as Pad Monitoring Wells (PMWs), shall be located near the corners of the pads to be constructed for EW-1 and DZMW-1, and shall be identified by location number and pad location, i.e. NW, NE, SW, and SE. If located in a traffic area the well head(s) must be protected by traffic bearing enclosure(s) and cover(s). Each cover must lock and be specifically marked to identify the well and its purpose. The PMWs shall be sampled as follows:

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- a. During the construction and associated testing phases, the PMWs shall be **sampled weekly for chlorides (mg/L), specific conductance ($\mu\text{mho}/\text{cm}$ or $\mu\text{S}/\text{cm}$), temperature, and water level relative to the North American Vertical Datum of 1988 (NAVD 88).**
Initial PMW analyses shall be submitted prior to the onset of drilling activities.
- b. The PMWs shall also be sampled for total dissolved solids (mg/L) during the first four weeks of PMW sampling and at all times when specifically requested by the Department.
- c. The results of the PMW analyses shall be submitted to the Department in the weekly progress report. The PMWs shall be retained in service throughout the construction phase of the project. Upon completion of construction, the permittee may submit a request to the Department for cessation of sampling followed by capping, or plugging and abandonment of these wells.

[62-528.410(9)(b)]

IV. QUALITY ASSURANCE/QUALITY CONTROL

1. The permittee shall ensure that the construction of this exploratory well system shall be as described in the application and supporting documents. Any proposed modifications to the permit shall be submitted in writing to the Tallahassee office of the Aquifer Protection Program for review and clearance prior to implementation. Changes of negligible impact to the environment and staff time will be reviewed by the program manager, cleared when appropriate and incorporated into this permit. Changes or modifications other than those described above will require submission of a completed application and appropriate processing fee as per Rule 62-4.050, F.A.C. *[62-528.100, 62-4.050]*
2. Proper operation and maintenance include effective performance and appropriate quality assurance procedures; adequate operator staffing and training; and adequate laboratory and process controls. *[62-528.307(2)(b)]*
3. All water quality samples required by this permit shall be collected in accordance with the appropriate Department Standard Operation Procedures (SOP), pursuant to Chapter 62-160, F.A.C., Field Procedures. A certified laboratory shall conduct the analytical work, as provided by Chapter 62-160, F.A.C., Laboratory Certification. Department approved test methods shall be utilized, unless otherwise stated in this permit. All calibration procedures for field testing and laboratory equipment shall follow **manufacturer's** instrumentation manuals and satisfy the requirements of the Department SOPs. A listing of the SOPs pertaining to field and laboratory activities is available at the FDEP website at: <http://www.dep.state.fl.us/water/sas/sop/sops.htm>. *[62-4.246, 62-160]*
4. All reports submitted to satisfy the requirements of this permit shall be signed by a person authorized under Rule 62-528.340(1), F.A.C., or a duly authorized representative of that person under Rule 62-528.340(2), F.A.C. All reports required by this permit

which are submitted to the Department shall contain the following certification as required by Rule 62-528.340(4), F.A.C.:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

[62-528.340(1), (2), and (4)]

5. Analyses shall be conducted on unfiltered samples, unless filtered samples have been approved by the Southeast District Office as being more representative of ground water conditions. *[62-520.310(5)]*
6. A professional engineer registered pursuant to Chapter 471, Florida Statutes (F.S.), shall be retained throughout the construction period to be responsible for the construction operation and to certify the application, specifications, completion report and other related documents. The Department shall be notified immediately of any change of engineer. *[62-528.440(5)(b)]*
7. Continuous on-site supervision by qualified personnel (engineer and/or geologist, as applicable) is required during all testing and geophysical logging operations. *[62-528.440(5)(b)]*

V. REPORTING REQUIREMENTS

A. General

1. The drilling and construction schedule, site layout of drilling pad, and pad monitoring well locations shall be submitted to the Department during site preparation but prior to drilling operation commencement for the injection well system. *[62-528.430(2)(a)]*
2. **Weekly progress reports shall be submitted to the Department's Tallahassee and Southeast District offices throughout the construction period for each well. These reports, which may be submitted by electronic mail, shall be submitted within 48 hours of the end of the period of record and shall include at a minimum the following information:**
 - a. **A cover letter summary of the daily engineer report, driller's log and a projection for activities in the next reporting period.**
 - b. **Daily engineers reports and driller's/work logs with detailed descriptions of all drilling progress, cementing, testing, logging, and casing installation activities.**

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- c. Description of daily footage drilled by diameter of bit or size of hole opener or reamer being used.
 - d. Collection of drilling cuttings every 10 feet and at every formation change.
 - e. Description of work during installation and cementing of casing, including amounts of casing and cement used. Details of cementing operations shall include the number of cementing stages, and the following information for each stage of cementing: the volume of cement pumped, the theoretical fill depth, and the actual tag depth. From both the physical tag and the geophysical logs, a percent fill shall be calculated. An explanation of any deviation between actual versus theoretical fill shall be provided.
 - f. Details of the additions of salt or other materials to suppress well flow, including the date, depth and amount of material used.
 - g. Description of testing accomplished including (but not limited to) pumping and packer tests.
 - h. Lithologic logs and core descriptions with cuttings description, formation and depth encountered.
 - i. Geophysical logs, video logs, and deviation survey results.
 - j. Water quality analyses, including but not limited to the weekly water quality analysis and water levels for the PMWs.
 - k. Well development records.
 - l. Description of any construction problems that developed during the reporting period and current status.
 - m. Interpretations included with all test results and logs submitted.
 - n. Documentation of disposal of drilling fluids, cuttings, formation water, or waste as per specific condition II.2.
 - o. Description of any construction problems that developed during the reporting period and current status.
 - p. Description of any deviation survey conducted.
- [62-528.430(1) and 62-528.410(9)(a)]*
3. The final selection of specific potential injection and monitoring intervals must be approved by the Department. In order to obtain an approval, the permittee shall **submit a written request to the Department's Tallahassee office. All casing seat requests for the injection well(s) and the monitoring well(s) shall be accompanied by technical justification. To the extent possible, each casing seat request should address the following items:**
- a. Lithologic and geophysical logs with interpretations, as the interpretations relate to the casing seat.
 - b. Water quality data (including but not necessarily limited to total dissolved solids concentrations).
 - c. Identification of confining units, including hydrogeologic data and interpretations.
 - d. Identification of monitoring zones.
 - e. Casing depth evaluation (mechanically secure formation, potential for grout seal.)
 - f. Lithologic drilling rate and weight on bit data, with interpretations (related to the casing seat).

- g. Identification of the base of the USDW using water quality, RWA plots, and geophysical log interpretations.
- h. A certified evaluation of all logging and test results, submitted with test data.
- i. Transmissivity or specific capacity of proposed monitoring zone.
- j. Packer test drawdown curves and interpretation.

[62-528.410(4)(c), 62-528.420(4)(c) and 62-528.605(2)]

- 4. Upon completion of analysis of cores and sample cuttings recovered during the construction of wells covered by this permit (when no longer needed by the well owner), the permittee shall contact the Geological & Geotechnical Data Acquisition Program of the Florida Geological Survey (FGS) to arrange for the transfer of the cores and cuttings. The FGS shall also be contacted to arrange for the collection of 100 ml water samples, with nitric acid preservative for metal analysis, at the end of each packer test (where sufficient water is available) and aquifer background sample collection events. *[62-528.450(5)]*
- 5. All cores, cuttings, and water samples for FGS shall be shipped to the Florida Geological Survey, Geological & Geotechnical Data Acquisition Program, 3915 Commonwealth Boulevard, Tallahassee, Florida 32399. All cores and samples shall clearly identify the site name, well name/number, depths of samples/cores, and the latitude/longitude location of the well(s) using the form in this permit. *[62-528.450(5)]*
- 6. A final report of the construction and testing of the exploratory well(s) and monitoring well(s), shall be submitted no later than 120 days after the wells are completely constructed or with the Class I construction permit application, pursuant to Rule 62-528.430(1)(e), F.A.C. In addition, a copy of the cover letter for the report shall be sent to the U. S. Environmental Protection Agency, Region 4, UIC program, 61 Forsyth St. SW, Atlanta, GA 30303-8909. This report shall include as a minimum, definitions of the injection interval, all relevant confining units, the depth of the base of the USDW, and all monitoring zones, including all relevant data and interpretations. *[62-528.450(5)]*

VI. ABNORMAL EVENTS

- 1. In the event the permittee is temporarily unable to comply with any of the conditions of a permit due to breakdown of equipment, power outages or destruction by hazard of fire, wind, or by other cause, the permittee of the facility shall notify the [Southeast](#) District office. *[62-528.415(4)(a)]*
- 2. Notification shall be made in person, by telephone, or by electronic mail (e-mail) within 24 hours of breakdown or malfunction to the [Southeast](#) District office. *[62-528.307(1)(x)]*
- 3. A written report of any noncompliance referenced in Specific Condition (1) above shall be submitted to the [Southeast](#) District office and the Tallahassee office within five days

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after its occurrence. The report shall describe the nature and cause of the breakdown or malfunction, the steps being taken or planned to be taken to correct the problem and prevent its reoccurrence, emergency procedures in use pending correction of the problem, and the time when the facility will again be operating in accordance with permit conditions. [62-528.415(4)(b)]

General Conditions

1. The terms, conditions, requirements, limitations and restrictions set forth in this permit are "permit conditions" and are binding and enforceable pursuant to section 403.141, F.S. [62-528.307(1)(a)]
2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action. [62-528.307(1)(b)]
3. As provided in subsection 403.087(7), F.S., the issuance of this permit does not convey any vested rights or exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor infringement of federal, state, or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in this permit. [62-528.307(1)(c)]
4. This permit conveys no title to land, water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title. [62-528.307(1)(d)]
5. This permit does not relieve the permittee from liability for harm to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties there from; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department. [62-528.307(1)(e)]
6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed and used by the permittee to achieve compliance with the conditions of this permit, or are required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules. [62-528.307(1)(f)]
7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at reasonable times, access to the premises where the permitted activity is located or conducted to:

PERMITTEE: Mr. Randall R. LaBauve, Vice President
FPL Okeechobee County Site
Class V, Exploratory Well System

WACS ID Number: 102139
Permit Number: 0330373-001-UC/IEX
Date: April 14, 2015

- a. Have access to and copy any records that must be kept under conditions of this permit;
 - b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and
 - c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.
 - d. Reasonable time will depend on the nature of the concern being investigated.
[62-528.307(1)(g)]
8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:
- a. A description of and cause of noncompliance; and
 - b. The period of noncompliance, including dates and times; or, if not corrected the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent the recurrence of the noncompliance. The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.
[62-528.307(1)(h)]
9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is proscribed by sections 403.111 and 403.73, F.S. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules. *[62-528.307(1)(i)]*
10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance; provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules. *[62-528.307(1)(j)]*
11. This permit is transferable only upon Department approval in accordance with rules 62-4.120 and 62-528.350, F.A.C. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department. *[62-528.307(1)(k)]*
12. This permit or a copy thereof shall be kept at the work site of the permitted activity.
[62-528.307(1)(l)]
13. The permittee shall comply with the following:
- a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records shall be extended automatically unless the Department determines that the records are no longer required.
 - b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation)

required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

- c. Records of monitoring information shall include:
 - 1) the date, exact place, and time of sampling or measurements;
 - 2) the person responsible for performing the sampling or measurements;
 - 3) the dates analyses were performed;
 - 4) the person responsible for performing the analyses;
 - 5) the analytical techniques or methods used;
 - 6) the results of such analyses.
- d. The permittee shall furnish to the Department, within the time requested in writing, any information which the Department requests to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit.
- e. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

[62-528.307(1)(m)]

- 14. All applications, reports, or information required by the Department shall be certified as being true, accurate, and complete. *[62-528.307(1)(n)]*
- 15. Reports of compliance or noncompliance with, or any progress reports on, requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each scheduled date. *[62-528.307(1)(o)]*
- 16. Any permit noncompliance constitutes a violation of the Safe Drinking Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. *[62-528.307(1)(p)]*
- 17. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. *[62-528.307(1)(q)]*
- 18. The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit. *[62-528.307(1)(r)]*
- 19. This permit may be modified, revoked and reissued, or terminated for cause, as provided in 40 C.F.R. sections 144.39(a), 144.40(a), and 144.41 (1998). The filing of a request by the permittee for a permit modification, revocation or reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition. *[62-528.307(1)(s)]*
- 20. The permittee shall retain all records of all monitoring information concerning the nature and composition of injected fluid until five years after completion of any plugging and abandonment procedures specified under rule 62-528.435, F.A.C. The permittee shall

PERMITTEE: Mr. Randall R. LaBauve, Vice President
FPL Okeechobee County Site
Class V, Exploratory Well System

WACS ID Number: 102139
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Date: April 14, 2015

deliver the records to the Department office that issued the permit at the conclusion of the retention period unless the permittee elects to continue retention of the records. [62-528.307(1)(t)]

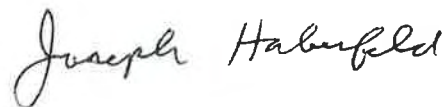
21. All reports and other submittals required to comply with this permit shall be signed by a person authorized under rules 62-528.340(1) or (2), F.A.C. All reports shall contain the certification required in rule 62-528.340(4), F.A.C. [62-528.307(1)(u)]
22. The permittee shall notify the Department as soon as possible of any planned physical alterations or additions to the permitted facility. In addition, prior approval is required for activities described in rule 62-528.410(1)(h). [62-528.307(1)(v)]
23. The permittee shall give advance notice to the Department of any planned changes in the permitted facility or injection activity which may result in noncompliance with permit requirements. [62-528.307(1)(w)]
24. The permittee shall report any noncompliance which may endanger health or the environment including:
 - a. Any monitoring or other information which indicates that any contaminant may cause an endangerment to an underground source of drinking water; or
 - b. Any noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between underground sources of drinking water.

Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause, the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

[62-528.307(1)(x)]

Issued this 14th day of April 2015

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION



Joseph Haberfeld
Aquifer Protection Program Administrator
Division of Water Resource Management

APPENDIX 10.3
ZONING DESCRIPTIONS

2.04.01. - Agricultural.

These districts are composed of large, open land areas. It is intended by the use of these districts to retain and preserve, insofar as desirable and practicable, the open character of the land. To that end, permitted and permissible uses are basically limited to agricultural, and, with certain limitations, other uses not contrary to the character of these districts. It is intended that this classification basically serve three purposes: (1) to preserve for agricultural uses those lands with agricultural development potential, to the end that man's future needs for food and fiber will be met; (2) to preserve and protect marsh lands, water sheds and water recharge areas, open spaces, scenic areas, and park areas (where not otherwise zoned PS); (3) to serve as a "holding classification" for lands which eventually may be required for more intensive uses. In the case of (3) it is the intention of this Code that such lands not be rezoned for more intensive uses without a clear showing of the public need, availability of services consistent with the more intensive uses proposed, and insurance that, upon rezoning, the development will not result in undue added financial burden to the residents of the County.

The regulations for the A districts discourage or prohibit non-agriculturally oriented residential development, and prohibit commercial or industrial development except for certain agriculturally related activities. The regulations are intended to protect life and property in areas subject to periodic flooding and to conserve fish and wildlife.

A. *Permitted principal uses and structures.*

1. Agricultural uses, including accessory structures and uses incident to agricultural activity.
2. Temporary roadside stands for sale of agricultural products.
3. Railroad, electric power or natural gas line right-of-way.
4. Permanent housing for agricultural labor employed on the premises located not closer than 200 ft. to any other property under separate ownership and with a ratio not greater than one dwelling unit for each 20 acres of land contained in the premises on which the labor is employed.
5. Cemetery, columbarium, or mausoleum, provided no grave, monument, or building shall be closer than 25 ft. to any boundary line of the property; crematory for human remains when accessory to and on the same premises as a cemetery, columbarium or mausoleum.
6. Game preserves and wildlife management areas; fish hatcheries and refuges; private hunting and fishing camps.
7. Water conservation areas, water reservoirs and control structures, water and drainage wells.
8. Boarding stable, provided no structure for the housing of animals shall be located within 200 ft. of any property line in separate ownership.
9. Home occupations.
10. Radio or television transmitting or receiving stations, radio, television or other commercial transmitting or receiving towers, antennas, antenna support structures subject to the criteria established in section 7.10, wireless communications facilities pursuant to section 7.10.

11. Public utility facilities and utility plant sites including independent power company generation plants and directly associated facilities, and smaller properties related to the distribution of a utility service (such as power substations and sewer lift stations). This use shall permit on-site disposal of waste ash which has been generated on site as a result of power production subject to the provisions of this Code and other applicable state and local regulations.
 12. Public or private elementary and high schools with conventional academic curriculums.
 13. Monasteries, convents, houses of worship.
 14. Residential single family dwellings and manufactured homes, subject to density criteria as established by the comprehensive plan.
 15. For lots or parcels five acres or less in area, only residential single family dwellings and manufactured homes or other permitted principal uses and structures as established for the residential single family—Estate (RSF-E) zoning district.
- B. *Prohibited uses and structures.* Any use or structure not specifically or provisionally permitted herein.
- C. *Accessory uses and structures.* uses and structures which are customarily accessory and clearly incidental and subordinate to permitted or permissible principal uses and structures. Residential structures shall be permitted as accessory uses only when such buildings are for the residence of the owner, operator, or employees of agricultural, conservation or other permitted or permissible activities. For lots or parcels five acres or less in area, permissible accessory uses and structures shall be as established for the residential single family-estate (RSF-E) zoning district.

(Ord. No. 93-10, § 3, 7-22-93; Ord. No. 95-1, § 1 (2.04.01), 6-8-95; Ord. No. 99-09, § 1(Exh. B), 8-12-99; Ord. No. 2005-12, 1(Exh. A), 7-28-05)

Section 911.06. - Agricultural and rural districts.

- (1) *Purpose and intent.* The agricultural, rural fringe development, and RS-1, single-family districts, are established to implement the policies of the Indian River County Comprehensive plan for managing land that is not part of the designated urban service area of the county, as well as land within the urban service area which warrants a very low density designation, by providing areas suitable for agriculture, silviculture, and the conservation and management of open space, vegetative cover, natural systems, aquifer recharge areas, wildlife areas and scenic areas. These districts are also intended to provide opportunities for residential uses at very low densities to promote housing opportunities in the county. These districts are further intended to permit activities which require non-urban locations and do not detrimentally impact lands devoted to rural and agricultural activities. Finally, the RFD, and RS-1 districts are intended to buffer active agricultural areas from urbanization.
- (2) *Districts established.* The following districts are established to implement the provisions of this chapter.
- A-1, A-2, and A-3 agricultural districts.
- RFD, rural fringe development district.
- RS-1, single-family district.
- (3) *Relationship with land use map.*
- (a) The agricultural and rural districts may be established in the following land use designations:

District	Land Use Designation					
	AG-1	AG-2	AG-3	R	PUB	REC
A-1	X	-	-	-	X	X
A-2	-	X	-	-	X	X
A-3	-	-	X	-	X	X
RFD	-	-	-	X	-	X
RS-1	-	-	-	X	-	X

X - District permitted

- -District not permitted

- (b) The existing Agricultural-1 and rural districts may continue within the Urban Service Area when those areas are currently used for agricultural uses, serve as or enhance open space or green belt areas of the county.
- (4) *Uses.* Uses in the agricultural and rural districts are classified as permitted uses, administrative permit uses and special exception uses.
- Site plan review shall be required for the construction, alteration and use of all structures and buildings except single-family dwellings and permitted agricultural uses.
- No residential development in agriculturally designated areas shall occur unless such development is approved as a planned development and meets the requirements of section 911.14; the following activities shall be exempt from this requirement:
- (a) Construction of a single-family dwelling unit on a tract or parcel existing on October 1, 1990.
- (b) Division of a tract or parcel into two (2) lots, each meeting or exceeding the minimum lot size of the agricultural zoning district and meeting the lot split criteria of section 913.06(3); any subsequent split of such property shall require approval in accordance with subdivision ordinance Chapter 913 requirements or planned development requirements.
- (c) Division of a tract into parcels of at least forty (40) acres in size.
- (d) Division of a tract via a subdivision plat or affidavit of exemption approved in accordance with subdivision ordinance Chapter 913 requirements.

Uses	District				
	A-1	A-2	A-3	RFD	RS-1
<i>Agricultural</i>					
General farming	P	P	P	-	-
Dairy farming	A	A	A	-	-
Livestock and poultry raising	P	P	P	-	-
Stables (noncommercial)	P	P	P	A	A
Stable (commercial)	P	P	P	-	-
Sludge spreading	A	A	A	-	-
Tree farms	P	P	P	-	-
Kennel and animal boarding places					

Commercial	A	A	A	-	-
Noncommercial	P	P	P	P	A
Fruit and vegetable juice extractions and packing houses	A	A	A	-	-
Small animal specialty farms	A	A	A	-	-
Tenant dwelling	S	S	S	-	-
Residential migrant housing facility	S	S	S		
Nursery and greenhouses					
Noncommercial	P	P	P	A	A
Commercial (cultivation, wholesaling, and off-site landscaping services allowed; no retail sales allowed on-site)	P	P	P	-	-
Agricultural businesses, excluding wholesaling and processing	S	S	S	-	-
Agricultural industries	S	S	S	-	-
Fish farms and water dependent plant and/or animal production	A	A	A	-	-
Agricultural research facilities	A	A	A	-	-
Aquaculture	A	A	A	A	A
Fruit spreading (subject to subsection <u>917.06</u> (15))	P	P	P	-	-
<i>Residential</i>					
Accessory single-family dwelling unit	A	A	A	A	A
Single-family dwelling	P	P	P	P	P
Mobile homes	A	A	A	-	-
Accessory housing for nightwatchman	A	A	A	-	-

Guest cottage or servant's quarters	A	A	A	A	A
Single-family docks and private observation/fishing piers on vacant lots	A	A	A	A	A
Bed and breakfast	A	A	A	-	-
<i>Institutional</i>					
Child or adult care facilities	A	A	A	A	S
Foster care facilities	P	P	P	P	P
Cemeteries	S	S	S	S	S
Places of worship	S	S	S	S	S
Group home (level I)	A	A	A	A	A
Group home (level II and III)	S	S	S	-	-
<i>Community Service</i>					
Emergency services	P	P	P	P	P
Educational centers, including primary and secondary schools	S	S	S	S	S
Correctional institutions	S	S	S	-	-
Cultural and civic facilities	S	S	S	S	S
Governmental administrative building	S	S	S	S	S
Colleges and universities	S	-	-	S	S
Civic and social membership organizations (M-1 and M-2 areas only)	S	-	-	-	-
<i>Recreation</i>					
Country clubs	A	A	A	S	S
Golf courses	A	A	A	S	S
Public parks and playgrounds	A	A	A	A	A
Major sports and recreation areas and facilities	S	S	S	-	-

Dude ranch	S	S	S	-	-
Retreats and camps	S	S	S	S	S
Commercial hunting and fishing lodges	S	S	S	-	-
Off-road vehicle tracts (commercial and noncommercial)	S	S	S	-	
<i>Commercial</i>					
Fruit and vegetable stands	A	A	A	-	-
Veterinary clinic or animal hospital	A	A	A	-	-
Driving ranges	S	S	S	-	-
Fruit, vegetable and nursery retail sales	S	S	S	-	-
<i>Transportation and Utilities</i>					
Airports and airstrips	S	S	S	S	-
Communications towers (wireless facilities including cell towers)	A/S ²	A/S ²	A/S ²	A ²	A ²
Communications towers (non-wireless facilities including TV and radio broadcast towers)					
Amateur radio (accessory use)					
Less than 80 feet	P	P	P	P	P
80 feet or taller (see <u>971.44</u> (4) for special criteria)	S	S	S	S	S
Commercial					
Up to 70 feet:					
Camouflaged	P	P	P	P	P
Non-camouflaged	P	P	P	-	-
70 feet to 150 feet:					
Camouflaged	A	A	A	A	A

Monopole (minimum of 2 users)	A	A	A	-	-
Not camouflaged and not monopole	A/S*	A/S*	A/S*	-	-
Over 150 feet:					
All tower types (see <u>971.44</u> (1) for special criteria)	-	S	S	-	-
Utility					
Public and private utilities, limited	A	A	A	S	S
Public and private utilities, heavy	S	S	S	S	S
Reservoirs, water farming	P	P	P	-	-
<i>Industrial</i>					
Recycling center (including vegetation debris mulching)	A	A	A	-	-
Small-scale bio-fuel processing plant	S	A	A	-	-
Large-scale bio- fuel processing plant	S	S	S	-	-
Mining	A	A	A	-	-
<i>Very Heavy Industrial</i>					
Demolition debris site	S	S	S	-	-

P - Permitted use

A - Administrative permit use

S - Special exception use

* See 971.44(4) to determine whether the administrative permit or special exception use process applies.

¹ The requirements of subsection 917.06(11), of the Accessory Uses and Structures Chapter, shall apply to towers.

² For wireless commercial facilities regulations, see subsection 971.44(5), Section 4 use table.

(5) *Accessory uses and structures* as provided in section 917.

(6) *Size and dimension criteria:*

Regulation	Unit	A-3	A-2	A-1	RFD	RS-1 ¹
Maximum density	du/gr.ac.	0.05	0.1	0.2	0.4	1
Minimum lot size	sq. feet	870,000	430,000	200,000	85,000	40,000
Minimum lot width	feet	150	150	150	150	125
Minimum yard setback	feet					

Front		30	30	30	30*	30*
Side		30	30	30	30*	20*
Rear		30	30	30	30*	30*
Maximum building height	feet	35	35	35	35	35
Maximum building coverage	% of lot	10	10	20	30	30
Minimum open space	% of lot	80 ²	80 ²	60 ²	50	50
¹ Nonconforming lots of record lawfully created prior to April 11, 1985 shall meet the RS-6 yard requirements						
Legally created lots of record existing prior to June 18, 1991, in the A-1, A-2, and A-3 districts may be developed for one single-family dwelling each, regardless of density; provided all other regulations and codes are satisfied. These lots must meet requirements of the RS-1 district for the size and dimension criteria.						
² For properties containing manmade bodies of water, the open water area may be excluded entirely from the open space calculation (e.g. excluded from gross area and from open space area credit).						

*Note: A one-foot additional setback is required for every one (1) foot in building height over twenty-five (25) feet in building height. For example, a building or portion of a building that has a thirty-five-foot building height, as defined in the land development regulations, must have an additional ten-foot setback from any adjacent front, side, or rear property line to that portion of the building that exceeds twenty-five (25) feet in building height.

Maximum FAR (Floor Area Ratio):

- Retail trade 0.23 FAR
- Office, business/personal services, recreational, schools, institutional 0.35 FAR
- Industrial, storage, wholesale/distribution, utilities, heavy repair 0.50 FAR

(Ord. No. 90-16, § 1, 9-11-90; Ord. No. 91-7, §§ 5, 28, 2-27-91; Ord. No. 91-48, §§ 13, 14, 12-4-91; Ord. No. 92-39, §§ 7, 10, 9-29-92; Ord. No. 93-29, §§ 3C, 11B, 9-7-93; Ord. No. 94-1, §§ 1B, 2B, 1-5-94; Ord. No. 95-10, § 8B, 5-31-95; Ord. No. 96-5, § 1(A), 2-27-96; Ord. No. 97-16, § 3(1), 5-6-97; Ord. No. 97-29, §§ 1, 5(A), 12-16-97; Ord. No. 98-9, § 9, 5-19-98; Ord. No. 2000-004, § 2A, 2-15-00; Ord. No. 2000-026, § 3A, 7-18-00; Ord. No. 2000-038, § 1A, 11-21-00; Ord. No. 2001-033, § 1, 10-23-01; Ord. No. 2002-016, § 1A, 4-2-02; Ord. No. 2002-017, § 1, 4-9-01; Ord. No. 2002-031, § 1A, 11-12-02; Ord. No. 2004-003, § 1, 1-6-04; Ord. No. 2012-016, §§ 4, 7A, 7-10-12)

APPENDIX 10.4
ENVIRONMENTAL RESOURCE PERMIT
APPLICATION
(See Volume III)

APPENDIX 10.5
LAND USE PLAN DESCRIPTIONS

APPENDIX 10.5.1

OKEECHOBEE COUNTY FUTURE LAND USE

Okeechobee County Comprehensive Plan

Goals, Objectives and Policies

Section 2

Future Land Use Element

June 2013

Okeechobee County Comprehensive Plan

Section 2

Future Land Use Element Goal, Objectives and Policies

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Map 2.2	Public Supply Potable Water Wells/Water Treatment Plants - Okeechobee County
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Map 2.4	Generalized Wetlands
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Map 2.7	Generalized Surface Minerals

Okeechobee County Comprehensive Plan

Section 2

Future Land Use Element Goal, Objectives and Policies

**Text Amended June 13, 2013
Map Series Amended August 23, 2012**

GOAL L: **Okeechobee County will promote public health, safety and welfare through a land use decision-making system which achieves and maintains a high quality living environment with a well-planned mix of compatible land uses.**
[9J-5.006(3)(a)]

Objective L1: All uses of land shall be consistent with the Future Land Use classifications established herein and portrayed on the Okeechobee County Future Land Use Map. The Future Land Use designations are intended to: a) coordinate land use with the natural environment, including soils, topography, and other resources; b) appropriately mix and distribute residential, commercial, industrial, recreation, public and conservation land uses; c) encourage an efficient pattern of development and discourage sprawl; and d) encourage the proper siting of schools and provide the potential for co-location of parks, libraries, recreational and other facilities. The Okeechobee County Future Land Use Map series shall be applied in conjunction with the policies of this element and other elements of this Plan. Okeechobee County hereby establishes the following land use classifications for the purpose of managing growth: Urban Residential Mixed Use; Commercial Corridor Mixed Use; Commercial Activity Center; Resort Corridor; Rural Activity Center; Resort Activity Center; Rural Estate; Power Plant; Public/Semi-Public Facility; Recreation; Industrial; Conservation 1; Conservation 2; and Agriculture.
[9J-5.006(3)(b)(1,7,8,9)] [AMENDED 05/2005]

Policy L1.1: **Urban Residential Mixed Use:** This classification encompasses existing and future areas of urban development within unincorporated Okeechobee County. It includes existing residential concentrations and areas where public facilities to support urban development are available, or are projected to be available during the planning period, including areas that are in designated service provision areas. Also included within this designation are existing supporting commercial land uses, educational facilities and other public uses. The

primary purpose of the Urban Residential Mixed Use category, as designated on the Future Land Use Map, shall be to provide for existing and future urban development, to accommodate a range of densities of residential development, and to maintain open space. In addition:

- a) Residential development is permissible subject to all applicable local regulations. The following standards shall be used as a basis for guiding future residential development and establishing maximum densities per gross acre within this classification:
 - i) New residential development at a gross density of 2 to 4 dwelling units per acre shall use a public supply water system or an enhanced package treatment plant designed to connect into a regional system when one is available;
 - ii) New residential development at a gross density greater than 4 dwelling units per acre shall use a public supply water system and a public sewage treatment system or enhanced package treatment plants designed to connect into regional systems when available, and must be within 1 mile of an arterial or collector road;
 - iii) New residential development shall not exceed a gross density of 12 units per acre. [AMENDED 05/2009]
- b) Neighborhood commercial uses which serve the daily needs of the community may be permitted only on arterial or collector roads and at a distance of no less than 1 mile from similar land uses, unless included in a comprehensive mixed use Planned Development, shall be compatible with the character of the area, and shall not create strip and disorganized patterns of commercial development. Multiple commercial uses may be grouped to constitute a single neighborhood commercial area. Commercial areas in an Urban Residential Mixed Use area shall be set back from adjacent land uses; shall not exceed 10 acres in size; shall not exceed impervious surface lot coverage of 70 percent, shall not exceed a floor area ratio of 1.0; and shall be consistent with the access management policies contained in this Plan and the procedures adopted by the Florida Department of Transportation. Commercial Uses, including recreational vehicle parks, shall not exceed 30 percent of total land uses in the Urban Residential Mixed Use classification. Recreational vehicle parks, subdivisions or condominiums may be permitted to a maximum density of 10 units per gross acre, subject to all applicable local regulations. [AMENDED 05/2005, 05/2009]
- c) Additional neighborhood commercial uses that serve the residents of a specific residential community may be located within that residential community provided that there shall be no evidence from public ways of the existence of such establishments or uses. Neighborhood commercial uses shall be subject to standards contained in local land development

regulations, and shall not exceed an impervious surface ratio of 70%, shall not exceed a floor area ratio of 1.0, shall not be greater than 2 acres in area, and shall be designed such that they are architecturally or otherwise compatible with the surrounding residential development.

- d) Industrial uses are not permissible in the Urban Residential Mixed Use classification.
- e) Agricultural uses are permissible within the Urban Residential Mixed Use area, subject to all applicable local regulations. [9J-5.006(3)(c)2,5,7]

Policy L1.2: **Commercial Corridor Mixed Use:** A Commercial Corridor Mixed Use classification denotes an area of existing development in which commercial land uses predominate. The primary purpose of this land use classification, as designated on the Future Land Use Map, is to promote efficient use of land and public facilities and services through the development of compatible uses, redevelopment, infill, and aggregation of small parcels into larger development sites. A Commercial Corridor Mixed Use area includes the arterial or collector on which it is centered, and a distance of 1,500 feet in either direction from the edge of right-of-way of U.S. 441 South from the City of Okeechobee city limit to the junction of U.S. 441/98 and S.R. 78, and 400 feet from the edge of right-of-way of all other collector and arterial roadways depicted in this classification on the Future Land Use Map. In addition:

- a) Residential development is permissible, subject to all applicable local regulations. Residential development shall not exceed 30% of this classification, shall be encouraged to be located above or behind commercial development, and shall not exceed a density of 18 dwelling units per gross acre.
- b) Commercial, professional office and light industrial development are permissible in a Commercial Corridor Mixed Use classification. Such development shall not exceed a floor area ratio of 2.0, except as otherwise established below, and shall not exceed impervious surface coverage of 90 percent. Light industrial development shall make up not more than 10 percent of total land uses. Recreational Vehicle parks, subdivisions or condominiums may be permitted to a maximum density of 10 units per gross acre, subject to all applicable local regulations.
 - i. For that portion of the Commercial Corridor Mixed Use classification along Highway 441 SE east of Nubbin Slough, as designated on the Future Land Use map series, development shall not exceed a floor area ratio of 0.30;
 - ii. For that portion of the Commercial Corridor Mixed Use classification along SR 70 East from the railroad tracks to NE 48th Avenue, and for that portion of the Commercial Corridor Mixed Use classification that

is along SR 710 from the intersection of SR 70 East to Nubbin Slough, as designated on the Future Land Use map series, development shall not exceed a floor area ratio of 0.30;

- iii. For that portion of the Commercial Corridor Mixed Use classification along US Highway 98 from NW 20th Trail to past NW 36th Street, as designated on the Future Land Use map series, development shall not exceed a floor area ratio of 0.30. [AMENDED 05/2005, 05/2009]

- c) Agricultural uses are permissible only where existing at the time of adoption of this amendment. [9J-5.006(3)(c)2,5,7]

Policy L1.3: In the Commercial Corridor Mixed Use and Commercial Activity Center classifications, a Site Development Plan shall be submitted to the County in conjunction with all development proposals, except those related to obtaining a permit to construct a single or two-family residential dwelling. After approval, the Site Development Plan shall become a binding condition of the Final Development Order, and shall demonstrate that the following requirements have been satisfied:

- a) That the proposal creates the minimum possible disruption of traffic flow and safety on adjoining streets, and adheres to an appropriate program of access management to arterial and collector roadways;
- b) That adequate setbacks or other measures are provided to allow future improvements in public roads to be made without removing structures;
- c) That adequate open space, buffering, landscaping, fencing or other appropriate features are provided to ensure that the development will be compatible with surrounding land uses, and will meet applicable local land development regulations; and
- d) That natural resources in the area, including wetlands, viable 100-year floodplains, ground waters, surface waters, and vegetative and wildlife communities designated as threatened, endangered or species of special concern, will not be adversely affected. Should the County require a Specific Management Plan to be prepared by the developer pursuant to Policy L5.2, the implementation of such management plan shall result in no net loss of wetlands, and shall include any necessary modifications to the proposed development, such as specific setbacks, buffers, or the clustering of development away from site resources, to ensure the protection, preservation or natural functions of site resources. [9J-5.006(3)(c)2,5,7]

Policy L1.4: **Rural Activity Center:** Rural Activity Centers accommodate low densities of development outside of the Urban Residential Mixed Use area. Public supply water and sewer facilities generally are not available, nor are they anticipated to be available during the planning period. Where appropriate or

required, however, a developer may provide a package treatment plant or otherwise provide for adequate public supply potable water and sewage facilities. A Rural Activity Center generally acknowledges existing communities or subdivisions, and provides decentralized job creation and economic opportunities. A rural activity center can provide for self-supporting communities so as to reduce dependence on the one existing urban area in the County for all employment opportunities and goods and services. Accordingly, Rural Activity Centers allow for existing and future agricultural and residential uses, as well as for recreational, public, neighborhood commercial and light industrial uses that support or complement agricultural uses or residential and community development and that provide employment or economic opportunities. Specific locations of Rural Activity Centers are shown on the Future Land Use Map series and are intended to separate urban from non-urban uses. Additional Rural Activity Centers shall require an amendment to the Future Land Use Map series. The land uses and intensities of development permissible within a Rural Activity Center must meet the requirements of concurrency.

A Rural Activity Center provides for agricultural, recreational, residential, neighborhood commercial and certain light industrial uses, subject to compatibility and buffering criteria provided in local land development regulations. Neighborhood commercial uses and, where permissible, light industrial uses, shall constitute no more than the greater of 30 acres or 5 percent of the total area of a Rural Activity Center; shall not exceed a floor area ratio of 1.0; and shall not exceed impervious surface coverage of 70 percent. Subject to density and intensity criteria as established by this Policy, Rural Activity Centers shall provide for the following:

- a) **Basinger (A):** Residential development not to exceed a density of 1 unit per gross acre, neighborhood commercial uses, light industrial uses where adequate facilities and services are available, agricultural, recreational and public uses;
- b) **Posey's Corner/Crooked Creek (B):** Residential development not to exceed a density of 1 unit per gross acre, neighborhood commercial uses, light industrial uses where adequate facilities and services are available, agricultural, recreational and public uses. In the 400-acre area added to this Rural Activity center on December 17, 1998, new development on any lot one acre or less in area shall be served by public supply water and sewer treatment facilities, and no more than 250 acres may be developed for residential lots of one acre or less. If development includes lots of one acre or less in area, then at least 150 acres shall remain undeveloped or in agricultural uses or shall be developed as a golf course or as other recreation or open space uses; [AMENDED 05/2005]

- c) **Four Seasons (C):** Residential development not to exceed a density of 1 unit per gross acre, neighborhood commercial uses, light industrial uses where adequate facilities and services are available, agricultural, recreational and public uses;
- d) **Lazy Seven (D):** Residential development not to exceed a density of 1 unit per 2 gross acres, neighborhood commercial, agricultural, recreational and public uses;
- e) **Dixie Ranch Acres (E):** Residential development not to exceed a density of 1 unit per 1 gross acre, neighborhood commercial, agricultural, recreational and public uses;
- f) **R-Bar (F):** Residential development not to exceed a density of 1 unit per 2.5 gross acres, neighborhood commercial, agricultural, recreational and public uses;
- g) **Country Hills/Okeechobee Golf and Country Club (G):** Residential development not to exceed a density of 1 unit per 4 gross acres in the rural density area and not to exceed a density of 1 unit per gross acre in the low density area; neighborhood commercial uses, light industrial uses where adequate facilities and services are available, agricultural, recreational and public uses; [AMENDED 05/2005]
- h) **Okeechobee Little Farms (H):** Residential development not to exceed a density of 1 unit per 5 gross acres in the rural density area and not to exceed a density of 1 unit per gross acre in the low density area, neighborhood commercial uses, light industrial uses where adequate facilities and services are available, agricultural, recreational and public uses;
- i) **Fort Drum (I):** Residential development not to exceed a density of 1 unit per 5 gross acres in the rural density area and not to exceed a density of 1 unit per gross acre in the low density area, neighborhood commercial uses, light industrial uses where adequate facilities and services are available, agricultural, recreational and public uses; Residential development not to exceed a density of 1 unit per gross acre, neighborhood commercial uses, light industrial uses where adequate facilities and services are available, agricultural, recreational and public uses; [AMENDED 05/2005]
- j) **River Oaks (J):** Residential development not to exceed a density of 1 unit per gross acre, agricultural, recreational and public uses;
- k) **Spot in the Sun/Starnes Loop (K):** Residential development not to exceed a density of 1 unit per 2.5 gross acres in the rural density area and not to exceed 2 units per gross acre in the low density area, neighborhood

commercial uses, light industrial uses where adequate facilities and services are available, agricultural, recreational and public uses.

- l) **Edwards/Otter Creek (L):** Residential development not to exceed a density of 1 unit per gross acre, neighborhood commercial uses, agricultural, recreational and public uses; and [AMENDED 05/2005]
- m) **Viking (M):** Residential development not to exceed a density of 1 unit per 1.25 gross acres, neighborhood commercial uses not to exceed one percent of the total area of the Rural Activity Center, agricultural, recreational and public uses. [9J-5.006(3)(c)2,5,7] [AMENDED 05/2005]
- n) **Amistad (A):** Residential development not to exceed a density of 1 unit per gross acre, neighborhood commercial uses not to exceed 15 acres in area, agricultural, recreational and public uses. To maintain the concept of a new, mixed use activity center, development may occur only in association with a complete site development plan for the entire Rural Activity Center that includes provisions for residential uses, recreational uses to be provided concurrent with residential uses, and neighborhood commercial uses. Other uses permissible within this Rural Activity Center may be incorporated into the site development plan. The site development plan shall take the form of a Planned Development or a comparable alternative as may be established in the County's land development regulations. [AMENDED 08/2012]

Policy L1.5: **Reserved.** [AMENDED 05/2009]

Policy L1.6: **Public/Semi-Public Facility:** This classification includes properties or facilities under public, semi-public or private ownership, which provide a needed public service to the residents of Okeechobee County and the State of Florida. Permissible uses include, but are not limited to, educational, health and recreational facilities, cemeteries, communications, cultural, and transportation and other utility facilities, landfills, airports, police and fire stations, correctional facilities, institutional facilities, and other such facilities which provide for the public. At the Okeechobee County Airport only, industrial uses and industrial parks are permissible in this classification. Landfills and public airports shall require a Public/Semi-Public designation on the Future Land Use Map. Except for landfills and public airports, Public/Semi-Public designations on the Future Land Use Map are not intended to represent the only possible locations of future facilities. Upon adoption of land development regulations pursuant to this Plan, these properties or facilities and accessory uses may be sited in any land use designation, subject to compatibility criteria provided in the regulations. Public/Semi-Public Facility development shall not exceed a floor area ratio of 2.0, and shall not exceed impervious lot coverage of 80 percent. Public/Semi-Public Facility

development shall meet all applicable local and state regulations regarding the quality and quantity of stormwater run-off. Subject to all applicable local regulations, agricultural activities are permissible in areas designated as Public/Semi-Public. [9J-5.006(3)(c)2,5,7]

Policy L1.7: **Recreation:** This classification includes properties or facilities under public, semi-public or private ownership, which provide a needed public service to the residents of Okeechobee County and the State of Florida. Permissible uses include, but are not limited to, existing active and passive recreational facilities. Also permissible are structures to serve a recreational intent, including visitor centers, administrative, maintenance or research facilities, or housing for on-site personnel or for visitors, such as primitive camping or bunk houses for a camp or retreat. Recreational facility development shall not exceed impervious lot coverage of 60 percent, not including lakes, streams or rivers that provide recreational opportunities. The Recreation designations on the Future Land Use Map are not intended to represent the only possible locations of future facilities. Bona fide public or private recreation facilities or uses may be located in any future land use classification, subject to compatibility criteria established by local land development regulations. [9J-5.006(3)(c)2,7]

Policy L1.8: **Industrial:** Industrial lands and Industrial Overlay Districts are appropriate for high-intensity commercial activities which involve manufacturing the storage or processing of raw materials, wholesaling, packing, distributing, and other similar uses. Industrial activities can create unappealing visual effects, noise or smells and often require buffers or large land areas, and therefore should often be separated from residential or traditional retail business areas. To address the range of Industrial needs and activities while providing for the employment, economic diversification and export opportunities generated by Industrial activities, Industrial uses are permissible as follows:

Industrial Lands: Permissible uses in this classification include traditional industrial and other industrial and commercial uses and activities that are appropriate in an industrial area. Development in this classification shall not exceed a floor area ratio of 1.0 except as otherwise established below, and shall not exceed impervious lot coverage of 80 percent. Industrial development shall meet all applicable local and state regulations.

Industrial Overlay Districts are established to provide for industrial and related or similar uses that provide employment opportunities, that provide for economic diversification, that may require large land areas, that may require substantial screening or buffering, that may be appropriately located away from residential and commercial uses, that are appropriately located near other industrial or large scale uses, or that are located on or near accessible transportation corridors. Industrial development within the overlay district shall be subject to the following performance criteria:

- a) Not more than 10% of the area designated in an overlay district may be developed with industrial uses;
 - b) Any individual site must contain a minimum area of 10 acres;
 - c) Individual sites shall be near necessary vehicular or rail corridors or shall be near other established industrial sites or activities;
 - d) A minimum of 35% of the total gross area of any individual site shall be open space;
 - e) Industrial uses in this classification shall not exceed a floor area ratio of 0.4 except as otherwise established below:
 - i. For the Industrial Overlay area between SR 70 West and the railroad tracks, as designated on the Future Land Use map series, development shall not exceed a floor area ratio of 0.20;
 - f) Appropriate zoning must be obtained and other local land use criteria shall be met, including demonstrating the concurrent availability of potable water, sewage disposal and transportation;
 - g) During siting of industrial development within the designated industrial overlay districts, the County will ensure that impacts to environmentally sensitive areas, including wetlands and habitat for listed species are avoided;
 - h) Stormwater treatment will be onsite and post-development quality and quantity must equal pre-development quality and quantity;
 - i) An Industrial Overlay District as depicted on the Future Land Use map series illustrates a generalized land area that meets the referenced criteria, but development of industrial and related or similar uses shall demonstrate that the specific criteria are met before development may commence.
- [9J-5.006(3)(c)2,7] [AMENDED 05/2009]

Policy L1.9: Conservation: Conservation areas, including conservation easements, are lands owned by public agencies or private organizations with an intent to maintain the land in an environmentally or culturally related conservation use. Conservation uses are further described as follows:

Conservation 1: Such public areas are environmentally sensitive or have a pristine quality which should be protected for the enjoyment of future generations. Accordingly, development shall be limited to structures or uses that are consistent with Conservation 1 uses, such as structures for administration or maintenance, visitor centers or visitor or research aids, primitive camping facilities, or research or educational facilities, including housing for on-site personnel and researchers.

Conservation 2: Such areas may be in public or private ownership and may include conservation easements, and are intended to maintain current or provide for future environmental or cultural conservation. Traditional residential, commercial or industrial development is not consistent with Conservation 2 uses, but limited commercial development that allows for and enhances the enjoyment of and participation in recreational activities compatible with Conservation 2 uses is permissible. Other development, such as structures for administration or maintenance, visitor centers or visitor or research aids, primitive camping facilities, or research or educational facilities, including housing for on-site personnel and researchers is consistent with Conservation 2 uses. In addition, agricultural activities are also permissible when such activities are used to provide a reasonable and compatible method of maintaining the affected lands, or when such activities allow the land to be kept in temporary productive use in anticipation of a future Conservation use, such as lands held in association with the restoration of the Kissimmee River or for other environmental or cultural projects. [9J-5.006(3)(c)2,6,7] [AMENDED05/2005]

- Policy L1.10: **Agriculture:** The primary functions of this classification are to protect agricultural land and to identify land that is not needed to serve projected growth. Such areas, having minimal road access and no public sewer or water service, are intended to be held in reserve for future needs. This classification includes those areas which are, and will continue to be, used primarily for agricultural pursuits, as well as agricultural processing activities. In addition:
- a) Residential development is permissible, subject to all applicable local regulations and subject to a density of up to 1 unit per 10 gross acres;
 - b) In addition to agricultural processing and other agriculturally related activities, limited commercial uses that allow for recreational activities or use of public lands are permissible, as well as educational, institutional, recreational and other public uses;
 - c) Within the Agriculture area, land management activities associated with agricultural uses may be incompatible with residential development; however, such management activities are considered to be of primary importance in the Agricultural classification. [(9J-5.006(3)(c)2,7] [AMENDED05/2005]

- Policy L1.11 **Commercial Activity Center (R, S, T, U, V):** A Commercial Activity Center denotes an area of existing development where commercial land uses predominate or where infill or future commercial development is logical or appropriate. The primary purpose of this future land use classification, as designated on the Future Land Use Map, is to promote efficient use of land and public facilities and services through the development of compatible uses, redevelopment, infill and aggregation of small parcels into larger development sites. The boundary of a Commercial Activity Center shall be as depicted on the future land use map series. In addition:

- a) Residential development is permissible, subject to all applicable local regulations. Residential development shall not exceed 30% of this classification, shall be encouraged to be located above or behind commercial development, and shall not exceed a density of 18 dwelling units per gross acre.
- b) Commercial, professional office and light industrial development is permissible in a Commercial Activity Center classification. Such development shall not exceed a floor area ratio of 2.0, except as otherwise established below, and shall not exceed impervious surface coverage of 90 percent. Light industrial development shall make up not more than 20% of total land uses. Recreational vehicle parks, subdivisions and condominiums may be permitted to a maximum of 10 units per gross acre, subject to all applicable local regulations.
 - i. For Commercial Activity Center “V” (SR 710), as designated on the Future Land Use map series, development shall not exceed a floor area ratio of 0.30. [AMENDED 05/2009]
- c) Agricultural uses are permissible only where existing at the time of adoption of this amendment. [9J-5.006(3)(c)2,5,7]

Policy L1.12: **Resort Activity Center:** A Resort Activity Center denotes an area with unique characteristics conducive to the establishment of a resort development, together with an appropriate mix of uses that provide for the resort atmosphere. A Resort Activity Center should be compatible with and incorporate the attributes of its natural surroundings. Public supply water and sewer facilities may not be available, but shall be provided by a developer where the proposed density or intensity of use would necessitate such facilities. Agricultural, residential, recreational and commercial development is permissible, subject to guidelines established for any specific Resort Activity Center. Specific locations of Resort Activity Centers are shown on the Future Land Use Map series. Additional Resort Activity Centers shall require an amendment to the Future Land Use Map series. The land uses and intensities of development permissible within a Resort Activity Center must meet the requirements of concurrency. The following Resort Activity Center is hereby established and provides for the following:

- a) **Rucks R.V. Resort (O):** Residential development not to exceed a density of 1 unit per gross acre, and commercial uses including recreational vehicle parks or subdivisions which shall not exceed a density of 8 units per gross acre provided that adequate public supply water and sewer facilities are provided. Sewage treatment facilities shall not be located within an unaltered 100-year flood plain (as designated by FEMA) if there are non-flood plain or altered flood plain areas located on site. Such facilities shall be located in or on the non-flood plain where they exist, or

may be located within an altered flood plain area if there are no non-flood plain areas on site. If there are no non-flood plain or altered flood plain areas, a sewage treatment plant may be located within an unaltered 100-year flood plain, provided that an engineer licensed by the State of Florida certifies that the facility is floodproofed and otherwise is constructed in accord with permitting agency regulations that address development in flood prone areas. Commercial uses, including recreational vehicle parks or subdivisions, shall not exceed 25% of the Resort Activity Center. Also permissible are agricultural, recreational and public uses, and existing active or permitted mining activities. Resort development shall be adequately buffered from mining and reclamation activities. [9J-5.006(3)(c)2,5,7]

Policy L1.13: **Resort Corridor:** A Resort Corridor denotes an area with unique characteristics conducive to the establishment of resort or resort ancillary uses that are compatible with and complement a resort atmosphere. A Resort Corridor should be compatible with and incorporate the attributes of its natural surroundings. Public supply water and sewer facilities may not be available, but shall be provided by a developer where the density or intensity of a proposed use would necessitate such facilities. Residential, recreational, service and other commercial development is permissible, subject to guidelines established for any designated Resort Corridor. Specific locations of Resort Corridor areas are shown on the Future Land Use Map series. Future Resort Corridors shall require an amendment to the Future Land Use Map series. The land uses and intensities of development permissible within these areas must meet the requirements of concurrency. The following Resort Corridor is hereby established and provides for the following:

- a) **Highway 78 Resort Corridor:** Commercial development that is oriented toward resort and neighborhood activities or that is indirectly related to such uses is permissible in this Corridor. Commercial uses, including recreational vehicle parks, subdivisions or condominiums may comprise up to 100% of the Resort Corridor. Such development shall not exceed an average floor area ratio of 2.0 and shall not exceed impervious surface coverage of 70 percent. Residential development, including townhomes, condominiums, multi-family developments and manufactured home parks, subdivisions, or condominiums may comprise up to 50% of the Resort Corridor. Such development is permissible at a density not to exceed 18 units per gross acre subject to standards established for the Urban Residential Mixed Use classification. Recreational vehicle parks, subdivisions or condominiums shall not exceed a density of 10 units per gross acre. Also permissible are recreational and public uses. Agricultural uses are permissible only where existing at the time of adoption of this amendment. [AMENDED 05/2005]

Policy L1.14: **Rural Estate:** This classification encompasses existing and future areas of low density development within unincorporated Okeechobee County. It includes existing residential subdivisions and areas where future low density residential subdivisions and communities are appropriate or desirable because of proximity to transportation routes while maintaining a semi-agricultural character and maintaining open space. Residential development not to exceed a density of 1 unit per 5 gross acres is permissible in the classification, as well as agricultural, recreational and public uses. [AMENDED 05/2005]

Objective L2: Okeechobee County will coordinate proposed future land uses with the appropriate soil conditions, topography, and the availability of public facilities and services. [9J-5.006(3)(b)1]

Policy L2.1: Okeechobee County will direct development to areas where public facilities and services, including City of Okeechobee and privately-owned sanitary sewer and water facilities and services, are available or are projected to be available. [9J-5.006(3)(c)3]

Policy L2.2: Okeechobee County will condition development orders upon the established levels of services for public facilities and services as defined herein, and to the availability of required public facilities and services concurrent with the impacts of development. [9J-5.006(3)(c)3]

Policy L2.3: Upon Plan adoption, Okeechobee County shall regulate the removal of rock, shell, sand and other minerals from the ground and for the transportation of these materials within the County. At a minimum, these standards will ensure that such activities do not adversely affect adjacent land uses or groundwater quality or quantity. [9J-5.006(3)(c)2]

Policy L2.4: The County shall review proposals for the installation of septic tank disposal systems in industrial developments, and shall prohibit the use of septic systems for developments that generate non-domestic wastes. [9J-5.006(3)(c)1,2]

Objective L3: Upon Plan adoption, Okeechobee County will establish systems to reduce or eliminate existing development and zoning districts that are inconsistent with the Future Land Use Element and Future Land Use Map series. While protecting public safety and minimizing public expenditures on public facilities and services, Okeechobee County may permit residential development on vested lots of record established prior to this Comprehensive Plan which do not conform to density standards set forth in the Future Land Use Element. [9J-5.006(3)(b)3]

Policy L3.1: Okeechobee County shall ensure that development existing at the time of adoption of this Comprehensive Plan that is inconsistent with the Future Land

Use Element or Future Land Use Map shall not be expanded, and that if the use of such development is discontinued for a period of more than six months, that it shall not be reestablished. [9J-5.006(3)(c)1,2]

Policy L3.2: No building permits will be issued for properties not having legal access to a county- or state-maintained road, or to a privately-owned road constructed to meet engineering standards established for an approved private road. The following shall constitute legal access:

- a) Direct frontage on the road in accordance with minimum width standards established in local land development regulations.
- b) Access by easement which meets applicable standards established in local land development regulations and which has been properly recorded in the public records of Okeechobee County. [9J-5.006(3)(c)1,3]

Objective L4: Okeechobee County shall continue to redevelop and renew blighted areas by utilizing Small Cities Community Development Block Grant funds to rehabilitate or eliminate and replace up to 20 substandard housing units per year through the year 2010, and by utilizing Small Cities CDBG funds to provide for the development or redevelopment of commercial and industrial areas. [9J-5.006(3)(b)2] [AMENDED 05/2005]

Policy L4.1: Okeechobee County shall continue to identify and prioritize areas in need of redevelopment or renewal. [9J-5.006(3)(c)1] [AMENDED 05/2005]

Policy L4.2: Okeechobee County will continue its program of CDBG-funded activities to be conducted for the renewal of blighted areas. Such activities will include the rehabilitation of substandard housing, and the revitalization, redevelopment or development of commercial or industrial areas to provide greater employment, shopping and recreational opportunities and to increase the tax base for the County. Those of low or moderate income, the unemployed, and others with identified special need shall be the intended primary beneficiaries of such programs and activities. [9J-5.006(3)(c)1]

Objective L5: Upon Plan adoption, Okeechobee County shall adopt and enforce standards that protect natural and historic resources. Natural resources shall be protected by the regulation of land use in proximity to public supply potable water wellfields and other environmentally sensitive lands, and by the management of stormwater runoff and drainage. [9J-5.006(3)(b)4]

Policy L5.1: Okeechobee County will implement procedures to evaluate development proposals in terms of the goal, objectives and policies set forth in the Conservation Element of this Comprehensive Plan. [9J-5.006(3)(c)6]

Policy L5.2: Through adoption of land development regulations, including provisions for site plan review, cluster development and other techniques, Okeechobee County shall protect certain floodplains, wetlands, cones of influence, natural groundwater aquifer recharge areas, native vegetative communities and wildlife habitats. All proposals for development and redevelopment activities shall be evaluated by the County during a development review process, and shall be subject to the referenced land development regulations. Specifically:

- a) The County shall require the identification of the extent to which any development or redevelopment is proposed to be placed in or on, to disturb, or to alter the natural functions of areas prone to 100-year frequency floods, as depicted by Zone "A" on Federal Emergency Management Agency Flood Insurance Rate Maps. If the County determines that a viable 100-year floodplain may be disturbed or altered, the County shall require the developer to provide an inventory related to the 100-year floodplain which may be encroached upon. This inventory shall be evaluated by the County during a phase of its development review process. Where it is determined that proposed development or redevelopment will encroach upon a viable 100-year floodplain, the County shall require a Specific Management Plan to be prepared by the developer which includes necessary modifications to the proposed development, such as specific buffers or clustering of development. All development activities in a viable 100-year floodplain shall conform to regulations as promulgated by the Federal Emergency Management Agency, National Flood Insurance Program (Regulations for Floodplain Management and Flood Hazard Identification), shall conform to the regulations of the appropriate water management district where such water management district has jurisdiction, shall conform to other applicable federal and state regulations, and shall conform to local regulations established to protect property and to protect the natural function of floodplain. Specifically, development shall be set back no less than 50 feet from a floodway, and residential development within a viable 100-year floodplain shall be flood-proofed or have the finished floor above the 100-year flood elevation, shall not displace the floodwaters of a 100-year frequency flood, and shall not alter the natural function of a viable 100-year flood plain. No non-mining industrial development shall be permitted in a viable 100-year flood plain. Permissible residential densities within a viable 100-year floodplain shall be no greater than one dwelling unit per 5 gross acres or no greater than one dwelling unit per 10 gross acres in areas designated as Agriculture.;

- b) The County shall require the identification of the extent to which any development or redevelopment is proposed to be placed in or on, to disturb, or to alter the natural functions of state or federally-defined wetlands; soils posing severe limitations to construction; or endangered or threatened species of wildlife and plants. If the County determines that one or more of the natural resources referenced above may be disturbed or altered, the County shall require the developer to provide an inventory related to the specific natural resource which may be encroached upon. This inventory shall be evaluated by the County during a phase of its development review process. Where it is determined that proposed development or redevelopment will encroach upon a referenced natural resource, the County shall require a Specific Management Plan to be prepared by the developer, which includes necessary modifications to the proposed development, such as specific setbacks, buffers, or clustering of development away from site resources, to ensure the protection, preservation or natural functions of the resource. The provisions of such management plans shall be consistent with the natural resource protection policies of the Conservation Element of this Plan;
- c) The County shall protect the natural function of identifiable wetlands by: 1) avoiding encroachment; 2) minimizing the loss of wetlands when encroachment cannot be avoided; or 3) mitigating the loss of wetlands. Where it is determined that proposed development or redevelopment will encroach upon a defined wetland, the County shall require a Specific Management Plan to be prepared by the developer, which includes necessary modifications to the proposed development, such as specific setbacks, buffers, or clustering of development away from the wetland. The provisions of such management plans shall be consistent with the natural resource protection policies of the Conservation Element of this Plan. Wetlands destroyed by future development activities shall be restored or created in accordance with regulations established by the appropriate jurisdictional authority, specifically the South Florida Water Management District, the St. Johns River Water Management District, the Florida Department of Environmental Regulation or the Army Corps of Engineers. The County's land development regulations shall include appropriate criteria and standards for wetlands protection, such as: setbacks of a minimum of 25 feet; buffers; conservation easements; compensatory acre-for-acre on-site mitigation, or two-to-one off-site mitigation; drainage criteria; allowed and exempted uses; wetland function; and significant and insignificant effects of development on wetlands. The definition of wetlands to be used for regulatory purposes shall be derived from the definition of wetlands used by the South Florida Water Management District, the St. Johns River Water Management District, the Florida Department of Environmental Regulation, and the Army Corps of Engineers. The Generalized Wetlands Map, adopted as

part of this Comprehensive Plan, is intended to serve as a guide to the possible location of wetlands. Specific identification of wetlands may require a survey to be provided at the expense of the developer and in coordination with relevant agencies, if appropriate, to determine whether wetlands under the jurisdiction of the South Florida Water Management District, the St. Johns River Water Management District, the Florida Department of Environmental Regulation or the Army Corps of Engineers are present on a site;

- d) The County shall cooperate with the South Florida Water Management District and the St. Johns River Water Management District to identify cones of influence and prime natural groundwater aquifer recharge areas, and develop a comprehensive wellhead protection program. The program shall include provisions to restrict incompatible uses and substances found on the Florida Substance list known to have adverse effects on water quality and quantity. Okeechobee County shall request funding assistance from the SFWMD and the SJRWMD to accomplish these activities. The County shall also consider assessing the users or owner/operators of public supply potable water wells to contribute toward the County's share of funding. However, as an interim measure between Plan adoption and the identification of public supply potable water well cones of influence by SFWMD and the SJRWMD, Okeechobee County shall establish a 400 ft. radius from the base of a public supply potable water well as a wellhead protection area. The first 200 foot radius shall be a zone of exclusion. The only development permissible within the zone of exclusion is the encroachment of the footprint of a single-family residential structure, excluding any on-site septic facilities, and only when such encroachment will prevent a regulatory taking. Within the remainder of the wellhead protection area, the following will be prohibited: landfills; facilities for bulk storage, handling or processing of materials on the Florida substance list; activities that require the storage, use, handling, production or transportation of restricted substances, agricultural chemicals, petroleum products, hazardous toxic waste, medical waste, or similar substances; feed lots or other commercial animal facilities; wastewater treatment plants, percolation ponds or similar facilities; mines; and excavation of waterways or drainage facilities which intersect the water table; and
- e) Wildlife habitat and unique native vegetative communities shall be protected from destruction by development activities in accordance with Policy C3.4. [9J-5.006(3)(c)1,2,4,6,7]

Policy L5.3: Upon Plan adoption, buffers shall be used to separate incompatible land uses and to protect certain natural resources. The size, composition and location of buffers shall be set forth in the County's land development regulations, shall be based on the proposed land use or development activity, and shall be

consistent with the policies of this Comprehensive Plan. Areas designated as buffers shall preserve or restore natural vegetative cover, except where drainage-ways and access paths are approved to cross the buffer or where a structural buffer, such as a wall or fence is required. Buffers may be supplemented only with native trees, shrubs and ground covers. The issuance of a final development order by the County shall be contingent upon implementation of all stipulations within a site development plan, or a Specific Management Plan as set forth in Policy L5.2. The provisions of such management plans shall be consistent with the natural resource protection policies of the Conservation Element of this Plan. [9J-5.006(3)(c)1,2,6]

Policy L5.4: Okeechobee County shall continue to protect historically significant properties. All sites listed in the Florida Master Site File or National Register shall be considered for local designation. Local designation, as well as demolition or alteration of locally designated sites or structures, shall be by action of the Board of County Commissioners. This procedure does not replace or diminish established procedures for the alteration or demolition of structures or sites in the County, but is an additional safeguard to protect structures and sites designated by the Board of County Commissioners as historically or archaeologically significant. [9J-5.006(3)(c)8] [AMENDED 05/2005]

Objective L6: Okeechobee County will ensure that proposed land use activities within the Kissimmee River study area are not inconsistent with the stated goal of the Resource Management Plan for the Lower Kissimmee River and Taylor Creek Drainage Basins, adopted August 21, 1985 and prepared pursuant to Chapter 380, Florida Statutes. [9J-5.006(3)(b)6]

Policy L6.1: During 1992, Okeechobee County will review the Resource Management Plan for the Lower Kissimmee River and Taylor Creek Drainage Basin, and coordinate its activities with other local governments addressed in the Resource Management Plan. [9J-5.006(3)(c)1,2,6]

Policy L6.2: Activities by Okeechobee County to implement the Resource Management Plan for the Lower Kissimmee River and Taylor Creek Drainage Basins will be those which support or coordinate with actions initiated by the State and regional agencies referenced in the Resource Management Plan. [9J-5.006(3)(c)1,2,6]

Objective L7: Okeechobee County shall continue to promote compact development and encourage the efficient use of public facilities. [9J-5.006(3)(b)7] [AMENDED 05/2005]

Policy L7.1: Ongoing decisions affecting the development of land will be consistent with the Future Land Use Element and Future Land Use Map. [9J-5.006(3)(c)1]
[AMENDED 05/2005]

Policy L7.2: Okeechobee County shall continue to implement land development regulations which contain specific provisions to implement the adopted Comprehensive Plan. Improvements to the land development regulation process shall focus on efficiency and effectiveness through a streamlining of procedures. Land development regulations shall, at a minimum: [AMENDED 05/2005]

- a) Regulate the subdivision of land. The County's subdivision regulations shall be reviewed and updated in order to be consistent with this Comprehensive Plan;
- b) Regulate areas subject to seasonal and periodic flooding and provide for drainage and stormwater management. This shall be accomplished by continued adherence to South Florida Water Management District regulations;
- c) Regulate signage. A sign provision of the County's land development regulations appropriate for various land use activities shall be adopted. At a minimum, the provision shall establish the frontage requirement for signs, consider allowing shared signs for smaller properties, and define terms within the provision to clarify its intent;
- d) Promote safe and convenient on-site traffic flow and vehicle parking through the adoption and continued enforcement of design standards for new construction; and
- e) Provide for the protection of environmentally sensitive lands, and provide for open space. "Environmentally sensitive lands" are defined as wetlands, viable 100-year floodplains or critical habitat for plant or animal species listed by the Florida Department of Agriculture and Consumer Services (FDACS), the Florida Game and Freshwater Fish Commission (FGFWFC), or the United States Fish and Wildlife Service (USFWS) as endangered, threatened, or species of special concern. A Critical Habitat means the specific area within a geographic area occupied by plant or animal species listed by the FDACS, FGFWFC or USFWS as endangered, threatened or species of special concern on which are found those physical or biological features essential to the conservation of the species and which may require management consideration or protection.
[9J-5.006(3)(c)(1,4)]

Policy L7.3: Upon Plan adoption, Okeechobee County will implement a Concurrency Management system to ensure that needed public facilities will be in place prior to or concurrent with the impacts of new development. An element of the County's concurrency management system shall be a program to bring planned,

permitted and zoned development capacity into alignment with existing and programmed capital improvements capacity. The program of aligning development capacity with capital improvements capacity shall provide for the recognition and protection of vested property rights. [9J-5.006(3)(c)3]

Policy L7.4: Okeechobee County will promote innovative land development techniques which mix and distribute land uses in such a way as to use public facilities in the most efficient manner possible. Land development regulations will be developed to encourage infill development in the Commercial Corridor Mixed Use and Urban Residential Mixed Use areas by providing for:

- a) Expedition of the permitting process for infill development proposals;
- b) Consideration of exceptions to requirements such as minimum lot sizes, minimum setbacks, or minimum parking requirements to provide for residential, affordable residential and economically viable commercial opportunities;
- c) Coordination with existing municipal and privately operated potable water, sanitary sewer and drainage facilities to develop regional public supply facilities and require compatibility of privately operated facilities;
- d) The direction of public expenditures to areas of higher intensities and densities of use and therefore encourage development to locate where public facilities are more readily and more economically available; or
- e) Coordination with municipal, county and state transportation facilities to provide adequate levels of service that support higher densities and intensities of development within or adjacent to currently developed areas. [9J-5.006(3)(c)3,5]

Objective L8: Okeechobee will ensure that appropriate sites and public facilities are available for future public educational facilities concurrent with new development.
[AMENDED 05/2005]

Policy L8.1: Okeechobee County shall establish threshold acreage for new schools as follows:

- a) *Elementary Schools:* A minimum of four (4) acres for the first two hundred (200) students, plus one (1) acre for each additional one hundred (100) students.
- b) *Middle Schools/Junior High Schools:* A minimum of six (6) acres for the first three hundred (300) students, plus one (1) acre for each additional one hundred (100) students.
- c) *Senior High Schools:* A minimum-of seven (7) acres for the first three hundred (300) students. plus one (1) acre for each additional fifty (50)

students up to one thousand (1,000) students, plus one (1) acre for each additional one hundred (100) students thereafter.

- d) *Area Vocational/Technical School:* A minimum of twenty (20) acres for the first five hundred (500) students, plus one (1) acre for each additional fifty (50) students up to one thousand (1,000) students.
- e) *Community College:* A main campus site shall be a minimum of one hundred (100) acres. Each separate center site shall contain a minimum of forty (40) acres for the first five hundred (500) students, plus two (2) acres for each additional one hundred (100) students. Special-purpose center site acreage shall be appropriate to contain the functions identified in the program. [AMENDED 05/2005]

Policy L8.2: Upon issuance of a development order for a new school, public facilities such as potable water, sanitary sewer, solid waste, drainage and roads necessary to serve the proposed use shall be in place or shall be programmed. Prior to the issuance of a development order, the School Board shall obtain written agreements from service providers assuring adequate capacity is or will be available. [AMENDED 05/2005]

Policy L8.3: Ingress and egress to new educational facilities should not create detrimental impacts on roads adjacent to the site and the site must provide for adequate on-site parking and vehicle circulation. [AMENDED 05/2005]

Policy L8.4: Approaches to new educational facilities should be safe for pedestrians, bicycles, cars and buses. [AMENDED 05/2005]

Policy L8.5: Okeechobee County shall advise the School Board of all Plan amendments that may affect the location of new schools and proposed improvements. [AMENDED 05/2005]

Policy L8.6: Proposed school sites should be located away from industrial uses and other potentially incompatible land uses to avoid noise, odors, dust, and other adverse impacts and hazards. [AMENDED 05/2005]

Policy L8.7: Disrupting influences caused by school yard noises and traffic shall be buffered to ensure sufficient distances from or compatibility with hospitals, adult communities, and nursing homes. [AMENDED 05/2005]

Policy L8.8: New school sites should, whenever possible, avoid floodways, wetlands, and other environmentally sensitive areas, and should not interfere with historic or archaeological resources. [AMENDED 05/2005]

Policy L8.9: Okeechobee County shall facilitate the adequate and efficient provision of public schools through: [AMENDED 05/2005]

- a) Continuing to allow new public elementary, middle and high schools in the Urban Residential Mixed Use, Rural Estate, Rural Activity Center, Resort Activity Center, Resort Corridor, Commercial Corridor Mixed Use, Commercial Activity Center and Public/Semi-Public Facilities future land use classifications locational criteria in the Comprehensive Plan and development standards in the county land development regulations;
- b) Not permitting new public schools for any site prohibited for a public school in Rule 6A-2, F.A.C;
- c) Addressing public school facilities pursuant to the provisions of Sections 163.3161(3), 163.3164(24) and 163.3177(10)(h), Florida Statutes;
- d) Initiating a coordination process with the School Board in its efforts on school planning, site selection and construction;
- e) Maintaining for public review, a listing of capacity-deficient public schools and the School Board's Educational Plan Survey and Capital Improvement Program when such information is provided to the County.

Objective L9: Okeechobee County will ensure that suitable land for public facilities and utility facilities to support proposed development is available. [9J-5.006(3)(b)8]

Policy L9.1: Land use designations established in the Future Land Use Element will include appropriate public facilities as permissible uses, and adequate acreage for such facilities will be provided on the Future Land Use Map. [9J-5.006(3)(c)1,2,3]

Policy L9.2: Okeechobee County will amend its zoning, subdivision and other land development regulations as necessary to ensure that adequate land or facilities are available to meet the needs of new development in the following areas:

- a) drainage
- b) stormwater management
- c) parking
- d) open space
- e) road right-of-way
- f) public utility plant sites
- g) schools [9J-5.006(3)(c)1,4]

Policy L9.3: Upon Plan adoption, the County's Concurrency Management System shall require evidence of adequate capacity available from public or private providers of utility services prior to the issuance of a final development order. A final development order includes a development permit for construction,

final approval for subdivision, and final approval for changes in zoning to a zoning district of greater density or intensity. [9J-5.006(3)(c)3]

Policy L9.4: The County's land development regulations shall require the set-aside, by dedication or easement, of land suitable to accommodate public utility facilities needed to service a proposed development. [9J-5.006(3)(c)3]

Policy L9.5: Public utilities needed to service existing and future land uses shall be permitted in all future land use classifications, provided the performance standards in the Power Plant Siting Act, the Transmission Line Siting Act, the Okeechobee County Comprehensive Plan, Okeechobee County land development regulations, and any other applicable land development regulations are met. [9J-5.006(3)(c)3] [AMENDED 05/2005]

Objective L10: Okeechobee County will promote the use of various and innovative land development techniques. [9J-5.006(3)(b)9]

Policy L10.1: Okeechobee County will amend its land development regulations to encourage development techniques which mix and distribute land uses to accomplish the following:

- a) Make the most efficient possible use of existing public facilities;
- b) Recognize and preserve distinctive natural features of the development site;
- c) Protect environmentally sensitive areas within the site;
- d) Meet specific needs of the County; and
- e) Promote a sense of pride and community for its residents. [9J-5.006(3)(c)2,3,5,6]

Objective L11: Okeechobee County shall support the role of the Avon Park Air Force Range by ensuring that adjacent future development is compatible with and will not negatively impact range operations. [163.3177(6)(a)]] [AMENDED 06/2013]

Policy L11.1 Okeechobee County shall establish an Avon Park Air Force Range (APAFR) Military Compatibility Zone overlay in its land development regulations to identify those areas where compatibility criteria will be implemented and to ensure development in this area and the military operations of the APAFR are compatible. The County will address public health and safety issues by minimizing conflicts between Range operations and surrounding land uses.

- Policy L11.2 In compliance with Section 163.3175(5), F.S., Okeechobee County shall continue to coordinate with range representatives and the Central Florida Regional Planning Council to adopt and implement development standards and guidelines that minimize impacts of development on the operations of the military installation. The land development regulations may address land use, lighting, height, noise and communication frequency spectrums in defining the criteria for compatibility within the Military Compatibility Zone.
- Policy L11.3 Okeechobee County shall coordinate with the Avon Park Air Force Range and the Central Florida Regional Planning Council to develop effective disclosure procedures making current and potential land owners aware of the APAFR and potential compatibility conflicts.
- Policy L11.4 Okeechobee County shall coordinate with the Central Florida Regional Planning Council and other agencies to support efforts to protect and preserve environmentally sensitive areas located adjacent to the Avon Park Air Force Range. These strategies may include programs to purchase conservation lands, establish conservation or agricultural easements and allow for the use of transfer or purchase of development rights as part of the development review process, among others.
- Policy L11.5 As mandated by Section 163.3175(7), F.S., Okeechobee County shall amend its land development regulations to provide for appointing a representative of the Avon Park Air Force Range as an ex officio, nonvoting member of the Okeechobee County Planning Board.
- Policy L11.6 The County shall continue to coordinate with the Avon Park Air Force Range and adjacent governments to consider the guidelines and standards identified in the Avon Park Air Force Range Joint Land Use Study.

END OF GOAL, OBJECTIVES AND POLICIES

Okeechobee County Comprehensive Plan

Goals, Objectives and Policies

Section 2

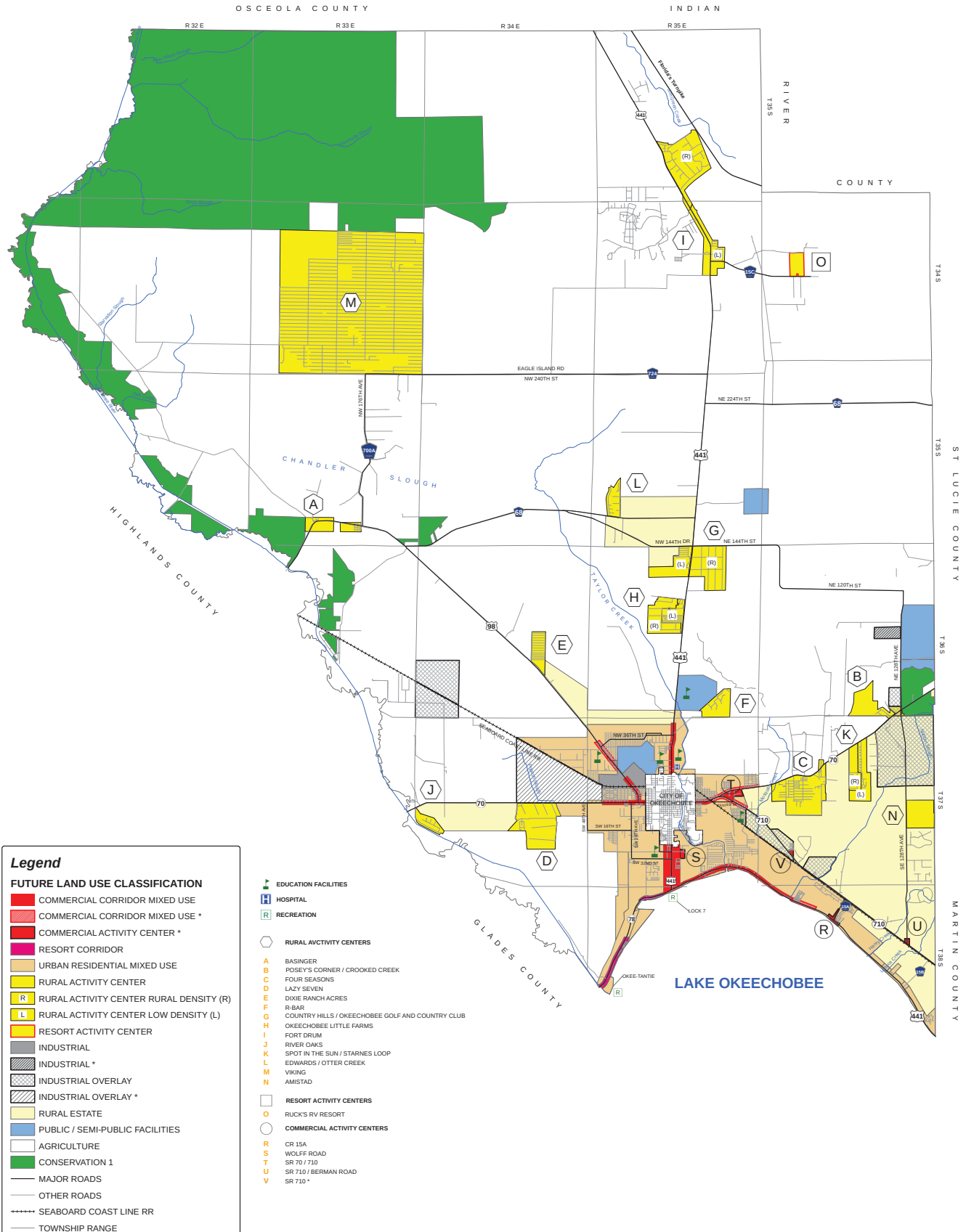
Future Land Use Map Series

- | | |
|---------|---|
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| Map 2.2 | Public Supply Potable Water Wells/Water Treatment Plants - Okeechobee County |
| Map 2.3 | Public Supply Potable Water Wells/Water Treatment Plants - Southern Okeechobee County |
| Map 2.4 | Generalized Wetlands |
| Map 2.5 | Generalized Floodplains |
| Map 2.6 | Generalized Soils |
| Map 2.7 | Generalized Surface Minerals |

June 2013

OKEECHOBEE COUNTY

CONCEPTUAL FUTURE LAND USE 2020



*See Comprehensive Plan Policies for Specific Development Criteria

APPENDIX 10.5.2

INDIAN RIVER COUNTY FUTURE LAND USE



Indian River County 2030 Comprehensive Plan

Chapter 2

Future Land Use Element

Indian River County Community Development Department

Adopted: October 12, 2010

Supplement #6; Adopted July 2, 2013, Ordinance 2013-007

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GOALS, OBJECTIVES, AND POLICIES

VISION STATEMENT

To maintain and promote the “Small Town Character” of Indian River County as a low density, low rise and “green” county, while providing for a variety of housing and transportation choices.”

The goals, objectives, and policies are the most important parts of each comprehensive plan element. This section identifies the future land use element goals, objectives, and policies. This plan uses the following definitions of a goal, an objective, and a policy:

Goal: Long term end toward which programs or activities are directed.

Objective: A specific, measurable, intermediate end that is achievable and marks progress toward a goal.

Policy: The course of action or way in which programs and activities are conducted to achieve an identified goal or objective.

GOAL

Land development in Indian River County will occur in an orderly and controlled manner which ensures balanced growth that optimizes the potential for economic development, provides for the efficient use of facilities and services, and ensures the protection of the county's rich and varied environmental resources.

OBJECTIVE 1: COMPACT, ENERGY EFFICIENT, LOW-DENSITY DEVELOPMENT

Indian River County will have a compact and energy efficient land use pattern; an overall low density character; and adequate land for utility facilities necessary to support development. By 2030, the overall residential density of the unincorporated portions of Indian River County, within the Urban Service Area, will be 1.75 units/acre.

Policy 1.1: Indian River County hereby adopts the Future Land Use goal, objectives, policies as well as Figures 2.9, 2.18, 2.20, 2.23, 2.24, 2.25, 2.26, 2.27, 2.29, and 2.33; and The Official Future Land Use Map.

Policy 1.2: Indian River County hereby adopts the following land use designations to be depicted on the Future Land Use Map (Figure 2.34):

C-1, Conservation-1 (zero density)
C-2, Conservation-2 (up to 1 unit/40 acres)
C-3, Conservation-3 (up to 1 unit/2.5 acres)
AG-1, Agriculture-1 (up to 1 unit/5 acres)
AG-2, Agriculture-2 (up to 1 unit/10 acres)
AG-3, Agriculture-3 (up to 1 unit/20 acres)
R, Rural Residential (up to 1 unit/acre)
T, Transitional Residential (up to 1 unit/acre; or up to 3 units/acre for Planned Development Projects)
L-1, Low-Density Residential-1 (up to 3 units/acre)
L-2, Low-Density Residential-2 (up to 6 units/acre)
M-1, Medium-Density Residential-1 (up to 8 units/acre)
M-2, Medium-Density Residential-2 (up to 10 unit/acre)
MHRP, Mobile Home Rental Park (up to 8 units/acre)
BCID, Blue Cypress Improvement District (up to 10 unit/acre)
C/I, Commercial/Industrial
RC, Regional Commercial
PUB, Public Facilities
REC, Recreation
Mixed Use (floating land use designation; not depicted on the future land use map)

Policy 1.3: Indian River County shall maintain, periodically review, and revise if necessary, its various zoning districts (including special districts) and overlay districts as may be warranted to ensure the implementation of the comprehensive plan. The zoning districts shall be based on the comprehensive plan and shall directly govern specific land uses, lot area, building type, and size and dimension criteria.

Additionally, Indian River County shall maintain, periodically review, revise if necessary, and enforce land development regulations. Those land development regulations shall be the primary mechanism through which the county shall implement the Comprehensive Plan. The criteria and standards established in the various elements of the comprehensive plan shall be the basis for the land development regulations. Those regulations shall include, but not be limited to, provisions for:

- The use of land and water consistent with the Future Land Use Map and the Comprehensive Plan;
- The subdivision of land;
- The use of areas subject to periodic flooding and the provision of adequate drainage and stormwater protection;
- The protection of potable water wellfields;

- The protection of environmentally sensitive lands;
- The regulation of signage, landscaping and other aesthetic controls;
- The provision of safe on-site and off-site traffic circulation and adequate parking; and
- The review of all development applications and modifications to ensure that all provisions of the Comprehensive Plan are enforced.

Policy 1.4: Indian River County's land development regulations shall, through various means, ensure that adjacent land uses are compatible. Those means shall include, but not be limited to, use of the following:

- vegetative buffers;
- setbacks;
- open space;
- physical separation;
- regulation of lighting;
- regulation of hours of operation; and
- regulation of access.

Policy 1.5: The Conservation Land Use designations shall be applied to those areas which contain or possess lands with qualities and features which play a vital or essential role in the normal functioning of the county's ecosystems and have been so identified in the conservation element or merit preservation as vestiges of once common county ecosystems.

Policy 1.6: Development of conservation designated land shall be limited to the following:

C-1, Conservation-1 (Publicly owned or controlled conservation areas)

Conservation Uses

Passive Recreational Uses

- including, but not limited to, nature centers and trails, hiking trails, canoe launches, observation towers, scenic areas, wildlife sanctuaries, wildlife feeding stations, hunter education centers (including shooting ranges), picnic areas, bathrooms, and parking areas
- up to 0.25 FAR

C-1 designated parcels shall be specifically depicted on the future land use map. C-1 designated parcels include but are not limited to land owned by the St. Johns River Water Management District for its Upper Basin Project, publicly owned spoil islands in the Indian River Lagoon, and other environmentally important land owned or controlled by public entities for conservation purposes.

C-2, Conservation-2 (Privately owned estuarine wetland and undeveloped lagoon island conservation areas)

Conservation Uses

Passive Recreational Uses

- including, but not limited to, nature centers and trails, hiking trails, canoe launches, observation towers, scenic areas, wildlife sanctuaries, wildlife feeding stations, picnic areas, bathrooms, and parking areas
- up to 0.25 FAR

Residential Uses

- up to 1 unit/40 acres (on-site)
- up to 1 unit/acre (Transfer of Development Rights)

C-3, Conservation-3 (Privately owned xeric scrub conservation areas)

Conservation Uses

Passive Recreational Uses

- including, but not limited to, nature centers and trails, hiking trails, canoe launches, observation towers, scenic areas, wildlife sanctuaries, wildlife feeding stations, picnic areas, bathrooms, and parking areas
- up to 0.25 FAR

Planned Development

- residential uses up to 1 unit/2.5 acres (on-site internal transfer of development rights)
- residential uses up to 1 unit/acre (external transfer of development rights)
- places of worship, up to 0.25 FAR

C-2 and C-3 designated areas shall be generally depicted on the future land use map; specific boundaries shall be established pursuant to Policy 1.7 of the Future Land Use Element.

Residential development in C-2 designated areas and in C-3 designated areas shall be limited to approved Planned Developments (PDs). The county shall require cluster development and density transfers to limit the impact of development on conservation lands. The PD and clustering requirements shall not apply to single-family lots along the east side of the St. Sebastian River that were legally created prior to February 13, 1990.

The following criteria shall apply to PDs in C-2 and C-3 designated areas:

- The density of the project shall not exceed the maximum density of the C-2 (for wetlands) or C-3 (for xeric scrub uplands) designated areas, as applicable; no density transfers from off-site lands and no density bonuses shall be permitted within PD projects on C-2 or C-3 designated lands;
- Lots created through the PD process shall not exceed one acre in size and shall be clustered, with the remainder of the area designated as open space;
- Open space areas shall be retained as natural areas; however, up to ten percent of the open space in C-3 designated areas may be used for passive recreation (including nature centers and trails, scenic areas, wildlife sanctuaries and feeding stations, and picnic areas), and historical sites, as appropriate.

- Within C-3 designated areas, the total area of xeric scrub disturbed by a PD project shall not exceed 20% of the total xeric scrub area occurring on site.

Policy 1.7: Conservation land use designations shall be depicted on the future land use map. The exact boundaries of the C-2 and C-3 Conservation designated areas shall be determined by environmental survey. With one exception, any area which is depicted as a C-2 (wetlands) area or C-3 (upland xeric scrub) area on the Future Land Use Map, but which is determined by environmental survey not to be wetlands (as defined in the Conservation Element) or xeric uplands (as defined by the presence of xeric scrub vegetation and Orsino fine sand, 0 to 5 percent slopes, or Electra sand, 0 to 5 percent slopes) will have the same land use designation as the contiguous adjacent property.

The exception applies to land located east of the St. Sebastian River and depicted as C-3 on the future land use map. If determined by environmental survey not to be xeric uplands, then that land shall be designated R, Rural Residential (up to 1 unit/acre).

All areas depicted as C-3 on the Future Land Use Map which have xeric scrub vegetation and Orsino fine or Electra sands will be deemed environmentally important, notwithstanding whether or not such areas meet the 5 acre minimum threshold for environmental importance established in Conservation Element Policy 6.11 for other districts in the county.

The determination of the exact outer boundaries of C-2 or C-3 areas will be made by the county environmental planning staff based on verification of the vegetation and soils criteria referenced above, as applied to the environmental boundary survey conducted by the landowner/applicant or his agent at the time of application for any development permit (other than a comprehensive plan amendment or rezoning).

The county environmental planning staff shall not make its determination of importance or sensitivity until after consultation with all appropriate local, state and federal agencies. Such consultation shall be ongoing, as required for proper coordination, throughout the land development permit approval process.

Policy 1.8: C-2 and C-3 designated lands shall be considered for public acquisition.

Policy 1.9: The Agricultural Land Use designations shall be applied to those areas of the county that have been traditionally used for agricultural purposes and are sufficiently removed from urban areas. The Agricultural Land Use categories will ensure the continuation of the agriculture industry, protect agricultural lands from urban encroachment, and provide valuable green and open space.

Policy 1.10: Development of agriculturally designated lands shall be limited to the following:

Agricultural Uses such as Farming, Groves, Range and Livestock Activities and Forestry
Excavation Activities

Agricultural Planned Developments consistent with Future Land Use Element Policy 5.9

Single-Family Residential Uses

- Up to 1 unit/lot or parcel on legally established non-conforming lots or parcels of record, existing on October 1, 1990
- Up to 1 unit/5 acres in AG-1 designated areas
- Up to 1 unit/10 acres in AG-2 designated areas
- Up to 1 unit/20 acres in AG-3 designated areas

Agricultural Research Uses

Agriculturally Related Businesses

Recreational Uses

Public Facilities

Institutional Uses

Recycling Facilities

Public Schools

- (Public schools shall be permitted on agriculturally designated lands only within mixed use projects and traditional neighborhood design projects, or on sites located outside of, but contiguous to, the urban service area boundary.)

New Towns

- As permitted by Future Land Use Element Policies 1.37 and 1.38

Public and Private Utilities, Limited and Heavy

Policy 1.11: The Low-Density Residential Land Use designations shall be applied to those areas which are suitable for urban and suburban scale development. Except for two areas that are adjacent to the City of Fellsmere, Low-Density Residential designated areas shall be limited to lands that are located within the urban service area and near existing urban centers.

The two exceptions are the L-1 designated Homewood Subdivision generally located along the City of Fellsmere's south boundary, and the L-2 designated Tropical Village Estates and Morningside Subdivisions located at the southeast corner of CR 512 and 130th Avenue.

Policy 1.12: Development in low-density residential areas shall be limited to the following:

Single-Family Residential Uses

- up to 1 unit/acre in R designated areas
- up to 3 units/acre in L-1 designated areas
- up to 6 units/acre in L-2 designated areas

Multiple-Family Residential Uses

- up to 3 units/acre in L-1 designated areas
- up to 6 units/acre in L-2 designated areas

Recreational Uses

- up to 0.35 FAR

Public Facilities

- up to 0.35 FAR

Institutional Uses

- up to 0.35 FAR

Schools (not including business and vocational schools)

- up to 0.35 FAR

Excavation Activities (in R designated areas only)

Agricultural Uses (as permitted in Future Land Use Element Policy 6.3)

Professional Office Uses

- as permitted by Future Land Use Element Policy 1.34
- up to 0.35 FAR

Mixed Use Development Projects

- As permitted by Future Land Use Element Policy 5.6

Public and Private Utilities, Limited

The FAR of mixed use projects shall be calculated by assigning a portion of the total development area to each use. The sum of the portions assigned to each use must equal the total development area. An exception shall be allowed for accessory residential uses within primarily non-residential projects. That exception shall allow the entire development area to be used to calculate the number of units allowed, without restricting the amount of development area available for calculating the maximum FAR for primary uses.

Policy 1.13: The Medium-Density Residential Land Use designations shall be applied to those areas which are suitable for urban scale development and intensities. Those areas shall be limited to lands that are located within the urban service area and near existing urban centers.

Policy 1.14: Development in medium-density residential areas shall be limited to the following:

Single-Family, Multiple-Family, and Mobile Home Residential Uses (excluding Mobile Home Rental Parks 15 acres or larger)

- up to 10 units/acre in M-2 designated areas
- up to 8 units/acre in M-1 designated areas

Recreation Uses

- up to 0.35 FAR

Public Facilities

- up to 0.35 FAR

Institutional Uses

- up to 0.35 FAR

Schools (not including business and vocational schools)

- up to 0.35 FAR

Professional Office Uses

- as permitted by Future Land Use Element Policies 1.34 & 1.40
- up to 0.35 FAR

Mixed Use Development Projects

- As permitted by Future Land Use Element Policy 5.6

Public and Private Utilities, Limited

The FAR of mixed use projects shall be calculated by assigning a portion of the total development area to each use. The sum of the portions assigned to each use must equal the total development area. An exception shall be allowed for accessory residential uses within primarily non-residential projects. That exception shall allow the entire development area to be used to calculate the number of units allowed, without restricting the amount of development area available for calculating the maximum FAR for primary uses.

Policy 1.15: The Mobile Home Rental Park Land Use designation will be applied only to those properties that contain mobile home rental parks fifteen (15) acres or more in size within the unincorporated portions of the county and limited to lands that are located within the urban service area.

Policy 1.16: Development in a Mobile Home Rental Park Land Use designation shall be limited to the following:

Mobile Home Residential Uses

- up to 8 units/acre

Recreational Vehicle Uses (up to 25% of allowed units, within parks of less than 20 acres)

- up to 8 units/acre

Recreation Uses

- up to 0.35 FAR

Public Facilities

- up to 0.35 FAR

Institutional Uses

- up to 0.35 FAR

Policy 1.17: The Commercial/Industrial Land Use designation shall be applied to those areas which are suitable for urban scale development and intensities. Those areas shall be limited to lands that are located within the urban service area and near existing urban centers.

Policy 1.18: Development in Commercial/Industrial designated areas shall be limited to the following:

USE	MAXIMUM INTENSITY/DENSITY
Retail Trade	0.23 FAR
Offices	0.35 FAR
Business and Personal Services	0.35 FAR
Residential	8 units/acre

USE	MAXIMUM INTENSITY/DENSITY
Manufacturing	0.50 FAR
Assembly	0.50 FAR
Materials Processing	0.50 FAR
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Storage/Warehousing	0.50 FAR
Public Facilities	0.35 FAR
Recreational	0.35 FAR
Schools	0.35 FAR
Institutional	0.35 FAR
Public or Private Utilities, Limited or Heavy	0.50 FAR

The Floor Area Ratio (FAR) in Commercial/Industrial designated areas shall not exceed the above cited limits. The FAR is determined by dividing the gross floor area of all floors of all buildings on a development site by the area of that development site. If there is a question concerning which FAR category applies to a particular use, then the applicable FAR category shall be the same category that applies to the use having the most similar characteristics to the use in question. County staff shall determine which use has the most similar characteristics to the original use in question. Factors used to make that determination shall include the type and volume of traffic generated, parking requirements, and the Standard Industrial Classification Code.

The FAR of mixed use projects shall be calculated by assigning a portion of the total development area to each use. The sum of the portions assigned to each use must equal the total development area. An exception shall be allowed for accessory residential in Commercial/Industrial designated areas. That exception shall allow the entire development area to be used to calculate the number of units allowed, without restricting the amount of development area available for calculating the maximum FAR for primary uses.

Policy 1.19: Land development regulations shall provide performance standards for commercial/industrial development which at a minimum address, but are not limited to, the following:

- Land use compatibility, buffering and landscaping
- Access points, traffic controls, and parking
- Signage

- Gross floor area, impervious surface ratios
- Open space
- Character of an area
- Environmental impact

Policy 1.20: Commercial/Industrial designated areas shall be structured as nodes. These nodes shall be located along roads with functional classifications appropriate to the level of activity.

Policy 1.21: Indian River County recognizes that, because of the scale of the Future Land Use Map, the exact boundaries of Commercial/Industrial nodes delineated on the map may require interpretation in order to determine the exact land use designation of various parcels, lots, and tracts. Therefore, when necessary, the following criteria shall be used to establish the location of a specific node boundary line on large-scale node boundary maps and on the county's zoning atlas:

- a. A node boundary line is subject to interpretation only when an inspection of the Future Land Use Map reveals that a boundary line does not obviously correspond to a major roadway right-of-way, canal, water body, section line, or corporate limit delineated on the Map.
- b. If the location of a node boundary line is subject to interpretation because it does not obviously correspond to a natural or man-made feature listed above, then the location of the boundary line shall be determined by the following criteria:
 1. If inspection of the Future Land Use Map and maps depicting lot, parcel or tract lines reveals that a node boundary line splits a lot, parcel or tract, and if the portion of the split lot, parcel or tract within the node is precluded from development, as permitted by the Future Land Use Map designation, because of such split, then the node boundary line shall be located to exclude the entire lot, parcel or tract from the node; or
 2. If inspection of the Future Land Use Map and maps depicting lot, parcel or tract lines reveals that a node boundary line splits a lot, parcel or tract, and if the portion of the split lot, parcel or tract outside the node is precluded from development, as permitted by the Future Land Use Map designation, because of such split, then the node boundary line may be extended up to 500 feet to incorporate the entire split lot, parcel or tract provided that no more than five additional acres are added to the node. An extension of a node boundary line to include within the node an entire lot, parcel or tract that would otherwise be precluded from development if the boundary line were not extended shall be approved by the Board of County Commissioners upon recommendation by the Planning and Zoning Commission in conjunction with a rezoning of the affected property. To prevent repetitive extension of the boundary line, a node boundary

line may be extended one time only and shall be permanently fixed and final unless changed by an approved plan amendment.

- c. Reference in this policy to the terms "parcel, lot or tract" shall not include any alterations to the property's tax parcel legal description that are made after February 13, 1990.

Policy 1.22: Node size shall be based on the intended use, service area population, existing land use pattern, and other demand characteristics.

Policy 1.23: Node configuration shall provide for the most efficient use of land, and of transportation and other public facilities and services, while eliminating sprawl and strip development.

Policy 1.24: No node shall be expanded unless 70% of the subject node's land area (less rights-of-way) is developed with non-residential and non-agricultural uses, or approved for non-residential and non-agricultural development, or otherwise warranted by the proposed development.

Otherwise warranted may include but not be limited to the following:

- Developed percentage of a node is between 60% and 70% and the node expansion meets one of the following criteria:
 - expansion of the node is necessary to accommodate the expansion of an existing use where there is not suitable vacant land adjacent to the use within the node, the land proposed for inclusion is owned or controlled by the owner of the site containing the use proposed for expansion, and a finding is made by the Board of County Commissioners that no other land in the node can feasibly accommodate the expansion of the referenced use, or
 - expansion of an existing node is necessary to adjust a node boundary that splits a small parcel of land and a finding is made by the Board of County Commissioners that development of the parcel is not feasible with the split land use designation and that inclusion of the parcel in the node is more appropriate than exclusion of the parcel from the node.
- Expansion of a node is necessary to accommodate a use (such as a regional mall or a large-scale research/technology/industrial park) which has a substantial land area requirement and no alternative suitable sites are available in existing nodes.
- Expansion of a node is necessary to compensate for existing or proposed right-of-way which was included within the node boundary and included in the node size calculation, where the node expansion will not exceed the acreage represented by the right-of-way.

- Expansion of a node is necessary to accommodate a substantial change in circumstances affecting a property adjacent to the node, where said change has had the effect of making the property unsuitable for residential use. Such change could include establishment of an adjacent, incompatible use, or a significant change in adjacent development patterns due to an act of government such as road development and expansion.
- Expansion of a node is necessary to include existing adjacent non-conforming commercial or industrial uses where a finding is made by the Board of County Commissioners that the non-conforming uses cannot be otherwise eliminated.
- Expansion of a node is necessary to facilitate a swap of land use designations involving more than one node where all involved nodes impact the same public facilities and the swap will not increase the overall land use density or intensity depicted on the Future Land Use Map. The total area added to any expanding node or nodes shall be equal to or less than the total area removed from any other involved node or nodes.
- Expansion of a node is necessary to correct an oversight or a mistake in the plan affecting property that meets the following criteria:
 - the property is residentially designated;
 - the property was given a residential designation as a result of an oversight or a mistake;
 - the property is unsuitable for residential use;
 - the property is adjacent to a node; and
 - the property is no more than 10 acres in size.

Policy 1.25: Commercial/industrial nodes shall not be created or expanded to within 1 ½ □ miles of an existing commercial/industrial node. This policy shall apply only to commercial/ industrial nodes that conformed to the 1½ miles requirement on December 31, 1997.

Policy 1.26: Given the existing concentration of commercial uses in the SR 60/58th Avenue commercial/industrial node and the volume of traffic that traverses the SR 60/58th Avenue intersection, the county hereby caps the SR 60/58th Avenue commercial/industrial node at its present size, which is 329.91 acres.

Policy 1.27: Consistent with the Historic Roseland Neighborhood Plan, the county hereby caps the Roseland/US Highway 1 commercial/industrial node at its present size, which is 135.04 acres. That plan determined that there is sufficient land within that node to accommodate needed commercial and industrial uses for area residents. This limitation on node expansion shall not prohibit the expansion of the node for medical uses.

Policy 1.28: The Board of County Commissioners may initiate a land use designation amendment to change C/I designated land to residential, provided that all of the following conditions exist:

- The parcel has been redesignated to C/I, Commercial/Industrial, since comprehensive plan adoption on February 13, 1990;
- The parcel is currently designated C/I;
- More than two years have passed since approval of the ordinance redesignating the parcel to C/I; and
- No construction activity has commenced on the parcel since approval of the ordinance redesignating the parcel to C/I.

Such action will not conflict with current property rights laws, because all comprehensive plan amendments since 1990 designating property to C/I have been subject to this reverter condition.

Policy 1.29: Node locations and estimated sizes shall be listed in Table 2.5.

Policy 1.30: The Regional Commercial land use designation shall be applied to regional malls and associated retail shopping centers designed to accommodate the needs of the retail market areas that extend beyond the boundaries of the county. These developments will include one or more "magnet" retail stores that are branches of statewide, multiple-state, or national organizations and satellite stores integrated through a common plan of development approved through the Chapter 380, F.S., Development of Regional Impact process. Sites will typically range in size from 90 to 150 acres to accommodate 750,000 to 1,500,000 gross square feet of leasable area (mall plus peripheral commercial) with a minimum open space ratio of 0.25, a maximum building coverage ratio of 0.40 and maximum impervious surface ratio of 0.75. All Regional Commercial designated land shall be located within the urban service area.

Policy 1.31: The Public Facilities land use designation shall be applied to land used for public facilities and services including, but not limited, to government offices, service centers, public utilities and transportation facilities, schools, parks, libraries, police and fire stations, dredged spoil disposal, and landfills and related uses such as recycling equipment operations, composting facilities and operations, incineration of solid waste, borrow pit operations for fill material, industrial waste and leachate treatment and management, equipment storage and maintenance, and water and wastewater treatment facilities. Not all public land uses are shown on the Future Land Use Map. Public facilities are not limited to the Public Facilities Land Use designation. The maximum intensity standards established by Future Land Use Element Policy 1.18 (commercial/industrial intensity standards) shall also apply to uses within the Public Facilities land use designation.

Policy 1.32: The Recreation land use designation shall be applied to land used for active and passive public parks and recreation facilities, including but not limited to ball fields, swimming pools, tennis courts, racquetball courts, handball courts, shuffleboard courts, basketball courts, volleyball courts, children's playgrounds, golf courses, fairgrounds, community/activity centers, walking/jogging/fitness trails, canoe launches, picnic areas, scenic areas, nature centers, bathrooms, and parking areas. Not all recreation sites are shown on the Future Land Use Map. Public parks and recreation facilities are not limited to this land use designation. The maximum Floor Area Ratio (FAR) for development within the Recreation land use designation shall not exceed 0.25.

Policy 1.33: The Blue Cypress Improvement District (BCID) is a special land use designation that shall be applied to the existing Blue Cypress Fish Camp on the western shore of Blue Cypress Lake.

Development within this district shall be limited to single-family and mobile home residential uses and conditioned on the provisions outlined in Ordinance 85-55. The BCID is not intended for expansion to adjacent or otherwise undeveloped property. Densities in the BCID shall not exceed 10 units/acre.

Policy 1.34: The county zoning code shall contain provisions for a Professional Office District. That district shall be limited to land that is within the medium- and low-density residential land use designations and is located along arterial roadways. The purpose of this zoning district shall be to encourage infill development and the redevelopment of blighted or declining residential areas which are no longer appropriate for strictly single-family use but are not considered appropriate for a broad range of commercial uses, as permitted in other commercial zoning districts.

Policy 1.35: Indian River County shall regulate the use of land in proximity to large scale public facilities such as airports and landfills in order to protect the facilities from encroachment by non-compatible uses and protect the public from any potentially hazardous impacts.

Policy 1.36: The county shall maintain a concurrency database which identifies areas with facility surpluses and deficiencies. Development shall be directed to areas with adequate facility capacity through publication of this information and through implementation of the county's concurrency management system.

Policy 1.37: The new town land use designation shall be a floating zone which may be overlaid on any property with an agricultural land use designation (AG-1, AG-2, and AG-3). Each new town designation shall be approved as a Planned Development (PD) and shall meet the requirements of Policy 1.38.

The size, density, and design of a new town shall allow for a sustainable new town population with an adequate level of commercial activity, as well as a sufficient greenbelt area. The new town shall be designed to accommodate a build-out population of at least 5,000 persons

(approximately 2,500 residential units).

No new town designation shall be approved except as an amendment to the Future Land Use Map of the Comprehensive Plan. Such amendments shall identify the location of the new town on the future land use map and shall update the plan's data and analysis section to reflect the population impacts of the new town. A new town amendment shall meet the following criteria:

- a. No new town shall be established unless it meets the following minimum size requirements:

LOCATION OF NEW TOWN	MINIMUM SIZE (CONTIGUOUS ACRES)
• East of Interstate 95	1,500
• West of Interstate 95	4,000

- b. No new town shall be established unless it is located on or has access to an arterial road.

- c. The number of new town projects shall be limited as follows:

- East of Interstate 95: 2
- West of Interstate 95: 2

- d. No new town shall be approved unless it is consistent with the Concurrency Management System.

- e. No new town shall be approved without a finding that the new town, as approved, will have no adverse impact on natural resources.

- f. No new town shall be approved unless the amendment application is supported by sufficient data and analysis to justify the need for the new town. The need justification can be met by data and analysis which shows that the project's projected population together with the projected population of any other approved new town projects will not significantly increase the county's residential allocation factor for the time horizon of the comprehensive plan.

Policy 1.38: The new town land use designation shall be established through the Planned Development (PD) process. For any land to receive the new town land use designation, a PD project must be approved which clusters residential and non-residential uses in a manner which protects agricultural and open space areas, protects natural resources, creates a self-sufficient community, minimizes off-site traffic, and does not increase urban sprawl.

All new town projects shall require submittal and approval of a PD project having the following characteristics:

- a. A proper mix of land uses that results in a sustainable small town rather than merely an amenitized residential community. The mix of land uses shall satisfy the following criteria:
 - 1. Residential areas; these are areas that provide for single-family and multiple-family residential units, including residential units behind or over businesses.
 - 2. Shopping areas; these are areas that provide for the sale of goods and services to accommodate the residents of the new town. Allowed uses are retail commercial and personal services.
 - 3. Work areas; these are areas that provide employment opportunities for the residents of the new town. Allowed uses are office, educational, light industrial, resource management and tourism, and agricultural uses and related industries.
 - 4. Public facilities and institutional uses, including schools, fire/police stations, cultural and community facilities, and places of worship.
 - 5. Recreational uses; these are areas which provide for active and passive recreational facilities.
 - 6. Natural open spaces and agricultural areas; these are areas which will be preserved due to their environmental importance or will be used for active agricultural production.
- b. Activity or town centers shall mixed use centers containing both nonresidential and residential uses, while residential uses not located within town centers shall be in compact neighborhoods.
- c. The gross residential density of a new town may exceed the underlying agricultural maximum densities; however, the new town density shall not exceed 1.5 units per acre of gross project area unless development rights are transferred to new towns from off-site properties. In such cases, the overall gross density of the new town shall not exceed 2 units per acre. Consistent with that allowance, new towns may be receiver sites for development rights sent from conservation or agricultural preservation areas that are located outside the urban service area and are not adjacent to the project. Sending areas shall be stripped of development rights as part of the new town approval. Density credits eligible for transfer shall not exceed 1 unit per acre for AG-1 sending areas, 1 unit per 2 acres for AG-2 sending areas, and 1 unit per 4 acres for AG-3 sending areas. Additional density allowances up to 1 unit per 2 acres may be allowed for environmentally significant portions of AG-3 sending areas.

- d. Uses within a new town shall be identified in the new town PD project application and shall comply with the following criteria.
 - 1. Commercial, personal services, and office areas shall be provided at ratio of three (3) to ten (10) acres per 1,000 residential units.
 - 2. Public facilities, including but not limited to water plants, sewer plants, schools (excluding university campuses or similar uses), fire stations, and police stations, and public institutional use areas, should not exceed five (5) percent of the entire PD area.
 - 3. Residential use areas shall constitute at least fifteen (15) percent but not more than thirty-five (35) percent of the entire PD area.
 - 4. Employment areas, including industrial, business, and office uses, shall comprise at least two (2) percent of the entire PD area.
- e. The following additional standards shall be met by any new town PD project application.
 - 1. Affordable/Workforce Housing: Affordable and/or workforce housing units shall be provided to ensure that there is housing available within the project area for workers employed within the project area. Therefore, at least ten (10) percent of the total housing units shall be affordable and/or workforce housing units, as defined in the county's land development regulations. The applicant shall provide sufficient data and analysis to justify the number and percentage of affordable housing units needed by his proposed project. This amount of affordable housing shall then be provided within the project; however, the total amount of affordable housing shall in no case be less than ten (10) percent of the total number of housing units in the project.
 - 2. Open Space: At least fifty (50) percent of the entire PD area shall be preserved or provided as open space. Open space areas shall be retained as natural areas or used for agriculture, recreation, stormwater management, water supply, or similar uses that complement the rural nature of the area.
 - (a) At least seventy (70) percent of the minimum required common open space area shall be located along main project boundaries and shall function as perimeter greenbelts or shall be in the form of a large contiguous block of land. If a proposed new town shares a boundary with land identified as conservation either through easement or by comprehensive land use designation, then the required greenbelt perimeter/open space block shall have a contiguous boundary with the conservation area. If a new town shares a boundary with multiple existing

conservation areas, the project design shall provide greenway connections between conservation areas.

- (b) For purposes of the fifty (50) percent common open space requirement, such green space shall not include conventional, individual private yard areas and shall not include any areas already in conservation. Common open space areas may include agricultural areas (e.g. crop lands, pastures, and equestrian areas), parks and recreation areas, conservation and natural areas (e.g. uplands, wetlands, and re-created natural areas), and water bodies (not to exceed thirty percent of the open space requirement).
 - (c) Active recreational uses shall be limited to a maximum of twenty-four (24) percent of the designated open space or twelve (12) percent of the entire PD area, whichever is less.
- 3. Timing of Land Uses: At the time of new town approval, commitments must be made as to the timing of developing work places and non-residential uses. A sufficient amount of job-producing and non-residential uses shall be developed in initial project phases to prevent creation of a de-facto residential only or bedroom community and to ensure development of a job-producing “anchor tenant” to sustain the new town’s economy. To ensure that all phases of the project develop as a viable new town development with a mixture of residential, shopping, working, recreational, and open space areas, various uses for each phase of the project shall be approved and developed in a proportional manner. Commercial and personal service uses, office and light industrial uses and residential uses shall generally constitute the same percentage of area for each phase as they constitute in the project as a whole. No more than twenty-five (25) percent of the proposed residential use development will be permitted until at least twenty-five (25) percent of the proposed commercial and personal service uses and office and light industrial uses occur.
- 4. Form: The project shall meet the Traditional Neighborhood Design standards of the Future Land Use Element Policy 18.1. In so doing, the new town shall have a perimeter edge and a center. Along the perimeter edge, a significant greenbelt shall be provided, and that greenbelt shall consist of natural areas, agricultural areas, and/or “no-build” areas designated on large acreage parcels. A project center shall be established for the concentration of residential and commercial uses. Major roadways shall run through or near the project center. The project design shall reflect the following:
 - (a) A network of ungated and open to the public interconnected streets in a grid or modified grid pattern.

- (b) An interconnected pedestrian sidewalk/path system that serves and integrates residential and non-residential uses.
 - (c) Appropriately sized blocks and pedestrian improvements that provide a layout that maximizes residential development in clusters around town centers. Town centers shall include but not be limited to public squares or parks, as well as commercial and residential uses.
 - (d) Wide sidewalks, street trees, and on-street parking in the town center.
5. Integration into Major Street Grid: Each new town project shall have multiple connections to major roads, and extend major roads planned to traverse the rural area in which the project is located.
 6. Building Height: Residential structures shall be limited to a maximum height of 35 feet, while nonresidential and mixed use structures shall be limited to a maximum height of 50 feet. For all structures, architectural embellishments may exceed the maximum height limitation by no more than 15 feet.

Policy 1.39: The county shall limit the use of the 665 acres of C/I designated property located north of SR 60 and west of 98th Avenue to research/technology/industrial uses only. Those uses include research/technology/industrial parks, light manufacturing and assembly facilities, distribution centers, and accessory commercial uses. For that portion of the 665 acre property that lies west of 102nd Avenue, the Floor Area Ratio shall be limited to .30 and development shall be limited to no more than 2% accessory commercial uses and no more than 49% research/technology uses. This policy shall be implemented through Planned Development (PD) zoning and/or Planned Development Plan requirements. In addition, each preliminary PD plan (site plan) for development of the portion of the 665 acre property that lies west of 102nd Avenue shall:

- incorporate a stormwater management and flood protection design that mitigates potential adverse impacts of a flood associated with the failure of federal and privately owned levees within the Upper St. Johns River Basin Project; and
- include upland edge buffers between industrial development and any adjacent wetland mitigation bank area; and
- provide mass transit infrastructure (bus waiting area shelters, benches, accommodations for pedestrians, bicyclists and accessibility by persons with disabilities); and
- incorporate a traffic circulation design that meets FDOT S.R. 60 access management requirements and provides shared access and interconnections between facilities.

On that portion of the 665 acre property lying west of 102nd Avenue, development will be limited to 4.2 million square feet of research, technology, industrial, and accessory commercial uses until I-95 north of S.R. 60 is widened.

Policy 1.40: The county shall permit Planned Development zoned projects located on residentially designated land between 41st Street and 45th Street, and between US 1 and Indian River Boulevard to consist of a mix of office and residential uses. No more than 20% of the project area shall be devoted to office uses.

Policy 1.41: The county shall encourage the school board to locate schools near urban residential areas. The county will do this by allowing schools within all residential zoning districts; by coordinating with the school board to establish a process for preliminary county review of school sites before the school board acquires or leases property for a new school; and by limiting school sites within agriculturally designated areas to mixed use projects, traditional neighborhood design projects, and sites that are contiguous to the urban service area boundary.

Policy 1.42: To the extent feasible, the county shall collocate public facilities, such as parks, libraries, and community centers, with schools.

Policy 1.43: The Board of County Commissioners shall rezone land only in a manner that is consistent with Future Land Use Element Table 2.14. Furthermore, the Board recognizes that not every zoning district allowed in a land use designation is appropriate for every site within that land use designation. For any parcel, the Board of County Commissioners may deny a rezoning request (even when the requested zoning district is consistent with the parcel's land use designation) if the denial serves a legitimate public purpose. A Board of County Commissioners' determination that the requested zoning district is not appropriate for the parcel may also be based upon the absence of the following locational criteria:

1. For the OCR, Office, Commercial, Residential zoning district:
 - adjacent to existing office uses
 - as a buffer between residential zoning districts and arterial roads or other commercial zoning districts.
 - at node perimeters
2. For the *MED, Medical* zoning district:
 - within commercial/industrial nodes containing hospitals and major medical facilities
 - separated from industrial areas
3. For the *CL, Limited Commercial* zoning district:
 - areas that are easily accessed from residential areas
 - between residential areas and general commercial areas or major roadways
 - separated from industrial areas
 - at node perimeters
4. For the *CG, General Commercial* zoning district:
 - along arterial roads and major intersections
 - separated from residential development
 - separated from industrial areas
 - near retail and office areas

5. For the *CH, Heavy Commercial* zoning district:
 - along arterial roads
 - along railroad tracks
 - between general commercial and industrial areas
 - separated from residential development
6. For the *IL, Light Industrial* zoning district:
 - along arterial roads
 - along railroad tracks
 - near industrial areas
 - separated from residential development
 - separated from retail and office areas
7. For the *IG, General Industrial* zoning district:
 - along arterial roads and major intersections
 - along railroad tracks
 - near industrial areas
 - separated from residential development by a major roadway or intervening property
 - separated from retail and office areas
8. For single-family zoning districts:
 - adjacent to other single-family areas
 - separated from major commercial areas and industrial areas
9. For multiple-family zoning districts:
 - adjacent to other multiple-family areas
 - adjacent to employment centers
 - along arterial and collector roads, particularly to buffer single-family areas
 - adjacent to commercial uses, particularly to buffer single-family areas
 - not abutting single-family areas on all sides

Additionally, the Board hereby adopts the following general criteria regarding the location of residential zoning districts:

10. Where medium density residential lands abut low density residential land, the medium density land may be zoned an intermediate density.
11. Residentially designated land that is located between higher density and lower density zoned areas may be zoned an intermediate density even when the intermediate zoned area has a land use designation that allows a higher density.

Policy 1.44: The county will evaluate requests to rezone CH and/or IL-zoned areas to CL or CG to ensure that sufficient CH and IL zoned land will remain if the rezoning is approved. In so doing, the county will favorably consider those types of rezonings where the subject property is located along high-volume roadways or adjacent to residential areas. The county shall maintain existing CH or IL zoning areas that are not located along high-volume roadways or not located near residential areas.

Policy 1.45: The Transitional Residential Land Use designation may be applied to those areas which serve as a transition area between urban and agriculturally designated land and are suitable for urban and suburban scale development. Additionally, Transitional Residential designated land must meet all of the following criteria:

- it must abut an arterial road that contains county water and sewer lines within its (the road's) right-of-way;
- it must abut a commercial/industrial node where at least 70% of the subject node's land area (less rights-of-way) is developed with non-residential and non-agricultural uses, or approved for non-residential and non-agricultural development; and
- it must be at least 20 acres in size.

Land that meets all of the above criteria may be included in the urban service area and may be redesignated to T, Transitional Residential.

Policy 1.46: Development in transitional residential areas shall be limited to the following:

Single Family Residential Uses

- up to 1 unit/acre; or up to 3 units/acre for Planned Development Projects

Recreational Uses

- up to 0.35 FAR

Public Facilities

- up to 0.35 FAR

Institutional Uses

- up to 0.35 FAR

Schools (not including business and vocational schools)

- up to 0.35 FAR

Excavation Activities

Agricultural Uses (as permitted in Future Land Use Element Policy 6.3)

The FAR of mixed use projects shall be calculated by assigning a portion of the total development area to each use. The sum of the portions assigned to each use must equal the total development area. An exception shall be allowed for accessory residential uses within primarily non-residential projects. That exception shall allow the entire development area to be used to calculate the number of units allowed, without restricting the amount of development area available for calculating the maximum FAR for primary uses.

Policy 1.47: To mitigate and reduce potential impacts between residential and agricultural uses, the following special regulations apply within areas designated as Transitional Residential:

- Caribbean Fruit Fly host plants shall be prohibited on T designated lands.
- When platting lots in residential projects on T designated land, the land owner shall place an informational note on the plat and on the deed of each lot informing

interested parties of the Florida Right to Farm Act, Section 823.14, Florida Statutes as amended, and stating that active farm operations occur nearby.

Policy 1.48: The county shall consider the impact of proposed amendments to the Future Land Use Map upon the county's jobs/housing balance in a manner consistent with Policy 4.8.

Policy 1.49: The county hereby designates the entire urban service area as an Energy Conservation Area. The county shall maintain its urban service area boundary in a manner consistent with Policies 2.1, 2.2, and 2.3.

Policy 1.50: Within Energy Conservation Areas, the county shall regulate all new development and redevelopment in a manner that promotes energy conservation.

Policy 1.51: The county shall encourage Traditional Neighborhood Design (TND) projects that are consistent with Policies 18.1, 18.2, and 18.3. Consistent with Policy 18.4, the county shall permit TND developments as conditional uses in the county's conventional zoning districts.

Policy 1.52: Within the urban service area, the county shall permit mixed use developments that are consistent with Policy 5.6.

Policy 1.53: In areas located outside the urban service area, the county shall promote clustered development, such as new towns and agricultural planned developments. New towns shall be consistent with Policies 1.37 and 1.38, while agricultural planned developments shall be consistent with Policy 5.9.

Policy 1.54: In reviewing new development proposals, the county shall require vehicular and pedestrian connections as specified in Policy 4.5.

OBJECTIVE 2: URBAN SERVICE AREA

In unincorporated Indian River County, all residential development greater than 0.2 units/acre, and all non-agriculture related commercial/industrial uses will be located within the urban service area, which contains the infrastructure and services needed to accommodate such development.

Policy 2.1: Indian River County hereby adopts the 2030 Urban Service Area depicted on the County's Official Future Land Use Map. The Urban Service Area includes land where services necessary to support urban development are available at levels identified in this and other elements of the Comprehensive Plan.

At a minimum, those services shall include centralized utilities service, improved roadways, solid waste disposal, stormwater management, police protection, fire protection, educational facilities, and park and recreational facilities.

Policy 2.2: Indian River County shall encourage and direct growth into the 2030 Urban Service Area through zoning, subdivision, and land development regulations. Such regulations shall promote efficient development by requiring utilization of the existing street system, extension of public facilities where necessary, connection to the centralized potable water and sanitary sewer systems where available, and incentives for mixed use projects.

Policy 2.3: Indian River County shall require all development except agricultural uses, residential uses with less than 0.2 units/acre, recreation/open space uses, Mixed Use Overlay Projects, and Traditional Neighborhood Design Overlay Projects to be located within the Urban Service Area.

Policy 2.4: The county may expand the urban service area if the expansion is warranted based on the need to accommodate additional projected population. Any expansion area shall be based on that area's environmental suitability for urbanization, existing and future land uses, and the availability of services and facilities.

OBJECTIVE 3: LEVELS OF SERVICE

Through 2030, the provision of public services and infrastructure in Indian River County will be at a level consistent with this plan.

Policy 3.1: For all facilities and services, the minimum levels of service established in this and other elements of the comprehensive plan will be maintained.

Policy 3.2: Regardless of land use designation or zoning district, no development shall be approved unless it is consistent with the concurrency management system in the capital improvements element, and the levels of service established in this element and other elements of the Comprehensive Plan.

Policy 3.3: Using the County's established concurrency management system, the County shall review proposed developments, assess their impact on services and facilities, and make determinations of adequacy or inadequacy of public facilities and services.

Policy 3.4: Consistent with the Capital Improvements, Infrastructure, Transportation, and Recreation and Open Space Elements of this plan, county land development regulations shall ensure that level of service standards for potable water service, sanitary sewer service, solid waste disposal service, stormwater management, traffic circulation, and parks and recreation are maintained. Those standards must be met by all proposed development prior to building permit.

Policy 3.5: The county will design and construct public facilities with capacities sufficient to meet the levels of service established in this plan, support the needs of the projected population, and accommodate the intensity of development as identified on the Future Land Use Map.

Policy 3.6: Indian River County shall define the needed right-of-way for proposed roadway improvements, roadway extensions, and new roadway corridors, and shall acquire and protect needed future right-of-way as identified in the Transportation Element of this plan.

Policy 3.7: Indian River County shall maintain a right-of-way/land acquisition program to locate and acquire property for the services and facilities identified in the Transportation, Infrastructure, Recreation and Open Space and other elements of this plan. This action is intended to provide for the needs of future development while minimizing disturbance to existing development.

Policy 3.8: The county hereby adopts level-of-service standards for selected public facilities as follows:

- a. Correctional Facilities: The county adopts the following correctional facilities level-of-service standard:
 - County wide level-of-service standard of 4.5 beds/1,000 permanent plus weighted peak seasonal population
- b. Fire/EMS: The county adopts the following Fire/EMS level-of-service standard:
 - County wide (excluding Indian River Shores) level-of-service standard of .089 Stations per 1,000 permanent plus weighted peak seasonal population
- c. Law Enforcement: The county adopts the following Law Enforcement level-of-service standard:
 - Unincorporated County level-of-service standard of 2.09 officers per 1,000 permanent plus weighted peak seasonal population
- d. Libraries: The county adopts the following Libraries level-of-service standards:
 - County wide level-of-service standard of 580 building square feet per 1,000 permanent plus weighted peak seasonal population
 - County wide level-of-service standard of 3,200 library material items per 1,000 permanent plus weighted peak seasonal population
 - County wide level-of-service standard of 0.7 computers per 1,000 permanent plus weighted peak seasonal population
 - County wide level-of-service standard of 0.2 other library equipment items per 1,000 permanent plus weighted peak seasonal population
- e. Public Buildings: The county adopts the following Public Buildings level-of-service standard:
 - County wide level-of-service standard of 1.99 building square feet per capita for permanent plus weighted peak seasonal population.
- f. Schools: The county adopts the following Schools level-of-service standards:
 - County wide level-of-service standard for Elementary Schools of 144.71 building square feet per student station

- County wide level-of-service standard for Middle Schools of 117.26 building square feet per student station
- County wide level-of-service standard for High Schools of 147.57 building square feet per student station
- County wide weighted average level-of-service standard for all schools of 139.07 building square feet per student station

- g. Transit: The county adopts the following transit level-of-service standard:
- One-hour headways shall be maintained on all fixed transit routes.

Policy 3.9: Indian River County shall coordinate with private utility providers, including electric, gas, telephone, and cable TV, to ensure that utility services are delivered efficiently.

Policy 3.10: The county shall provide infrastructure improvements to existing subdivisions with inadequate infrastructure, such as Vero Lake Estates, Paradise Park, Oslo Park, and Pine Tree Park, through the petition paving program and the utility assessment process.

OBJECTIVE 4: EFFICIENT MIX OF USES TO REDUCE TRAFFIC DEMAND AND GREENHOUSE GAS EMISSIONS

By 2030, Indian River County will have a land use pattern that maintains the number of daily automobile trips per capita and the length of trips on county roadways at or within 10% of 2005 levels. Those levels were 4.53 daily automobile trips per capita and 18.94 minutes per trip.

Policy 4.1: Land use districts shall be located in a manner which concentrates urban uses, thereby discouraging urban sprawl.

Policy 4.2: By January 2011, Indian River County shall identify and map target areas for redevelopment and infill development.

Policy 4.3: For the areas targeted for redevelopment and infill development in Future Land Use Element Policy 4.2, Indian River County shall, by 2012, assess the potential for future development, review infrastructure capabilities and needs, and develop special overlay or use districts and regulations, if warranted.

Policy 4.4: By January 2013, Indian River County shall work with property owners, developers, and the public to develop and implement a plan to promote development of the areas targeted for redevelopment and infill development. That plan shall examine the feasibility of reduced development fees, streamlined application processing, mixed uses, density bonuses, Traditional Neighborhood Design, home/work linkages and other innovative techniques to promote development in those areas.

Policy 4.5: Where proposed development projects abut undeveloped or developed property, the county shall require that such development be designed and constructed or guaranteed to accommodate both vehicular and bicycle/ pedestrian interconnections. Interconnections may include shared roadways or driveways that provide local traffic circulation. Exemptions shall be granted where interconnections would create a “funneling effect” through an existing neighborhood or have no potential for providing interconnectivity or through-street benefits (e.g. segments that dead-end into water bodies, built facilities, or environmentally sensitive areas).

Policy 4.6: By 2011, the county shall adopt traffic-calming standards and designs to address concerns about the speed of “cut-through” traffic. Traffic calming improvements shall be constructed with project interconnections where necessary

Policy 4.7: The county shall require that developers construct sidewalks on both sides of internal project streets in higher density residential developments and mixed-use projects.

Policy 4.8: When reviewing amendments to the Future Land Use Map, the county shall consider the impact of the proposed amendment upon the jobs/housing balance of the following subareas: north county, central county, and south county. In so doing, the county will not approve amendments where the effect will be to lower the jobs/housing balance in the north county, central county, and south county subareas from their 2005 baseline values.

OBJECTIVE 5: DIVERSITY OF DEVELOPMENT

Indian River County will have a diverse mix of land uses, development patterns, housing densities, and housing types. By 2030, 25% of the County’s housing units will be in multiple-family, mixed use, or traditional neighborhood design projects.

Policy 5.1: The county’s adopted Land Development Regulations (LDRs), including zoning, shall constitute the county’s minimum requirement for land development. All LDRs shall be consistent with the provisions of the comprehensive plan.

Policy 5.2: The residential densities depicted on the future land use plan map shall be the maximum densities permitted. Where density bonuses are applicable, density maximums may be exceeded.

Policy 5.3: Indian River County zoning districts shall permit a variety of residential building and development styles.

Policy 5.4: To prevent the emergence of strip development along US Highway 1, the county shall allow residential uses within commercial areas through mixed-use development. Such accessory residential uses shall be allowed by right in commercial zoning districts.

Policy 5.5: Indian River County LDRs shall contain a special Planned Development (PD) zoning district. That district shall be designated as an overlay on the county’s zoning atlas. The PD

zoning district is intended to provide for the development of projects which require flexibility in order to maximize open space and conserve natural features, provide alternative and energy-efficient/sustainable designs, incorporate recreational facilities, incorporate a mix of uses, and provide a variety of housing choices.

Policy 5.6: By 2011, Indian River County shall adopt development regulations allowing mixed use PDs in residentially-designated areas. All mixed use PDs in residentially designated areas shall meet all of the following criteria:

Development Parameters

1. The maximum project area for a mixed use PD in a residential area shall be 40 acres. Mixed use projects exceeding 40 acres shall be designed as Traditional Neighborhood Design (TND) developments and shall comply with Future Land Use Element Policies 18.1, 18.2, and 18.3.
2. Mixed use PDs shall be limited to areas designated L-1, L-2, M-1, and M-2 and shall be located along SR 60, US 1, Indian River Blvd., 58th Avenue, CR 510 (west of the Indian River Lagoon), CR 512, or Oslo Road. Alternatively, mixed use PDs in M-1 and M-2 designated areas may be located on sites that are adjacent to C/I nodes.

Mix of Uses

3. To ensure that mixed use PDs contain an appropriate mix of residential and commercial uses, commercial uses shall be allowed to constitute no more than 25% of a project's land area.
4. The vertical mixing of uses is allowed and strongly encouraged. Where residential and/or office uses are designed and located above commercial uses, the amount of commercial area may constitute up to 30% of the project's land area.
5. For purposes of these mixed use regulations, commercial area shall include buildings, parking areas, and adjacent improvements that serve commercial uses. Open space areas and common areas/improvements that are shared with residential uses, however, shall not be treated as commercial area.
6. Commercial uses allowed in mixed-use PDs shall be limited to lodging, institutional, office, retail (including fuel sales), personal service, and restaurant uses.

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7. Within mixed use PDs, the Floor Area Ratio (FAR) for commercial uses shall be applied to the commercial area. For the commercial area, the maximum FAR shall be 0.35.
8. Within mixed use PDs, the maximum number of allowable residential units shall be derived by applying the applicable comprehensive plan land use designation density allowance to the entire area of the project and, in addition, may include any applicable density bonuses.
9. Within mixed use PDs, commercial areas may be internal to the project or may be located along a project's boundary, where such boundary abuts a thoroughfare road or is adjacent to C/I-designated property. Where such commercial uses would face residential uses located outside the project, buffering and compatibility improvements shall be required to mitigate any adverse impacts.
10. On-street parking shall be allowed within mixed use projects.
11. All mixed use PDs shall be designed to include a transit stop within the project.

Building Design and Setbacks

12. Within mixed use PDs, common architectural themes, common hardscape and signage themes, and multiple pedestrian connections shall be required to integrate nonresidential uses with residential uses. Common architectural themes shall apply to both commercial and residential areas of the project.
13. Within mixed use PDs, no individual commercial building shall exceed 25,000 sq. ft. in commercial floor area. Lodging uses shall be exempt from this limitation.
14. Where a nonresidential building in a mixed use PD is adjacent to residential buildings located outside the project, the nonresidential buildings shall be compatible with nearby residential buildings. The scale of such nonresidential buildings may be minimized by articulating the building's mass, using sloped roofs instead flat roofs screened by parapets, and/or by planting canopy trees around the building's foundation. For residential buildings adjacent to a mixed use PD, an existing buffer may be used to satisfy the compatibility requirement.

Street Network

15. Each mixed use PD shall offer alternative routes and connections between destinations within the project and to appropriate uses on adjacent sites by designing and constructing a street network that consists of a grid or modified grid pattern that accommodates connections to appropriate uses on adjacent sites.

16. The project shall contain a network of interconnected streets, sidewalks, and pathways. Streets shall be designed to balance pedestrian and automobile needs, to discourage high automobile speeds, to effectively and efficiently accommodate transit systems, and to distribute and diffuse traffic rather than concentrate it.
17. Street trees shall be provided so as to shade sidewalk areas and buffer sidewalk areas from automobile traffic.

Timing of Construction

18. In each mixed use PD, no more than 3 acres or 50% of the total commercial area allowed, whichever is greater, shall be constructed until at least 25% of the proposed residential development has been constructed, and no certificate of occupancy shall be issued for commercial area exceeding 3 acres or 50% of the total commercial area allowed, whichever is greater, unless at least 25% of the total residential development has received certificates of occupancy.

Policy 5.7: PDs shall be permitted throughout the county, without amendment of the future land use map, provided the proposed development is shown to be consistent with the goals, objectives and policies of the Comprehensive Plan. PDs shall be consistent with the maximum density permitted by the future land use map unless density bonuses are permitted consistent with Future Land Use Element Policy 5.8.

Policy 5.8: Within the urban service area, Indian River County's Land Development Regulations shall encourage the use of Planned Developments (PDs) with diverse development by allowing density bonuses and development rights transfers in PDs that:

- include housing units that are affordable to very low and low income households, in accordance with the housing element; and/or
- include development rights transferred from conservation designated areas.

Density bonuses for PDs shall not increase the project's density to more than 25% over the maximum allowed by the project's underlying land use designation.

Policy 5.9: All Planned Development (PD) projects approved in any agriculturally designated area shall meet the following criteria:

- The density of the project shall not exceed the maximum density of the underlying land use designation; no density transfers from off-site lands, and no density bonuses shall be permitted within PD projects in agriculturally designated areas;
- At least 80% of each Agricultural PD's overall project area shall be open space;

- Residential lots created through the PD process shall not be less than 1 acre with the remainder of the area designated as open space;
- The open space shall be in contiguous areas;
- Common open space, if provided, shall be under the control of an appropriate entity and maintained in perpetuity, through an open space, recreation, conservation and/or agricultural preservation easement(s), to be created through Deed Restrictions, with infill prohibited;
- Agricultural PDs shall implement Best Management Practices submitted to and approved by staff; and
- All recreational amenities shall be depicted on the PD plan; no recreational uses that could constitute a nuisance to adjacent properties shall be permitted.

OBJECTIVE 6: AGRICULTURAL PROTECTION

In recognition of the Indian River County's desire to protect agriculture despite the challenges and changes facing the citrus industry, the county's objective is to retain, through 2017, at least 125,000 acres of land in the unincorporated county that is used for active agricultural operations.

According to the United States Department of Agriculture's 2007 Census of Agriculture, there were 157,196 acres of land that were used for active agricultural operations that year. Of this land, approximately 139,000 acres are located within the unincorporated area of the county.

This objective, by itself, does not justify or suggest a need for Future Land Use Amendments from Agricultural Designations.

Policy 6.1: Indian River County shall not provide public services or facilities which would induce or encourage the development of agriculturally designated lands. As such, the county shall not provide water and sewer service outside the urban service area except in the following instances:

- To provide for the health and safety of existing residents in a manner consistent with Sanitary Sewer Sub-Element Policy 2.4 and Potable Water Sub-Element 2.4;
- To serve lots or portions of lots which front on a public roadway that serves as an urban service boundary, as long as the provision of utility service is consistent with Potable Water Sub-Element Policy 5.7 and Sanitary Sewer Sub-Element Policy 5.8;

- To serve Agricultural Planned Developments;
- To serve Traditional Neighborhood Design Developments that meet the requirements of policies 18.1, 18.2, and 18.3 of the Future Land Use Element;
- To serve New Town Districts that meet the requirements of policies 1.37 and 1.38 of the Future Land Use Element; and
- To serve approved agricultural businesses and agricultural industries.

Policy 6.2: To protect and conserve agriculturally designated lands, Indian River County shall maintain its development regulations which control the division and development of agriculturally designated lands.

Policy 6.3: Indian River County shall permit the continuation of agricultural uses within the urban service area where those uses serve as or enhance open space and greenbelt areas of the county.

Policy 6.4: The county shall require that residential subdivision projects, site plan projects, and planned development projects located inside the urban service area where new residential lots or units are proposed adjacent to the urban service area boundary include provisions for a special buffer along that boundary. This buffer shall protect adjacent agricultural lands from conflicts with new residential uses.

Within the urban service area, the county shall require subdivision and planned development projects that propose new residential lots adjacent to active agricultural operations to provide special buffers.

Policy 6.5: Indian River County land development regulations shall require the following special conditions for Affidavit of Exemption, Administrative Permit, Special Exception and/or Planned Development approval of projects on agriculturally designated land; and for Administrative Permit, Special Exception and/or Planned Development approval of projects within the urban service area that are located near active citrus groves:

- Caribbean Fruit Fly host plants and Asian Citrus Psyllid host plants shall be prohibited on the subject site. That prohibition shall be enforceable through the county code enforcement board; and
- A legal document, acceptable to the county attorney's office, shall be established on the subject site. That legal document shall prohibit the occurrence of host plants for either the Caribbean Fruit Fly or the Asian Citrus Psyllid on the subject site. The legal document may be structured to sunset the prohibition if circumstances change such that the prohibition is no longer necessary.

Policy 6.6: Residential projects created via the affidavit of exemption process shall be limited to nineteen or fewer lots.

Policy 6.7: The county shall maintain its land development regulations requiring additional public notification of mining applications in agricultural areas.

Policy 6.8: To facilitate the preservation of agricultural land, the county shall allow the transfer of development rights from agriculture property to eligible receiving sites. Density credits eligible for transfer shall not exceed 1 unit per acre for AG-1 sending areas, 1 unit per 2 acres for AG-2 sending areas, and 1 unit per 4 acres for AG-3 sending areas. Additional density allowances up to 1 unit per 2 acres may be allowed for environmentally significant portions of AG-3 designated land.

Eligible receiving sites are new town projects, Traditional Neighborhood Design (TND) projects, and projects within the urban service area which are located on land suited for high density. Receiving sites within the urban service area shall be within or adjacent to a commercial/industrial node; shall be designated L-2, M-1, or M-2; and shall not be located within the Coastal High Hazard Area.

Individual sending and receiving sites shall be approved through the PD rezoning process. With the exception of new towns, transferred density shall not increase a receiving site's density by more than 20% of its base density. In cases where transferred density is being used in conjunction with other density bonuses (e.g. TND, affordable housing), the combined density bonus may exceed 20% of the base density.

Policy 6.9: By 2011, the county shall adopt development regulations allowing small-scale biofuel processing plants as accessory agricultural uses in areas designated AG-2 and AG-3. The equipment, processing areas, and transport facilities of accessory biofuel-processing plants shall occupy no more than 20 acres or 10% of a site, whichever is less. Such facilities shall be subject to staff-level site plan approval and shall be located at least 300' away from nearby residential uses. Larger scale biofuel processing plants shall be allowed in areas designated AG-1, AG-2, and AG-3 if approved through the special exception process.

Policy 6.10: Because reservoirs and water farming allow the reuse of stormwater for irrigation or other uses while also attenuating the flow of stormwater into the Indian River Lagoon, the county's land development regulations shall permit the development of reservoirs and water farming in agricultural areas. The county acknowledges that public or private utilities may be a necessary mechanism for water farming to occur.

OBJECTIVE 7: PROTECTION OF NATURAL RESOURCES

By 2015, there will be at least 108,500 acres of environmentally important land under federal, state, or county ownership or control within the unincorporated portion of Indian River County. In 2007, there were 105,186 acres of conservation land in public ownership.

Policy 7.1: Indian River County shall regulate development of areas which are prone to flooding and areas within the 100 year floodplain in a manner that is consistent with the regulations established by the National Flood Insurance Program.

Policy 7.2: The County shall continue to provide for the transfer of development rights (TDR) from estuarine wetlands to approved uplands. All projects involving TDRs must be Planned Development projects. No density can be transferred to agriculturally designated land. Deed restrictions and/or easements shall be used to ensure that land from which density has been transferred is preserved and protected. The development rights transferred shall be up to 1 unit per acre of estuarine wetlands; provided, however, that the maximum density permitted on the upland project area receiving the density transfer shall not increase by more than:

- twenty percent of the maximum density allowed by the receiving site's underlying comprehensive plan land use designation(s) where the receiving site is not adjacent to the area from which density is transferred; or
- fifty percent of the maximum density allowed by the receiving site's underlying comprehensive plan land use designation(s) where the receiving site is adjacent to the area from which density is transferred.

Policy 7.3: The County shall provide protection to environmentally sensitive lands through land development regulations that limit building densities, require mitigation for impacted areas, permit the transfer of development rights, and promote the use of conservation easements, dedications, and public acquisition.

Policy 7.4: Any development activity in areas designated as environmentally sensitive or important, as defined in policies 5.4 and 6.11 of the Conservation Element, shall require an environmental survey as part of the approval of a development order. Based upon the results of the environmental survey, development projects shall be required to provide a site design which minimizes impacts upon endangered and threatened plants and animals.

Policy 7.5: The county shall review and evaluate proposed development projects to ensure that stormwater runoff from the new development will not negatively impact adjacent properties or receiving surface waterbody quality.

Policy 7.6: Indian River County shall maintain and enforce regulations to protect wetlands from the negative impacts of development. These regulations address building setbacks, protection from solid and liquid wastes including pesticides and herbicides, dredging or filling of wetlands, incorporation of wetlands into a site's development scheme, and mitigation of lost or destroyed wetlands.

Policy 7.7: Indian River County acknowledges the environmental importance of the prime aquifer recharge areas shown on Figure 2.29. The county shall regulate the development of these

areas. Regulations include an overlay district which restricts land uses, implements special siting requirements for septic tanks to mitigate soil drainage characteristics, and regulates other factors which impact the recharge capability of the land.

Policy 7.8: The county shall protect public water supply wells by prohibiting the placement of septic systems; stormwater retention/detention areas; wastewater treatment plant effluent discharges, including but not limited to percolation ponds, surface water discharge, spray irrigation, and drainfields; sanitary landfills, feed lots and other concentrated animal facilities; mining and excavation activities; and the handling, production, and storage of regulated substances within wellfield cones of influence.

Policy 7.9: Consistent with the Potable Water Sub-Element, the county shall continue to extend the county water system, enabling the acquisition of small public water systems, thereby reducing the number of residents using the shallow aquifer, which is subject to groundwater pollution threats.

Policy 7.10: Through the use of fee simple purchase, transfer of development rights, and conservation easements, Indian River County shall coordinate with other state, federal and local agencies to identify and protect vegetative communities identified in Conservation Element policies 6.1 through 6.7.

Policy 7.11: The county, in cooperation with the local Environmental Health Department, shall continue to regulate the siting of septic tanks including siting requirements to mitigate soil characteristics.

OBJECTIVE 8: PROTECTION OF HISTORIC RESOURCES

Through 2015, at least 95% of unincorporated Indian River County's historic properties (as identified in "Historic Properties Survey of Indian River County, Florida", prepared by Historic Property Associates, Inc., April 1989) will continue to be preserved in fair, good, or excellent condition.

Policy 8.1: The county historian and, as needed, outside consultants and experts shall provide guidance and advice to the Board of County Commissioners on matters concerning historic and archaeological preservation. The county historian shall be consulted for recommendations concerning:

- proposed changes to county regulations protecting historic and archaeological resources; and
- projects which may impact historical and archaeological sites identified on the Florida Master Site File or designated as significant by the Board of County Commissioners.

Policy 8.2: Indian River County shall use incentives such as transfer of development rights, tax relief, mitigation, and public acquisitions; and penalties such as fines and imprisonment, to protect and preserve historically and archaeologically important resources. The following criteria are used to determine the historical significance of a resource:

- whether or not the resource is at least 50 years old;
- whether or not the resource contains significant character, interest or value as part of the historical, cultural, aesthetic and architectural heritage of the county;
- whether or not the resource displays historical, political, cultural, economic, or social trends of community history;
- whether or not the resource displays unique and/or distinguishing characteristics of an architectural style, design period, construction method, detail, craftsmanship, or material; and
- whether or not the resource is a work by a prominent architect, designer, engineer, builder or landscape architect.

Policy 8.3: All public and private development or redevelopment proposals shall be reviewed for their impact upon designated historic resources.

Policy 8.4: Public and private development and redevelopment activities shall cease, at least temporarily, if historic or archaeological artifacts are discovered, in order to allow for evaluation of historic significance.

Policy 8.5: Indian River County land development regulations shall include provisions for land use management techniques such as Transfer of Development Rights, Tax Relief, Mitigation or Public Acquisition to ensure compliance with the provisions of these policies and to minimize the impact on property owners.

Policy 8.6: The county shall periodically update its historic properties survey. In addition to providing a more accurate assessment of the condition of historic properties, such updates will also allow the inclusion of newly-eligible properties.

OBJECTIVE 9: PROMOTE AESTHETIC DEVELOPMENT

Through the implementation of land development regulations, Indian River County will have aesthetically pleasing buildings, signs, landscaping, parking areas, and roads.

Policy 9.1: By January 2012, Indian River County shall establish guidelines to ensure that all new county buildings and facilities will be compatible with the architectural character of the surrounding neighborhood.

Policy 9.2: Indian River County will enhance and maintain landscaping and aesthetic hardscape improvements within county owned rights-of-way along roads that serve as entranceways to the county and along major arterials running through the county.

Policy 9.3: Indian River County shall maintain corridor plans and special corridor regulations for development located along roads that serve as entranceways to the county and along other major roads, as determined by the county. The county shall continue to implement the recommendations of the Wabasso, SR 60, north barrier island, and Roseland corridor plans.

Policy 9.4: Indian River County shall coordinate with the State Department of Transportation to install landscaping within existing road rights-of-way of roads that serve as entrances to the county. That landscaping will be installed when the appropriate portions of the road are being improved.

Policy 9.5: Indian River County land development regulations shall require the use of natural and manmade buffers between incompatible land uses.

Policy 9.6: Indian River County shall enforce sign code regulation standards, including standards contained in corridor plans, for the type, location, size, number, and maintenance of signs.

Policy 9.7: Indian River County shall encourage, through its land development regulations, the use of native vegetation in meeting landscaping requirements.

Policy 9.8: Indian River County land development regulations shall include minimum landscape and maintenance requirements for all development requiring site plan approval.

Policy 9.9: Indian River County shall provide guidelines for use of landscaping and other buffers to shield parking, driveways and loading areas from surrounding development, and public rights-of-way.

Policy 9.10: Indian River County shall support the cultural enrichment of the county by evaluating community cultural facilities and, where appropriate, the design of county buildings shall incorporate artistic and cultural amenities.

Policy 9.11: Indian River County Land Development Regulations shall address aesthetic concerns regarding telecommunication towers and antennas by several means including: providing incentives for co-location of antennas on existing structures, limiting the possible location of future towers, setbacks, landscaping, camouflaging, and requiring unobtrusive lighting (day/night lighting).

Policy 9.12: The county shall implement certain corridor standards on a countywide basis. Those corridor standards to be applied countywide will include standards for foundation landscaping, building color, pitched roof, signage, screening, and lighting. As is done within designated corridors, exemptions will be allowed for multi-family developments as well as industrial/warehouse projects.

Policy 9.13: By 2011, the county shall control the visual clutter created by temporary signs by adopting development regulations that establish limits on where temporary signs are to be allowed, on the number of temporary signs allowed, and on the duration that temporary signs may be posted.

Policy 9.14: To combat monotony in single-family residential developments, the county shall adopt development regulations requiring that applicants submit design guidelines for all new residential planned developments. Such guidelines shall be project-specific and require approval by the Planning and Zoning Commission prior to release of development plans for construction. PD design guidelines shall address all of the following criteria:

- garage placement and scale;
- variations in building placement;
- frequency of use for a model within the same subdivision;
- building materials (façade and roof);
- building massing and architectural details that relate to articulation;
- the project's appearance from adjacent public streets;
- internal streetscape;
- enforcement mechanisms; and
- any additional requirements deemed necessary by the Planning and Zoning Commission to limit residential monotony within the project.

Policy 9.15: The county shall not require buffers between similar residential uses.

OBJECTIVE 10: NONCONFORMING USES

With the exception of legally established non-conformities, all new development in Indian River County will be consistent with the future land use map.

Policy 10.1: Indian River County land development regulations shall allow legally established non-conforming uses to continue until ceased. When a non-conforming use has ceased, it can be replaced only with a conforming use. All new development, even development associated with non-conforming structures, must meet current regulations.

Policy 10.2: To allow for the reasonable use of such properties, Indian River County shall permit the development of nonconforming lots of record legally established under regulations in effect at the time that the lot was created. Provisions of this policy shall not apply to plats of reclamation, except when non-conforming parcels have been transferred by deed prior to February 13, 1990.

Policy 10.3: The county shall provide courtesy notification to adjacent property owners regarding staff determinations involving existing nonconforming non-residential uses.

Policy 10.4: Multi-family residential sections of The Moorings that were zoned RM-10 prior to February 13, 1990 shall be allowed to maintain their RM-10 zoning and shall be considered

conforming uses within the L-1 designation. These phases include Windward, Southwinds, Harbour Side, The Pointes, River Mews, and South Passage.

OBJECTIVE 11: BLIGHTED AREAS

By 2016, Indian River County will have taken action to encourage redevelopment in at least three blighted areas.

Policy 11.1: By 2012, Indian River County shall develop guidelines and regulations to designate areas in need of redevelopment.

Policy 11.2: Within one year of designating a redevelopment area, Indian River County shall determine the needs and deficiencies as well as remedies and solutions for that area.

Policy 11.3: Indian River County shall enforce the provisions of the PRO, Professional Office zoning district. The purpose of this zoning district shall be to encourage infill development and the redevelopment of blighted or declining residential areas which are no longer appropriate for strictly single-family use but are not considered appropriate for a broad range of commercial uses, as permitted in other commercial zoning districts.

Policy 11.4: Indian River County shall encourage the development, redevelopment, and upgrading of undeveloped and underdeveloped subdivisions through mechanisms such as Block Grant Programs, Municipal Service Tax Units, creative finance and development proposals, zoning, and simplified replatting procedures.

Policy 11.5: Indian River County shall maintain a vigorous code enforcement program operating in all areas of the unincorporated county.

OBJECTIVE 12: COORDINATED PLANNING

All development in Indian River County will be consistent with the resource planning and management activities of the state, and with approved management plans including the Hutchinson Island Management Plan.

Policy 12.1: The county acknowledges the application of the Hutchinson Island Resource Planning and Management Plan (HIRPMP) to Indian River County. Past county actions have resulted in development regulations consistent with the HIRPMP. All new development on the unincorporated barrier island will be consistent with the HIRPMP by implementing the policies of this comprehensive plan.

Policy 12.2: As part of the county's periodic Capital Improvements Element evaluation and update process, the impact of new development on hurricane evacuation times and the need for improvements and the timing of improvements to evacuation routes in order to maintain or reduce evacuation times shall be assessed.

Policy 12.3: Indian River County shall include within its land development regulations a mechanism to assess the impact of new development on emergency evacuation.

OBJECTIVE 13: LOCAL PLANNING

By 2015, the County will have a formal coordination mechanism with other federal, state, regional, and local governments and agencies for land use planning activities, provision of facilities and services, and funding and implementation of programs.

Policy 13.1: Indian River County shall ensure that land development activities, development orders and permits, rezonings, and comprehensive plan amendments are coordinated, as may be appropriate, with the municipalities of the county, adjacent counties, regional and special districts, and state and federal agencies.

Policy 13.2: Indian River County, through coordination with municipalities within the county, shall ensure that future annexation will not create enclave areas.

Policy 13.3: By 2011, the county shall encourage municipalities to identify potential areas for annexation, develop criteria for annexation decisions, and execute interlocal agreements with the county to formalize these criteria.

Policy 13.4: Indian River County shall coordinate with municipalities within the county to amend the proposed interlocal service boundary agreement between the county and municipalities to address annexation issues, maintenance of established level of service standards, extra-jurisdictional developmental impacts, upfront coordination on land use amendments and rezonings, and establishment of a dispute resolution process.

OBJECTIVE 14: PLAN AMENDMENT AND REVIEW

Indian River County will have a mechanism for review and amendment of the comprehensive plan.

Policy 14.1: Indian River County shall provide for the amendment of the Comprehensive Plan in accordance with the provisions of Chapter 163, FS. Applications to amend the future land use plan map may be submitted by the owner or the agent for the owner of property proposed for redesignation, by the county planning staff, or by the Board of County Commissioners. Where an individual application is submitted, land development regulations shall provide for payment of an appropriate fee and disclosure of all individuals having an equitable interest in the proposed change. Applications to amend other portions of the comprehensive plan may be submitted by any interested party, the planning staff, or the Board of County Commissioners. Applications to amend the comprehensive plan will be accepted only during the months January, April, July, and October with the exception of DRI-related amendments and small-scale amendments.

Policy 14.2: Applications requesting amendments to the Comprehensive Plan or Future Land Use Map shall be evaluated to consider the following:

- consistency with the Goals, Objectives and Policies of the comprehensive plan;
- impacts on public facilities and services;
- environmental impacts;
- compatibility with surrounding areas; and
- other timely issues.

Policy 14.3: Indian River County shall approve plan amendments only upon a showing that one of the following criteria has been met:

- The proposed amendment will correct an oversight in the approved plan.
- The proposed amendment will correct a mistake in the approved plan.
- The proposed amendment is warranted based on a substantial change in circumstances. For Future Land Use Map amendments, the change in circumstances must affect the subject property.
- For Future Land Use Map amendments, the proposed amendment involves a swap or reconfiguration of land use designations at separate sites and, that that swap or reconfiguration will not increase the overall land use density or intensity depicted on the Future Land Use Map.

Policy 14.4: The county shall require applications to amend the comprehensive plan to include a written statement discussing the following:

- The proposed amendment's consistency with all the goals, objectives, and policies of the comprehensive plan;
- The proposed amendment's impact on public facilities and services;
- The proposed amendment's environmental impacts; and
- For Future Land Use Map amendments, the proposed amendment's compatibility with surrounding areas.

Policy 14.5: The county may utilize the small scale development amendment process, as described in section 163.3187(1)(c)2., FS, only for Future Land Use Designation Amendment requests that meet all of the following criteria:

1. the applicant requests in writing that the proposed amendment be processed as a small scale development amendment;
2. the requirements of 163.3187(1)(c)2., FS, as amended, are satisfied;
3. the subject property does not contain any environmentally sensitive land as defined in Conservation Element Policy 5.4, or any environmentally important land as defined in Conservation Element Policy 6.11;
4. the subject property is located within the existing urban service area;

5. the proposed amendment does not expand the existing urban service area;
6. the proposed amendment does not expand the SR 60/58th Avenue commercial/industrial node; and
7. the proposed amendment does not create a new commercial/industrial node.

OBJECTIVE 15: PROTECTION OF PRIVATE PROPERTY RIGHTS

Indian River County will have land development regulations that are consistent with the protection of private property rights.

Policy 15.1: Consistent with Chapters 125 and 163, Florida Statutes, Indian River County shall give adequate public notice to landowners of any application to change the land use designation or zoning of their land.

Policy 15.2: Indian River County will regulate the use of land only for valid public purposes in a reasonable manner, in accordance with due process.

OBJECTIVE 16: PROTECTION OF THE INDIAN RIVER LAGOON

Through 2030, the portion of the Indian River Lagoon within unincorporated Indian River County will have a class II state water quality rating.

Policy 16.1: Indian River County land development regulations shall require an environmental impact analysis of development within conservation districts or lands abutting the Indian River or St. Sebastian River.

Policy 16.2: Indian River County shall prohibit land use activity which results in the alteration, degradation or destruction of coastal and estuarine resources except when necessary to prevent a public hazard or provide public benefits which exceed those lost as a result of such activity. Public benefits of such resources include floodplain protection, natural habitat for threatened and endangered plants and animals, natural aquifer groundwater recharge, aquaculture, and recreation.

Policy 16.3: Indian River County shall continue to provide technical, monetary and political support to conservation programs aimed at land acquisition on the barrier island and in other coastal conservation areas.

Policy 16.4: Indian River County shall review all proposed land use changes for consistency with policies set forth in the Conservation and Coastal Management Elements.

Policy 16.5: To improve the Indian River Lagoon's water quality, the county shall develop additional stormwater projects that reduce the amount of stormwater that flows into the lagoon and/or improve the quality of stormwater flowing into the lagoon. In recent years, successful

stormwater treatment projects have included the Sebastian Stormwater Park, the Main Relief Canal filtration system, and the Egret Marsh project.

OBJECTIVE 17: COASTAL POPULATION

Through 2030, the county will have no increase in land use designation density or intensity within the Coastal High Hazard Area.

Policy 17.1: The county shall not approve plan amendments that increase the residential density or land use intensity within the Coastal High Hazard Area.

Policy 17.2: The county shall support programs of land acquisition on the barrier island for natural resource preservation, recreation or both.

Policy 17.3: The county shall limit densities in the coastal high hazard area to ensure timely evacuation of the barrier island.

Policy 17.4: The county shall prohibit new development of adult congregate living facilities, nursing homes, homes for the aged, total care facilities, and similar developments within the Coastal High Hazard Area.

Policy 17.5: The county hereby adopts the Coastal High Hazard Area boundary depicted on the county's Future Land Use Map.

OBJECTIVE 18: TRADITIONAL NEIGHBORHOOD DESIGN (TND) COMMUNITIES

Between January 1, 1998 and January 1, 2020, ten percent of new residential development (dwelling units) occurring in unincorporated Indian River County will be located in Traditional Neighborhood Design projects.

Policy 18.1: By January 2011, the county shall adopt land development regulations that establish the TND, Traditional Neighborhood Design zoning district. The TND district shall be limited to planned developments. To qualify as a TND development, projects must meet the following criteria:

Development Parameters

1. The minimum contiguous project land area shall be 40 acres.
2. Land shall be under unified control, planned and developed as a whole in a single development or as an approved series of developments or neighborhoods. The project shall be approved under the Planned Development (PD) rezoning process.

Street Network

3. In order to disperse traffic by offering many alternative routes and connections between destinations within the project and to appropriate uses on adjacent sites, the street network shall consist of a grid or modified grid pattern and shall accommodate connections to appropriate uses on adjacent sites.
4. Not more than 10% of blocks shall have a block with a perimeter measuring more than 1,800 feet. Within commercial and mixed use areas, no block face dimension should exceed 400 feet.
5. The project shall contain a network of interconnected streets, sidewalks, and pathways.
6. Streets shall be designed to balance pedestrian and automobile needs, to discourage high automobile speeds, to effectively and efficiently accommodate transit systems, and to distribute and diffuse traffic rather than concentrate it.
7. Street trees shall be provided so as to shade sidewalk areas and buffer sidewalk areas from automobile traffic.
8. Streets and adjacent buildings shall be sited and designed to encourage interactions between the street and buildings through the use of amenities such as reduced building setbacks, “build-to” lines, front porches, stoops, rear and side yard parking lot locations, and other means.
9. Projects shall decrease the prominence of front yard driveways, garages, and parking lots through one or more of the following: mid-block alleys, garages located toward the rear of lots, rear and side loaded garages, garages which are not the predominant architectural feature of the front elevation of buildings off-street parking at the rear of buildings, restricted driveway connections to streets, and traffic calming techniques.

Mixing of Uses

10. The project shall be designed as a compact or clustered development. Projects may include the following mix of uses occurring together in close proximity:
 - single-family residential,
 - accessory dwelling units,
 - multiple-family residential,
 - commercial and work place,
 - civic and cultural, and
 - open space.
11. The following ratios shall apply to land uses within the project:

- a. Community open spaces open to the public, such as squares, plazas, or parks, shall comprise a minimum of 5% of the total project area.
 - b. Civic uses, such as post offices, churches, community centers, meeting halls, schools, day care centers and cultural facilities shall comprise a minimum of 1% of the total project area.
 - c. Residential uses shall comprise a minimum of 50% and a maximum of 80% of the total non-conservation and non-agricultural project area.
 - d. Commercial and office uses located on residentially or agriculturally designated land shall not exceed 10% of the total land area designated on the land use plan as residential and agricultural.
12. The vertical mixing of uses is allowed and strongly encouraged around designated town centers, main streets, mixed-use centers, and central squares and greens.

Centers (Locus of Community Activity)

13. Each project must have at least one public square, town center, or mixed use area within a ¼ mile walking distance from 50% of the project's residential units and within ½ mile walking distance from 75% of the project's residential units.
14. To accommodate increased pedestrian use, 50% of sidewalks in public squares, town centers, or mixed use areas shall have a minimum unobstructed width (clear and passable for pedestrians) of at least seven feet.
15. On-street parking shall be allowed within public squares, town centers, or mixed use areas.
16. Off-street parking lots within public squares, town centers, or mixed use areas shall be provided only at the rear of buildings.
17. The center shall accommodate space for a transit stop and a civic building.

Edges (Perimeter of the Community)

18. Project edges located outside the Urban Service Area shall be established and designed for environmental, agricultural, recreational, or other open space uses.

Public Buildings

19. Public buildings, such as schools, churches, post offices, and community centers, shall be provided in prominent, accessible locations within the project. Such locations generally

are at the termination of streets, the perimeter of the neighborhood center, or the frontage along a designated main street of a neighborhood or adjacent thoroughfare plan road.

Policy 18.2: The county shall provide incentives to develop Traditional Neighborhood Design projects within the urban service area. Those incentives shall include, but not be limited to, the following:

- 10% density bonus for TND projects located entirely within the urban service area;
- reduced building setback requirements;
- reduced lot size requirements;
- increased maximum impervious surface limits for individual lots;
- reduced right-of-way and travel lane widths;
- reduced corner radii requirements; and
- reduced off-street parking requirements.

Policy 18.3: To facilitate TND projects east of I-95 that are partially outside but adjacent to the urban service area, and to continue to preserve the agricultural and natural character and function of the area, the county shall allow portions of TND projects to be located outside of the urban service area. A minimum of 60% of the total project density shall be derived from the portion of the project located within the urban service area. Density shall be calculated and allowed based upon:

- the land use designation underlying the portion of the project within the urban service area; and
- 1 unit/acre for project property located outside of the urban service area.

Policy 18.4: By January 2011, the county shall amend its land development regulations to permit TND development, on multi-family zoned project sites that are less than 40 acres in size, as an administrative permit use in the county's conventional zoning districts. As is the case for administrative permit uses, the land development regulations shall specify criteria addressing design aspects such as project scale, lot widths, setbacks, mix of uses, street layout, rear alleys, building design, and compatibility with adjacent uses.

OBJECTIVE 19: HAZARD MITIGATION REPORT RECOMMENDATIONS

Within one year of the issuance of a Hazard Mitigation Report by Indian River County or the Treasure Coast Regional Planning Council, any recommendations that identify land use conflicts or inconsistencies will have been implemented.

Policy 19.1: Indian River County shall issue Hazard Mitigation Reports following natural or manmade hazardous incidents. Such incidents may include, but not be limited to, hurricanes and tropical storms, tornadoes, flooding, hazardous material accidents, nuclear power plant accidents, armed violence (civil disturbance, terrorism, or military conflict), mass immigration, coastal oil spill, freezes, fires, and drought.

Policy 19.2: Following the issuance of any Hazard Mitigation Reports, Indian River County shall review its comprehensive plan for consistency with that Hazard Mitigation Report. Appropriate Hazard Mitigation Report based plan amendments shall be processed at that time.

OBJECTIVE 20: DREDGED SPOIL DISPOSAL SITES

In the county, sufficient land will be available for material dredged by the Florida Inland Navigation District (FIND). By 2011, all dredged material management areas shall designated as PUB, Public Facilities, on the county's Future Land Use Map.

Policy 20.1: The county hereby adopts the following dredged spoil disposal site selection criteria:

- sites should be located close to the Indian River Lagoon;
- sites should be altered, non-native upland vegetation areas;
- sites should not abut residential land unless sites are sufficiently large to accommodate adequate buffers;
- sites should not support endangered species; and
- sites should not be wetlands, unless wetlands are degraded/non-functional.

Where they abut residential land, sites shall provide adequate buffers. Where sites impact degraded/non-functional wetlands, wetland impacts shall be mitigated.

Policy 20.2: The county shall redesignate land that FIND has acquired for dredged spoil disposal to the PUB, Public Facilities, land use designation.

FUTURE LAND USE MAP

The previous sections have provided a description of the existing land use pattern, capabilities and constraints of the natural and man-made systems to support future development and an analysis of the future land use needs, demands and trends. With the addition of population projections, these form the basis for delineating the Future Land Use Map. Two major factors should be considered as givens for the future land use pattern regardless of the map designation.

Despite a high projected population growth rate, the county has an ample supply of land to accommodate the full range of land uses for a period well beyond the planning horizon. The fact that the county will not reach a buildout condition within the planning period must be considered in determining the future land use map.

Large portions of the county consist of virtually undevelopable land. This includes the vast St. Johns Marsh and other environmentally important publicly owned property. Those areas provide no building potential but serve a vital role in supporting development.

POPULATION PROJECTIONS

The analysis of need for various land use categories as well as public facilities and services is based on population projections for 2030 contained in the Introductory Element of the comprehensive plan. Those projections are summarized in the table below. In that table, the functional population is the resident population plus the seasonal population.

Table 2.13, Indian River County 2030 Population Projections

	Resident Population	Seasonal Population	Functional Population
Indian River County	196,900	28,015	224,915

Source: Indian River County Planning Department
Bureau of Economic and Business Research, University of Florida

LAND OUTSIDE THE URBAN SERVICE AREA

The urban service area boundary depicted on the Future Land Use Map divides the county into two distinct areas: the agricultural and conservation areas outside the urban service area and the developed area within the urban service area.

Including virtually all land area west of Interstate 95 and a portion of land area east of I-95 in the northern, southern and central portions of the county, the nonurban area represents over 80% of the unincorporated area of the county (or over 224,000). The vast majority of this area consists of four land use designations. Those are the county's three agricultural designations (AG-1, AG-2, and AG-3) and a conservation designation (C-1).

The Publicly Owned or Controlled Conservation Designation

The C-1, Publicly Owned or Controlled Conservation, designation is found both outside and within the urban service area. Outside the urban service area, C-1 designated land encompasses over 75,000 acres of the St. Johns Marsh. As the name implies, the conservation designation limits land uses to wildlife and natural resource management and recreation uses. The public ownership and conservation designation precludes development of this property. There are two other conservation districts, C-2 and C-3, which are located within or close to the urban service area.

The Agricultural Designations

The Agricultural Districts encompass nearly 137,000 acres. Over 48,000 acres located west of the marsh and used for primarily for cattle operations are designated AG-3 (up to 1 unit/20 acres). The AG-2 (up to 1 unit/10 acres) land use category encompasses over 60,000 acres located between I-95 and the marsh. That land is devoted to citrus, plant crops, and grazing. The remaining 28,000 acres, mostly located east of I-95, are designated AG-1 (up to 1 unit/5 acres). That land is largely undeveloped and is used for citrus and cattle grazing.

The density assigned to this land use provides an underlying value to the property as well as specific development rights. There is little likelihood of substantial development in this area. The only area west of I-95 with substantial development is immediately surrounding the City of Fellsmere.

The development potential of the non-urban service area is severely limited by natural, man-made and economic constraints. Many of the soils are poorly drained and within the flood plain. Where agricultural operations such as citrus or crops exist, drainage improvements have been made; however, these improvements would not be capable of supporting large scale development. Few improved roads exist west of I-95. State Road 60, CR 512, and CR 507 are the only paved roads. A few unpaved roads also exist; however, the major access is by way of canal maintenance roadways and between parcels.

LAND WITHIN THE URBAN SERVICE AREA

The urban service area encompasses the remaining portions of the county. It is this area of the county that is scheduled for the infrastructure and services that are demanded or required by the increasing population. This area contains enough land area to support projected population growth. Despite land uses which permit urban and suburban residential densities, and the accompanying commercial/industrial and public land uses, much of this area probably will not be developed within the planning horizon.

The Commercial/Industrial Designation

Land uses in the urban service area include the 5,070 acres of C/I, Commercial/Industrial, designated land. This land use designation is primarily located along the US 1 corridor, the SR

60 corridor, and at 3 locations adjacent to I-95. Much of the commercial land in the US 1 corridor is in a strip pattern that has developed historically. This pattern has been enhanced by the presence of the FEC Railroad just to the west. The resulting narrow band of property between these transportation routes has little development potential except as designated. Table 2.5 gives the location and size of the county's commercial/industrial nodes.

The Residential Designations

The majority of land in the urban service area has been designated for residential use. The county's five residential land use designations provide for a variety of development types and densities.

➤ Low Density

The Low Density Residential designations are R (up to 1 unit/acre), L-1 (up to 3 units/acre), and L-2 (up to 6 units/acre). These designations have the largest land area (25,530 acres) of all the residential designations. These districts fill-in the urban service area between transportation corridors and along the medium density districts. The L-1 and R designated areas are intended for single-family residential development, while the L-2 designation is also suitable for townhouse, duplex, and limited multiple-family development. These land use designations also permit a variety of nonresidential uses which support residential uses. These include schools, churches, recreation facilities and communication and utility uses.

➤ Medium Density

The Medium Density Residential designations are M-1 (up to 8 units/acre) and M-2 (up to 10 units/acre). Located in areas with fully developed services and infrastructure, these designations allow the highest residential densities in the county. Medium density areas are located along major transportation routes near shopping, employment, and service centers. Located along US 1, along Indian River Blvd., along SR 60, and in Gifford, these land use designations are intended for multiple-family apartments, condominiums, townhouses, and mobile home developments. These land use designations do not preclude the development of single-family residences. Together, the medium density districts encompass approximately 6,402 acres.

➤ Mobile Home Rental Parks

Within the urban service area, approximately 780 acres of land is designated as MHRP, Mobile Home Rental Park (up to 8 units/acre). In MHRP designated areas, development primarily consists of mobile home parks.

The Conservation Designations

➤ Publicly Owned or Controlled

The C-1, Publicly Owned or Controlled Conservation, designation is found both outside and within the urban service area. Inside the urban service area, C-1 designated land encompasses approximately 1,200 acres including the Oslo Riverfront Conservation Area, the Wabasso scrub habitat, and properties along the Indian River Lagoon. As with C-1 designated land outside the urban service area, this land use designation limits land uses to wildlife and natural resource management and recreation uses. The public ownership and conservation designation precludes development of this property.

➤ Estuarine Wetlands

The C-2, Estuarine Wetlands Conservation, designation includes land along the Indian River Lagoon and the St. Sebastian River, as well as undeveloped islands within those water bodies. Limited residential development at densities of one unit per 40 acres is permitted, and a density transfer of one unit per acre is applied to these lands to encourage their continued preservation.

➤ Xeric Scrub

Located along the St. Sebastian River, the C-3 designation consists primarily of upland and xeric scrub; it allows a density of 1 unit/2½ acres. Approximately 2,860 acres of this habitat exist within Indian River County.

The Public Facilities and Recreation Designations

The remaining designations in the urban service area include recreation and public use. These designations provide land for public parks and services. Together, these designations encompass approximately 2,005 acres.

Figure 2.35, Commercial/Industrial Future Land Use Map

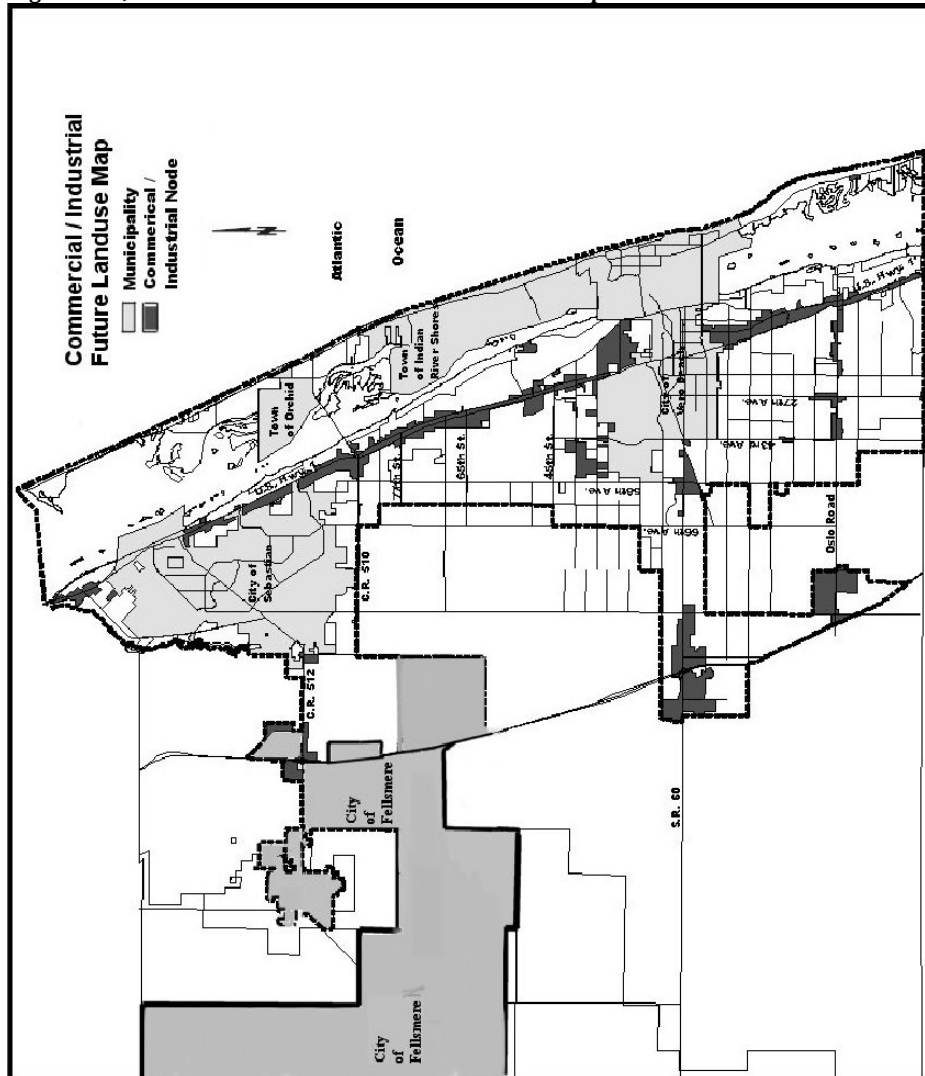


Table 2.14, Relationship between Land Use Designation and Zoning Districts

Zoning District	C-1	C-2	C-3	AG-1	AG-2	AG-3	R	L-1	L-2	M-1	M-2	C/I	PUB	REC	RC	BCID	T	MHRP
A-1				P									P	P				
A-2					P								P	P				
A-3						P							P	P				
RFD							P							P			P	
RS-1							P	T						P			P	
RS-2								P	P					P				
RS-3								P	P	T	T			P				
RS-6									P	P	T			P				
RT-6									P	P	T			P				
RM-3								P	P	T	T			P				
RM-4									P	T	T			P				
RM-6									P	P	P			P				
RM-8										P	P			P				
RM-10											P			P				
RMH-6										P	P							P
RMH-8										P	P							P
PRO								P	P	P	P	P						
OCR												P						
MED												P						
CN								P	P	P	P							
CL												P	P					
CG												P	P		P			
CH												P	P					
IL												P	P					
IG												P	P					
CON-1	P																	
CON-2		P																
CON-3			P															
CRVP												P						
R-BCID																P		
ROSE-4									P	P								
AIR-1				P	P	P	P	P										
PD		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	

P - District permitted

T - District permitted when used as transition from less intense/dense development or consistent with existing development

Shaded - District not permitted

APPENDIX 10.6
EXISTING STATE PERMITS



CONSUMPTIVE USE PERMIT APPLICATION



St. Johns River Water Management District

4049 Reid Street • P.O. Box 1429 • Palatka, FL 32178-1429 • (386) 329-4500

Application forms may also be submitted electronically at floridaswater.com.

SECTION I – CONTACT INFORMATION

If necessary, attach additional sheets if there are multiple applicants, owners, agents, etc.

1. **APPLICANT** (Complete legal name in which permit should be issued)

NAME: **Florida Power and Light Company**

If applicant is a business, provide a contact person: _____

ADDRESS: **700 Universe Boulevard,**

CITY, STATE, ZIP: **Juno Beach FL 33408**

PHONE: **(561) 691-2820**

CELL PHONE: _____

EMAIL ADDRESS: **agnes.ramsey@fpl.com**

Do you want all correspondence to be transmitted electronically to this email address? ☐ Yes ☐ No

Applicant is: ☐ Owner ☐ Lessee* ☐ Other (explain) _____

*Attach copy of current lease, or written authorization from property owner

2. **OWNER** (If different than applicant)

NAME: **, Florida Power and Light Company**

ADDRESS: **700 Universe Boulevard,**

CITY, STATE, ZIP: **Juno Beach FL 33408**

PHONE: **(561) 691-2820**

CELL PHONE: _____

EMAIL ADDRESS: **agnes.ramsey@fpl.com**

3. **AGENT OR CONSULTANT** Address all correspondence to the person below? ☐ Yes ☐ No

NAME: **Matthew Raffenberg**

COMPANY NAME (if applicable): **Florida Power and Light Company**

ADDRESS: **700 Universe Boulevard**

CITY, STATE, ZIP: **Juno Beach FL 33408**

PHONE: **(561) 691-2820**

CELL PHONE: _____

EMAIL ADDRESS: **matthew.raffenberg@fpl.com**

4. **COMPLIANCE CONTACT** (Person responsible for ensuring that the permit conditions are met)

NAME: **Agnes Ramsey, Florida Power and Light Company**

ADDRESS: **700 Universe Boulevard,**

CITY, STATE, ZIP: **Juno Beach FL 33408**

PHONE: **(561) 691-2820**

CELL PHONE: _____

EMAIL ADDRESS: **agnes.ramsey@fpl.com**

SECTION II – APPLICATION INFORMATION

For permit application guidance, please refer to the Applicant's Handbook, Consumptive Uses of Water, which is incorporated by reference in Rule 40C-2.101(1)(a), F.A.C. (A.H.). Please complete all fields. Enter N/A for any fields that are not applicable.

1. **TYPE OF APPLICATION:** ☒ New ☐ Modification ☐ Renewal

If this application is for a modification, please describe the modification request and the reason the modification is necessary. _____

2. **CONSUMPTIVE USE PERMIT NO.** (if application is for renewal or modification): _____

3. **REQUESTED PERMIT DURATION:** ☒ 20 years ☐ _____ years (up to 20 years)

☐ This project qualifies for a duration greater than 20 years, per Section 373.236, F.S.

FPL-NE Okeechobee

4. **PROJECT NAME:** Property **COUNTY:** Okeechobee

PHYSICAL ADDRESS: 3193 N.E. 366th Trail Okeechobee 34972

5. **RELATED PERMITS** (for projects other than Public Supply)

☐ ENVIRONMENTAL RESOURCE PERMIT: MSSW/ERP No(s): _____

☐ INDUSTRIAL WASTEWATER (IWW) PERMIT: IWW Permit No(s): _____

☐ NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT:

NPDES Permit No(s): _____

SECTION III – USE TYPE CATEGORIES

Please check all applicable use categories associated with this application and complete the associated supplemental form(s) indicated. The **Minor Individual Supplemental Form** (Form No. 40C-2.900(2)) can be completed in lieu of Supplemental Forms A through G if all of the following criteria are met:

- Use is less than 100,000 gallons per day
- Withdrawal facilities (wells or pump intakes) are less than 8-inches diameter
- Combined withdrawal capacity is less than 1,000,000 gallons per day
- Use is not for Mining/Dewatering
- Use is for Public Supply where end users are not individually metered

Use Type Category	Supplemental Form
☒ Agricultural (e.g., crops, livestock, nursery, aquaculture, pasture)	Form A Form No. 40C-2.900(1)(a)
☐ Commercial / Industrial (e.g., service business, food and beverage production, cooling and heating, commercial attraction, manufacturing, chemical processing, power generation)	Form B Form No. 40C-2.900(1)(b)
☐ Landscape / Recreation (e.g., irrigation of parks, cemeteries, landscaped areas, golf courses, athletic fields, playgrounds)	Form C Form No. 40C-2.900(1)(c)
☐ Mining / Dewatering (e.g., water use or removal associated with construction or excavation)	Form D Form No. 40C-2.900(1)(d)
☐ Public Supply (e.g., public or privately owned potable water supply utility)	Form E Form No. 40C-2.900(1)(e)
☐ Environmental / Other (e.g., aquifer remediation, environmental enhancement, or the use of water for other purposes)	Form F Form No. 40C-2.900(1)(f)

SECTION IV – SOURCES OF WATER
(please attach additional facility tables if necessary)

SUMMARY OF GROUNDWATER (WELL) FACILITIES

Site or Wellfield Name ¹	District ID (if available)	Florida Unique Well ID (if available)	Owner's Well Name	Capacity (gpm)	Pump Type ²	Casing Diameter (inches) ³	Casing Depth (feet)	Total Depth (feet)	Status ⁴ (include date if proposed)	Type of Water Use Accounting Method ⁵	Last Meter Check / Method Validation ⁶	Type of Water Use (refer to Section III)
FPL-NE Okeechobee Property	0		Fort Drum Well	259	Other	6	Unknown	Unknown	Active	Time Clock/Pump Run Time	14-JUL-15	Agricultural
FPL-NE Okeechobee Property	0		Airplane House Well	211	Other	6	Unknown	Unknown	Active	Time Clock/Pump Run Time	14-JUL-15	Agricultural
FPL-NE Okeechobee Property	0		Grove Well	300	Other	6	Unknown	Unknown	Active	Time Clock/Pump Run Time	14-JUL-15	Agricultural
FPL-NE Okeechobee Property	0		Main Pump Well	225	Other	10	Unknown	Unknown	Active	Time Clock/Pump Run Time	14-JUL-15	Agricultural
FPL-NE Okeechobee Property	0		West Well	60	Other	6	Unknown	Unknown	Active	Time Clock/Pump Run Time	14-JUL-15	Agricultural

- 1 If project consists of separate or non-contiguous pieces of property or wellfields
- 2 Centrifugal (impeller located above water level), submersible (pump set below water level), turbine (motor at ground surface that drives an impeller below water level), vacuum underdrain (typically used for dewatering), well point system (typically used for dewatering), or other (any pump that does not fall into one of the categories previously listed)
- 3 The casing diameter is defined as the largest permanent water-bearing casing of the well at land surface.
- 4 Active (currently in use), Inactive (capped, does not have power, or the connection to the water supply system has been severed), Abandoned (plugged and abandoned in accordance with 40C-3, Florida Administrative Code), or Proposed (include anticipated construction date)
- 5 Flow Meter, Time Clock / Pump Run Time, Hour Meter, Digital Electric Meter, Analog Electric Meter
- 6 Enter the date of the last flow meter accuracy check or alternative method validation

SUMMARY OF SURFACE WATER (PUMP) FACILITES

Site Name ¹	District ID (if available)	Owner's Pump Name	Pump Capacity (gpm)	Pump Intake Diameter (inches)	Pump Type ²	Name of Surface Water Body	Type of Surface Water Body ³	Status ⁴ (include date if proposed)	Type of Water Use Accounting Method ⁵	Last Meter Check / Method Validation ⁶	Type of Water Use (refer to Section III)
FPL-NE Okeechobee Property	0	Main Pump		10	Turbine		Ditch/Canal	Inactive	Time Clock/Pump Run Time		Agricultural

- 1 If project consists of separate or non-contiguous pieces of property or wellfields
- 2 Centrifugal (impeller located above water level), submersible (pump set below water level), turbine (motor at ground surface that drives an impeller below water level), hydraulic dredge pump (typically used for mining), hydraulic dewatering pump (typically used for construction or mining), other (any pump that does not fall into one of the categories previously listed)
- 3 Ditch/canal, lake/pond (natural), lake/pond (artificial), river/creek, spring, mining/borrow pit
- 4 Active (currently in use), Inactive (does not have power, or the connection to the water supply system has been severed), Proposed
- 5 Flow Meter, Time Clock / Pump Run Time, Hour Meter, Digital Electric Meter, Analog Electric Meter
- 6 Enter the date of the last flow meter accuracy check or alternative method validation

SUMMARY OF CONNECTION POINT FACILITIES

Connection points include locations where potable or non-potable water (including reclaimed water) purchased from a water supplier enters a project site.

Site Name ¹	District ID (if available)	Owner's Connection Point Name	Water Supplier Name ²	Type of Surface Water Body ³	Status ⁴ (include date if proposed)	Type of Water Use Accounting Method ⁵	Last Meter Check / Method Validation ⁶	Type of Water Use (refer to Section III)
------------------------	-------------------------------	----------------------------------	-------------------------------------	--	--	--	---	--

- 1 If project consists of separate or non-contiguous pieces of property or wellfields
- 2 Name of water supplier that provides water to the project through the connection point
- 3 Reclaimed water holding pond, stormwater management system
- 4 Active (currently in use), Inactive (the connection to the water supply system has been severed), Proposed
- 5 Flow Meter, Time Clock / Pump Run Time, Hour Meter, Digital Electric Meter, Analog Electric Meter
- 6 Enter the date of the last flow meter accuracy check or alternative method validation

SECTION V – USE OF LOWEST QUALITY WATER AND EVALUATION OF RECLAIMED WATER FEASIBILITY

The applicant may be required to evaluate the feasibility of utilizing reclaimed water and/or other lower quality water sources. The feasibility analysis must be completed as outlined in Section 2.3.3(e), A.H.

SECTION VI – SUMMARY OF REQUESTED WATER USE

Summarize the requested water use from each supplemental form (Agricultural, Public Supply, Commercial / Industrial, etc.) in the table below. Provide projections for each source, at five-year intervals, for the requested permit duration. If the requested permit duration exceeds 20 years, please attach a supplemental sheet providing additional five-year projections for each source.

Year	Requested Amounts and Source(s) of Water				
	Floridan Aquifer (mg ²)	(mg)	(mg)	(mg)	Total Requested Water Use (mg)
Other/U nknown	1 6 3 . 7 5				163.75
2020 - 2025	1 6 3 . 7 5				163.75
2025 - 2030	1 6 3 . 7 5				163.75
2030 - 2035	1 6 3 . 7 5				163.75

¹ Provide the name of the water source. Examples include upper Floridan aquifer, stormwater pond, surficial aquifer, Davis Lake.

² Million gallons per year

SECTION VII – AQUIFER STORAGE AND RECOVERY *(complete if applicable)*

ASR Facility Name	Source of Stored Water ¹	Storage Aquifer Name	Recovery Water Destination	Projected Demand Average (mg)	Projected Demand Maximum (mg)	Projected Injected Average (mg)	Projected Injected Maximum (mg)

¹ Aquifer name, surface water body, water treatment plant name.

Please describe any projected increases or decreases (from historical average) in the amounts stored or recovered.

SECTION VIII – IMPACT EVALUATION

When determining whether the permit applicant has provided reasonable assurances that the conditions for issuance in Rule 40C-2.301, F.A.C., are met, the District will consider the projected impacts of the proposed consumptive use on an individual and cumulative basis. In order to provide reasonable assurance, studies and/or impact evaluations may be required. Please refer to the Applicant's Handbook for guidance regarding the impact evaluations and attach analyses, if applicable.

SECTION IX – APPLICANT CERTIFICATION

I certify that to the best of my knowledge and belief, all of the information provided on this form and in any attachment to it is correct. I also certify that I have legal authority to execute this application for the applicant and certify that the applicant will have sufficient legal authority to undertake the activities described herein. I understand that any material false statement in an application to continue, initiate, or modify a use, or any material false statement in any report or statement of fact required of the permittee, may result in revocation, in whole or in part, of the permit (Section 373.243(1), F.S.). With advance notice, I agree to provide St. Johns River Water Management District staff, with proper identification, entry to the project site for the purpose of performing analyses of the site for determining whether the conditions for issuance will be met. Further, if a permit is granted, I agree that, with advance notice, District staff with proper identification shall have permission to enter, inspect, collect samples, and take measurements of permitted facilities to determine compliance with the permit conditions and permitted plans and specifications.

(If applicable) I authorize Matthew J. Raffenberg to act as my agent for permit application coordination.

_____ APPLICANT'S NAME (print or type)	_____ APPLICANT'S SIGNATURE	<u>22-SEP-15</u> DATE
<u>Matthew J. Raffenberg</u> AUTHORIZED AGENT'S NAME (print or type)	_____ AUTHORIZED AGENT'S SIGNATURE	<u>22-SEP-15</u> DATE

When an application that will be considered by the District's Governing Board is complete, the applicant will be notified of the date of the hearing (Governing Board meeting) at which the application will be considered at least 14 days in advance. The Governing Board normally meets on the second Tuesday of the month.

SECTION X – APPLICANT CHECKLIST

The following items must be included with the permit application submittal:

- ☐ Proof of Property Control (e.g., deed, lease), if not already on file with the District
- ☐ Application Fee (refer to online fee schedule or Applicant's Handbook)

☐ Location/Site Map

☐ Supplemental Form(s) and associated supporting information (e.g., maps, calculations)

☐ Water Conservation Plan

Additional Addresses

Applicant	
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Land Owner	
-------------------	--

Agent	
--------------	--

Compliance Contact	
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Consultant	
-------------------	--

Water Use Reporting (EN-50) Contact	
--	--

Attorney	
-----------------	--

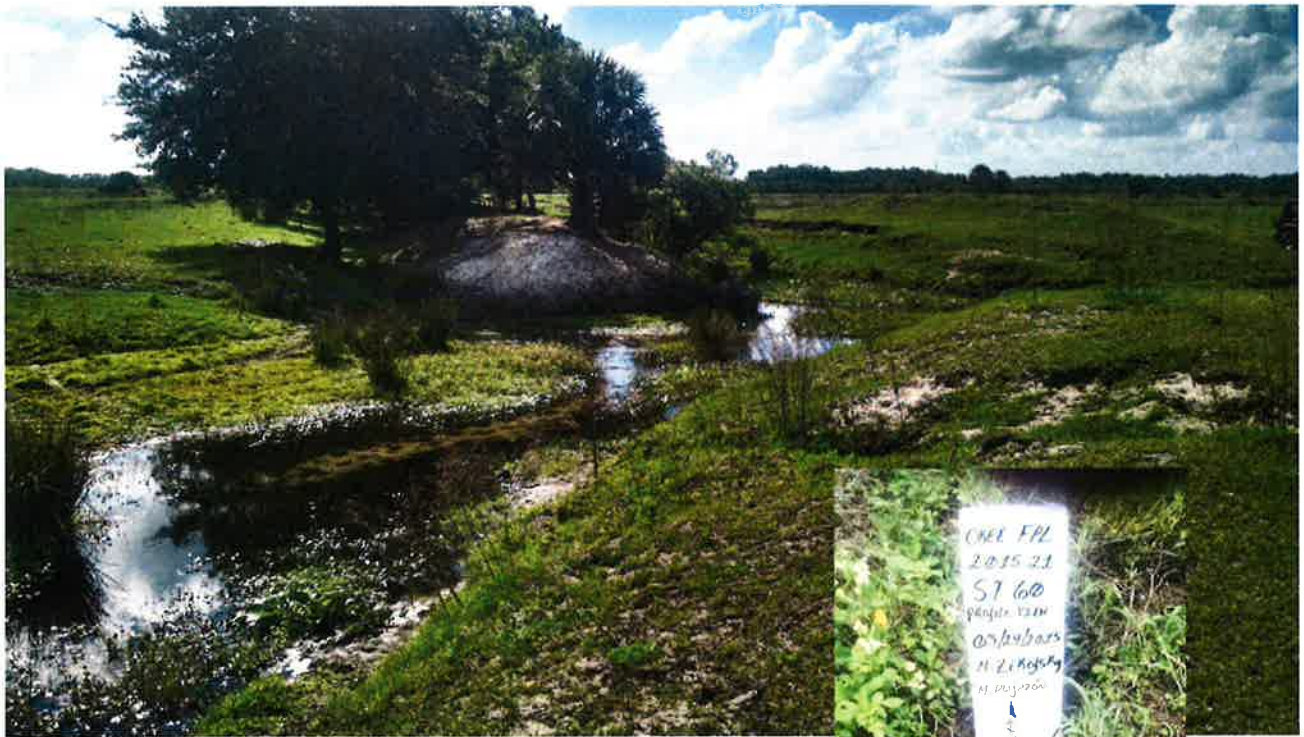
APPENDIX 10.7
MONITORING PROGRAMS

APPENDIX 10.7.1
CULTURAL RESOURCES



A CULTURAL RESOURCE ASSESSMENT OF THE FPL NATURAL GAS COMBINED CYCLE POWER BLOCK PARCEL OKEECHOBEE COUNTY, FLORIDA

ARCHAEOLOGICAL AND HISTORICAL CONSERVANCY, INC.



AHC TECHNICAL REPORT NO. 1058
MARCH 2105

A CULTURAL RESOURCE ASSESSMENT OF THE FPL NATURAL GAS COMBINED CYCLE POWER BLOCK PARCEL OKEECHOBEE COUNTY, FLORIDA

By:

Robert S. Carr, M.S.

John Beriault, B.A.

ARCHAEOLOGICAL AND HISTORICAL CONSERVANCY, INC.

4800 SW 64th Avenue, Suite 107

Davie, Florida 33314

954-792-9776

archlgcl@bellsouth.net

For:

FLORIDA POWER & LIGHT COMPANY

AHC PROJECT NO. 2015.21

AHC TECHNICAL REPORT NO.1058

MARCH 2015



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CONSULTANT SUMMARY

In March, 2015, the Archaeological and Historical Conservancy, Inc. (AHC), conducted a cultural resource assessment of a 2340.89 acre FPL Okeechobee County Energy Center (OCEC) property (preliminary certified site), that included a Phase I cultural resource assessment of the FPL Natural Gas Combined Cycle (NGCC) Power Block parcel lying within the OCEC parcel. In addition, a desktop cultural resource assessment was conducted for the potential solar field and potential mitigation area (Figure 1).

The OCEC property is located southwest of State Road 60 in northeastern Okeechobee County (Figures 1). The 2341 acre parcel encompasses improved pastures, citrus groves, and natural areas.

This assessment was conducted to fulfill historic resource requirements in response to Chapter 267 of the Florida Statutes and conforms to guidelines and specifications set forth in Chapter 1A-46, Florida Administrative Code.

This assessment included a review of aerial photographs, archival documents, a pedestrian survey, and shovel testing. A total of 78 systematic and judgmental shovel tests were dug in the NGCC power block parcel and access road easement. None of the tests were positive for archaeological material (Figure 10). A desktop survey was completed for other parts of the parcel. The desktop survey included an archival review and a determination of higher probability areas on the potential solar area and potential mitigation area (Figure 9).

As a result of the Phase I assessment of the NGCC parcel it is the consultant's opinion based on available data that no cultural resources potentially eligible for listing in the National Register of Historic Places occur within that part of the project parcel. If additional development or plans are implemented for the potential solar area or potential mitigation area then a Phase I cultural resource assessment should be completed for those areas.

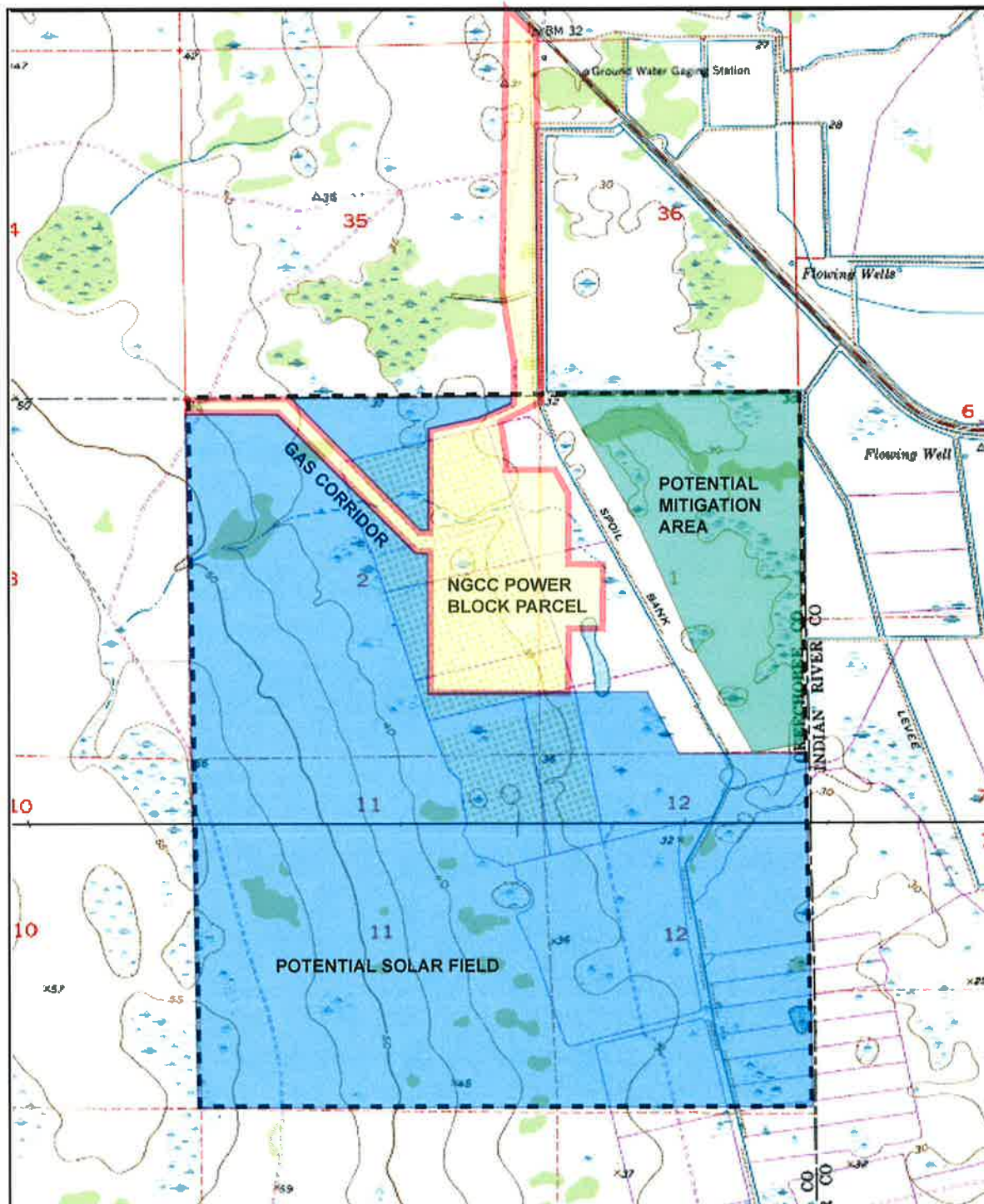


Figure 1. USGS map depicting the FPL Okeechobee County Energy Center (OCEC) project parcel.

--- = OCEC SITE BOUNDARIES

TOWNSHIP 32S, RANGE 35E, SECTION 35
TOWNSHIP 33S, RANGE 35E, SECTION 1, 2, 11, 12
USGS MAP: FORT DRUM NE, REV. 1971

FPL, Preliminary Site Plan OCEC, 2015



0 1/4 1/2
0 .4 .8



1 Mile approx.
1.6 Km. approx.

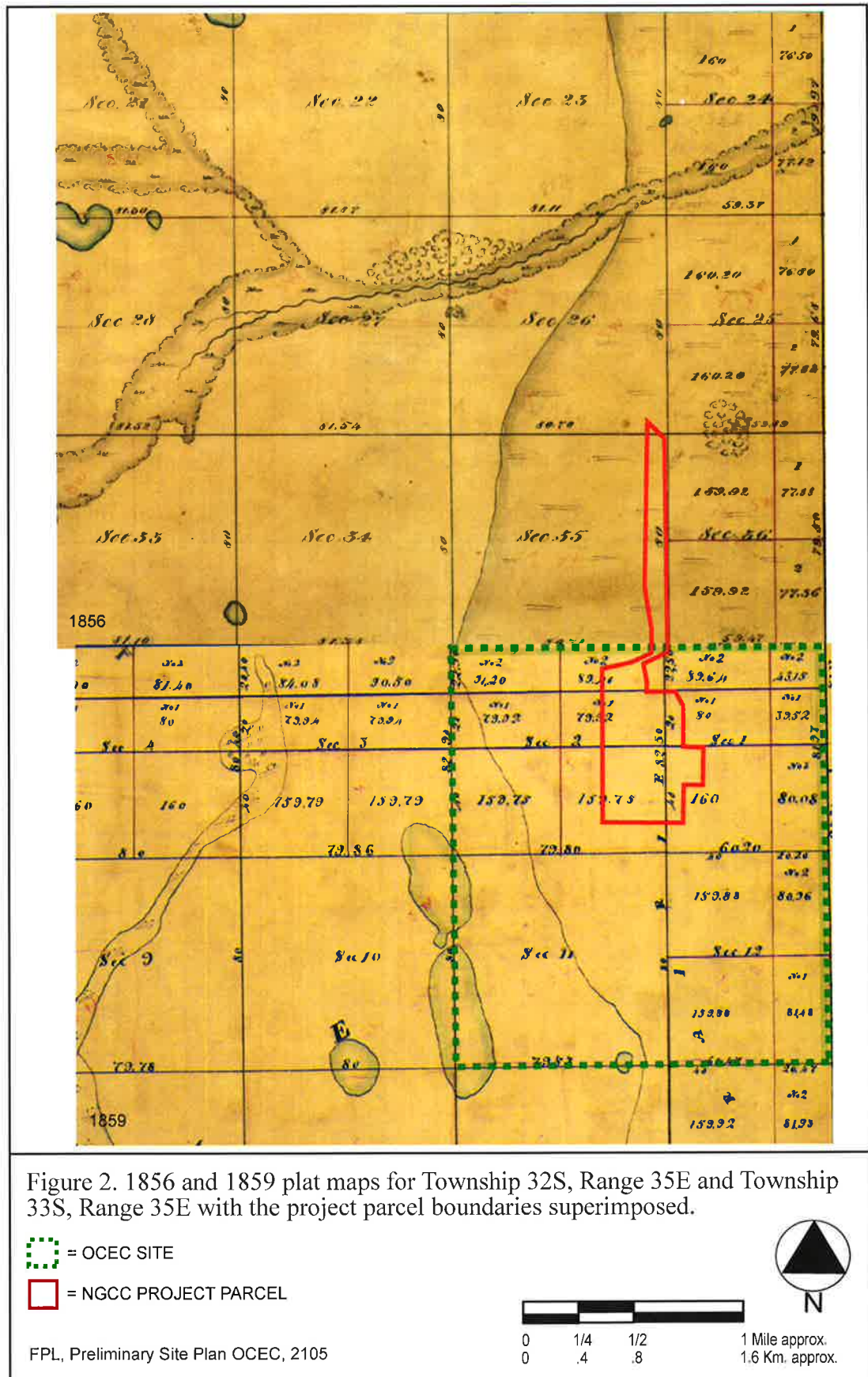
PROJECT SETTING

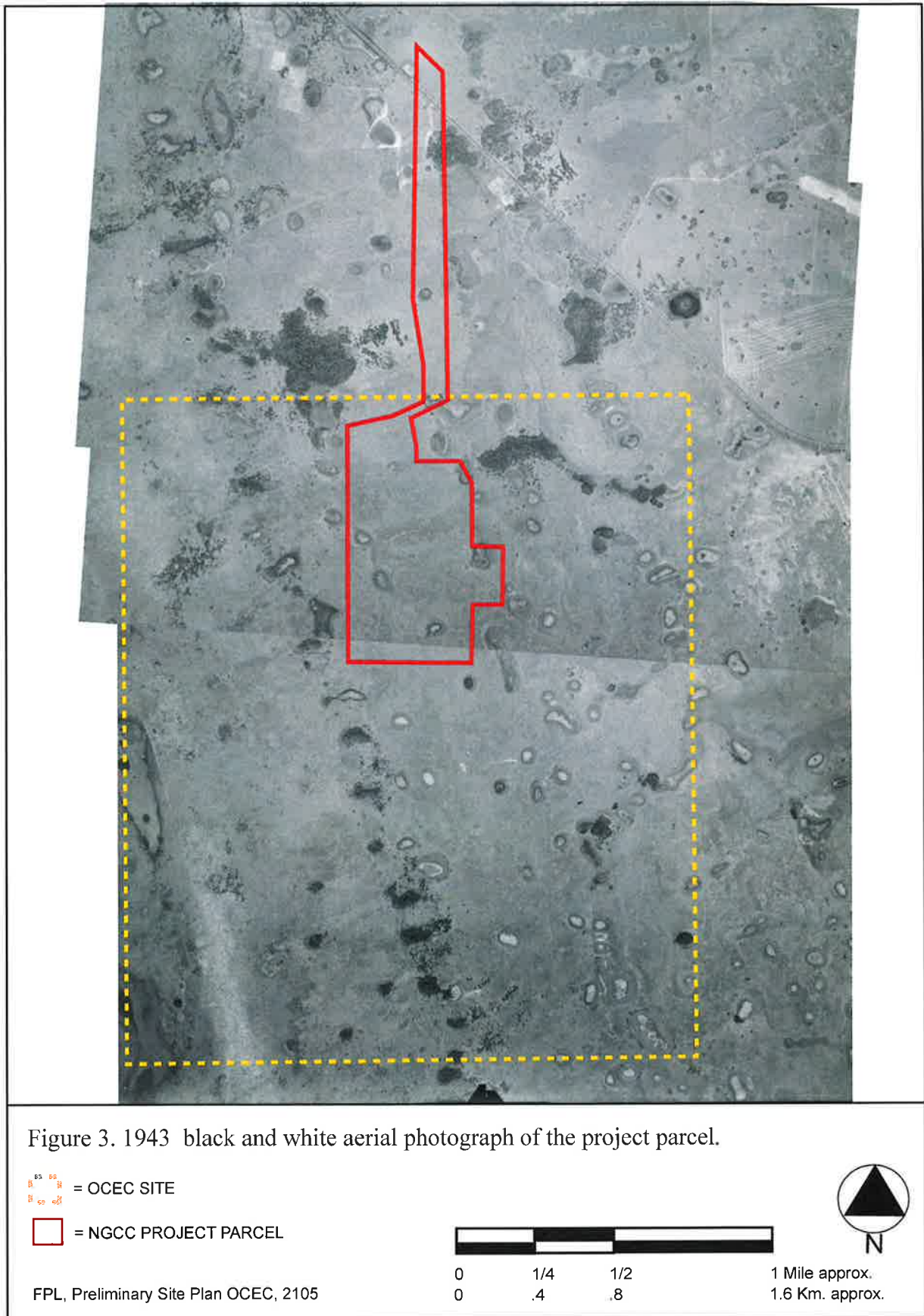
The OCEC project parcel is located in Section 35 in Township 32S, Range 35E and Sections 1, 2, 11, and 12 in Township 33S, Range 35E in the northeast corner of Okeechobee County. The ±2341 acre project parcel lies approximately one mile southwest of the St. Johns Marsh. The relevant USGS map is Fort Drum NE (Figure 1).

The OCEC includes a 168.09 acre NGCC power block project parcel, 310.75 acres for potential wetlands mitigation and a 1720.28 acre area west and south of the NGCC project parcel for potential development as a solar energy field (Figure 2).

The overall parcel is vacant land encompassing improved pasture, citrus groves, and natural areas. Vintage aerial photographs dating back to the 1940s indicate that historically the area was characterized by savannahs interspersed with cypress ponds, sloughs, and scattered hammocks (Figure 3). The largest hammock in the project area is adjacent to the northern end of the access road. Vintage aerial photographs indicate that by the late 1940s the area was used as cattle range, with a citrus grove planted between 1953 and 1962 (Figures 4, 5).

The USDA Web Soil Survey indicates that soil types across the overall FPL Okeechobee site to be EauGallie fine sand; Myakka-Myakka wet, fine sands, 0-2 percent slopes; Pineda fine sand; Boca fine sand; Holopaw fine sand, 0-2 percent slopes; Pompano fine sand; Manatee mucky loamy fine sand, depressionnal; Bassinger fine sand, 0 to 2 percent slopes; Bassinger and Placid soils, depressionnal; Myakka fine sand, 0 to 2 percent slopes; and St. Johns fine sand. These are fine poorly drained wetland soil types (United States Department of Agriculture 2015).





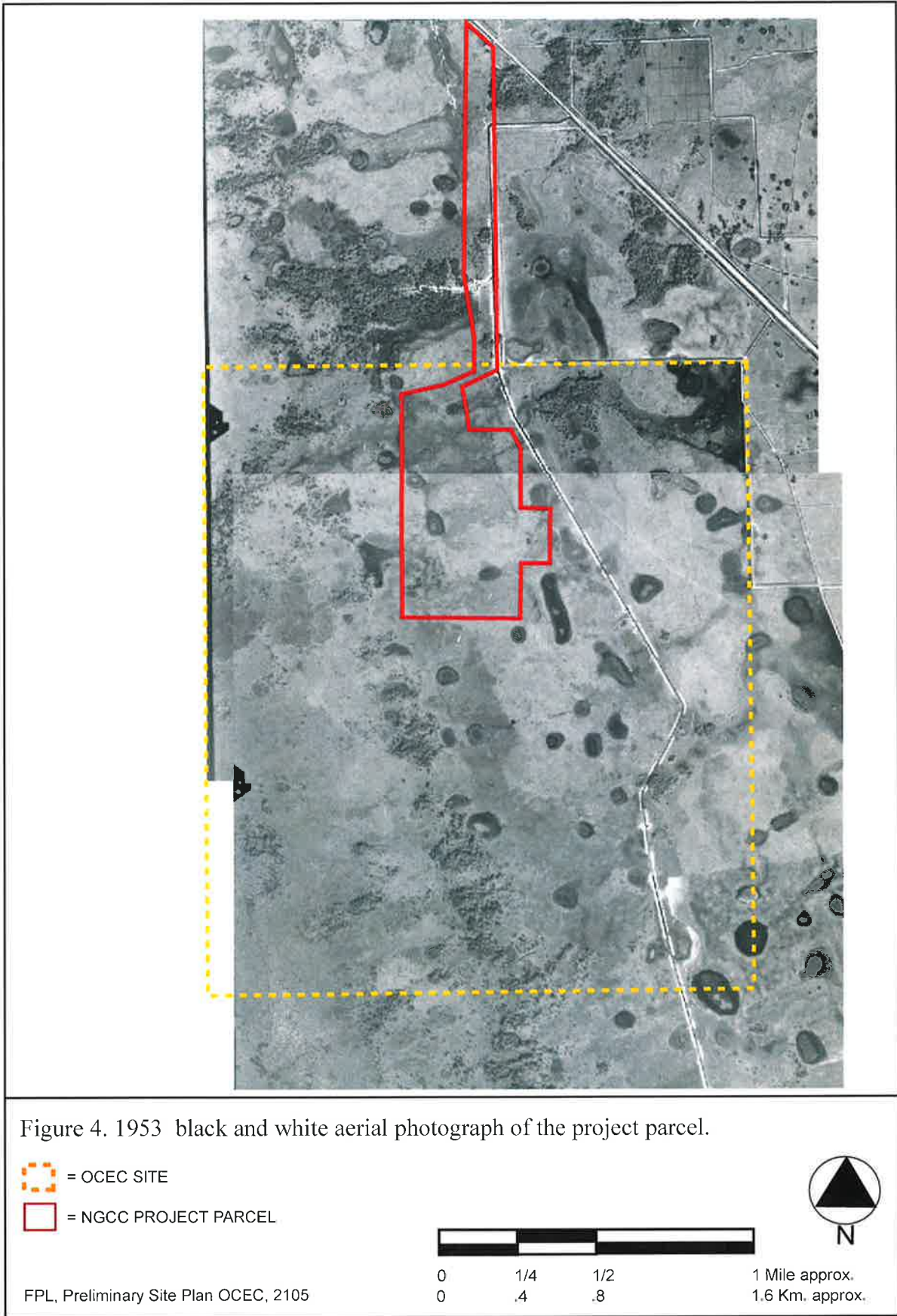




Figure 5. 1962 black and white aerial photograph of the Okeechobee County Energy Center parcel.

 = OCED SITE

 = NGCC PROJECT PARCEL

FPL, Preliminary Site Plan OCEC, 2105



0 1/4 1/2
0 .4 .8

1 Mile approx.
1.6 Km. approx.



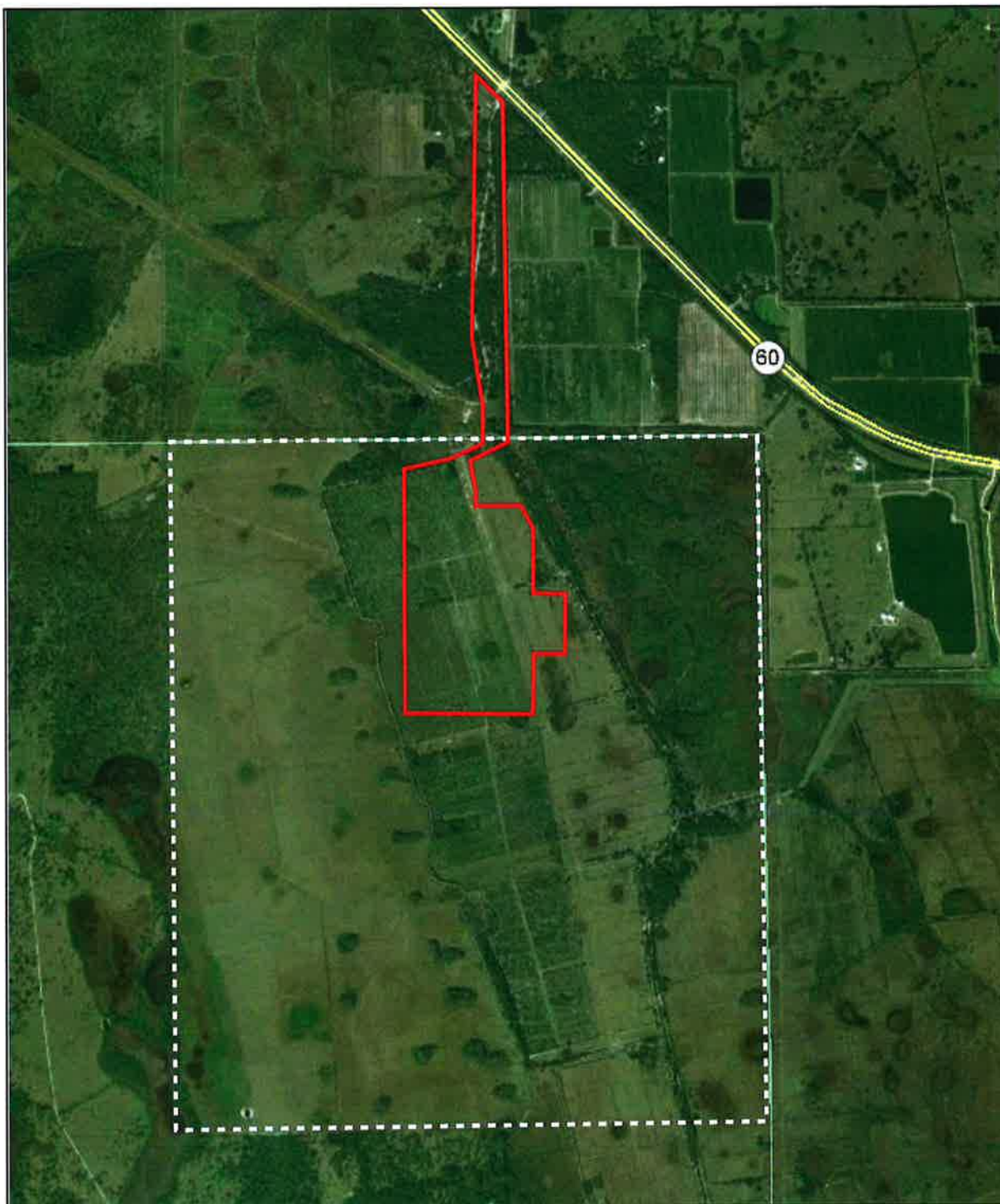


Figure 6. 2015 color aerial orthophotograph of the project parcel.

 = OCEC SITE

 = NGCC PROJECT PARCEL

FPL, Preliminary Site Plan OCEC, 2105



0 1/4 1/2
0 .4 .8



1 Mile approx.
1.6 Km. approx.



Figure 7. View of the NGCC power block parcel, looking west.



Figure 8. View of the NGCC power block parcel, looking west.

PREVIOUS RESEARCH

The earliest archaeological observations in the Lake Okeechobee area were of the Ortona Site, a large earthwork and mound complex. The Ortona Canal, 8GL4, is depicted on the McKay and Blake map of 1839 and on Tannehill's township map of 1871, Tannehill describing them as old canals or "fortifications." Other nineteenth century visitors to the site included Conklin (1875:331), LeBaron (1884:779), Kenworthy (1883: 633) and Farber (1887:307-308), whose account is the most detailed. Farber makes reference to a diagram of the site but the diagram was not published in his account. A detailed description of the site was made by Wainwright (1917). Brief descriptions of the mound complex were made in the 1920s with botanist John Kunkel Small's visit (1923: 220), Collins (1929: 153) and Hrdlicka (1922: 52). In 1940 John Griffin conducted a reconnaissance of the largest mounds and the canal. John Goggin recorded the Ortona mound complex in 1952 on Florida's Master Site File.

Other archaeological investigations were conducted in the western part of the Belle Glade Culture Area in the late 1930s to 1940s by pioneer archaeologists John M. Goggin, Gordon Willey, and John W. Griffin (Goggin nd, 1952, 1964; Griffin 1952; Willey 1949). Ross Allen, best known for his work with reptiles, published an article in the *Florida Anthropologist* on Tony's Mound in 1948 (Allen 1948). In addition to these researchers, Ripley P. Bullen of the Florida State Museum became interested in the region and published several articles (Bullen 1959, 1970).

In 1948, John W. Griffin and G. Hale Smith excavated a sand burial mound near Goodno. They recovered an extensive collection of post-Contact period metal objects, including one of the few *in situ* metal ceremonial tablets ever recovered (Griffin 1949).

Systematic archaeological research in the general region was initiated in the early 1960's by William Sears at Fort Center, a large earthwork/village midden site in the eastern Fisheating Creek area (Sears and Sears 1976; Sears 1971, 1977), culminating in his book, *Fort Center: An Archaeological Site in the Lake Okeechobee Basin*, in 1982.

In the 1970s Robert S. Carr authored several important descriptions and inventories of Belle Glade regional earthworks using aerial photographs (Carr 1973, 1975, 1985). William Johnson (Johnson 1990) augmented and expanded on this work in his surveys of archaeological sites west of Lake Okeechobee.

In 1985 Robert S. Carr conducted an archaeological survey for the Lykes Brothers in the 41-square-mile Palmdale/Squirrel Island area of the Fisheating Creek drainage discovering fifteen archaeological and historical sites, twelve of which were situated in the drainage basin (Carr 1985).

Mary Glowacki and Christine Newman as CARL archaeologists conducted cultural resource assessments of the immediate area of Cowbone Marsh/Fisheating Creek documenting three new sites (Glowacki and Newman 2005).

Archaeological investigations within the northern Everglades Basin and the eastern edge of Lake Okeechobee have not been numerous. Isolated from the more accessible coast, interior southern Florida was generally passed over by the archaeologists that visited southern Florida during the late 19th century and early 20th century. The exceptions were studies of large earthwork sites located along the edge of the Everglades. These circular and linear earthwork complexes were large and conspicuous and caught the attention of ranchers who shared their observations with archaeologists. Among the earliest investigations of an earthworks was Big Mound City conducted by the Smithsonian Institution (Willey 1949). Other documented earthworks included Tony's Mound (Allen 1948). These early reports became the impetus for additional surveys (Carr 1975, 1985, Hale 1984, Johnson 1990) and scientific excavations of earthwork sites such as at Fort Center at Fisheating Creek in the 1960's (Sears 1982) and Ortona on the Caloosahatchee River (Carr et al. 1995) that were to have impacts on developing site models, chronology, and a regional model for the Lake Okeechobee region and the Belle Glade Area in particular.

In the 1930s the Federal Relief program included archaeological investigations in Florida. Gene M. Sterling and D. Lloyd Reichard directed excavations at the Belle Glade Mound (8PB40 and Belle Glade Midden (8PB41) (Willey 1949:5).

John Goggin's surveys of sites in the Okeechobee and Everglades areas were pivotal for furthering our knowledge of the extent of site distribution throughout the area (Goggin 1949, 1947). His work and later that of Sterling and Sears developed a chronology for Formative period Belle Glades Sites (Sears 1982).

Florida Atlantic University and AHC performed archaeological surveys in the eastern Okeechobee area, adding archaeological sites to the Florida master site file (Kennedy 1991). Other studies have focused on pre-Columbian settlement patterns and subsistence patterns such as that done by H. Stephen Hale on three Lake Okeechobee sites (Hale 1984).

Historical archaeological studies have included assessments of the Okeechobee Battlefield (Carr and Steele 1986) and Fort Van Swearingen in St. Lucie County (Carr et al. 2007).

In recent years the fluctuation of water levels in Lake Okeechobee has fueled investigations especially along the southern edge of the lake in Palm Beach County. Christian Davenport, Palm Beach County Archaeologist took advantage of low water levels in 2005-2006 and traveled to Ritta and Kreamer Islands and other sites near Belle Glade/South Bay recording archaeological resources that had been inaccessible and under several meters of lake water (Davenport et. al. 2006; Janus Research 2007).

Other CRAS surveys conducted in the general area of the project parcel include: road and utilities right-of-ways, bridges, and improvements (Poe 1981; de la Fuente 1982; Almy 1992; Janus Research, Inc. 1994; Lewis 1996a, 1996b) and archaeological investigations of specific parcels (Campbell 1984; Richards 1995; Keel 2008).

LITERATURE REVIEW

A search was requested on 2/12/15 with the Florida Division of Historic Resources for archives and literature associated with the project area. This included site forms from the Master Site File in Tallahassee of previously recorded archaeological sites within a one mile radius of Township 32S, Range 35E, Section 35 and Township 33S, Range 35E, Sections 1 and 2 containing the project parcel as well as cultural resource reports conducted within a one mile radius of the project parcel (Table 1).

Table 1. Literature Review Summary

Previously Recorded Sites:	2
Within project parcel	0
Within one mile radius of project parcel	2
Previous Assessments:	9
In project parcel	0
Within one mile radius of project parcel	9

A review of Florida site files determined that no previously recorded archaeological or historic sites occur within the project parcel (Figure 10).

Table 2. Previously Recorded Sites Summary¹

Site No.	Site Name	Site Type	References	In Project Parcel	Outside of Parcel
8IR63	NWR40	Artifact Scatter, Low Density	Campbell 1984		X
8IR64	NWR41	Artifact Scatter, Low Density	Campbell 1984		X
Note: ¹ Based on sites within one mile radius of the project parcel.					

A review of the state report files indicated that ten cultural resource assessments were previously conducted within a one-mile radius of the parcel (Table 3).

Table 3. Previous Cultural Resource Assessments¹

Date	Survey Number	Author	Title	In Parcel	Out of Parcel
1981	594	Poe, Charles B.	<i>Lake Poinsett-Midway 500 KV Transmission Line Project, Archaeological and Historical Assessment</i>		X
1982	11753	de la Fuente, Francisco	<i>An Archaeological and Historical Assessment of the Proposed Florida Power and Light Company Poinsett/Martin/Midway 500 KV Transmission Line in Orange, Osceola, Indian River and St. Lucie Counties, Florida</i>		X
1984	1152	Campbell, L. Janice	<i>Reconnaissance Survey of the Upper St. Johns River Flood Control project, Osceola, Brevard and Indian River Counties, Florida</i>		X
1992	3234	Almy, Marion M.	<i>A Cultural Resource Assessment Survey OF S R 60 from M.P. 4.72 to M.P. 10.24, Indian River County, Florida</i>		X

1994	4361	Janus Research, Inc.	<i>Cultural Resource Assessment Survey of the Proposed Improvements to State Road 60 from East of the Turnpike to West of Interstate 95</i>		X
1995	4197	Richards, Storm L.	<i>Latt Maxcy Corporation Fort Drum Project in Indian River County, Florida</i>		X
1996a	5102	Lewis, Scott P.	<i>Archaeological Survey of Proposed Water Retention Areas, State Road 60 from East of the Turnpike to West of Interstate 95</i>		X
1996b	19008	Lewis, Scott P.	<i>Archaeological Investigation of an Additional SR 60 Drainage Area (Water Retention Area 3A) Located at Twenty Mile Bend, Indian River County, Florida</i>		X
2008	15363	Keel, Frank J.	<i>A Cultural Resource Assessment of the Fort Drum Service Plaza Wastewater Treatment Facility Tract, Okeechobee County, Florida</i>		X
Note: ¹ Based on assessments within one mile of the project area					

CULTURAL SUMMARY

The earliest ethnographic description of the Lake Okeechobee area is an account written by Hernando d'Escalante Fontaneda in 1575 (True 1945). In this narration of his experiences as a captive of the Calusa Indians of southwest Florida Fontaneda described the Indians of the Lake Okeechobee area and their economy of harvesting certain root crops to augment a hunting/gathering subsistence.

The prehistoric cultures of southern Florida were first classified in 1936 when archaeologist Matthew W. Stirling defined a Glades cultural area that included all of south Florida (Stirling 1936). Griffin (1988) points out that this was not formulated as a strict cultural area, but rather a geographic region with some common cultural traits. Kroeber (1939), in a review of North American prehistory, followed Stirling by utilizing a slightly different term-the "South Florida Area." He based his definition on both environmental and cultural factors. Subsequently, John M. Goggin delineated more particular boundaries for southern Florida and divided the region into three sub-areas: "Okeechobee" around Lake Okeechobee, "Tekesta" for southeast Florida and the Florida Keys, and "Calusa" for Southwest Florida (Goggin 1947:114-127).

Following Goggin's study, subsequent researchers have refined or altered the cultural distinctions attributed to southern Florida's prehistoric populations. There has been criticism that Goggin's names and definitions were based on historic accounts of the main (proto) historic groups found in the respective regions and not on the archaeological evidence of spatial/temporal/cultural differences (Griffin 1974, Carr and Beriault 1984, Griffin 1988). John W. Griffin, in particular, questioned these cultural distinctions. He believed cultural uniformity was varied only by local environmental conditions and ceramic exchange rates. Griffin believed the inhabitants of prehistoric southern Florida were largely dwelling on the coast and that the interior was nearly uninhabited and under-utilized. Griffin designated the entire southern Florida region as the "Circum-Glades" area (Eck 1997:5, Griffin 1974: 342-346). This new designation was taken up by a widely-circulated book on Florida archaeology by Milanich and Fairbanks (1980). Griffin later (1988) retreated to some extent from his earlier position as further research (particularly by Ehrenhard, Carr, Komara, and Taylor in the Big Cypress and Carr in the eastern Everglades in the 1970s and 1980s) showed abundant sites (and concomitant use and habitation) in the interior and Everglades and in the area surrounding Lake Okeechobee and extending up the Kissimmee River Valley.

Carr and Beriault, in particular, have taken issue with the concept of a Circum-Glades region. Carr's research in the Big Cypress and Everglades regions and the variation of key cultural markers (particularly ceramic decoration) formed the basis for the contention that there was abundant evidence for cultural (and probably political or tribal) diversity in the several areas of south Florida. Carr and Beriault particularly noted and defined differences between the lower southwest Florida coast that they termed the "Ten Thousand Island" region and the area to the north that they called the "Caloosahatchee"

region. They believed this latter area to be the seat of the historic-period Calusa chiefdomship, although previous (and some subsequent) researchers have called the entire southwest Florida from Cape Sable to the Cape Haze peninsula (and beyond) in Charlotte County “Calusa.” The Okeechobee sub-area has been considered the “seat of operations” for the Maya’imi, a tribal group recognizable in early historic sources.

Griffin, in his definitive 1988 synthesis on Everglades archaeology, attempts to reconcile and refine some of conflict in the definition of south Florida prehistoric/historic culture areas. As stated by Carr, Steele, and Davis (1994), “the issue... appears in part to be one of trying to determine the significance of regional and temporal variation, rather than whether these differences are real.” There is evidence that changes through time in regional political affiliations or realties makes any model *not* addressing this complex issue two-dimensional. The Calusa hegemony that was in place by the time of the arrival of Europeans, and this may have begun as early as 800 AD in the Ten Thousand Island “district” or area (Griffin 1988:321; Carr, Steele, and Davis 1994b:12).

The project parcel is in northeast Okeechobee County near the northeast boundary of the Belle Glade culture area. The Belle Glade area surrounds the Lake Okeechobee region including the upper reaches of the Caloosahatchee River, Lake Hicpochee area, Fisheating Creek, at least the lower portion of the Kissimmee River drainage extending to the Lake Wales Ridge to the north and west, and to the northeast across the Kissimmee Prairie to the “hungry lands” and the lower reaches of the St. Johns Marsh.

TEMPORAL PERIODS AND ADAPTATIONS

The following information is generalized and abbreviated. The dates are approximate; transitions between periods are in reality more gradual than the way they are expressed for convenience. Dates are expressed in years before present (BP), which is more consistent with radiocarbon dating determination than the better-known and more widely used BC/AD system.

PALEO PERIOD (14,000 - 8,500 BP)

The Paleo period is the earliest documented period of human occupation in Florida. Native Americans began moving into the southern portion of Florida by 11,000 BP. There is one possible Paleoindian site in Glades County, the shark tooth mountain site where heavily patinated chert was found in the spoil of an excavated pond (Carr et al. 1990). Other sites include Warm Mineral Springs and Little Salt Spring in Sarasota County (Cockrell and Murphy 1978; Clausen et al. 1979), Harney Flats in Hillsborough County (Daniel and Wisenbaker 1986) and the Cutler Fossil Site in Miami-Dade County (Carr 1986, 2012).

ARCHAIC PERIOD (8,500 - 2,500 BP)

The Archaic Period reflects a post-Pleistocene shift in adaptation marked by an increase in the seasonal exploitation of a broad spectrum of food resources, possibly a more

restricted use of territory due to regional specialization, and more semi-sedentary habitation sites. No ceramics are known until the Late Archaic.

There is no firm evidence of human presence in Glades County for the Early Archaic (8500-7000BP). There is evidence of an environment too arid to support scrub oak, and of the presence of shifting wind-formed dunes (Watts 1973, Widmer 1983).

By about 6500 BP mesic conditions began to spread, although localized xeric conditions continued (and still exist in some areas) through south Florida. Middle Archaic sites dating from this time are rare, although the Bay West Nursery site (8CR200) in Collier County and the Ryder Pond site (8LL1850) in Lee County near Bonita Springs provide evidence of occupation, as do several sites in southeast Florida. It is likely that the areas around Fisheating Creek in Glades County were inhabited by the mid-Archaic, although no sites have yet been documented. However, Griffin (1988) summarizes evidence indicating that despite the rise of available surface water, brackish estuaries and other major landscape features had not formed, and human population was still sparse.

During the Archaic period sea levels began to rise at a fairly rapid rate, estimated at 8.3 cm per 100 years 6000-3000 BP, and 3.5 cm per 100 years afterwards (Scholl, Craighead, and Stuiver 1969), although whether sea levels were steadily rising or oscillating is still unclear (see Griffin 1988, Allerton and Carr 1990 for recent reviews of the literature). Data is somewhat difficult to sort out as sea level rise was in places accompanied by both shore regression and transgression. Cypress swamps and hardwood sub-tropical forests established themselves by about 5000 BP as conditions became wetter (and warmer) in the interior, (Carbone 1983, Delcourt and Delcourt 1981).

During the Archaic regional specializations became more marked, not only with material culture but also with distinct utilization of local plant and animal resources.

Toward the end of the Archaic fiber-tempered pottery appears in the archaeological record, and this is often used as a marker of the Orange Phase, commencing at about 4000 BP, either coincident with or soon after the development of the extensive shell middens. The Late Archaic Orange Phase subsistence strategy appears to have intensified the use of shellfish and marine resources as well as being marked by an accelerated trend toward regional specializations.

Semi-fiber tempered sherds have been recovered from the earliest occupations at the Fort Center Site on Fisheating Creek by William Sears (Sears 1982), suggesting Late Archaic to Transitional period habitation. There is evidence that small single to extended family groups occupied river banks, sloughs and mesic hammocks throughout the Belle Glade area beginning about the end of the Archaic.

FORMATIVE STAGE or BELLE GLADE PERIODS (2500 BP - 500 BP)

The Formative or Belle Glade adaptation (though with increasing specializations in gathering strategies and tool-making) was based on hunting, fishing, and the harvesting

of animals and plants. Earlier writers have typed this hunter-gatherer society as primitive (Kroeber 1939: said the culture was “low-level”). However, there is evidence from the specialization of tools and the beautifully-executed wood carvings from Fort Center in Glades County near Lake Okeechobee (Sears 1982) that the south Florida area had an advanced culture that Goggin and Sturtevant (1964) have called a “stratified non-agrarian society.”

The preceding Late Archaic late Orange phase (also known as the transitional phase) is marked by changes in pottery, and terminated with the relatively rapid replacement of fiber-tempered pottery with sand-tempered, limestone-tempered, and chalky ‘temperless’ pottery, as well as changes in style and often reduction in size of stone projectile points.

The Formative Stage (beginning about 2500 BP) is divided in south Florida into the Glades period and Belle Glades period sequences. Subsistence adaptation is marked by a narrowing spectrum of resource use, as well as continued trends toward regional diversity and ecological specializations, marked in part by the proliferation of inland resource extraction encampments.

Formative period cultural evolution eventually led to increased political sophistication, perhaps initially of modest dimensions but culminating in broad regional political alliances and regulation of materials and goods (i.e. resources) between the coast and inland areas (Milanich and Fairbanks 1980). By protohistoric and Contact times the Calusa were the dominant tribal group, gaining broad political influence and at least partial control over much of south Florida as far north as central Brevard County. Historically, the main Calusa village has been regarded as “Calos” on Mound Key in Estero Bay in Lee County, although 50 to 70 large villages were under direct Calusa control by contact times (Griffin 1988).

During the Formative periods, village sites grew to large multi-use complexes. Some of the projected intra-site functions of the elements of these complex earthworks were as house mounds, canals, causeways, temple and platform mounds, courtyards and watercourts, and the possibility of raised-field agriculture due to intriguing evidence of *Trypsicum* and *Zea mays* pollen presented by the Sears’ (Sears and Sears 1976). Excavations at Fort Center involving the excavating of large contiguous areas have led to evidence of uses beginning to establish demonstrable uses for the features of these large sites (Sears 1982).

Rivers and inland hammocks along deep water sloughs, marshes, and permanent ponds were seasonally visited for extraction of natural resources, and are now marked by small to relatively large black dirt middens, some of which may have been semi-permanent villages. The pine and cypress flatwoods, interfaces of river floodplains, dry prairies and hammocks appear to have supported many sites. Areas around Lake Trafford and other rich interior areas have substantial sites including sand mounds and may be more similar to the Okeechobee cultural area than to the coastal cultures.

In 1995 the Kissimmee Valley Archaeological Society, with the help of Robert Austin, excavated a Deptford Period burial mound (the Royce Mound) in the north and west of the Kissimmee River in Highlands County. Exotic trade items and several human burials were recovered. The evidence suggests that social stratification and complexity may occur earlier than the Formative period (Austin 1996).

Coastal sites (shell middens) reflect a predominate dependence on fish and shellfish, wild plant foods and products, and larger inland game. The inland sites show a greater reliance on interior resources including large, medium, and small mammals, turtle, small freshwater fish, alligator, snake, frogs, and, sometimes, freshwater shellfish. Interior and coastal resource exchange can be documented by the consistent finds of moderate amounts of marine shell in many interior middens, as well as interior resources in coastal middens.

The Formative stage (with a nod to John M. Goggin) has been termed the Belle Glade cultural tradition. Much of this “tradition” is keyed to Belle Glade Plain ceramics that are usually in the majority in the archaeological record, the better part of recovered (rim) sherds being plainware. This pottery is a reduction-fired vitreous ware with distinctive shaving that results in a very recognizable appearance. However, despite this, pottery (and its decorations) is usually utilized as the major temporal marker(s) for fitting sites into a temporal framework. Changes in pottery do not represent mere changes in artistic motifs, but reflect inter- and intra-regional trade contacts, outside cultural influences (possibly through exogamy, shifting of populations, and even the evolution of a culture through time. Whatever the influences, the Belle Glade tradition is continuous from post-Archaic times to contact times.

Despite the fact exogamy is likely to have been practiced, traders or other specialists probably moved between major cultural areas in small numbers, and genetic flow probably accompanied cultural exchange, although perhaps not on the same scale. This may have increased in later times due to use of traditional obligations of kinship and intermarriage to stabilize alliances that were not codified into a formal legal system.

The following table has been modified from several sources, but is in large part based on Milanich and Fairbanks (1980), Sears (1982), and Widmer (1988). Dates have been rounded off.

Table 4. Belle Glade Cultural Sequence

Belle Glade I (800 BC – 200 AD)	Small populations, only fiber-tempered and semi fiber-tempered ware at the beginning of Period I, but most of the pottery is sand-tempered plain ware by the end of the period.
Belle Glade II (200 AD – 600-800 AD)	No Glades decorated wares and the presence of Belle Glades Plain. Expansion of mayor earthworks

construction throughout the area.
Emergence of chiefdomships.

Belle Glade III (600-800 AD – 1200-1400 AD)

Pottery types remain the same as Period II with Belle Glade Plain being the predominate ware followed by Glades plain wares. St. Johns Check Stamped begins.

Belle Glade IV (1200-1400 AD – 1700 AD)

Period of excelling craftsmanship; creation of a regional chiefdomship; first appearance of European objects toward the end of the period.

By European contact times (first half of the 16th century), the central interior of southern Florida was characterized by political chiefdoms with a broad network of alliances, as well as a rich and ancient cultural tradition of artistic forms on wood and bone.

Direct conflict with Europeans and, more importantly, exposure to European diseases led to the rapid decline of the Maya'imi and other interior tribes. By the mid-1700s their numbers had greatly diminished. The remnants of these once-powerful tribes may have left south Florida in the 1760s with the Spanish for relocation in Cuba. Others may have become indistinguishable from Seminole or "Spanish Indians" who worked the great fishing "ranchos" in the Pine Island Sound region and elsewhere catching and salting fish for export to Cuba. Other groups of indigenous Native Americans may have fused with the Creek derived Seminoles as pressures from colonial (and later) white encroachment on their traditional territories forced them into the Big Cypress, Everglades, and Okeechobee Basin areas by the 1830s. By this time most of the cultural identity of pre-contact times had been lost, although some of the Maya'imi subsistence strategies may have been partly adopted by Seminoles. A number of Seminole period sites have been documented on prehistoric Glades middens. This coincidence may in part reflect the paucity of high land in the interior (Ehrenhard et al. 1978, 1979, 1980, 1980; Taylor et al. 1983, 1984, 1985). Older midden sites (particularly those called "black dirt" middens) can be rich agriculturally as well as archaeologically, making these foci for historic Seminole gardens and citrus/banana/papaya groves.

Seminole periods in south Florida are divided into I (1820-1860), II (1860-1900), and III (1900-1940) (Ehrenhard et al. 1978). Post-1940 Seminole camps are designated "Late Seminole" in some reports. These designations reflect the different stages of Seminole migration and acculturation into South Florida.

FORT DRUM / INDIANTOWN AREA HISTORY

Early Euro-American settlement began in the project area in the late 19th century, but is not well documented until the late 1870s. The initial impetus for settlement was provided by the series of Seminole War era military forts and the roads connecting them. One military road ran roughly east-west from Fort Bassinger on the Kissimmee River to Fort Vinton north of Vero beach. Another ran north south from Fort Kissimmee to Fort

Jupiter. This later road became known as the “Old Wire Road”, and where the two military roads crossed became known as Fort Drum, as the U.S. Army briefly maintained a fort there.

The earliest settlers were drawn to the region by its potential use as cattle range. Henry Parker moved to Fort Drum from Bartow in 1870 and operated a store and trading post supplying the needs and wants of local Seminole Indians scattered in camps along the St. Johns Marsh, Cow Creek, Mosquito Creek, Bluefield, Indiantown as far as Hungryland. Other early settlers at Fort Drum included Joel Swain, Henry Parker and Henry Holmes.

By 1899 Francis Marion Platt began cattle ranching in an area east of Lake Okeechobee extending to the western edge of the Halpatiokee Swamp. He built a log cabin roofed with cypress shingles 15 miles north of present-day Indiantown. He named the settlement, Annie, after his wife. Their cabin was located near the ‘Old Wire Road’, the route of the military telegraph line between Fort Drum and Fort Jupiter. In 1902 the Annie post office was established there. Near Platt’s settlement was the camp of Tom Tiger, a local Seminole leader. Besides the Platts, another family named Bowers lived in the immediate vicinity. In 1898 the Disston Land Company purchased much of the land in western Martin County, but the land reverted back to the State of Florida in 1902 and was sold to the Southern States Land and Timber Company for 50 cents an acre. This money was used to pay off debts by the State and to initiate the Everglades Drainage Program, a plan backed by Governor Napoleon Bonaparte Broward. In ca. 1910 Mr. Platt was instrumental in creating a road from Annie to Stuart on the coast; this road is now known as Kanner Highway or State Road 76. Mr. Platt kept his ranch holdings in the area until 1924 when he sold all but his house and yard and moved to West Palm Beach.

Before World War I, the State of Florida started work on the St. Lucie Canal. The community of Annie had been relocated closer to the canal project, and in 1924, the Southern States Land and Timber Company changed the name of the growing town to Indiantown. S. Davies Warfield brought the Seaboard Coastline Railroad through the community to West Palm Beach and built the Seminole Inn at Indiantown in 1926. Warfield planned to build major railroad support facility in the area, but his death in 1927 ended those plans. In 1937 much of the land in the area was purchased by the Indiantown Development Company.

METHODOLOGY

Prior to conducting fieldwork in the project parcel, relevant archives and literature were reviewed. It included, but was not limited to, studying previous archaeological reports for sites in northeast Okeechobee County and western Indian River County, reviewing information from the Master Site File in Tallahassee concerning nearby sites, and examining USGS maps of the project area. Also, black and white as well as color aerial photographs of the project area, which could aid in revealing anthropogenic changes to the topography and floral communities, were interpreted.

RESEARCH DESIGN

The principal project goal was to determine the probability of cultural resources occurring in the overall OCEC parcel, and to conduct a Phase I assessment to locate and document any sites within the NGCC project parcel. It was determined that the project parcel overall had a low to high probability of associated archaeological sites. Aerial photos revealed that farming had occurred within the NGCC parcel area, increasing the likelihood that any archaeological sites there were affected by ground disturbing activities. A total of 16 hammocks were observed within the overall OCEC parcel, of which only part of one was located within the parcel access road (Figure 10).

FIELDWORK

The NGCC project parcel was assessed by pedestrian survey and shovel testing. A total of 78 shovel tests were dug across the parcel at 100 meter intervals along transects 1, 3, 4, and 5 (Figure 10). Twenty holes were dug on transect 2 at 25 meter intervals. These shovel tests represent a 30+ percent sampling of the NGCC parcel's low probability areas. Eight test holes were dug at 10 meter intervals within one large hammock at the entrance. Five judgmental tests were dug at other locations. All shovel tests were 50 cm diameter and excavated to a depth of 100 cm or to water level where possible. All dug sediments were screened through ¼" mesh hardware cloth.

COLLECTIONS

No materials of archaeological significance were observed or collected.

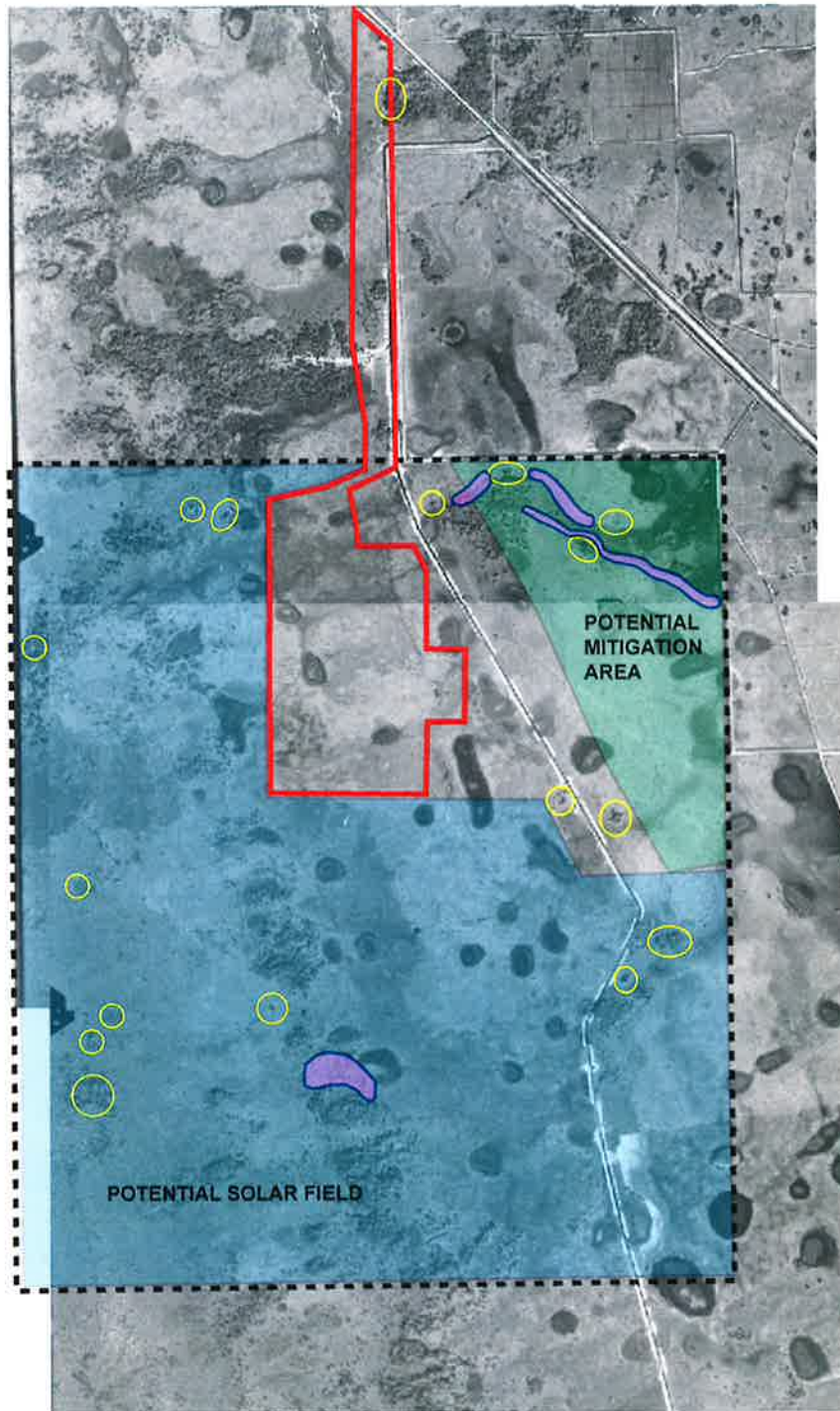
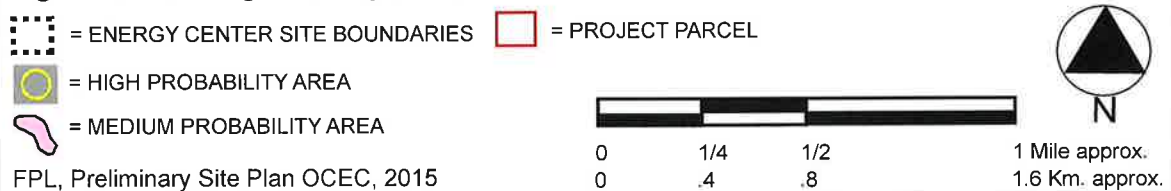


Figure 9. 1953 black and white aerial photograph of the OCEC project parcel depicting high and medium probability areas.



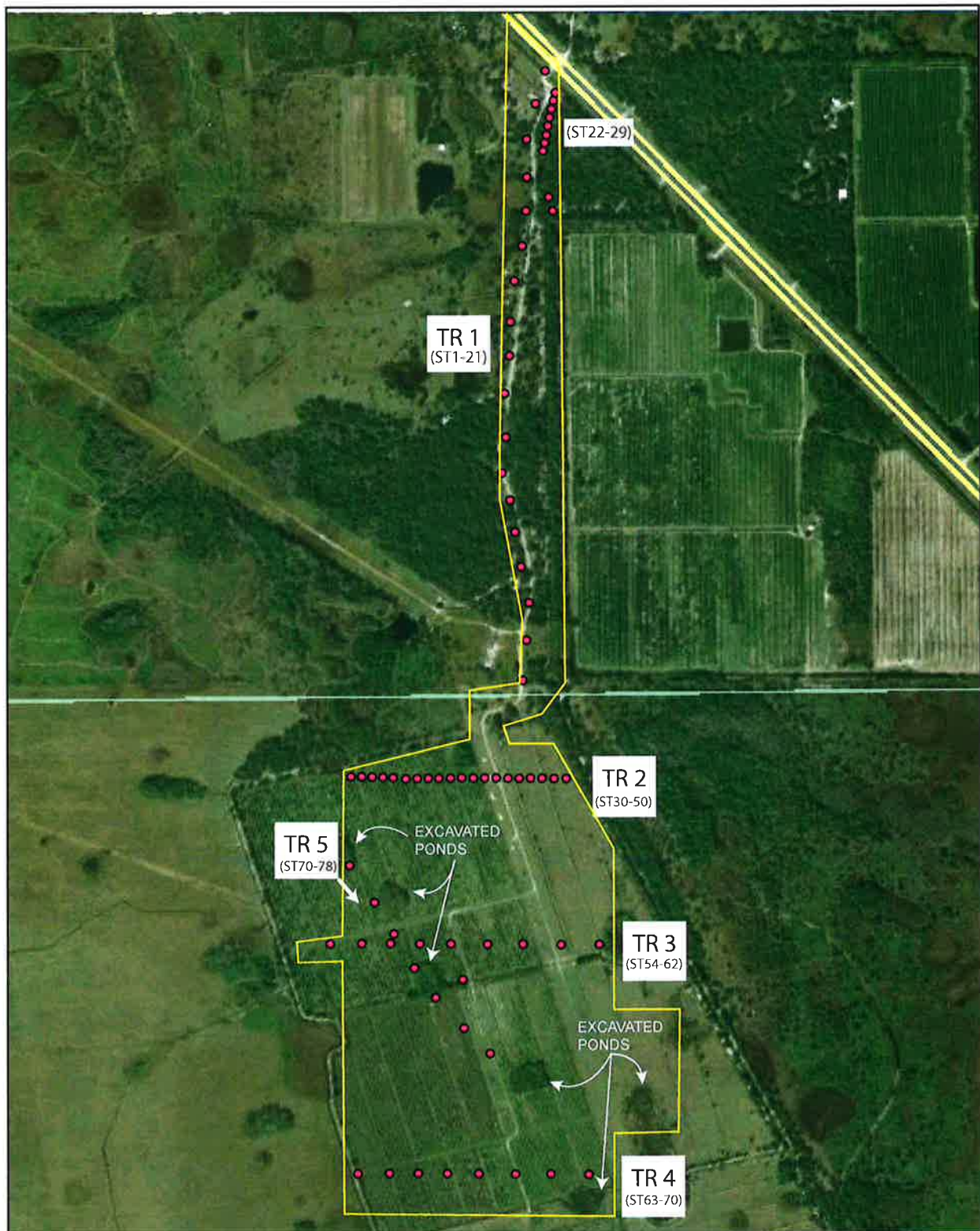
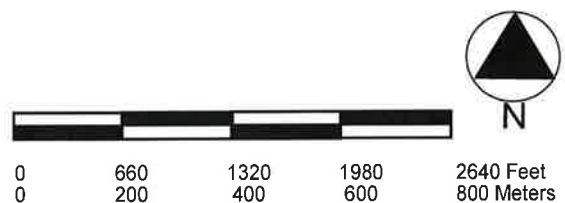


Figure 10. 2015 color aerial of the NGCC parcel showing transects and shovel test locations.

● = NEGATIVE SHOVEL TEST



FPL, Preliminary Site Plan OCEC, 2015

CONCLUSIONS AND RECOMMENDATIONS

A desktop survey was conducted of the overall FPL OCEC parcel and a Phase I cultural resource assessment was conducted of the encompassed NGCC parcel. A total of 78 shovel tests were dug across the NGCC project parcel. All were negative for archaeological material. Sixty eight test holes were dug in low probability areas with ten being dug in a high probability hammock (Figure 10). Testing revealed disturbed soils to a depth of one meter.

All of the NGCC parcel has been altered by prior ground disturbing activities, particularly citrus farming. The parcel has been ditched and bermed with several ponds and canals dug throughout the parcel. No cultural resources were identified as a result of this Phase I cultural resource assessment of the NGCC Power Block parcel and access road easement.

The desktop cultural resource assessment of the overall OCEC site, encompassing the potential mitigation area and the potential solar field area resulted in identifying 16 hammocks regarded as having a high probability for archaeological sites. Four medium probability areas, specifically uplands adjacent to sloughs and larger ponds, were identified (Figure 9). If plans are implemented for using the potential solar field or the potential mitigation area, a Phase I assessment should be conducted of those areas. Additional Phase I testing within other parts of the OCEC parcel could yield as yet undocumented sites.

It is the consultant's opinion that the NGCC project parcel contains no significant archaeological or historic resources that would be eligible for listing in the National Register of Historic Places; however, Phase I testing conducted within other parts of the OCEC parcel could yield previously unrecorded sites. If human remains are uncovered during the development of the project parcel then the provisions of Florida Statute 872.05 will apply, and the Florida Division of Historical Resources will be notified.

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APPENDIX I: FLORIDA SURVEY LOG

Ent D (FMSF only) _____



Survey Log Sheet

Florida Master Site File

Version 4.1 1/07

Survey # (FMSF only) _____

Consult *Guide to the Survey Log Sheet* for detailed instructions.

Identification and Bibliographic Information

Survey Project (name and project phase) FPL Okeechobee County Energy Center, 2015.21, desktop for overall property and Phase I for NGCC project parcel

Report Title (exactly as on title page) A Cultural Resource Assessment of the FPL Natural Gas Combined Cycle Power Block Parcel, Okeechobee County, Florida

Report Authors (as on title page, last names first) 1. Carr, Robert S. 3. _____
2. Beriault, John G. 4. _____

Publication Date (year) 2015 **Total Number of Pages in Report (count text, figures, tables, not site forms)** 32

Publication Information (Give series, number in series, publisher and city. For article or chapter, cite page numbers. Use the style of *American Antiquity*.)
AHC Technical Report #1058

Supervisors of Fieldwork (even if same as author) Names Carr, Robert S.

Affiliation of Fieldworkers: Organization Archaeological and Historical Conservancy, Inc. **City** Davie

Key Words/Phrases (Don't use county name, or common words like *archaeology, structure, survey, architecture, etc.*)

1. Belle Glade 3. _____ 5. _____ 7. _____
2. _____ 4. _____ 6. _____ 8. _____

Survey Sponsors (corporation, government unit, organization or person directly funding fieldwork)

Name Florida Power & Light Company **Organization** _____

Address/Phone/E-mail _____

Recorder of Log Sheet Franklin, Ryan **Date Log Sheet Completed** 4-1-2015

Is this survey or project a continuation of a previous project? ☒ No ☐ Yes: **Previous survey #s (FMSF only)** _____

Mapping

Counties (List each one in which field survey was done; attach additional sheet if necessary)

1. Okeechobee 3. _____ 5. _____
2. _____ 4. _____ 6. _____

USGS 1:24,000 Map Names/Year of Latest Revision (attach additional sheet if necessary)

1. Name FORT DRUM NE Year 1971 4. Name _____ Year _____
2. Name _____ Year _____ 5. Name _____ Year _____
3. Name _____ Year _____ 6. Name _____ Year _____

Description of Survey Area

Dates for Fieldwork: Start 2-26-2015 **End** 3-6-2015 **Total Area Surveyed (fill in one)** _____ **hectares** 230 **acres**

Number of Distinct Tracts or Areas Surveyed 1

If Corridor (fill in one for each) **Width:** _____ **meters** _____ **feet** _____ **Length:** _____ **kilometers** _____ **miles**

Research and Field Methods

Types of Survey (check all that apply): ☒ archaeological ☐ architectural ☒ historical/archival ☐ underwater
☐ damage assessment ☐ monitoring report ☒ other(describe): Desktop

Scope/Intensity/Procedures Desktop survey of overall property; Phase I of NGCC parcel

Preliminary Methods (check as many as apply to the project as a whole)

☒ Florida Archives (Gray Building) ☐ library research- *local public* ☐ local property or tax records ☐ other historic maps
☐ Florida Photo Archives (Gray Building) ☐ library-special collection - *nonlocal* ☐ newspaper files ☒ soils maps or data
☐ Site File property search ☒ Public Lands Survey (maps at DEP) ☒ literature search ☐ windshield survey
☒ Site File survey search ☐ local informant(s) ☐ Sanborn Insurance maps ☒ aerial photography
☐ other (describe): _____

Archaeological Methods (check as many as apply to the project as a whole)

☐ Check here if **NO** archaeological methods were used.
☐ surface collection, controlled ☐ shovel test-other screen size ☐ block excavation (at least 2x2 m)
☐ surface collection, uncontrolled ☐ water screen ☐ soil resistivity
☒ shovel test-1/4" screen ☐ posthole tests ☐ magnetometer
☐ shovel test-1/8" screen ☐ auger tests ☐ side scan sonar
☐ shovel test 1/16" screen ☐ coring ☒ pedestrian survey
☐ shovel test-unscreened ☐ test excavation (at least 1x2 m) ☐ unknown
☐ other (describe): _____

Historical/Architectural Methods (check as many as apply to the project as a whole)

☒ Check here if **NO** historical/architectural methods were used.
☐ building permits ☐ demolition permits ☐ neighbor interview ☐ subdivision maps
☐ commercial permits ☐ exposed ground inspected ☐ occupant interview ☐ tax records
☐ interior documentation ☐ local property records ☐ occupation permits ☐ unknown
☐ other (describe): _____

Survey Results (cultural resources recorded)

Site Significance Evaluated? ☐ Yes ☐ No

Count of Previously Recorded Sites 0 Count of Newly Recorded Sites 0

Previously Recorded Site #'s with Site File Update Forms (List site #'s without "8". Attach additional pages if necessary.) _____

Newly Recorded Site #'s (Are all originals and not updates? List site #'s without "8". Attach additional pages if necessary.) _____

Site Forms Used: ☐ Site File Paper Form ☐ Site File Electronic Recording Form

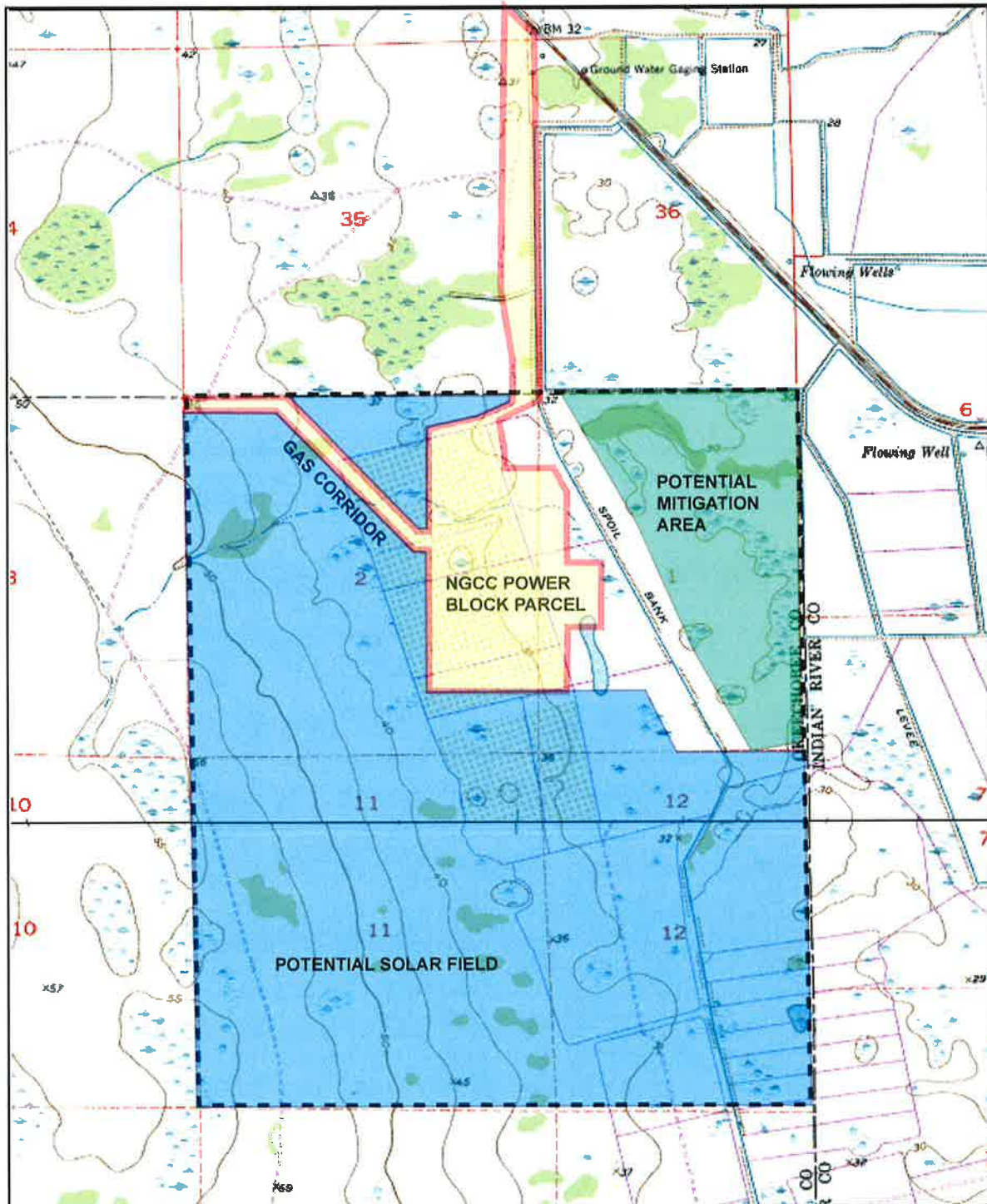
*****REQUIRED: ATTACH PLOT OF SURVEY AREA ON PHOTOCOPY OF USGS 1:24,000 MAP(S)*****

SHPO USE ONLY

SHPO USE ONLY

SHPO USE ONLY

Origin of Report: ☐ 872 ☐ CARL ☐ UW ☐ 1A32 # _____ ☐ Academic ☐ Contract ☐ Avocational
☐ Grant Project # _____ ☐ Compliance Review: CRAT # _____
 Type of Document: ☐ Archaeological Survey ☐ Historical/Architectural Survey ☐ Marine Survey ☐ Cell Tower CRAS ☐ Monitoring Report
☐ Overview ☐ Excavation Report ☐ Multi-Site Excavation Report ☐ Structure Detailed Report ☐ Library, Hist. or Archival Doc
☐ MPS ☐ MRA ☐ TG ☐ Other: _____
 Document Destination: _____ Plotability: _____



USGS map depicting the FPL Okeechobee County Energy Center (OCEC) project parcel.

 = OCEC SITE BOUNDARIES

TOWNSHIP 32S, RANGE 35E, SECTION 35
TOWNSHIP 33S, RANGE 35E, SECTION 1, 2, 11, 12
USGS MAP: FORT DRUM NE, REV. 1971

FPL, Preliminary Site Plan OCEC, 2015



0 1/4 1/2
0 .4 .8



1 Mile approx.
1.6 Km. approx.

APPENDIX 10.7.2
NOISE INFORMATION

Certificate of Calibration and Conformance

Certificate Number 2013-168280

Instrument Model 831, Serial Number 0001314, was calibrated on 03JAN2013. The instrument meets factory specifications per Procedure D0001.8310, ANSI S1.4-1983 (R 2006) Type 1; S1.4A-1985 ; S1.43-1997 Type 1; S1.11-2004 Octave Band Class 1; S1.25-1991; IEC 61672-2002 Class 1; 60651-2001 Type 1; 60804-2000 Type 1; 61260-2001 Class 1; 61252-2002.

Instrument found to be in calibration as received: YES

Date Calibrated: 03JAN2013

Calibration due: 03JAN2014

Calibration Standards Used

MANUFACTURER	MODEL	SERIAL NUMBER	INTERVAL	CAL. DUE	TRACEABILITY NO.
Stanford Research Systems	DS360	61889	12 Months	27JAN2013	61889-012712

Reference Standards are traceable to the National Institute of Standards and Technology (NIST)

Calibration Environmental Conditions

Temperature: 24 ° Centigrade

Relative Humidity: 17 %

Affirmations

This Certificate attests that this instrument has been calibrated under the stated conditions with Measurement and Test Equipment (M&TE) Standards traceable to the U.S. National Institute of Standards and Technology (NIST). All of the Measurement Standards have been calibrated to their manufacturers' specified accuracy / uncertainty. Evidence of traceability and accuracy is on file at Provo Engineering & Manufacturing Center. An acceptable accuracy ratio between the Standard(s) and the item calibrated has been maintained. This instrument meets or exceeds the manufacturer's published specification unless noted.

The collective uncertainty of the Measurement Standard used does not exceed 25% of the applicable tolerance for each characteristic calibrated unless otherwise noted.

The results documented in this certificate relate only to the item(s) calibrated or tested. A one year calibration is recommended, however calibration interval assignment and adjustment are the responsibility of the end user. This certificate may not be reproduced, except in full, without the written approval of the issuer.

"AS RECEIVED" data same as shipped data.

Tested with PRM831-0480

Signed: 
Technician: Ron Harris

Certificate of Calibration and Conformance

Certificate Number 2013-168261

Instrument Model PRM831, Serial Number 0480, was calibrated on 03JAN2013. The instrument meets factory specifications per Procedure D0001.8167.

Instrument found to be in calibration as received: YES

Date Calibrated: 03JAN2013

Calibration due: 03JAN2014

Calibration Standards Used

MANUFACTURER	MODEL	SERIAL NUMBER	INTERVAL	CAL. DUE	TRACEABILITY NO.
Agilent Technologies	34401A	MY41044529	12 Months	26JAN2013	5522640
Larson Davis	LDSigGn/2209	0277 / 0109	12 Months	20MAR2013	2012-156690

Reference Standards are traceable to the National Institute of Standards and Technology (NIST)

Calibration Environmental Conditions

Temperature: 24 ° Centigrade

Relative Humidity: 17 %

Affirmations

This Certificate attests that this instrument has been calibrated under the stated conditions with Measurement and Test Equipment (M&TE) Standards traceable to the U.S. National Institute of Standards and Technology (NIST). All of the Measurement Standards have been calibrated to their manufacturers' specified accuracy / uncertainty. Evidence of traceability and accuracy is on file at Provo Engineering & Manufacturing Center. An acceptable accuracy ratio between the Standard(s) and the item calibrated has been maintained. This instrument meets or exceeds the manufacturer's published specification unless noted.

The collective uncertainty of the Measurement Standard used does not exceed 25% of the applicable tolerance for each characteristic calibrated unless otherwise noted.

The results documented in this certificate relate only to the item(s) calibrated or tested. A one year calibration is recommended, however calibration interval assignment and adjustment are the responsibility of the end user. This certificate may not be reproduced, except in full, without the written approval of the issuer.

" AS RECEIVED" data same as shipped data.

Signed: 
Technician: Ron Harris

Certificate of Calibration and Conformance

Certificate Number 2013-168697

Instrument Model CAL200, Serial Number 4318, was calibrated on 11JAN2013. The instrument meets factory specifications per Procedure D0001.8190.

Instrument found to be in calibration as received: YES

Date Calibrated: 11JAN2013

Calibration due: 11JAN2014

Calibration Standards Used

MANUFACTURER	MODEL	SERIAL NUMBER	INTERVAL	CAL. DUE	TRACEABILITY NO.
Larson Davis	2900	0661	12 Months	06APR2013	2012-157399
PCB	1502B02FJ15PSIA	1428	12 Months	10APR2013	3416909125.00
Larson Davis	2559	2506	12 Months	11JUN2013	19157-1
Hewlett Packard	34401A	3146A10352	12 Months	28AUG2013	5778699
Larson Davis	PRM902	0480	12 Months	07SEP2013	2012-163567
Larson Davis	MTS1000/2201	0111	12 Months	07SEP2013	SM070912-3
Larson Davis	PRM915	0112	12 Months	08OCT2013	2012-164811

Reference Standards are traceable to the National Institute of Standards and Technology (NIST)

Calibration Environmental Conditions

Environmental test conditions as shown on calibration report.

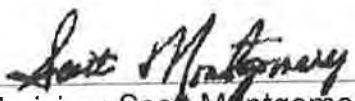
Affirmations

This Certificate attests that this instrument has been calibrated under the stated conditions with Measurement and Test Equipment (M&TE) Standards traceable to the U.S. National Institute of Standards and Technology (NIST). All of the Measurement Standards have been calibrated to their manufacturers' specified accuracy / uncertainty. Evidence of traceability and accuracy is on file at Provo Engineering & Manufacturing Center. An acceptable accuracy ratio between the Standard(s) and the item calibrated has been maintained. This instrument meets or exceeds the manufacturer's published specification unless noted.

The collective uncertainty of the Measurement Standard used does not exceed 25% of the applicable tolerance for each characteristic calibrated unless otherwise noted.

The results documented in this certificate relate only to the item(s) calibrated or tested. A one year calibration is recommended, however calibration interval assignment and adjustment are the responsibility of the end user. This certificate may not be reproduced, except in full, without the written approval of the issuer.

Before: 113.91 dB, 93.93 dB, 1000.3 Hz @ sea level.
After: Refer to Certificate of Measured Output.

Signed: 
Technician: Scott Montgomery

CERTIFICATE OF ENVIRONMENTAL TEST

Certificate # 2013-0111-1

Test Date:	11JAN2013	Serial #:	0001314
Sound Level Meter:	831	Serial #:	0480
Preamplifier Model:	PRM831	Serial #:	
Microphone Model:		Humidity Range:	50% to 95%
Temperature Range:	-40° C to 70°C		

Calibrated Equipment used during Test:

Type	Mfg.	Model	Serial	Trace #	Cal Due
Humidity Chamber	Thermotron	SE-1000L	36541	2012-1015-01	15OCT2013

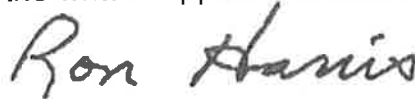
ENVIRONMENTAL CONDITIONS:

Temperature:	23 °C
Relative Humidity:	25 %
Barometric Pressure:	85 kPa

This "Certificate of Environmental Test" verifies that this system has been tested to the Larson Davis environmental specifications appropriate for the instrument. Copies of the test data are attached for customer review.

This calibration complies with the requirements of ISO 9001.

The results documented in this certificate relate only to the system that was verified and tested. Calibration interval assignment and adjustment is the responsibility of the end user. This certificate may not be reproduced, except in full, without the written approval of Larson Davis.



Ron Harris, Technician

Test performed at: Larson Davis, a division of PCB Piezotronics, Inc
1681 West 820 North, Provo Utah 84601

Larson Davis, a division of PCB Piezotronics, Inc
Tel: 716 684-0001 www.LarsonDavis.com

Certificate of Calibration and Conformance

Certificate Number 2014-190695

Instrument Model 824, Serial Number A3106, was calibrated on 12 May 2014. The instrument meets factory specifications per Procedure D0001.8046, IEC 61672-1:2002 Class 1; IEC 60651-2001, 60804-2000 and ANSI S1.4-1983 Type 1 1/3, 1/1 Oct. Filters; S1.11-1986 Type 1C; IEC61260-am1-2001 Class 1 .

Instrument found to be in calibration as received: YES

Date Calibrated: 12 May 2014

Calibration due: 12 May 2015

Calibration Standards Used

MANUFACTURER	MODEL	SERIAL NUMBER	INTERVAL	CAL. DUE	TRACEABILITY NO.
Larson Davis	LDSigGn/2209	0617 / 0104	12 Months	17 Jan 2015	2014-185086

Reference Standards are traceable to the National Institute of Standards and Technology (NIST)

Calibration Environmental Conditions

Temperature: 22 ° Centigrade

Relative Humidity: 29 %

Affirmations

This Certificate attests that this instrument has been calibrated under the stated conditions with Measurement and Test Equipment (M&TE) Standards traceable to the U.S. National Institute of Standards and Technology (NIST). All of the Measurement Standards have been calibrated to their manufacturers' specified accuracy / uncertainty. Evidence of traceability and accuracy is on file at Provo Engineering & Manufacturing Center. An acceptable accuracy ratio between the Standard(s) and the item calibrated has been maintained. This instrument meets or exceeds the manufacturer's published specification unless noted.

The collective uncertainty of the Measurement Standard used does not exceed 25% of the applicable tolerance for each characteristic calibrated unless otherwise noted.

The results documented in this certificate relate only to the item(s) calibrated or tested. A one year calibration is recommended, however calibration interval assignment and adjustment are the responsibility of the end user. This certificate may not be reproduced, except in full, without the written approval of the issuer.

"As received" data is the same as shipped data.

Tested with PRM902 S/N 3275

Signed:



Technician: Sean Childs

Certificate of Calibration and Conformance

Certificate Number 2014-190728

Microphone Model 2560, Serial Number 3424, was calibrated on 13 May 2014. The microphone meets factory specifications per Test Procedure D0001.8167.

Instrument found to be in calibration as received: YES

Date Calibrated: 13 May 2014

Calibration due: 13 May 2015

Calibration Standards Used

MANUFACTURER	MODEL	SERIAL NUMBER	INTERVAL	CAL. DUE	TRACEABILITY NO.
Larson Davis	2559	2506	12 Months	13 Jun 2014	29027
Larson Davis	2900	0575	12 Months	24 Jul 2014	2013-177110
Larson Davis	2559	3034LF	12 Months	13 Aug 2014	2013-178081
Larson Davis	PRM902	0206	12 Months	15 Aug 2014	2013-178254
Larson Davis	MTS1000 / 2201	1000 / 0100	12 Months	3 Sep 2014	SM090313
Larson Davis	PRM902	0529	12 Months	10 Sep 2014	2013-179249
Larson Davis	PRM902	0528	12 Months	10 Sep 2014	2013-179248
Hewlett Packard	34401A	3146A62099	12 Months	4 Dec 2014	6327913
Larson Davis	PRM915	0102	12 Months	11 Dec 2014	2013-183533
Larson Davis	PRM916	0102	12 Months	11 Dec 2014	2013-183534
Larson Davis	CAL250	42630	12 Months	3 Jan 2015	2014-184458

Reference Standards are traceable to the National Institute of Standards and Technology (NIST)

Calibration Environmental Conditions

Environmental test conditions as printed on microphone calibration chart.

Affirmations

This Certificate attests that this instrument has been calibrated under the stated conditions with Measurement and Test Equipment (M&TE) Standards traceable to the U.S. National Institute of Standards and Technology (NIST). All of the Measurement Standards have been calibrated to their manufacturers' specified accuracy / uncertainty. Evidence of traceability and accuracy is on file at Provo Engineering & Manufacturing Center. An acceptable accuracy ratio between the Standard(s) and the item calibrated has been maintained. This instrument meets or exceeds the manufacturer's published specification unless noted.

The collective uncertainty of the Measurement Standard used does not exceed 25% of the applicable tolerance for each characteristic calibrated unless otherwise noted.

The results documented in this certificate relate only to the item(s) calibrated or tested. A one year calibration is recommended, however calibration interval assignment and adjustment are the responsibility of the end user. This certificate may not be reproduced, except in full, without the written approval of the issuer.

"AS RECEIVED" data is the same as shipped data.

Signed: 
Technician: Abraham Ortega

Certificate of Calibration and Conformance

Certificate Number 2014-190694

Instrument Model PRM902, Serial Number 3275, was calibrated on 12 May 2014. The instrument meets factory specifications per Procedure D0001.8126.

Instrument found to be in calibration as received: YES

Date Calibrated: 12 May 2014

Calibration due: 12 May 2015

Calibration Standards Used

MANUFACTURER	MODEL	SERIAL NUMBER	INTERVAL	CAL. DUE	TRACEABILITY NO.
Hewlett Packard	34401A	US36033460	12 Months	1 Jul 2014	6141807
Larson Davis	LDSigGn/2209	0617 / 0104	12 Months	17 Jan 2015	2014-185086

Reference Standards are traceable to the National Institute of Standards and Technology (NIST)

Calibration Environmental Conditions

Temperature: 22 ° Centigrade

Relative Humidity: 29 %

Affirmations

This Certificate attests that this instrument has been calibrated under the stated conditions with Measurement and Test Equipment (M&TE) Standards traceable to the U.S. National Institute of Standards and Technology (NIST). All of the Measurement Standards have been calibrated to their manufacturers' specified accuracy / uncertainty. Evidence of traceability and accuracy is on file at Provo Engineering & Manufacturing Center. An acceptable accuracy ratio between the Standard(s) and the item calibrated has been maintained. This instrument meets or exceeds the manufacturer's published specification unless noted.

The collective uncertainty of the Measurement Standard used does not exceed 25% of the applicable tolerance for each characteristic calibrated unless otherwise noted.

The results documented in this certificate relate only to the item(s) calibrated or tested. A one year calibration is recommended, however calibration interval assignment and adjustment are the responsibility of the end user. This certificate may not be reproduced, except in full, without the written approval of the issuer.

"As received" data is the same as shipped data.

Signed: 
Technician: Sean Childs

Calibration Certificate

Certificate Number 2014000938

Customer:

Golder Associates Inc
6026 Northwest 1st Place
Gainesville FL, 32607, US

Model Number CAL200
Serial Number 5636
Test Results **Pass**
Initial Condition AS RECEIVED same as shipped
Description Larson Davis CAL200 Acoustic Calibrator

Procedure Name Calibrator
Technician Scott Montgomery
Calibration Date 12 May 2014
Calibration Due 12 May 2015
Temperature 24 °C ± 0.3 °C
Humidity 36 %RH ± 3 %RH
Static Pressure 101.4 kPa ± 1 kPa

Evaluation Method The data is acquired by the insert voltage calibration method using the reference microphone's open circuit sensitivity. Data reported in dB re 20 µPa.

Compliance Standards Compliant to Manufacturer Specifications per D0001.8190 and IEC 60942:2003.

Larson Davis, a division of PCB Piezotronics, Inc. certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the SI through the National Institute of Standards and Technology (NIST), or other national measurement institutes.

The quality system is registered to ISO 9001:2008.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances will be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

This report may not be reproduced, except in full, unless permission for the publication of an approved abstract is obtained in writing from the organization issuing this report.

Standards Used

Description	Cal Date	Cal Due	Cal Standard
Agilent 34401A DMM	09/03/2013	09/03/2014	001021
Sound Level Meter / Real Time Analyzer	04/07/2014	04/07/2015	001051
Microphone Calibration System	08/22/2013	08/22/2014	005446
1/2" Preamplifier	10/09/2013	10/09/2014	006506
Larson Davis 1/2" Preamplifier 7-pin LEMO	08/23/2013	08/23/2014	006507
1/2 inch Microphone - RI - 200V	06/13/2013	06/13/2014	006511
Pressure Transducer	10/02/2013	10/02/2014	007204

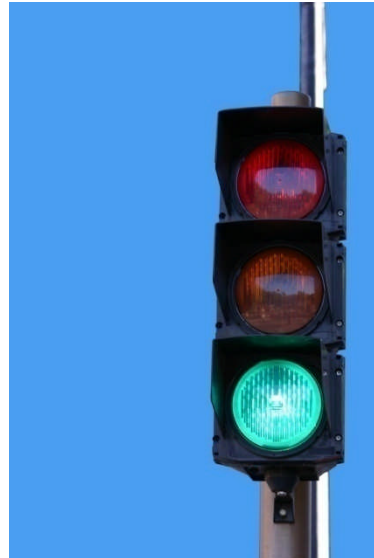
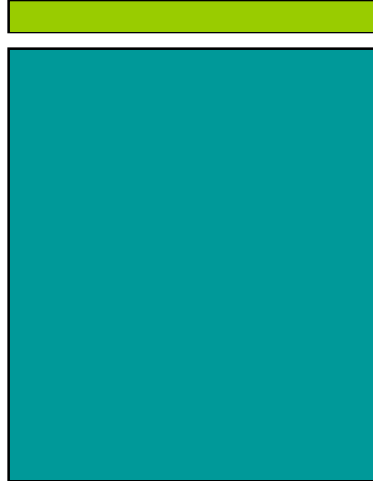
Larson Davis, a division of PCB Piezotronics, Inc.
1681 West 820 North
Provo UT, 84601, United States
716-684-0001

 **LARSON DAVIS**
A PCB PIEZOTRONICS DIV.

APPENDIX 10.7.3
TRAFFIC INFORMATION

Florida Power & Light Okeechobee Energy Center

traffic study



prepared for:
Golder Associates, Inc.

Traf Tech
ENGINEERING, INC.

September 2015

September 22, 2015

Mr. Kennard F. Kosky, P.E.
Principal – Golder Associates, Inc.
6026 NW 1st Place
Gainesville, Florida 32607

Re: Okeechobee County Energy Center – Traffic Study

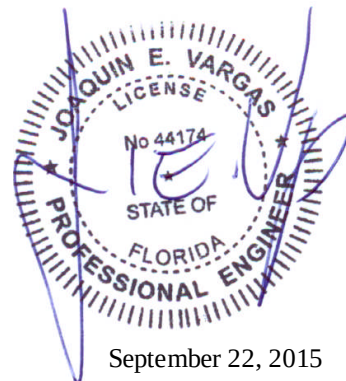
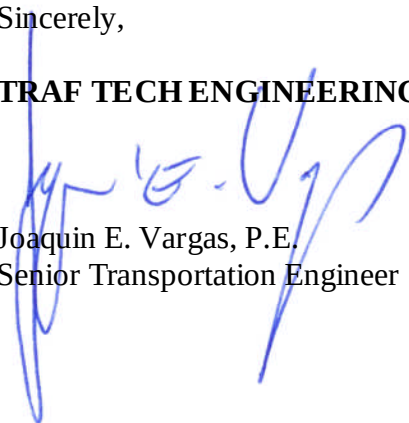
Dear Ken:

Traf Tech Engineering, Inc. is pleased to provide you with the results of the updated traffic study undertaken for the Okeechobee Energy Center project planned to be located on the south side of State Road 60 approximately 7.5 miles east of Florida's Turnpike in Okeechobee County, Florida. The revised report addresses all traffic-related comments provided by Indian River County Public Works Department. It has been a pleasure serving Golder Associates, Inc. on this project.

Sincerely,

TRAF TECH ENGINEERING, INC.

Joaquin E. Vargas, P.E.
Senior Transportation Engineer



September 22, 2015

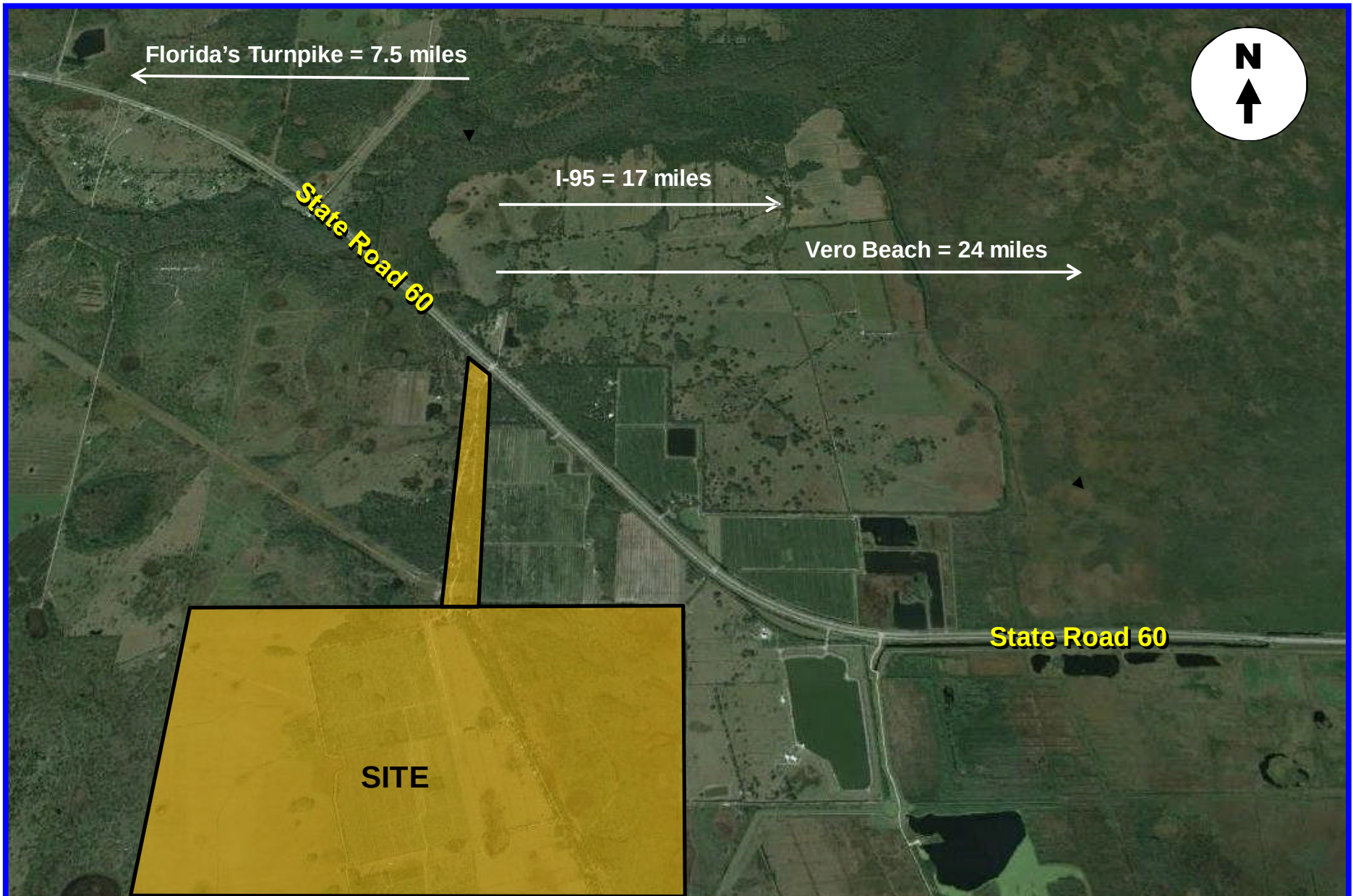
INTRODUCTION

The Okeechobee Energy Center is a proposed energy-generating power plant planned to be located on the south side of State Road 60 approximately 7.5 miles east of Florida's Turnpike in Okeechobee County, Florida. Figure 1 on the following page shows the location of the Okeechobee Energy Center facility and its relationship to the existing street system surrounding the subject utility plant.

Traf Tech Engineering, Inc. was retained by Golder Associates, Inc. to conduct a traffic study associated with the Okeechobee Energy Center. The traffic study evaluates the traffic impacts during the construction phase of the project.

This study is divided into six (6) sections, as listed below:

1. Inventory
2. Traffic Counts
3. Trip Generation
4. Trip Distribution and Traffic Assignment
5. Traffic Analysis
6. Conclusions and Recommendations



INVENTORY

Existing Land Use and Access

The existing site is currently vacant. The primary access to the Okeechobee Energy Center site is planned via a full-access driveway off of State Road 60. The entrance driveway will align with an existing median opening including a westbound left-turn lane with approximately 600 feet of storage capacity.

Roadway System

The primary roadway system providing access to and from the future Okeechobee Energy Center consists of a four-lane principal arterial roadway oriented in the east-west direction. The posted speed limit near the project site is 65 miles per hour.

TRAFFIC COUNTS

The Florida Department of Transportation (FDOT) has a continuous traffic count station on State Road 60 near the project site. Traffic Count Station 0139 is located approximately 1.5 miles east of Blue Cypress Lake Road in Indian River County. Table 1 below documents the historical traffic volumes during the past five years. As shown in Table 1, traffic counts have remained relatively flat between 2009 and 2013.

TABLE 1 Annual Average Daily Traffic Traffic Count Station 0139	
Year	Daily Traffic Volumes
2013	5,029
2012	4,878
2011	4,896
2010	4,965
2009	4,940

SOURCE: Florida Department of Transportation

According to the continuous traffic counts recorded at Station 0139, the peak month for this area is March. In reviewing the March hourly volumes, the morning peak hour occurs from 7:00 AM to 8:00 AM with an hourly volume of approximately 210 vehicles (130 eastbound and 90 westbound). Similarly, the afternoon peak hour occurs from 5:00 PM to 6:00 PM with an hourly volume of approximately 360 vehicles (165 eastbound and 195 westbound).

The historical and hourly traffic volumes published by the FDOT are contained in Appendix A.

TRIP GENERATION

The trip generation during the critical construction phase of the project was determined as presented below:

Construction Traffic

Peak construction is estimated at approximately 650 workers. Assuming an automobile occupancy of 1.3 workers per vehicle, approximately 500 vehicles are anticipated during the peak construction period. That is, 500 inbound vehicles during the AM peak hour and 500 exiting vehicles during the PM peak hour. The daily volume during the construction period is estimated at approximately 1,240 vehicles per day¹. For purposes of this traffic study, only the worse construction-period scenario was evaluated (650 workers). Table 2 summarizes the trip generation associated with the construction phase of the project.

TABLE 2 Okeechobee Energy Center Trip Generation Summary				
Workers	Vehicles²	AM Peak Hour Inbound	PM Peak Hour Outbound	Daily Traffic Volume
650	500	500	500	1,240

SOURCE: FPL and Traf Tech Engineering, Inc.

Normal Operation

After the Okeechobee Energy Center is built, normal operation traffic volumes are projected to be significantly less than during the critical construction period. Using information from a similar/comparable³ energy center facility, the estimated traffic volumes during normal operation include approximately 60 daily trips.

¹ Daily volumes includes the 1,000 peak hour trips plus approximately 20 miscellaneous trips per hour for a 12-hour period. The 20 vehicles per hour is based on FPL's experience with construction projects of similar/comparable facilities.

² Based on an automobile occupancy of 1.3 people per vehicle.

³ Cape Canaveral FPL Power Plant facility.

TRIP DISTRIBUTION AND TRAFFIC ASSIGNMENT

The trip distribution and traffic assignment for the project was based on the existing traffic patterns and examination of the surrounding street system located in the immediate vicinity of the project site.

The following traffic assignment was assumed for the subject project:

- o 85% to and from the east (to/from I-95 and Vero Beach)
- o 15% to and from the west (to/from Florida's Turnpike)

TRAFFIC ANALYSIS

This section of the study is divided into two parts. The first part evaluates the roadway segments that will be impacted by the construction work-force. The second part evaluates the future operating conditions of the main access driveway off of State Road 60.

Link Analyses

Tables 3 and 4 document the existing and future operating conditions of the roadway segments impacted during the peak construction-phase of the project. As indicated in the tables, acceptable levels of services will be maintained. The additional traffic created by the peak construction work-force will not degrade the operating conditions of State Road 60.

Intersection of State Road 60 and Main Project Entrance

Intersection capacity/level of service analyses were performed for the intersection of State Road 60 and the main project entrance (peak construction period). The analyses were undertaken following the capacity/level of service procedures outlined in the Highway Capacity Manual. The results of the capacity analyses are summarized in Table 5. As Indicated in Table 5, during the peak construction phase of the project, acceptable level of service is anticipated on the following stopped-controlled movements:

- o Westbound (inbound) left-turn movement (existing)
- o Northbound (exit) left-turn and right-turn movements on a single exit lane

Moreover, the existing 600 feet of storage capacity on the existing westbound left-turn lane is sufficient to accommodate the peak construction traffic without the need to extend the subject auxiliary lane.

TABLE 3 Okeechobee Energy Center Existing and Future Traffic Conditions (AM Peak Hour)							
Roadway	From	To	# of Lanes	Existing		Future	
				Hourly Volume	LOS	Hourly Volume	LOS
SR 60 Eastbound	Turnpike	Site	2	130	B	205	B
SR 60 Westbound	Site	Turnpike	2	90	B	90	B
SR 60 Eastbound	Site	I-95	2	130	B	130	B
SR 60 Westbound	I-95	Site	2	90	B	515	B

Source: Florida Department of Transportation

NOTE: 85% assigned to and from the east, or 425 vehicles per hour. 15% assigned to and from the west, or 75 vehicles per hour.
Per FDOT Capacity Tables, LOS "B" threshold is 1,340 vph, LOS "C" is 2,100 vph, LOS "D" is 2,660 vph, and LOS "E" is 3,020 vph.

TABLE 4 Okeechobee Energy Center Existing and Future Traffic Conditions (PM Peak Hour)							
Roadway	From	To	# of Lanes	Existing		Future	
				Hourly Volume	LOS	Hourly Volume	LOS
SR 60 Eastbound	Turnpike	Site	2	166	B	166	B
SR 60 Westbound	Site	Turnpike	2	195	B	270	B
SR 60 Eastbound	Site	I-95	2	166	B	591	B
SR 60 Westbound	I-95	Site	2	195	B	195	B

Source: Florida Department of Transportation

NOTE: 85% assigned to and from the east, or 425 vehicles per hour. 15% assigned to and from the west, or 75 vehicles per hour.
Per FDOT Capacity Tables, LOS "B" threshold is 1,340 vph, LOS "C" is 2,100 vph, LOS "D" is 2,660 vph, and LOS "E" is 3,020 vph.

TABLE 5 Intersection Level of Service – Stop Control Intersection Okeechobee Energy Center	
Intersection Movements	Future Traffic Conditions With Construction Trips
<i>State Road 60 & Main Project Entrance</i> - WB Left-Turn - NB Exit Lane (for left and right turns)	A (A) A (C)

Source: Highway Capacity Manual. LEGEND: AM Peak (PM Peak)

An eastbound right-turn lane was not found to be warranted for the following reasons:

- o SR 60 is a multi-lane roadway
- o The existing traffic on SR 60 is low
- o The projected eastbound right-turn volume is not excessive (75 vehicles during the AM peak hour)

A 50-foot radius is recommended for the east-to-south right-turn movement in order to assist with the right-turn volume.

CONCLUSIONS AND RECOMMENDATIONS

The Okeechobee Energy Center is a proposed energy-generating power plant planned to be located on the south side of State Road 60 approximately 7.5 miles east of Florida's Turnpike in Okeechobee County, Florida. The primary access to the Okeechobee Energy Center is planned via a full-access driveway off of State Road 60.

Traf Tech Engineering, Inc. was retained by Golder Associates, Inc. to conduct a traffic study associated with the Okeechobee Energy Center. The traffic study evaluates the traffic impacts during the construction phase of the project.

During the peak construction period, 500 inbound vehicles are anticipated during the AM peak hour and 500 exiting vehicles during the PM peak hour, for a total daily traffic volume of approximately 1,240 trips per day.

The additional traffic created by the peak construction work-force will not degrade the operating conditions of State Road 60 in the vicinity of the proposed Okeechobee Energy Center project.

During the peak construction phase of the project, acceptable level of service is anticipated at the full-access driveway (all movements are projected to operate at acceptable levels of services). Moreover, the existing 600 feet of storage capacity on the existing westbound left-turn lane is sufficient to accommodate the peak construction traffic without the need to extend the subject auxiliary lane.

After the Okeechobee Center is built, the estimated traffic volumes during normal operation include approximately 60 daily trips, which is insignificant from a traffic-engineering standpoint.

A 50-foot radius is recommended for the east-to-south right-turn movement from SR 60 into the project driveway.

APPENDIX A

Traffic Counts

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2013 HISTORICAL AADT REPORT

COUNTY: 88 - INDIAN RIVER

SITE: 0139 - SR 60-1.5 MI E OF BLUE CYPRESS LK RD INDIAN RIV CO

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
----	-----	-----	-----	-----	-----	-----
2013	5029 C	E 2547	W 2482	9.50	53.70	29.10
2012	4878 C	E 2451	W 2427	9.50	53.20	29.20
2011	4896 C	E 2465	W 2431	9.50	53.30	30.30
2010	4965 C	E 2527	W 2438	10.65	55.45	31.60
2009	4940 C	E 2499	W 2441	10.55	53.79	31.90
2008	4375 C	E 2208	W 2167	10.14	60.82	24.00
2007	0 E	0	0	9.97	62.63	23.90
2006	5200 S			10.80	77.38	31.60
2005	5000 F	E	W	10.80	77.40	31.60
2004	4805 C	E 2420	W 2385	10.80	77.40	31.60
2003	4649 C	E 2335	W 2314	10.70	58.90	31.30
2002	4409 C	E 2222	W 2187	10.50	52.30	33.10
2001	4254 C	E 2150	W 2104	10.70	54.30	33.60
2000	4216 C	E 2121	W 2095	10.40	52.40	32.90
1999	4169 C	E 2094	W 2075	10.30	53.60	29.40
1998	4050 C	E 2066	W 1984	10.50	54.00	34.70

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; F = FOURTH YEAR ESTIMATE
V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN
*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

DATE 03/26/14

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC COUNTS
HOURLY CONTINUOUS COUNTS FINAL REPORT
JANUARY 2013

COUNTY NAME: INDIAN RIVER STATION: 0139 DIRECTION: E LANE: 0
DESCRIPTION: SR 60-1.5 MI E OF BLUE CYPRESS LK RD INDIAN RIV CO
LOCATION: COUNTY 88 SECTION 060 SUBSECTION 000 MILEPOST 6.051 ROUTES: SR-60

DY	D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAILY
1	T	19	21	19	22	9	16	26	39	67	115	223	221	226	211	214	198	199	170	156	106	72	58	48	2481H	
2	W	37	18	26	32	57	80	111	114	127	142	187	196	194	229	201	188	185	156	161	90	105	65	49	2819N	
3	R	37	29	36	47	55	58	113	122	108	122	166	198	169	206	159	196	157	168	141	106	94	68	50	2656N	
4	F	28	30	39	42	40	74	101	127	118	136	169	166	224	200	196	204	190	209	187	154	124	82	79	2971N	
5	A	44	39	25	23	20	32	48	59	84	109	191	212	181	197	194	187	159	170	162	138	104	73	62	54	2567N
6	S	27	22	18	21	15	15	23	34	39	96	124	217	196	210	189	205	200	217	193	159	106	73	58	33	2490N
7	M	31	12	25	26	58	88	131	115	105	153	151	140	128	169	156	135	128	131	148	85	62	56	45	39	2317N
8	T	25	53	32	45	44	73	112	120	117	139	132	161	146	153	144	154	134	144	108	87	67	58	46	42	2336N
9	W	29	30	34	25	48	55	112	75	150	90	139	170	138	146	172	184	152	129	97	79	67	47	38	32	2238N
10	R	29	27	38	36	46	67	124	125	99	156	134	166	142	156	125	195	144	146	119	107	61	65	52	32	2391N
11	F	27	21	39	41	49	60	112	124	118	129	159	149	165	176	186	199	183	190	183	144	96	69	58	39	2716N
12	A	38	23	24	23	19	38	71	77	100	127	154	219	187	180	179	181	149	143	141	113	95	53	56	30	2420N
13	S	27	16	14	19	16	19	22	27	61	101	122	181	203	185	177	181	214	192	174	141	99	71	46	31	2339N
14	M	23	29	27	37	49	92	155	115	131	140	159	164	149	147	156	179	145	146	110	92	61	54	40	32	2432N
15	T	23	33	39	40	48	66	112	140	143	129	161	150	179	165	137	133	137	140	117	94	66	44	43	30	2369N
16	W	28	24	25	48	48	73	105	111	112	136	162	171	166	176	133	152	164	140	136	86	75	55	52	36	2414N
17	R	27	26	40	37	53	62	129	124	123	139	153	177	177	164	161	170	181	175	121	111	71	80	46	20	2567N
18	F	34	31	27	43	48	53	102	125	121	145	165	194	192	188	215	113	174	270	284	248	151	83	81	41	3128A
19	A	40	24	32	21	27	31	53	75	127	153	239	235	253	215	203	191	220	190	171	131	108	87	62	34	2922N
20	S	28	20	14	17	17	11	18	30	46	115	193	246	296	264	261	248	214	189	208	137	109	80	48	37	2846N
21	M	32	32	21	27	45	83	135	107	128	137	198	189	191	202	214	221	207	177	161	113	94	84	62	43	2903H
22	T	37	40	28	40	46	73	126	107	123	142	162	149	158	171	138	143	146	145	120	77	62	57	62	35	2387N
23	W	34	20	31	49	51	57	127	123	128	127	135	159	165	150	151	153	137	148	124	90	67	48	54	38	2366N
24	R	39	23	35	34	53	71	113	117	120	141	143	169	171	162	171	176	200	169	136	113	80	71	59	39	2605N
25	F	41	37	32	31	45	51	103	108	96	135	144	187	185	212	204	189	230	206	204	154	100	97	68	46	2905N
26	A	24	26	30	21	22	37	47	59	97	127	170	204	188	192	243	239	245	198	180	125	126	119	61	51	2831N
27	S	41	21	23	16	10	13	32	45	53	101	157	239	268	265	236	258	263	260	234	133	116	84	49	51	2968N
28	M	23	16	31	38	48	87	129	130	129	130	200	177	150	178	150	152	128	140	120	97	62	48	52	37	2452N
29	T	40	17	34	34	51	60	105	116	123	148	170	154	176	161	152	130	160	134	126	77	72	58	61	40	2399N
30	W	35	15	35	37	48	60	105	132	107	140	157	167	164	164	147	157	157	140	111	97	63	52	63	27	2380N
31	R	23	28	23	38	48	51	130	125	112	136	160	166	183	179	185	149	172	157	129	106	79	58	56	39	2532N
WEEKDAY AVERAGE = 2569 SATURDAY AVERAGE = 2685 SUNDAY AVERAGE = 2661 NUMBER OF GOOD DAYS 31 TOTAL MONTHLY COUNT = 80147																										
MONTHLY AVERAGE = 2598																										

COMMENTS:
1/1: NEW YEAR'S DAY
WINTER BREAK ENDS: COLL./UNIV. 1/4-14; PUB. SCHOOLS 1/4
1/7: NCAA BCS NAT'L CHAMPIONSHIP GAME - SUN LIFE STADIUM (MIAMI) 8:30PM
1/21: MARTIN LUTHER KING JR DAY
"B"====> BAD DAY
"N"====> NORMAL DAY
"A"====> ATYPICAL DAY (HOLIDAY)
"H"====> ATYPICAL DAY (HOLIDAY)
"S"====> ATYPICAL DAY (SPECIAL EVENT)

NOTE: ATYPICAL DAYS HAVE COUNTS THAT ARE HIGHER OR LOWER THAN NORMAL, BUT STILL REASONABLE, AND NO LOCAL SPECIAL EVENTS ARE KNOWN.

DATE 03/26/14

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC COUNTS
HOURLY CONTINUOUS COUNTS FINAL REPORT
JANUARY 2013

COUNTY NAME: INDIAN RIVER STATION: 0139 DIRECTION: W LANE: 0
DESCRIPTION: SR 60-1.5 MI E OF BLUE CYPRESS LK RD INDIAN RIV CO
LOCATION: COUNTY 88 SECTION 060 SUBSECTION 000 MILEPOST 6.051 ROUTES: SR-60

DY	D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAILY					
1	T	10	12	17	12	21	14	33	54	89	133	187	215	160	175	164	174	145	146	119	105	58	33	31	23	2130H					
2	W	16	14	25	18	37	63	101	124	164	201	209	201	192	214	195	173	173	167	120	105	70	61	39	32	2714N					
3	R	30	15	19	23	31	62	90	121	167	164	180	173	197	193	189	181	202	168	145	84	63	60	39	37	2633N					
4	F	20	16	15	17	30	53	109	130	164	209	200	232	224	211	236	225	237	207	152	110	81	73	45	45	3041N					
5	A	28	9	16	21	32	42	77	118	151	214	216	207	212	208	181	175	183	150	139	108	75	52	38	13	2665N					
6	S	13	12	5	9	15	22	32	71	108	128	214	153	165	182	164	197	181	149	134	107	60	42	34	18	2215N					
7	M	17	14	13	15	28	62	102	112	150	140	188	175	149	152	143	163	156	137	107	69	62	49	41	26	2270N					
8	T	25	12	19	31	33	52	100	134	147	140	154	157	140	172	165	177	183	144	119	74	57	50	35	30	2350N					
9	W	20	13	21	20	34	50	89	117	143	167	154	152	137	128	157	174	167	168	110	87	64	62	38	40	2312N					
10	R	8	17	16	11	22	53	95	140	164	163	149	140	156	160	193	189	158	187	123	77	70	49	44	27	2411N					
11	F	28	19	14	19	27	45	100	115	158	150	176	169	194	189	204	233	253	204	154	128	71	77	57	37	2821N					
12	A	22	11	23	17	14	39	78	112	178	202	219	172	144	204	157	159	168	148	106	83	65	49	29	9	2408N					
13	S	12	13	8	7	10	26	31	64	83	128	181	153	133	179	166	203	147	146	123	84	56	45	35	13	2046N					
14	M	11	10	9	12	33	58	94	121	149	158	168	178	148	177	170	162	166	166	112	78	51	71	46	43	2391N					
15	T	19	13	18	19	29	39	91	121	139	170	170	160	148	159	167	188	160	154	94	84	54	45	34	33	2308N					
16	W	22	11	20	21	25	48	87	111	158	195	177	161	170	180	165	167	165	152	112	80	65	52	32	39	2415N					
17	R	21	7	18	16	40	52	89	128	144	154	159	176	156	179	207	189	204	197	129	74	88	53	53	30	2563N					
18	F	20	17	18	25	25	36	93	140	179	219	227	224	257	220	250	260	281	265	198	138	108	65	52	45	3362N					
19	A	24	15	16	18	18	46	79	141	201	252	249	255	227	207	211	222	167	192	130	88	86	47	28	22	2941N					
20	S	11	12	7	8	10	24	43	71	109	146	196	173	192	178	167	175	168	128	108	86	91	70	38	23	2234N					
21	M	13	12	15	12	33	50	88	132	150	183	179	178	205	214	206	193	237	203	136	118	89	56	57	28	2787H					
22	T	22	11	18	16	33	57	105	125	146	186	159	170	165	170	150	176	174	143	108	73	75	48	42	31	2403N					
23	W	22	9	16	15	27	38	94	100	123	166	140	158	155	157	178	185	182	149	125	93	66	56	47	27	2328N					
24	R	26	14	18	25	38	47	97	135	161	152	187	187	196	165	217	197	191	173	128	91	86	60	40	36	2667N					
25	F	25	17	22	24	31	46	93	124	138	201	205	232	237	246	214	242	261	213	189	129	119	75	61	38	3182N					
26	A	23	13	17	13	25	43	95	172	224	268	277	238	250	222	193	171	172	160	135	78	68	63	49	16	2985N					
27	S	13	11	5	12	6	28	36	48	95	153	173	186	156	178	169	178	180	189	129	107	70	51	37	19	2229N					
28	M	15	9	7	9	46	58	110	94	134	166	169	182	150	180	157	151	169	135	103	85	66	56	35	25	2311N					
29	T	25	11	17	18	35	57	92	134	155	149	167	142	174	164	196	169	177	159	108	87	59	45	48	27	2415N					
30	W	15	9	18	18	27	53	87	96	136	130	167	190	145	162	158	173	161	120	118	81	43	61	46	23	2237N					
31	R	18	17	12	17	29	44	98	108	145	154	183	181	163	185	196	196	192	157	113	95	75	45	50	23	2496N					
=====																															
WEEKDAY AVERAGE =		2564				SATURDAY AVERAGE =				2750				SUNDAY AVERAGE =				2181				NUMBER OF GOOD DAYS				31		TOTAL MONTHLY COUNT =		78270	
MONTHLY AVERAGE =		2536																													

COMMENTS:
1/1: NEW YEAR'S DAY
WINTER BREAK ENDS: COLL./UNIV. 1/4-14; PUB. SCHOOLS 1/4
1/7: NCAA BCS NAT'L CHAMPIONSHIP GAME - SUN LIFE STADIUM (MIAMI) 8:30PM
1/21: MARTIN LUTHER KING JR DAY
"B"====> BAD DAY
"N"====> NORMAL DAY
"A"====> ATYPICAL DAY
"H"====> ATYPICAL DAY (HOLIDAY)
"S"====> ATYPICAL DAY (SPECIAL EVENT)

NOTE: ATYPICAL DAYS HAVE COUNTS THAT ARE HIGHER OR LOWER THAN NORMAL, BUT STILL REASONABLE, AND NO LOCAL SPECIAL EVENTS ARE KNOWN.

DATE 03/26/14

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC COUNTS
HOURLY CONTINUOUS COUNTS FINAL REPORT
FEBRUARY 2013

COUNTY NAME: INDIAN RIVER STATION: 0139 DIRECTION: E LANE: 0
DESCRIPTION: SR 60-1.5 MI E OF BLUE CYPRESS LK RD INDIAN RIV CO
LOCATION: COUNTY 88 SECTION 060 SUBSECTION 000 MILEPOST 6.051 ROUTES: SR-60

DY	D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAILY					
1	F	24	21	43	52	53	51	119	125	100	154	183	203	205	194	250	222	218	200	202	152	106	86	68	32	3063N					
2	A	21	16	40	32	32	23	51	70	92	137	167	213	217	217	249	221	211	235	194	145	87	78	41	45	2834N					
3	S	21	21	11	16	11	12	18	38	54	100	152	175	201	204	176	187	210	204	148	97	77	61	41	39	2274S					
4	M	24	24	22	31	52	93	128	112	110	129	172	151	161	153	167	163	154	151	121	91	69	61	65	43	2447N					
5	T	26	30	30	32	44	56	107	104	104	138	164	156	139	149	146	140	156	150	113	72	59	57	52	36	2260N					
6	W	24	29	34	40	36	57	121	123	101	138	149	177	154	141	166	164	158	159	142	98	69	70	60	31	2441N					
7	R	32	43	25	38	35	69	117	120	130	161	171	194	191	151	152	167	176	163	150	90	75	56	62	27	2595N					
8	F	31	27	34	42	51	59	107	111	125	137	189	203	179	192	213	224	226	212	191	168	126	95	72	61	3075N					
9	A	32	19	30	27	25	33	60	63	102	154	170	210	210	198	183	189	195	174	164	143	94	63	66	39	2643N					
10	S	38	12	11	12	8	7	23	29	55	85	164	208	221	252	221	204	253	241	241	148	135	84	53	56	2761N					
11	M	27	21	21	28	57	88	129	145	108	151	167	196	181	170	183	173	153	150	134	92	69	63	62	38	2606N					
12	T	30	28	28	35	42	62	102	130	115	135	169	152	162	187	165	163	167	145	112	90	95	54	64	34	2466N					
13	W	32	20	21	39	54	69	128	111	108	173	152	221	192	193	186	163	157	143	128	99	71	52	73	39	2624N					
14	R	38	23	31	30	44	63	118	98	120	153	163	161	174	221	174	168	182	174	151	96	86	64	61	44	2637N					
15	F	29	28	33	35	59	65	101	116	95	143	179	176	204	209	202	215	261	234	210	172	137	116	94	48	3161N					
16	A	36	31	28	34	28	40	42	71	96	136	209	213	230	223	197	236	211	188	167	142	99	77	66	45	2845N					
17	S	33	20	21	16	6	15	18	26	42	112	139	235	225	236	243	213	209	258	204	174	135	107	75	40	2802N					
18	M	42	15	21	29	44	66	108	110	135	133	229	238	238	202	218	237	219	246	189	137	92	69	52	45	3114H					
19	T	32	22	37	30	40	71	110	116	117	164	202	178	194	196	174	182	176	172	150	103	77	50	74	32	2699N					
20	W	31	30	29	39	55	67	95	121	136	164	175	186	211	191	204	183	182	175	134	114	66	70	50	47	2755N					
21	R	32	30	40	43	58	64	110	157	126	165	179	218	217	202	179	211	204	197	152	97	87	70	61	55	2954N					
22	F	48	36	32	42	49	68	116	113	100	148	235	238	230	261	239	240	251	212	244	171	133	105	73	46	3430N					
23	A	56	22	28	32	25	50	60	79	131	173	213	264	224	215	187	186	211	218	205	126	90	83	63	54	2995N					
24	S	25	28	19	8	12	16	26	47	79	129	212	265	254	478	511	338	221	249	196	141	143	104	69	43	3613A					
25	M	35	24	37	34	52	75	127	125	119	165	198	230	191	176	177	180	177	167	136	99	79	61	46	53	2763N					
26	T	29	38	36	46	47	63	132	127	142	173	173	152	177	167	172	147	168	165	100	70	76	52	57	38	2547N					
27	W	15	43	34	46	49	73	99	124	118	141	192	189	175	163	182	159	184	161	153	88	71	75	65	51	2650N					
28	R	36	28	33	37	45	73	112	100	121	149	184	219	189	174	171	163	182	179	145	116	102	84	67	55	2764N					
=====																															
WEEKDAY AVERAGE =		2753				SATURDAY AVERAGE =				2829				SUNDAY AVERAGE =				2863				NUMBER OF GOOD DAYS				28		TOTAL MONTHLY COUNT =		77818	
MONTHLY AVERAGE =		2779																													

COMMENTS:
2/3: SF 49ERS VS BALTIMORE RAVENS - SUPER BOWL (SUPERDOME NOLA) (6:20PM)
2/14: VALENTINE'S DAY; 2/18: PRESIDENT'S DAY

"B"-----> BAD DAY
"N"-----> NORMAL DAY
"A"-----> ATYPICAL DAY
"H"-----> ATYPICAL DAY (HOLIDAY)
"S"-----> ATYPICAL DAY (SPECIAL EVENT)

NOTE: ATYPICAL DAYS HAVE COUNTS THAT ARE HIGHER OR LOWER THAN NORMAL, BUT STILL REASONABLE, AND NO LOCAL SPECIAL EVENTS ARE KNOWN.

DATE 03/26/14

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC COUNTS
HOURLY CONTINUOUS COUNTS FINAL REPORT
FEBRUARY 2013

COUNTY NAME: INDIAN RIVER STATION: 0139 DIRECTION: W LANE: 0
DESCRIPTION: SR 60-1.5 MI E OF BLUE CYPRESS LK RD INDIAN RIV CO
LOCATION: COUNTY 88 SECTION 060 SUBSECTION 000 MILEPOST 6.051 ROUTES: SR-60

DY	D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAILY
1	F	23	12	17	15	29	40	112	115	121	163	206	225	189	246	221	321	296	232	201	132	98	82	85	56	3237N
2	A	30	13	15	19	21	39	87	166	209	222	278	243	228	181	162	180	148	135	119	86	60	57	63	23	2784N
3	S	17	17	11	5	12	16	17	56	95	161	145	180	177	160	160	165	160	146	118	93	52	47	26	21	2057N
4	M	16	7	11	19	40	57	97	122	161	190	197	188	169	180	142	176	161	141	116	70	51	45	35	17	2408N
5	T	21	9	14	21	29	62	92	106	152	139	160	150	151	156	181	177	152	132	118	86	58	51	37	30	2284N
6	W	16	11	20	16	25	38	90	117	150	165	167	148	156	156	193	176	189	157	109	87	60	51	43	46	2386N
7	R	24	21	14	18	32	43	84	123	160	166	190	171	138	183	195	194	178	172	119	89	83	45	25	25	2492N
8	F	29	21	12	13	30	55	104	119	148	180	223	198	226	205	226	240	226	256	201	159	92	73	56	48	3140N
9	A	22	15	19	14	20	48	78	137	190	216	247	203	203	159	188	163	189	140	154	91	49	52	58	26	2681N
10	S	12	15	12	7	10	21	48	83	118	164	171	205	159	197	200	216	215	167	147	120	82	40	27	16	2452N
11	M	10	13	13	22	32	78	124	118	178	163	216	190	165	158	179	169	156	156	126	83	83	55	30	25	2542N
12	T	16	17	16	24	30	57	103	147	168	203	195	174	159	153	169	164	200	176	101	83	68	58	38	34	2553N
13	W	31	18	24	23	19	53	93	129	150	163	159	176	160	158	163	173	199	125	122	77	79	57	39	40	2430N
14	R	43	20	23	25	31	62	81	156	142	157	180	189	151	185	229	231	172	150	116	78	77	52	31	30	2611N
15	F	22	12	24	19	27	44	94	119	170	194	236	254	243	241	240	275	271	226	208	159	117	79	56	51	3381N
16	A	26	14	25	20	22	70	108	144	209	252	240	235	215	181	160	216	164	162	127	79	74	72	59	21	2895N
17	S	20	10	12	8	9	18	32	63	105	157	183	198	206	199	184	207	172	178	170	138	87	68	29	22	2475N
18	M	20	10	13	18	28	53	110	138	186	185	214	223	232	215	199	204	208	171	120	95	74	68	34	21	2839H
19	T	33	21	20	22	38	46	105	161	174	222	199	229	171	169	199	179	176	158	114	102	58	49	32	31	2708N
20	W	23	17	14	18	31	51	103	141	181	191	207	192	180	188	201	194	184	150	123	102	82	50	44	30	2697N
21	R	27	18	21	16	33	51	103	149	207	199	225	220	219	188	192	208	198	189	125	119	82	65	45	39	2938N
22	F	28	14	18	32	19	48	110	150	192	225	233	236	230	248	258	278	286	239	179	145	106	75	55	40	3444N
23	A	33	17	12	17	32	54	96	174	219	279	259	243	191	194	210	161	182	184	133	98	86	61	42	40	3017N
24	S	20	15	5	7	9	14	40	89	104	171	194	224	215	228	200	211	205	201	170	126	78	59	46	31	2662N
25	M	14	21	11	27	37	58	98	147	157	188	206	233	174	207	167	187	197	178	123	105	71	65	45	34	2750N
26	T	27	19	17	15	30	51	106	153	153	170	210	187	167	161	169	187	160	137	105	86	81	50	38	33	2512N
27	W	20	16	12	15	31	56	95	129	183	208	220	190	182	185	206	184	195	159	121	98	67	58	47	40	2717N
28	R	28	16	23	13	41	43	90	135	186	160	187	204	200	201	175	213	213	189	141	105	95	57	54	28	2797N

WEEKDAY AVERAGE = 2744 SATURDAY AVERAGE = 2844 SUNDAY AVERAGE = 2412 NUMBER OF GOOD DAYS 28 TOTAL MONTHLY COUNT = 75889
MONTHLY AVERAGE = 2711

COMMENTS:
2/3: SF 49ERS VS BALTIMORE RAVENS - SUPER BOWL (6:20PM)
2/14: VALENTINE'S DAY; 2/18: PRESIDENT'S DAY
"B"-----> BAD DAY
"N"-----> NORMAL DAY
"A"-----> ATYPICAL DAY
"H"-----> ATYPICAL DAY (HOLIDAY)
"S"-----> ATYPICAL DAY (SPECIAL EVENT)

NOTE: ATYPICAL DAYS HAVE COUNTS THAT ARE HIGHER OR LOWER THAN NORMAL, BUT STILL REASONABLE, AND NO LOCAL SPECIAL EVENTS ARE KNOWN.

DATE 03/26/14

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC COUNTS
HOURLY CONTINUOUS COUNTS FINAL REPORT
MARCH 2013

COUNTY NAME: INDIAN RIVER STATION: 0139 DIRECTION: E LANE: 0
DESCRIPTION: SR 60-1.5 MI E OF BLUE CYPRESS LK RD INDIAN RIV CO
LOCATION: COUNTY 88 SECTION 060 SUBSECTION 000 MILEPOST 6.051 ROUTES: SR-60

DY	D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAILY
1	F	33	35	41	35	58	72	104	129	134	171	208	244	229	225	208	230	222	228	211	186	138	128	109	40	3418N
2	A	38	35	34	24	21	24	57	56	103	138	186	230	189	221	212	180	214	183	179	134	115	90	77	32	2772N
3	S	39	23	18	16	12	18	26	31	56	119	180	252	248	251	209	238	226	275	184	153	124	87	66	40	2891N
4	M	31	32	30	35	46	64	116	131	130	157	198	193	164	172	149	164	174	144	155	111	85	92	80	48	2701N
5	T	33	26	31	48	48	63	116	111	122	179	189	219	195	191	161	161	181	166	142	102	89	84	71	49	2777N
6	W	34	29	27	39	42	50	119	118	120	128	173	183	218	186	153	195	239	224	143	112	89	78	74	39	2812N
7	R	38	42	45	45	47	69	118	136	115	137	180	184	201	190	180	196	224	194	164	121	95	86	87	57	2951N
8	F	36	26	43	40	49	51	109	123	125	159	177	207	212	216	232	251	244	236	242	175	125	119	98	44	3339N
9	A	45	33	39	28	19	32	43	81	114	179	228	270	235	237	207	179	223	195	178	166	108	97	79	53	3068N
10	S																									3135B
11	M	36	39	33	34	47	74	127	130	138	137	195	228	229	192	194	174	183	159	135	116	95	73	71	56	2895N
12	T	31	28	38	35	56	53	108	127	111	150	193	181	200	185	162	176	203	189	151	129	72	66	57	51	2752N
13	W	34	24	34	44	55	59	118	112	117	151	208	181	224	202	184	172	160	177	133	124	93	85	55	61	2807N
14	R	42	32	33	48	43	63	129	109	119	157	181	191	189	205	191	180	186	170	159	134	108	78	74	48	2869N
15	F	55	36	25	40	53	58	99	150	90	132	185	220	223	236	239	219	215	250	223	192	131	127	88	62	3348N
16	A	35	32	34	38	26	35	65	59	119	159	196	241	240	215	180	167	201	196	149	130	112	98	102	55	2884N
17	S	49	33	22	17	15	22	23	26	71	128	186	287	222	216	328	238	247	216	201	163	132	163	124	103	3232S
18	M	38	29	40	33	48	85	134	146	104	125	180	236	217	174	193	178	148	152	129	103	77	91	62	35	2757N
19	T	41	29	37	39	50	58	121	123	125	144	190	166	151	188	153	160	190	159	108	106	98	74	59	47	2616N
20	W	34	25	36	31	47	67	130	123	115	139	190	158	177	209	197	176	166	163	128	76	87	72	67	64	2677N
21	R	36	29	37	48	63	73	107	117	129	147	197	209	187	199	172	158	174	181	158	118	95	89	67	63	2853N
22	F	30	37	36	37	55	70	111	138	114	142	188	213	219	227	213	240	220	233	255	176	151	138	73	72	3388N
23	A	48	37	36	21	24	36	52	83	109	153	197	214	237	243	204	209	232	212	195	181	139	126	81	72	3141N
24	S	38	25	16	20	15	21	29	38	49	98	194	244	265	294	273	223	240	210	214	179	128	96	76	44	3029N
25	M	32	28	36	31	46	82	144	132	131	143	195	235	248	212	218	214	177	177	162	131	90	99	74	55	3092N
26	T	37	24	40	40	50	61	109	134	131	179	180	194	207	200	122	200	150	161	149	107	115	86	71	56	2803N
27	W	41	37	43	46	48	63	94	120	122	171	198	217	178	228	193	186	153	178	177	156	108	110	83	61	3011N
28	R	53	30	33	54	49	59	112	135	116	153	206	233	212	224	225	198	195	244	191	158	150	109	97	81	3317A
29	F	49	39	41	51	57	59	116	109	109	136	213	268	287	285	244	254	262	253	245	177	168	148	115	66	3751N
30	A	53	37	32	34	36	34	56	80	92	180	221	290	312	271	268	214	205	200	189	169	127	120	82	51	3353N
31	S	42	32	15	15	8	18	19	30	62	112	177	255	269	228	196	221	237	209	274	206	159	122	93	61	3060N

WEEKDAY AVERAGE = 2974 SATURDAY AVERAGE = 3044 SUNDAY AVERAGE = 3053 NUMBER OF GOOD DAYS 30 TOTAL MONTHLY COUNT = 90364
MONTHLY AVERAGE = 2996

COMMENTS:

"B"-----> BAD DAY
"N"-----> NORMAL DAY
"A"-----> ATYPICAL DAY
"H"-----> ATYPICAL DAY (HOLIDAY)
"S"-----> ATYPICAL DAY (SPECIAL EVENT)

SPRING BREAK FOR COLLEGES 3/2-3/17 - PUBLIC SCHOOLS 3/11-4/5
3/17, ST. PAT'S DAY - 3/10, DAYLIGHTS SAVINGS TIME BEGINS - 3/20, SPRING BEGINS
3/31: EASTER SUNDAY

NOTE: ATYPICAL DAYS HAVE COUNTS THAT ARE HIGHER OR LOWER THAN NORMAL, BUT STILL REASONABLE, AND NO LOCAL SPECIAL EVENTS ARE KNOWN.

DATE 03/26/14

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC COUNTS
HOURLY CONTINUOUS COUNTS FINAL REPORT
MARCH 2013

COUNTY NAME: INDIAN RIVER STATION: 0139 DIRECTION: W LANE: 0
DESCRIPTION: SR 60-1.5 MI E OF BLUE CYPRESS LK RD INDIAN RIV CO
LOCATION: COUNTY 88 SECTION 060 SUBSECTION 000 MILEPOST 6.051 ROUTES: SR-60

DY	D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAILY
1	F	33	13	23	26	35	65	98	150	194	194	245	269	277	244	271	244	296	273	206	167	99	86	58	38	3604N
2	A	73	57	31	17	27	52	82	124	200	220	254	243	202	182	199	206	174	177	115	110	58	67	50	31	2951A
3	S	17	13	10	11	14	24	35	66	102	163	187	216	201	186	229	195	199	198	146	121	87	63	49	22	2554N
4	M	16	11	16	14	34	70	89	144	159	200	174	211	186	176	190	210	173	151	123	94	72	49	41	33	2636N
5	T	24	17	17	16	27	46	98	140	190	195	183	204	203	169	231	204	169	159	152	117	77	61	37	33	2769N
6	W	11	18	16	19	30	41	99	165	152	195	183	199	165	185	245	231	321	305	243	162	65	54	59	27	3190A
7	R	21	13	14	21	44	39	103	108	179	197	214	206	181	214	236	211	199	198	157	110	69	72	63	41	2910N
8	F	23	16	25	22	31	39	98	131	199	222	237	231	234	241	265	277	242	263	198	153	103	85	65	43	3443N
9	A	23	12	16	23	29	45	86	138	196	227	262	252	198	182	192	186	177	140	146	109	69	48	46	21	2823N
10	S																									2800B
11	M	16	7	9	12	33	62	101	125	163	191	237	212	186	182	168	178	189	189	136	125	75	75	63	30	2764N
12	T	33	29	25	13	33	51	82	139	138	198	204	189	197	173	196	206	167	149	120	92	90	53	36	39	2652N
13	W	31	21	24	19	28	55	105	119	151	190	191	216	194	214	216	214	189	165	147	112	88	69	43	41	2842N
14	R	23	14	25	18	32	53	91	136	161	190	206	210	205	171	218	188	204	214	152	127	85	79	60	44	2906N
15	F	24	12	18	12	34	56	98	128	188	228	232	281	264	285	258	287	270	288	213	188	112	90	69	53	3688N
16	A	33	17	23	16	30	59	102	121	190	244	233	265	222	214	185	195	207	181	128	122	97	72	51	38	3045N
17	S	26	19	8	7	16	27	45	67	115	156	224	226	240	226	228	190	188	196	190	167	79	82	55	28	2805N
18	M	19	19	16	16	36	75	114	131	167	186	205	243	208	187	195	212	181	166	134	89	76	47	38	24	2784N
19	T	27	12	24	17	33	57	91	125	152	179	178	196	186	174	185	192	168	146	143	114	86	62	42	28	2617N
20	W	33	22	9	14	28	53	90	151	168	194	190	177	201	156	184	207	195	134	136	101	79	68	29	30	2649N
21	R	31	20	16	16	28	53	108	116	164	188	187	207	213	213	211	194	202	202	133	116	95	62	41	39	2860N
22	F	22	15	19	19	35	55	105	139	186	226	229	242	217	275	264	233	292	288	223	189	117	73	60	39	3562N
23	A	32	16	14	15	23	78	105	128	210	228	245	207	215	194	170	200	195	185	162	138	77	67	47	35	2986N
24	S	20	7	10	12	21	32	45	64	125	173	216	210	224	265	253	197	210	178	196	97	75	74	33	25	2762N
25	M	22	18	6	16	26	67	95	132	169	210	207	222	177	203	175	239	199	176	146	110	104	73	51	37	2880N
26	T	28	13	11	16	28	58	76	138	168	204	189	209	167	194	141	211	193	188	139	103	78	61	52	36	2701N
27	W	18	14	16	15	25	61	96	147	178	211	224	207	190	196	190	215	215	178	161	113	89	68	49	35	2911N
28	R	19	17	11	12	30	50	100	145	207	190	242	222	230	245	240	250	257	231	161	157	113	79	51	39	3298N
29	F	35	10	16	32	36	56	71	126	159	217	253	258	256	237	264	298	250	226	223	150	105	100	48	50	3476N
30	A	30	11	18	22	19	61	92	137	165	221	245	256	217	178	209	192	217	189	171	106	94	67	41	31	2989N
31	S	22	15	6	9	10	20	42	67	104	154	190	202	187	198	180	209	277	309	280	202	163	94	47	35	3022N

WEEKDAY AVERAGE = 2980 SATURDAY AVERAGE = 2959 SUNDAY AVERAGE = 2786 NUMBER OF GOOD DAYS 30 TOTAL MONTHLY COUNT = 89079
MONTHLY AVERAGE = 2949

COMMENTS:
"B"-----> BAD DAY
"N"-----> NORMAL DAY
"A"-----> ATYPICAL DAY
"H"-----> ATYPICAL DAY (HOLIDAY)
"S"-----> ATYPICAL DAY (SPECIAL EVENT)
SPRING BREAK FOR COLLEGES 3/2-3/17 - PUBLIC SCHOOLS 3/11-4/5
3/17, ST. PAT'S DAY - 3/10, DAYLIGHTS SAVINGS TIME BEGINS - 3/20, SPRING BEGINS
3/31: EASTER SUNDAY

NOTE: ATYPICAL DAYS HAVE COUNTS THAT ARE HIGHER OR LOWER THAN NORMAL, BUT STILL REASONABLE, AND NO LOCAL SPECIAL EVENTS ARE KNOWN.

DATE 03/26/14

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC COUNTS
HOURLY CONTINUOUS COUNTS FINAL REPORT
APRIL 2013

COUNTY NAME: INDIAN RIVER STATION: 0139 DIRECTION: E LANE: 0
DESCRIPTION: SR 60-1.5 MI E OF BLUE CYPRESS LK RD INDIAN RIV CO
LOCATION: COUNTY 88 SECTION 060 SUBSECTION 000 MILEPOST 6.051 ROUTES: SR-60

DY	D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAILY
1	M	30	19	22	24	48	87	77	154	128	159	230	262	228	233	199	180	186	159	153	123	114	61	64	51	2991A
2	T																								929B	
3	W	33	29	37	30	56	73	112	126	113	165	167	195	189	182	153	156	188	137	138	94	89	81	67	45	2655N
4	R	29	30	39	41	60	62	130	122	115	154	164	195	170	173	168	149	170	149	128	91	72	59	61	37	2568N
5	F	30	32	26	30	59	66	100	105	97	152	161	190	180	221	178	192	178	211	161	157	122	110	77	55	2890N
6	A	33	35	28	31	24	35	53	70	92	131	171	194	210	190	194	166	177	159	169	132	118	89	71	51	2623N
7	S	27	26	19	19	12	18	41	37	50	109	179	276	225	258	245	251	237	256	195	170	129	85	55	55	2974N
8	M	41	24	31	27	51	79	135	155	117	149	150	167	195	169	157	148	143	143	144	91	84	77	57	36	2570N
9	T	27	32	33	31	46	69	122	131	126	144	164	159	164	160	125	143	146	165	126	88	75	72	46	42	2436N
10	W	32	25	27	34	50	63	106	119	123	152	180	159	153	172	168	151	148	155	136	118	89	68	62	34	2524N
11	R	35	29	50	43	57	63	116	114	123	140	153	183	184	161	159	172	164	156	119	109	77	61	52	53	2573N
12	F	35	39	37	42	53	71	112	120	105	130	167	183	189	183	203	208	223	243	218	181	141	86	74	58	3101N
13	A	48	26	19	25	27	34	63	67	115	129	221	231	189	192	194	160	164	155	178	131	113	125	79	71	2756A
14	S	35	19	18	9	19	18	22	26	63	105	165	226	263	248	236	211	217	212	208	143	129	90	61	46	2789N
15	M	30	25	24	32	50	79	121	136	131	143	178	172	164	156	156	155	146	136	118	100	78	63	66	49	2508N
16	T	36	29	28	29	37	64	124	118	117	154	159	165	157	148	140	138	158	129	135	96	66	61	64	33	2385N
17	W	30	25	25	37	49	71	135	128	119	134	173	182	186	185	168	143	138	122	106	108	77	49	53	33	2476N
18	R	43	37	38	42	57	67	94	138	129	167	159	167	166	158	165	153	156	135	126	88	77	63	59	42	2526N
19	F	34	34	34	40	38	78	98	133	143	138	171	188	181	222	191	197	222	213	193	158	111	85	70	42	3014N
20	A	39	37	33	20	30	23	58	61	86	126	172	202	209	195	165	192	160	158	136	129	94	90	57	57	2529N
21	S	39	21	16	13	16	15	28	32	47	86	139	208	247	208	214	254	221	229	215	153	113	90	54	44	2702N
22	M	23	27	26	32	41	72	123	126	107	143	157	165	157	153	155	136	149	132	128	107	66	47	45	32	2349N
23	T	26	18	30	30	45	60	119	114	132	136	141	145	159	159	136	158	144	160	113	98	67	65	48	43	2346N
24	W	28	26	34	40	47	69	93	114	105	121	135	176	167	166	157	132	176	124	139	91	69	65	57	43	2374N
25	R	37	34	32	35	57	64	106	120	131	136	176	171	157	187	146	150	182	156	127	106	89	44	57	45	2545N
26	F	33	26	34	29	38	73	94	128	128	159	181	196	175	181	185	195	207	214	202	169	139	81	72	51	2990N
27	A	34	23	33	24	12	33	61	77	109	161	224	232	183	180	156	163	188	161	136	136	83	68	69	33	2579N
28	S	25	20	10	12	12	24	30	51	64	84	161	202	224	201	203	272	205	225	206	204	134	78	60	41	2748N
29	M	40	31	29	23	55	80	131	140	106	133	142	162	169	166	156	156	158	149	129	88	63	66	51	32	2455N
30	T	25	23	34	42	45	49	116	105	121	130	136	155	155	148	152	124	112	146	122	93	61	65	55	40	2254N
WEEKDAY AVERAGE = 2598 SATURDAY AVERAGE = 2622 SUNDAY AVERAGE = 2803 NUMBER OF GOOD DAYS 29 TOTAL MONTHLY COUNT = 76230																										
MONTHLY AVERAGE = 2631																										

COMMENTS:

4/15: FEDERAL TAX DAY

"B"-----> BAD DAY

"N"-----> NORMAL DAY

"A"-----> ATYPICAL DAY

"H"-----> ATYPICAL DAY (HOLIDAY)

"S"-----> ATYPICAL DAY (SPECIAL EVENT)

NOTE: ATYPICAL DAYS HAVE COUNTS THAT ARE HIGHER OR LOWER THAN NORMAL, BUT STILL REASONABLE, AND NO LOCAL SPECIAL EVENTS ARE KNOWN.

DATE 03/26/14

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC COUNTS
HOURLY CONTINUOUS COUNTS FINAL REPORT
APRIL 2013

COUNTY NAME: INDIAN RIVER STATION: 0139 DIRECTION: W LANE: 0
DESCRIPTION: SR 60-1.5 MI E OF BLUE CYPRESS LK RD INDIAN RIV CO
LOCATION: COUNTY 88 SECTION 060 SUBSECTION 000 MILEPOST 6.051 ROUTES: SR-60

DY	D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAILY
1	M	17	13	9	13	33	68	125	125	191	210	211	232	196	211	213	217	179	173	127	119	80	69	49	35	2915A
2	T																								956B	
3	W	16	17	17	13	35	60	107	137	154	192	169	162	147	124	210	179	207	161	119	94	63	57	42	32	2514N
4	R	25	19	28	19	33	50	84	123	148	174	186	182	174	187	181	201	161	170	114	92	77	59	36	28	2551N
5	F	25	13	17	22	39	57	107	136	152	189	212	233	231	259	276	244	232	234	194	137	103	81	57	43	3293N
6	A	24	17	18	20	27	57	93	129	197	218	229	202	178	180	156	173	168	151	106	106	76	65	39	26	2655N
7	S	18	8	14	4	22	32	51	94	134	158	186	186	175	186	202	211	174	176	183	130	87	62	38	19	2550N
8	M	25	14	14	20	35	59	128	114	173	185	187	189	188	179	185	160	160	137	119	105	81	45	33	26	2561N
9	T	30	16	19	19	35	63	108	141	167	198	156	185	177	144	163	197	172	159	112	69	66	51	36	27	2510N
10	W	21	21	14	23	32	64	114	145	164	131	183	187	165	157	198	190	164	159	117	99	52	38	34	41	2513N
11	R	15	14	21	23	28	49	112	146	167	159	180	142	194	176	191	196	170	192	123	84	71	57	53	24	2587N
12	F	28	17	15	19	38	58	99	117	176	226	223	231	184	263	246	274	244	233	167	143	111	82	52	35	3281N
13	A	29	17	21	15	36	64	110	138	180	202	212	206	182	164	136	161	191	136	102	99	74	60	32	29	2596N
14	S	10	10	8	6	13	33	41	84	105	157	191	210	176	184	188	180	243	186	135	115	91	77	49	27	2519N
15	M	10	12	8	11	28	73	100	129	162	139	182	178	140	178	166	146	160	136	109	73	69	50	35	37	2331N
16	T	23	12	22	19	34	78	98	118	185	170	146	162	168	164	166	146	129	121	108	87	56	53	29	23	2317N
17	W	19	15	17	24	30	59	101	116	166	158	162	156	170	149	167	154	167	176	137	80	78	54	35	40	2430N
18	R	24	16	19	16	31	73	128	149	169	166	159	223	159	181	193	179	151	162	117	101	72	59	32	28	2607N
19	F	26	18	20	21	28	62	106	123	157	202	207	224	237	231	250	258	227	237	217	148	106	93	38	47	3283N
20	A	49	21	13	15	27	49	80	140	165	211	212	205	182	151	153	165	144	168	124	98	91	70	28	21	2582N
21	S	10	11	11	6	12	37	33	56	92	134	159	161	165	153	170	191	201	186	152	130	86	60	37	22	2275N
22	M	12	12	14	13	35	49	95	115	140	130	161	168	170	160	150	164	133	137	122	81	56	59	32	29	2237N
23	T	25	16	7	24	37	53	107	128	166	142	148	142	151	138	142	130	136	143	99	105	70	56	44	31	2240N
24	W	26	20	12	20	26	61	105	123	161	160	169	156	160	175	136	160	152	128	95	90	57	52	32	31	2307N
25	R	20	18	13	19	22	55	105	139	161	154	159	154	197	182	143	175	172	159	135	135	82	55	35	34	2523N
26	F	25	16	13	20	31	53	105	111	160	191	197	209	196	231	264	217	220	217	209	139	122	64	48	40	3098N
27	A	24	13	18	16	36	49	84	156	175	236	233	172	159	172	161	185	173	136	133	72	82	55	35	37	2612N
28	S	11	9	12	12	15	31	52	64	93	148	180	176	195	203	190	216	202	200	155	125	95	62	35	27	2508N
29	M	20	12	13	15	31	69	125	131	165	132	152	178	143	176	175	170	145	142	111	82	79	42	41	27	2376N
30	T	34	13	20	17	27	43	122	129	152	158	182	165	162	175	158	161	147	122	103	74	68	42	33	33	2340N
WEEKDAY AVERAGE = 2617 SATURDAY AVERAGE = 2611 SUNDAY AVERAGE = 2463 NUMBER OF GOOD DAYS 29 TOTAL MONTHLY COUNT = 75111																										
MONTHLY AVERAGE = 2594																										

COMMENTS:

4/15: FEDERAL TAX DAY

"B"-----> BAD DAY

"N"-----> NORMAL DAY

"A"-----> ATYPICAL DAY

"H"-----> ATYPICAL DAY (HOLIDAY)

"S"-----> ATYPICAL DAY (SPECIAL EVENT)

NOTE: ATYPICAL DAYS HAVE COUNTS THAT ARE HIGHER OR LOWER THAN NORMAL, BUT STILL REASONABLE, AND NO LOCAL SPECIAL EVENTS ARE KNOWN.

DATE 03/26/14

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC COUNTS
HOURLY CONTINUOUS COUNTS FINAL REPORT
MAY 2013

COUNTY NAME: INDIAN RIVER STATION: 0139 DIRECTION: E LANE: 0
DESCRIPTION: SR 60-1.5 MI E OF BLUE CYPRESS LK RD INDIAN RIV CO
LOCATION: COUNTY 88 SECTION 060 SUBSECTION 000 MILEPOST 6.051 ROUTES: SR-60

DY	D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAILY
1	W	24	28	29	41	62	61	114	127	120	147	142	162	139	170	148	143	146	140	124	69	82	66	61	52	2397N
2	R	27	33	28	34	50	67	115	118	100	140	143	152	144	156	178	139	159	160	129	94	75	60	63	44	2408N
3	F	33	37	43	39	45	59	111	97	107	129	169	148	156	175	182	178	203	185	188	177	150	111	92	59	2873N
4	A	47	43	21	27	26	29	50	55	86	143	152	180	185	189	143	170	170	172	120	123	150	97	73	52	2503A
5	S	31	19	17	15	11	16	31	52	45	100	151	192	177	202	221	226	224	242	210	185	118	105	83	59	2732N
6	M	38	25	39	23	62	80	130	133	102	141	155	161	164	152	146	159	165	157	115	89	93	60	54	53	2496N
7	T	33	20	35	42	60	49	104	126	114	149	155	130	162	161	159	136	140	141	114	91	69	66	59	55	2370N
8	W	34	30	32	29	49	55	115	105	103	141	155	173	165	167	176	148	151	171	139	106	73	45	63	39	2464N
9	R	29	30	32	40	41	68	115	126	115	154	175	138	162	168	162	197	190	177	138	90	91	70	63	38	2609N
10	F	31	24	33	40	43	61	136	119	114	148	179	206	189	220	215	217	205	250	239	167	131	107	92	46	3212N
11	A	50	32	26	26	28	40	52	73	116	155	175	240	226	204	181	192	193	191	142	126	105	90	90	44	2797N
12	S	31	23	14	14	15	22	23	33	60	110	177	230	219	177	228	240	207	217	208	146	122	88	48	74	2726S
13	M	31	29	27	26	48	71	124	147	122	124	151	160	147	145	137	125	155	132	108	93	62	66	44	40	2314N
14	T	22	16	35	36	52	55	99	120	142	146	140	145	142	152	132	121	115	134	113	79	68	56	51	33	2204N
15	W	40	19	36	26	50	64	99	114	126	136	138	135	156	137	148	148	129	137	112	88	73	54	55	41	2261N
16	R	38	29	26	47	47	60	109	104	119	142	144	155	134	151	131	144	177	130	131	106	82	60	75	36	2377N
17	F	37	30	31	37	48	54	118	115	115	138	157	171	166	188	188	198	184	217	210	190	114	98	71	56	2931N
18	A	41	32	21	28	25	30	55	107	116	145	201	195	179	203	176	163	185	113	161	123	88	74	76	52	2589N
19	S	46	21	22	11	21	16	36	41	56	99	188	195	189	207	194	214	171	214	205	158	113	106	61	56	2640N
20	M	31	28	32	26	47	72	114	118	114	126	146	160	125	149	155	134	134	121	105	89	73	68	55	33	2255N
21	T	33	29	34	33	49	60	99	119	114	124	136	128	146	122	291	245	149	122	80	67	64	50	71	31	2394A
22	W	35	38	32	24	43	57	94	113	87	121	139	146	136	137	136	156	126	138	118	84	66	65	67	36	2194N
23	R	25	19	33	27	66	65	102	103	89	149	121	148	143	132	159	153	166	145	155	90	85	75	60	60	2370N
24	F	36	27	38	31	53	60	102	114	83	170	154	178	200	197	227	246	256	281	263	243	183	106	96	67	3411A
25	A	41	42	32	33	28	37	68	78	97	186	207	264	230	223	217	212	171	183	160	147	111	86	75	64	2992N
26	S	48	32	20	22	22	20	33	44	63	122	181	216	205	222	188	199	159	164	158	160	117	102	61	52	2610A
27	M	17	13	18	16	15	26	32	51	100	130	190	226	282	269	240	227	178	230	201	173	130	107	75	45	2991H
28	T	32	29	28	33	47	80	107	121	132	132	122	137	155	160	124	122	137	119	87	86	69	54	51	42	2206N
29	W	41	22	23	38	49	61	102	117	121	136	144	119	160	118	111	104	122	131	123	96	58	66	60	38	2160N
30	R	30	20	32	39	53	61	94	99	98	150	134	128	133	142	128	127	146	137	140	94	62	64	61	38	2210N
31	F	19	35	39	28	56	60	80	109	111	124	153	136	151	176	164	176	187	224	180	138	110	78	79	64	2677N

WEEKDAY AVERAGE = 2504 SATURDAY AVERAGE = 2504 SUNDAY AVERAGE = 2677 NUMBER OF GOOD DAYS 31 TOTAL MONTHLY COUNT = 79373
MONTHLY AVERAGE = 2559

COMMENTS:
5/1-9: COLLEGES & UNIVERSITIES 2013 SPRING SEMESTER ENDS
5/12, MOTHER'S DAY - 5/5, CINCO DE MAYO
5/27, MEMORIAL DAY (OBSERVED)
"B"-----> BAD DAY
"N"-----> NORMAL DAY
"A"-----> ATYPICAL DAY
"H"-----> ATYPICAL DAY (HOLIDAY)
"S"-----> ATYPICAL DAY (SPECIAL EVENT)

NOTE: ATYPICAL DAYS HAVE COUNTS THAT ARE HIGHER OR LOWER THAN NORMAL, BUT STILL REASONABLE, AND NO LOCAL SPECIAL EVENTS ARE KNOWN.

DATE 03/26/14

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC COUNTS
HOURLY CONTINUOUS COUNTS FINAL REPORT
MAY 2013

COUNTY NAME: INDIAN RIVER STATION: 0139 DIRECTION: W LANE: 0
DESCRIPTION: SR 60-1.5 MI E OF BLUE CYPRESS LK RD INDIAN RIV CO
LOCATION: COUNTY 88 SECTION 060 SUBSECTION 000 MILEPOST 6.051 ROUTES: SR-60

DY	D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAILY
1	W	28	12	18	15	33	50	129	125	157	144	189	150	170	175	163	173	151	119	119	89	56	51	46	28	2390N
2	R	30	15	22	18	37	37	95	103	151	183	157	157	162	167	173	164	143	144	115	97	66	51	30	33	2350N
3	F	24	16	19	17	32	35	137	133	135	199	178	198	194	233	218	227	221	206	181	118	95	80	56	45	2997N
4	A	23	23	16	15	22	54	84	127	185	192	189	170	152	145	178	155	138	106	107	70	92	71	38	26	2378N
5	S	10	12	14	11	23	26	55	71	100	146	161	184	154	159	190	177	175	178	129	99	89	78	46	25	2312N
6	M	13	15	6	12	38	63	127	134	137	152	144	151	148	158	132	142	146	130	98	84	65	48	40	34	2217N
7	T	32	19	15	19	30	50	112	142	158	146	140	149	142	146	149	145	159	143	100	71	61	41	38	38	2245N
8	W	18	9	21	16	17	57	98	128	132	157	162	149	167	150	157	148	146	150	128	88	66	64	46	30	2304N
9	R	27	12	11	15	30	44	112	132	170	139	157	142	186	169	200	187	156	168	120	118	103	86	50	27	2561N
10	F	35	11	16	16	29	60	116	175	172	147	180	190	190	208	250	256	230	232	178	136	116	82	80	39	3144N
11	A	25	17	24	16	25	39	94	127	197	189	201	188	184	163	159	166	192	162	159	136	91	63	46	22	2685N
12	S	15	17	11	7	5	20	39	77	103	140	179	198	195	193	195	211	266	222	183	159	106	88	44	22	2695S
13	M	19	14	7	16	43	65	109	156	140	148	168	176	172	160	183	156	141	129	84	66	60	54	43	26	2335N
14	T	24	12	12	15	31	44	118	144	138	168	168	160	157	146	173	162	134	130	95	84	51	53	39	21	2279N
15	W	25	8	10	29	27	53	111	129	148	147	125	151	162	157	173	179	147	153	108	67	57	60	37	26	2289N
16	R	22	7	14	15	28	55	126	135	159	168	163	144	148	159	157	180	144	138	114	83	83	51	43	23	2359N
17	F	28	16	14	18	30	52	102	115	161	162	205	177	215	217	224	245	241	167	170	167	107	74	61	36	3058N
18	A	28	14	18	19	23	38	101	142	218	211	216	188	150	168	158	157	155	134	140	102	89	65	41	31	2606N
19	S	14	16	16	15	12	33	50	67	103	166	159	172	165	160	177	195	217	194	139	117	96	68	33	28	2412N
20	M	18	8	11	14	36	55	123	126	137	137	146	148	166	168	153	129	122	124	94	77	63	42	33	35	2165N
21	T	23	12	20	18	29	61	104	134	138	121	146	126	123	130	160	157	155	123	96	67	55	43	38	22	2101N
22	W	23	15	10	18	30	41	112	141	124	120	132	138	135	155	162	175	150	109	86	76	67	46	29	27	2121N
23	R	20	6	14	19	31	60	105	144	157	157	138	169	146	173	189	160	159	157	125	97	87	55	47	33	2448N
24	F	25	20	10	22	33	43	114	124	161	197	200	198	220	233	249	257	256	240	215	186	125	83	72	55	3338A
25	A	31	12	19	20	26	27	73	129	199	282	284	209	201	160	149	165	160	157	121	94	98	83	43	23	2765A
26	S	14	7	10	14	8	19	45	78	112	137	158	169	160	144	162	144	185	163	155	160	111	62	48	24	2289A
27	M	16	16	5	13	20	26	65	65	114	148	203	271	253	221	243	243	268	268	217	131	125	83	43	30	3087H
28	T	21	11	12	9	36	59	121	137	171	159	164	173	146	160	172	146	130	127	91	73	59	34	38	25	2274N
29	W	27	8	17	20	21	51	109	129	144	136	135	144	145	149	163	144	132	101	88	64	57	45	40	28	2097N
30	R	18	14	17	15	24	49	112	116	141	116	152	151	135	170	138	150	157	141	108	68	69	59	43	40	2203N
31	F	26	12	14	27	19	41	124	129	135	172	161	165	159	192	214	213	215	214	147	156	88	82	52	49	2806N
WEEKDAY AVERAGE = 2474 SATURDAY AVERAGE = 2609 SUNDAY AVERAGE = 2427 NUMBER OF GOOD DAYS 31 TOTAL MONTHLY COUNT = 77310																										
MONTHLY AVERAGE = 2486																										
COMMENTS:																										
"B"-----> BAD DAY																										
"N"-----> NORMAL DAY																										
"A"-----> ATYPICAL DAY																										
"H"-----> ATYPICAL DAY (HOLIDAY)																										
"S"-----> ATYPICAL DAY (SPECIAL EVENT)																										

NOTE: ATYPICAL DAYS HAVE COUNTS THAT ARE HIGHER OR LOWER THAN NORMAL, BUT STILL REASONABLE, AND NO LOCAL SPECIAL EVENTS ARE KNOWN.

DATE 03/26/14

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC COUNTS
HOURLY CONTINUOUS COUNTS FINAL REPORT
JUNE 2013

COUNTY NAME: INDIAN RIVER STATION: 0139 DIRECTION: E LANE: 0
DESCRIPTION: SR 60-1.5 MI E OF BLUE CYPRESS LK RD INDIAN RIV CO
LOCATION: COUNTY 88 SECTION 060 SUBSECTION 000 MILEPOST 6.051 ROUTES: SR-60

DY	D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAILY
1	A	41	25	22	30	19	42	58	70	85	134	165	205	185	180	176	171	163	134	117	112	91	66	57	49	2397N
2	S	28	18	12	20	13	20	28	39	66	85	132	154	142	196	167	169	193	170	154	143	127	90	64	41	2271N
3	M	25	28	25	21	38	82	123	120	112	124	126	229	143	159	126	131	109	139	120	80	73	47	39	33	2252N
4	T	35	27	24	28	45	52	99	110	105	120	122	133	140	132	123	130	138	121	82	70	67	31	51	54	2039N
5	W	37	25	20	36	32	57	118	92	96	139	125	160	119	134	125	112	129	126	121	82	62	51	57	36	2091N
6	R	21	19	29	31	45	50	74	93	89	108	106	134	108	129	117	128	129	105	93	79	45	53	45	38	1868A
7	F	24	23	34	23	43	67	84	105	98	178	154	157	191	205	223	194	209	213	178	153	122	99	70	40	2887N
8	A	36	34	24	20	27	37	54	61	102	132	174	202	210	178	169	141	184	153	116	100	81	71	60	34	2400N
9	S	39	17	10	14	7	15	29	44	54	105	147	171	194	164	199	205	188	173	198	154	101	77	65	47	2417N
10	M	32	23	19	22	48	81	118	113	110	150	154	162	156	148	149	123	154	142	117	83	57	45	48	34	2288N
11	T	33	23	19	31	42	58	106	111	109	125	145	157	143	138	147	136	131	132	115	87	79	38	67	29	2201N
12	W	30	24	35	30	40	57	88	104	115	118	150	151	161	157	143	162	148	156	126	94	102	62	60	36	2349N
13	R	31	27	29	30	61	48	98	90	101	131	156	131	173	163	158	140	157	131	125	112	102	56	56	43	2349N
14	F	31	20	24	36	43	61	102	113	124	167	140	179	176	203	179	223	198	215	205	182	133	105	69	37	2965N
15	A	35	32	32	22	21	27	41	61	103	119	181	208	218	209	176	169	174	162	137	93	109	96	55	46	2526N
16	S	33	23	12	13	13	14	23	35	65	108	177	221	225	207	209	220	224	209	193	160	119	84	64	51	2702N
17	M	27	32	24	31	42	89	140	133	112	119	170	177	157	162	154	132	119	136	102	112	67	38	64	37	2376N
18	T	23	26	30	36	50	68	83	118	119	124	143	156	139	125	139	149	121	99	89	77	59	79	46	28	2126N
19	W	36	31	30	35	38	54	96	83	104	137	157	139	129	124	141	131	145	108	108	85	70	51	58	33	2123N
20	R	26	19	23	42	50	66	91	87	117	139	145	142	136	166	140	125	170	125	139	92	86	56	58	36	2276N
21	F	20	39	30	38	49	64	86	81	102	114	155	183	162	189	197	193	172	225	190	128	122	93	63	36	2731N
22	A	29	24	34	25	27	27	37	64	91	126	178	197	173	167	157	168	150	137	142	120	94	69	60	37	2333N
23	S	38	27	11	18	16	20	28	35	60	89	149	153	204	199	198	211	213	208	157	137	87	123	72	50	2503A
24	M	27	31	37	32	44	80	123	121	125	107	116	151	161	140	118	139	163	112	119	84	70	47	54	36	2237N
25	T	32	23	27	34	55	63	83	95	112	139	137	116	141	130	141	121	148	104	96	80	59	53	58	37	2084N
26	W	37	26	30	41	38	63	95	91	113	127	149	129	148	160	134	141	142	148	107	79	59	66	60	47	2230N
27	R	32	29	24	55	53	77	92	101	100	154	153	170	157	149	138	153	157	164	126	94	65	87	69	30	2429N
28	F	43	26	26	47	47	61	98	105	116	131	160	165	159	157	193	209	201	173	174	153	126	90	78	29	2767N
29	A	45	29	17	20	31	34	43	52	97	131	160	190	183	161	170	149	140	125	123	106	86	83	55	56	2286N
30	S	31	22	21	23	22	17	35	36	77	80	119	207	156	203	173	182	198	197	166	108	112	83	44	51	2363N

WEEKDAY AVERAGE = 2334 SATURDAY AVERAGE = 2388 SUNDAY AVERAGE = 2451 NUMBER OF GOOD DAYS 30 TOTAL MONTHLY COUNT = 70866
MONTHLY AVERAGE = 2358

COMMENTS:
6/5-7: TROPICAL STORM ANDREA IMPACTS TRAFFIC
6/6: PUBLIC SCHOOLS CLOSE
6/16: FATHER'S DAY

"B"====> BAD DAY
"N"====> NORMAL DAY
"A"====> ATYPICAL DAY
"H"====> ATYPICAL DAY (HOLIDAY)
"S"====> ATYPICAL DAY (SPECIAL EVENT)

NOTE: ATYPICAL DAYS HAVE COUNTS THAT ARE HIGHER OR LOWER THAN NORMAL, BUT STILL REASONABLE, AND NO LOCAL SPECIAL EVENTS ARE KNOWN.

DATE 03/26/14

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC COUNTS
HOURLY CONTINUOUS COUNTS FINAL REPORT
JUNE 2013

COUNTY NAME: INDIAN RIVER STATION: 0139 DIRECTION: W LANE: 0
DESCRIPTION: SR 60-1.5 MI E OF BLUE CYPRESS LK RD INDIAN RIV CO
LOCATION: COUNTY 88 SECTION 060 SUBSECTION 000 MILEPOST 6.051 ROUTES: SR-60

DY	D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAILY
1	A	20	15	16	13	21	38	127	130	157	184	218	217	161	140	133	143	149	142	110	96	71	55	36	25	2417A
2	S	19	7	9	2	9	11	54	66	95	130	151	147	163	176	173	171	170	154	152	89	92	53	30	23	2146N
3	M	8	12	5	11	31	54	114	114	130	149	151	149	185	140	142	126	126	121	89	83	68	54	30	24	2116N
4	T	21	11	11	15	38	49	111	133	122	127	133	120	123	136	142	140	106	133	75	69	44	46	35	24	1964N
5	W	21	7	9	23	19	50	95	118	123	130	119	129	130	141	151	140	142	110	80	73	60	43	32	32	1977N
6	R	21	9	12	17	18	47	75	87	92	111	122	123	136	127	148	118	148	115	79	62	52	38	28	33	1818A
7	F	30	14	20	19	28	34	91	110	168	135	171	189	168	187	208	199	194	214	158	127	91	65	56	38	2714N
8	A	16	15	11	15	29	33	84	114	146	186	168	185	180	171	176	160	166	113	126	89	72	48	47	33	2383N
9	S	18	8	13	7	13	28	32	62	108	127	157	166	161	192	201	190	188	182	156	149	96	90	54	21	2419N
10	M	11	13	13	11	29	61	102	125	138	147	186	167	177	165	187	157	198	167	92	92	64	50	34	19	2405N
11	T	25	6	15	24	25	56	86	137	152	149	150	170	178	184	169	140	127	149	97	67	85	50	34	35	2310N
12	W	12	9	10	18	31	47	106	121	167	170	157	151	164	159	171	265	233	129	108	72	71	48	51	37	2507A
13	R	24	16	14	10	23	64	101	124	143	128	155	145	168	144	187	174	153	155	107	101	61	51	43	35	2326N
14	F	24	15	14	15	25	61	85	104	154	181	180	199	190	204	213	243	219	210	197	129	97	79	51	45	2934N
15	A	20	15	15	20	21	26	100	105	167	174	220	210	176	146	152	142	168	177	112	93	83	58	38	23	2461N
16	S	13	9	12	7	14	18	44	66	117	167	178	209	181	184	196	206	191	213	156	131	97	55	39	26	2529N
17	M	19	14	9	20	30	58	104	137	117	160	162	160	171	152	156	143	134	126	91	71	62	50	45	38	2229N
18	T	30	14	11	21	28	69	84	117	157	144	123	135	144	165	162	144	145	129	113	80	55	44	43	29	2186N
19	W	20	12	13	25	24	66	76	107	143	137	130	152	162	167	135	142	176	133	98	94	68	46	38	29	2193N
20	R	21	16	17	17	20	58	112	111	129	166	145	149	158	178	153	194	150	121	119	95	60	39	36	22	2286N
21	F	29	15	15	18	25	48	87	119	130	168	154	173	195	234	198	226	205	194	176	109	88	70	46	53	2775N
22	A	24	15	16	13	31	38	93	103	128	159	187	182	154	163	142	138	161	134	111	94	69	61	46	49	2311N
23	S	22	13	7	1	14	17	37	78	74	116	165	187	174	194	207	194	186	192	162	123	105	75	38	26	2407N
24	M	20	9	17	14	28	61	94	123	123	164	146	171	180	150	151	153	175	136	95	79	45	55	34	36	2259N
25	T	20	17	18	19	18	74	101	101	148	130	143	151	132	158	152	142	136	122	105	82	52	40	31	41	2133N
26	W	23	16	9	17	31	47	87	129	153	151	140	147	157	178	165	167	142	127	113	74	55	53	32	34	2247N
27	R	26	11	12	20	42	50	108	123	144	155	175	172	164	149	170	138	192	140	125	100	76	54	44	36	2426N
28	F	21	20	15	18	25	48	106	102	145	170	184	177	192	200	198	200	220	193	168	135	93	59	55	39	2783N
29	A	25	21	16	11	18	56	73	103	140	180	192	206	154	165	183	170	148	161	124	76	83	61	32	24	2422N
30	S	14	12	14	12	12	18	43	67	80	119	146	182	179	196	194	185	146	124	128	108	84	59	32	12	2166N

WEEKDAY AVERAGE = 2329 SATURDAY AVERAGE = 2399 SUNDAY AVERAGE = 2333 NUMBER OF GOOD DAYS 30 TOTAL MONTHLY COUNT = 70249
MONTHLY AVERAGE = 2340

COMMENTS:

6/5-7: TROPICAL STORM ANDREA IMPACTS TRAFFIC
6/6: PUBLIC SCHOOLS CLOSE
6/16: FATHER'S DAY

"B"====> BAD DAY

"N"====> NORMAL DAY

"A"====> ATYPICAL DAY

"H"====> ATYPICAL DAY (HOLIDAY)

"S"====> ATYPICAL DAY (SPECIAL EVENT)

NOTE: ATYPICAL DAYS HAVE COUNTS THAT ARE HIGHER OR LOWER THAN NORMAL, BUT STILL REASONABLE, AND NO LOCAL SPECIAL EVENTS ARE KNOWN.

DATE 03/26/14

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC COUNTS
HOURLY CONTINUOUS COUNTS FINAL REPORT
JULY 2013

COUNTY NAME: INDIAN RIVER STATION: 0139 DIRECTION: E LANE: 0
DESCRIPTION: SR 60-1.5 MI E OF BLUE CYPRESS LK RD INDIAN RIV CO
LOCATION: COUNTY 88 SECTION 060 SUBSECTION 000 MILEPOST 6.051 ROUTES: SR-60

DY	D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAILY
1	M	30	34	39	32	44	78	115	118	93	118	132	144	148	157	103	138	138	109	112	77	62	52	34	27	2134N
2	T	26	22	28	39	54	56	98	93	110	136	128	141	138	159	125	139	136	103	103	103	69	48	57	37	2148N
3	W	27	22	27	32	39	52	101	81	88	112	142	153	168	181	198	176	162	185	204	165	158	85	93	60	2711A
4	R	35	34	31	28	18	29	40	42	71	122	137	197	159	171	179	145	116	113	73	54	48	49	42	39	1972H
5	F	33	31	23	24	33	47	84	67	80	113	153	176	196	189	177	166	173	163	155	102	95	81	61	45	2467N
6	A	35	40	26	21	16	29	45	65	62	103	162	207	239	190	202	180	138	146	132	137	114	103	67	59	2518N
7	S	42	21	11	16	14	19	22	41	51	103	178	211	227	210	203	272	277	234	180	155	100	88	71	45	2791N
8	M	30	34	29	20	45	96	126	132	113	117	148	150	156	134	141	126	146	126	112	90	65	63	53	37	2289N
9	T	32	27	29	31	51	74	94	103	118	113	147	142	131	150	132	141	106	111	132	91	70	58	69	42	2194N
10	W	30	42	27	33	46	60	97	94	114	138	141	165	155	118	140	127	116	146	94	87	50	55	46	39	2160N
11	R	25	26	35	40	46	67	101	116	107	110	129	152	108	154	162	116	158	168	138	94	76	70	46	51	2295N
12	F	25	29	30	26	61	79	89	96	98	156	132	161	168	169	176	202	197	184	149	133	116	79	70	52	2677N
13	A	32	34	20	21	25	33	40	59	103	93	156	189	175	158	159	158	170	139	111	92	67	70	50	36	2190N
14	S	20	19	17	11	13	22	29	22	53	77	127	157	180	159	171	212	175	205	154	126	111	71	80	41	2252N
15	M	35	20	25	24	42	65	119	119	121	124	230	674	599	256	167	130	126	123	115	99	73	46	63	51	3446A
16	T	26	28	34	37	55	65	88	101	118	108	122	166	145	150	123	122	143	124	109	85	64	55	44	36	2148N
17	W	27	19	27	33	47	56	110	106	94	119	137	136	145	155	151	136	133	134	114	62	68	56	58	38	2161N
18	R	26	26	33	37	42	64	106	100	124	131	133	163	146	154	145	134	148	141	118	100	80	70	54	40	2315N
19	F	24	26	26	38	42	63	101	110	118	135	150	172	171	184	197	193	183	201	171	167	131	117	71	51	2842N
20	A	32	28	29	32	22	30	51	54	84	138	154	221	193	216	204	183	131	147	130	103	84	78	43	34	2421N
21	S	27	33	14	15	13	13	23	33	47	71	125	188	182	221	207	235	209	196	184	155	139	82	68	50	2530N
22	M	34	28	27	28	48	73	112	107	118	137	130	164	147	162	169	164	142	134	117	90	74	47	51	47	2350N
23	T	33	32	27	22	43	71	98	119	113	114	141	152	145	149	143	137	138	132	105	81	64	58	44	29	2190N
24	W	29	20	30	24	49	64	102	110	106	124	149	155	151	141	130	148	154	152	101	82	67	56	60	32	2236N
25	R	25	29	17	18	45	51	102	105	95	144	120	156	142	151	143	163	144	144	133	90	80	89	52	42	2280N
26	F	31	32	17	30	47	65	87	77	94	108	131	172	171	176	176	169	220	178	184	138	128	108	94	42	2675N
27	A	34	27	27	17	30	34	44	59	84	142	153	185	184	187	171	188	158	154	132	141	74	66	74	43	2408N
28	S	31	20	18	13	13	16	24	32	45	92	152	201	191	204	222	209	220	208	179	157	122	94	53	42	2558N
29	M	34	23	27	29	57	71	112	115	95	119	149	128	166	142	140	140	139	133	96	75	67	53	57	31	2198N
30	T	40	20	28	23	41	66	91	108	108	111	133	136	156	130	107	128	141	115	93	85	78	69	42	38	2087N
31	W	20	21	30	31	42	57	90	97	97	128	131	157	178	137	146	141	127	141	98	89	80	57	56	36	2187N

WEEKDAY AVERAGE = 2362 SATURDAY AVERAGE = 2384 SUNDAY AVERAGE = 2533 NUMBER OF GOOD DAYS 31 TOTAL MONTHLY COUNT = 73830
MONTHLY AVERAGE = 2389

COMMENTS:
7/4, INDEPENDENCE DAY

"B"====> BAD DAY
"N"====> NORMAL DAY
"A"====> ATYPICAL DAY
"H"====> ATYPICAL DAY (HOLIDAY)
"S"====> ATYPICAL DAY (SPECIAL EVENT)

NOTE: ATYPICAL DAYS HAVE COUNTS THAT ARE HIGHER OR LOWER THAN NORMAL, BUT STILL REASONABLE, AND NO LOCAL SPECIAL EVENTS ARE KNOWN.

DATE 03/26/14

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC COUNTS
HOURLY CONTINUOUS COUNTS FINAL REPORT
JULY 2013

COUNTY NAME: INDIAN RIVER STATION: 0139 DIRECTION: W LANE: 0
DESCRIPTION: SR 60-1.5 MI E OF BLUE CYPRESS LK RD INDIAN RIV CO
LOCATION: COUNTY 88 SECTION 060 SUBSECTION 000 MILEPOST 6.051 ROUTES: SR-60

DY	D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAILY
1	M	8	13	8	18	32	54	72	111	137	131	150	144	167	164	156	123	142	104	82	74	70	43	42	31	2076N
2	T	27	9	8	18	24	45	87	119	143	126	112	154	129	146	158	131	129	122	110	74	65	52	41	32	2061N
3	W	16	15	15	21	30	32	99	85	140	126	130	160	148	194	194	191	193	197	145	145	88	75	47	29	2515A
4	R	26	19	14	18	18	23	60	78	93	147	157	167	138	116	85	75	97	109	74	78	60	44	66	42	1804H
5	F	19	10	7	19	18	43	62	105	139	167	176	182	213	166	176	194	182	178	159	130	93	85	60	34	2617N
6	A	16	19	6	15	18	24	64	110	129	184	200	219	183	175	176	144	165	155	138	113	73	55	47	25	2453N
7	S	37	17	9	11	13	24	51	73	97	163	198	236	233	277	246	218	227	194	213	141	107	56	51	22	2914N
8	M	10	10	10	20	31	59	105	135	142	133	152	155	154	171	182	121	145	137	121	79	75	55	36	38	2276N
9	T	27	14	7	18	24	53	77	149	145	122	149	136	149	161	150	138	141	127	96	73	52	57	40	34	2139N
10	W	17	21	15	20	27	53	95	102	122	157	152	141	161	159	132	141	135	122	96	82	74	45	28	31	2128N
11	R	24	17	11	19	26	46	95	119	140	140	156	159	161	137	158	159	137	137	130	84	75	57	42	37	2266N
12	F	31	15	15	30	20	50	82	115	183	140	174	193	183	182	194	212	237	193	140	114	87	65	52	38	2745N
13	A	28	4	10	14	13	31	77	108	143	167	175	172	161	165	150	182	136	112	80	78	71	67	35	37	2216N
14	S	20	13	5	6	9	18	53	63	88	116	158	171	178	172	178	196	163	120	130	92	75	56	24	25	2129N
15	M	14	11	13	10	32	54	80	101	150	130	138	388	472	500	220	134	149	135	95	98	68	55	28	30	3105A
16	T	32	16	13	24	23	40	100	132	128	144	146	139	154	156	148	182	130	119	66	62	60	52	39	26	2131N
17	W	27	13	14	18	28	40	79	134	168	159	156	167	167	158	144	171	141	112	66	86	46	43	34	27	2198N
18	R	15	15	10	13	18	42	85	108	139	128	144	169	160	125	199	183	164	157	125	73	60	56	33	41	2262N
19	F	18	14	10	19	17	46	83	124	136	144	182	192	201	220	217	221	183	230	183	131	100	72	46	33	2822N
20	A	35	15	8	10	24	39	87	132	203	179	168	176	182	185	134	151	127	106	90	77	75	65	49	26	2343N
21	S	23	13	5	8	14	14	47	73	98	133	186	157	177	223	216	211	199	195	160	119	80	55	45	19	2470N
22	M	11	10	11	10	27	52	85	114	148	130	160	145	170	132	156	162	150	143	110	84	68	56	53	30	2217N
23	T	28	16	12	12	20	39	96	130	152	141	151	161	148	142	176	139	156	124	100	72	55	47	32	25	2174N
24	W	17	7	9	13	25	40	93	113	164	127	157	153	145	147	143	161	155	120	97	61	70	50	38	25	2130N
25	R	35	21	14	11	25	49	125	111	115	158	154	155	175	173	164	143	154	138	144	80	78	54	41	35	2352N
26	F	31	10	10	25	22	35	96	116	121	159	197	175	180	181	223	206	184	194	176	148	103	85	47	45	2769N
27	A	27	14	13	12	17	44	85	124	158	183	199	175	144	169	149	165	135	150	124	113	73	70	49	24	2416N
28	S	15	13	8	7	13	21	36	72	93	132	168	182	165	185	202	213	177	200	146	134	96	56	38	26	2398N
29	M	20	16	7	16	29	67	107	116	124	157	146	181	171	168	153	149	138	114	101	80	67	52	42	34	2255N
30	T	22	18	6	12	19	48	85	117	134	134	128	155	154	158	179	142	136	127	110	60	72	43	39	24	2122N
31	W	22	12	12	22	29	43	82	129	150	136	159	146	154	143	154	174	135	119	100	74	66	58	39	36	2194N

WEEKDAY AVERAGE = 2331 SATURDAY AVERAGE = 2357 SUNDAY AVERAGE = 2478 NUMBER OF GOOD DAYS 31 TOTAL MONTHLY COUNT = 72697
MONTHLY AVERAGE = 2355

COMMENTS:
7/4, INDEPENDENCE DAY

"B"====> BAD DAY
"N"====> NORMAL DAY
"A"====> ATYPICAL DAY
"H"====> ATYPICAL DAY (HOLIDAY)
"S"====> ATYPICAL DAY (SPECIAL EVENT)

NOTE: ATYPICAL DAYS HAVE COUNTS THAT ARE HIGHER OR LOWER THAN NORMAL, BUT STILL REASONABLE, AND NO LOCAL SPECIAL EVENTS ARE KNOWN.

DATE 03/26/14

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC COUNTS
HOURLY CONTINUOUS COUNTS FINAL REPORT
AUGUST 2013

COUNTY NAME: INDIAN RIVER STATION: 0139 DIRECTION: E LANE: 0
DESCRIPTION: SR 60-1.5 MI E OF BLUE CYPRESS LK RD INDIAN RIV CO
LOCATION: COUNTY 88 SECTION 060 SUBSECTION 000 MILEPOST 6.051 ROUTES: SR-60

DY	D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAILY
1	R	40	19	43	31	45	69	97	126	91	141	140	153	141	172	151	144	142	126	107	84	85	54	46	40	2287N
2	F	29	34	49	68	99	63	96	86	107	140	154	195	165	178	176	171	180	215	174	146	114	84	58	46	2827A
3	A	37	24	29	22	24	23	48	49	102	126	195	179	182	192	183	160	114	161	130	124	86	62	51	55	2358N
4	S	35	18	12	16	13	15	22	30	44	88	110	185	196	226	182	213	185	193	169	161	118	91	66	55	2443N
5	M	34	30	26	28	48	77	107	114	124	90	168	147	154	163	142	141	124	111	110	91	69	50	43	47	2238N
6	T	27	25	26	34	43	59	101	117	88	133	134	120	119	126	123	115	134	134	96	89	64	60	45	47	2059N
7	W	29	21	32	32	40	69	97	108	104	122	157	129	143	151	142	142	122	126	118	73	68	53	58	44	2180N
8	R	31	24	29	30	49	55	110	106	120	146	147	142	151	141	151	137	129	136	119	98	98	81	58	35	2323N
9	F	26	32	32	31	42	54	97	93	89	144	147	178	196	165	194	195	176	215	178	160	138	102	66	47	2797N
10	A	30	34	24	20	24	33	57	66	88	159	179	206	237	169	163	168	146	140	137	143	95	77	67	48	2510N
11	S	46	17	8	15	7	20	25	48	51	105	156	211	220	210	199	185	210	173	186	148	123	117	63	47	2590N
12	M	39	20	34	22	45	74	128	113	114	138	158	151	173	176	146	144	141	133	108	76	66	54	48	33	2334N
13	T	43	28	31	26	45	59	93	116	94	127	140	123	132	154	148	113	143	136	110	88	75	57	64	38	2183N
14	W	32	21	26	32	52	48	82	108	113	140	135	128	154	145	157	137	126	156	113	68	74	55	62	37	2201N
15	R	31	28	29	31	53	59	77	112	116	138	169	120	167	127	131	151	158	139	108	95	83	74	58	23	2277N
16	F	22	55	22	31	47	69	94	85	104	133	141	168	160	175	172	158	168	176	193	149	109	85	75	46	2637N
17	A	41	33	23	25	25	31	40	68	82	138	167	200	184	160	172	179	150	139	132	126	96	75	67	46	2399N
18	S	37	19	16	19	17	15	31	34	46	66	123	166	188	179	195	185	195	234	186	144	138	92	76	55	2456N
19	M	32	21	22	34	51	83	106	131	118	135	142	142	141	139	109	113	141	124	94	81	49	55	47	35	2145N
20	T	35	25	27	33	37	52	104	125	94	134	147	149	123	115	122	102	130	112	110	82	70	48	39	34	2049N
21	W	31	24	31	28	55	62	105	99	102	125	125	118	130	120	120	133	137	104	102	62	58	61	43	37	2012N
22	R	23	22	25	34	52	69	104	106	113	134	139	138	147	120	135	122	153	134	100	87	64	57	38	33	2149N
23	F	32	24	29	28	42	57	110	93	88	118	134	140	157	140	180	158	162	172	176	132	104	74	73	33	2456N
24	A	31	27	19	21	36	19	45	66	90	143	132	165	171	156	142	172	138	134	146	107	86	78	56	38	2218N
25	S	31	18	19	15	18	18	19	30	44	71	104	154	177	164	148	183	204	173	150	138	92	86	54	27	2137N
26	M	32	23	29	18	50	75	123	129	117	127	153	117	151	115	114	120	118	116	98	61	49	49	56	18	2058N
27	T	28	13	22	32	53	70	84	105	108	130	114	132	129	113	106	117	136	103	86	70	73	45	46	47	1962N
28	W	30	19	28	34	44	57	90	109	112	128	126	137	122	118	95	140	121	129	90	76	77	35	53	33	2003N
29	R	29	28	25	27	53	66	96	114	96	125	128	137	131	123	124	142	123	119	117	68	87	53	53	34	2098N
30	F	37	32	30	31	44	54	103	102	116	117	146	153	176	181	220	165	188	253	243	259	221	145	96	52	3164A
31	A	42	29	34	21	39	30	38	57	82	147	231	223	242	172	190	172	147	138	123	99	102	78	69	37	2542N

WEEKDAY AVERAGE = 2272 SATURDAY AVERAGE = 2405 SUNDAY AVERAGE = 2407 NUMBER OF GOOD DAYS 31 TOTAL MONTHLY COUNT = 72092
MONTHLY AVERAGE = 2310

COMMENTS:
8/2-4: FLORIDA STATE SALES TAX HOLIDAY WEEKEND
8/20: PUBLIC SCHOOLS OPEN
8/21-28: COLLEGES & UNIVERSITIES OPEN FOR FALL SEMESTER

"B"-----> BAD DAY
"N"-----> NORMAL DAY
"A"-----> ATYPICAL DAY
"H"-----> ATYPICAL DAY (HOLIDAY)
"S"-----> ATYPICAL DAY (SPECIAL EVENT)

NOTE: ATYPICAL DAYS HAVE COUNTS THAT ARE HIGHER OR LOWER THAN NORMAL, BUT STILL REASONABLE, AND NO LOCAL SPECIAL EVENTS ARE KNOWN.

DATE 03/26/14

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC COUNTS
HOURLY CONTINUOUS COUNTS FINAL REPORT
AUGUST 2013

COUNTY NAME: INDIAN RIVER STATION: 0139 DIRECTION: W LANE: 0
DESCRIPTION: SR 60-1.5 MI E OF BLUE CYPRESS LK RD INDIAN RIV CO
LOCATION: COUNTY 88 SECTION 060 SUBSECTION 000 MILEPOST 6.051 ROUTES: SR-60

DY	D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAILY
1	R	23	14	12	14	27	39	89	106	140	141	159	146	155	166	177	151	155	135	121	82	64	58	39	44	2257N
2	F	22	13	9	17	21	43	99	111	161	178	172	189	182	193	236	225	198	196	195	130	91	81	40	45	2847N
3	A	23	18	14	22	21	32	88	107	138	172	203	187	153	189	161	127	132	124	120	83	76	47	36	21	2294N
4	S	12	11	13	7	13	17	32	59	78	109	164	178	173	183	189	173	186	172	139	112	85	68	32	16	2221N
5	M	19	12	11	18	31	48	108	139	147	141	155	149	183	155	158	152	140	142	96	88	47	44	48	23	2254N
6	T	22	10	9	16	24	45	85	140	135	124	118	157	160	157	167	153	127	137	86	67	53	50	35	32	2109N
7	W	16	10	13	16	27	49	93	126	147	111	150	137	145	163	153	144	156	134	103	92	59	47	34	32	2157N
8	R	29	15	12	18	28	39	96	105	141	172	172	183	163	192	190	182	175	118	126	79	54	68	28	29	2414N
9	F	26	15	14	25	17	40	101	111	156	168	190	187	206	209	191	184	225	187	189	140	93	78	45	48	2845N
10	A	29	9	14	12	20	37	66	106	151	188	189	180	163	155	196	161	134	159	112	102	91	59	38	28	2399N
11	S	14	12	9	10	8	26	30	51	107	109	158	167	209	187	183	207	209	211	151	136	100	72	37	32	2435N
12	M	18	11	10	12	35	47	74	131	117	138	142	171	151	149	140	152	137	150	128	86	84	52	41	31	2207N
13	T	29	13	12	19	35	46	75	106	157	124	141	150	153	166	141	135	158	144	104	70	68	57	32	33	2168N
14	W	22	14	16	17	28	34	94	122	142	156	144	146	160	151	163	177	159	124	105	93	57	53	33	32	2242N
15	R	32	10	9	12	28	37	94	118	145	163	138	133	191	159	181	183	162	136	110	78	57	45	34	23	2278N
16	F	26	9	13	23	27	45	81	107	138	148	191	171	186	229	200	199	206	221	173	130	97	70	43	38	2771N
17	A	34	16	7	14	23	41	85	113	166	206	205	184	191	169	162	154	130	138	96	108	69	64	49	44	2468N
18	S	25	13	8	7	13	17	35	59	104	156	152	148	156	151	166	179	165	163	151	99	75	58	33	22	2155N
19	M	13	12	14	12	36	49	101	128	133	139	141	143	137	142	157	139	145	138	111	80	57	51	42	36	2156N
20	T	15	11	15	18	26	49	88	134	122	155	141	128	141	126	138	133	129	128	81	73	52	53	35	35	2026N
21	W	24	15	12	10	32	45	82	125	142	120	137	150	130	145	140	130	139	144	95	69	68	46	41	24	2065N
22	R	26	13	12	17	27	43	99	103	127	132	139	165	164	148	147	136	163	129	112	91	58	53	38	27	2169N
23	F	37	19	13	19	26	46	100	82	136	148	149	148	152	183	206	223	185	204	164	120	91	61	70	39	2621N
24	A	31	17	11	13	25	49	66	114	140	183	161	182	127	127	144	156	134	122	117	87	61	56	37	31	2191N
25	S	15	9	7	6	12	16	33	60	91	139	120	154	151	140	171	151	136	143	143	94	86	50	44	25	1996N
26	M	10	12	13	7	35	49	96	102	122	124	119	119	117	142	144	115	128	112	82	69	57	46	34	22	1876N
27	T	24	14	19	16	21	51	66	111	128	120	126	139	125	131	137	126	128	109	80	86	58	45	32	35	1927N
28	W	23	19	14	11	25	38	90	99	114	124	123	107	133	131	137	139	125	116	88	67	48	41	38	25	1875N
29	R	24	13	13	12	17	41	92	109	136	120	109	134	146	171	146	159	149	146	108	72	59	49	36	33	2094N
30	F	21	18	8	22	26	55	87	97	131	144	157	162	212	192	189	263	242	256	212	156	94	71	67	55	2937N
31	A	34	8	18	14	22	40	78	114	157	188	193	201	170	186	136	155	141	128	99	106	76	53	50	26	2393N

WEEKDAY AVERAGE = 2262 SATURDAY AVERAGE = 2266 SUNDAY AVERAGE = 2202 NUMBER OF GOOD DAYS 31 TOTAL MONTHLY COUNT = 70847
MONTHLY AVERAGE = 2266

COMMENTS:
"B"-----> BAD DAY
"N"-----> NORMAL DAY
"A"-----> ATYPICAL DAY
"H"-----> ATYPICAL DAY (HOLIDAY)
"S"-----> ATYPICAL DAY (SPECIAL EVENT)
8/2-4: FLORIDA STATE SALES TAX HOLIDAY WEEKEND
8/20: PUBLIC SCHOOLS OPEN
8/21-28: COLLEGES & UNIVERSITIES OPEN FOR FALL SEMESTER

NOTE: ATYPICAL DAYS HAVE COUNTS THAT ARE HIGHER OR LOWER THAN NORMAL, BUT STILL REASONABLE, AND NO LOCAL SPECIAL EVENTS ARE KNOWN.

DATE 03/26/14

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC COUNTS
HOURLY CONTINUOUS COUNTS FINAL REPORT
SEPTEMBER 2013

COUNTY NAME: INDIAN RIVER STATION: 0139 DIRECTION: E LANE: 0
DESCRIPTION: SR 60-1.5 MI E OF BLUE CYPRESS LK RD INDIAN RIV CO
LOCATION: COUNTY 88 SECTION 060 SUBSECTION 000 MILEPOST 6.051 ROUTES: SR-60

DY	D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAILY
1	S	27	23	17	18	15	18	27	26	63	98	155	243	201	170	157	165	165	153	133	125	113	87	52	52	2303N
2	M	33	19	14	14	22	28	29	34	52	96	188	207	242	231	257	204	206	209	191	137	100	80	58	30	2681H
3	T	31	22	24	139	205	370	367	518	643	581	653	705	681	594	163	142	151	113	96	65	54	37	39	30	6423A
4	W	25	26	24	23	52	68	119	110	94	130	126	123	129	121	109	110	140	117	81	63	50	49	50	19	1958N
5	R	27	30	21	41	47	71	105	92	101	128	151	133	138	118	109	129	139	106	78	98	64	68	42	32	2068N
6	F	23	24	24	41	54	70	97	112	116	113	129	166	132	139	155	160	181	157	182	102	117	81	55	33	2463N
7	A	22	69	30	18	25	27	48	63	79	96	148	163	169	170	145	124	136	116	119	92	86	56	52	43	2096A
8	S	30	17	23	11	12	16	18	26	45	78	101	134	162	167	176	138	166	168	159	144	91	68	49	38	2037N
9	M	28	21	25	25	51	78	114	121	119	118	139	133	154	122	118	121	117	86	105	69	53	37	34	33	2021N
10	T	22	28	33	37	49	69	98	107	106	121	130	114	100	122	120	111	109	117	85	49	59	41	32	30	1889N
11	W	24	30	25	39	50	66	104	85	104	124	130	126	116	122	107	106	126	118	88	64	60	36	47	37	1934N
12	R	28	25	27	30	48	78	99	102	105	127	145	124	128	99	157	133	131	101	96	82	51	45	47	32	2040N
13	F	24	25	29	23	47	68	93	91	91	134	126	156	165	157	175	157	180	186	161	149	94	67	57	49	2504N
14	A	29	27	20	18	26	30	55	56	96	121	132	188	158	147	132	154	129	142	124	99	97	56	63	21	2120N
15	S	17	20	10	11	7	20	19	23	48	85	123	151	171	193	159	190	197	186	173	124	100	81	51	49	2208N
16	M	29	24	33	27	37	79	133	128	107	127	137	154	154	150	132	126	130	86	96	71	64	41	44	41	2150N
17	T	21	18	31	22	45	71	104	98	89	127	146	122	127	126	108	97	136	104	90	63	53	41	43	34	1916N
18	W	21	24	37	26	39	62	110	106	88	127	124	136	128	110	120	103	125	118	88	65	54	46	42	42	1941N
19	R	31	32	29	25	52	67	92	101	106	136	117	126	131	130	121	112	131	138	87	91	62	41	50	29	2037N
20	F	27	27	16	30	44	61	100	94	97	126	131	163	127	156	155	179	197	198	192	150	116	61	60	25	2532N
21	A	27	25	25	27	22	26	55	58	76	111	141	176	161	159	153	154	130	119	101	108	92	83	81	52	2162A
22	S	44	21	10	16	13	7	27	25	44	80	111	182	178	215	201	193	202	225	200	110	115	79	73	42	2413N
23	M	25	19	27	28	56	91	118	107	97	129	116	151	124	114	120	106	101	119	101	52	60	40	29	28	1958N
24	T	20	23	19	28	51	64	92	84	95	105	120	100	133	118	103	106	102	99	73	57	55	35	29	18	1729N
25	W	19	27	23	33	35	69	92	102	90	109	122	123	106	100	128	111	106	121	95	52	46	49	39	26	1823N
26	R	25	14	38	28	45	67	94	100	121	121	130	129	141	124	141	116	142	123	101	92	77	54	39	44	2106N
27	F	31	23	26	46	36	83	99	88	108	102	154	162	171	182	177	168	185	197	171	171	123	88	73	79	2743A
28	A	51	24	20	18	22	28	44	57	86	93	139	183	159	153	163	157	146	145	150	116	100	89	51	48	2242N
29	S	39	30	14	13	8	16	21	31	53	89	139	187	198	207	200	191	201	196	224	159	137	93	60	36	2542N
30	M	28	27	24	29	52	90	130	117	95	143	151	149	142	124	137	127	142	104	102	78	57	42	46	22	2158N

WEEKDAY AVERAGE = 2344 SATURDAY AVERAGE = 2155 SUNDAY AVERAGE = 2301 NUMBER OF GOOD DAYS 30 TOTAL MONTHLY COUNT = 69197
MONTHLY AVERAGE = 2311

COMMENTS:
9/2/2013, LABOR DAY

"B"====> BAD DAY
"N"====> NORMAL DAY
"A"====> ATYPICAL DAY
"H"====> ATYPICAL DAY (HOLIDAY)
"S"====> ATYPICAL DAY (SPECIAL EVENT)

NOTE: ATYPICAL DAYS HAVE COUNTS THAT ARE HIGHER OR LOWER THAN NORMAL, BUT STILL REASONABLE, AND NO LOCAL SPECIAL EVENTS ARE KNOWN.

DATE 03/26/14

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC COUNTS
HOURLY CONTINUOUS COUNTS FINAL REPORT
SEPTEMBER 2013

COUNTY NAME: INDIAN RIVER STATION: 0139 DIRECTION: W LANE: 0
DESCRIPTION: SR 60-1.5 MI E OF BLUE CYPRESS LK RD INDIAN RIV CO
LOCATION: COUNTY 88 SECTION 060 SUBSECTION 000 MILEPOST 6.051 ROUTES: SR-60

DY	D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAILY						
1	S	19	13	13	5	14	17	30	57	85	113	157	156	120	165	139	170	165	156	135	113	84	54	37	24	2041N						
2	M	20	18	6	14	15	20	46	58	72	156	208	256	265	259	266	237	224	199	176	122	99	45	34	17	2832H						
3	T	19	12	7	39	84	139	252	370	224	175	128	151	140	136	135	136	133	144	74	63	67	40	33	30	2731A						
4	W	29	8	14	24	25	55	77	90	142	130	107	137	144	153	123	133	130	122	93	75	49	39	42	29	1970N						
5	R	29	11	13	20	37	42	88	79	126	124	112	150	134	149	147	147	147	122	110	68	57	45	32	35	2024N						
6	F	20	14	14	16	31	42	97	84	140	135	159	165	153	165	172	204	208	191	151	105	83	49	43	31	2472N						
7	A	26	14	12	17	19	39	84	95	129	149	153	151	136	115	114	148	126	114	92	75	53	37	37	22	1957N						
8	S	19	15	6	11	14	13	19	62	80	105	139	143	146	157	160	148	149	133	117	101	69	45	43	16	1910N						
9	M	11	12	12	8	33	60	87	95	115	138	153	148	141	136	142	134	115	137	77	64	51	47	39	27	1982N						
10	T	21	19	11	11	28	46	86	112	114	132	126	131	135	129	122	133	122	112	95	58	55	50	33	36	1917N						
11	W	20	15	11	13	17	50	77	102	134	121	131	110	135	135	158	134	125	121	86	55	49	44	37	17	1897N						
12	R	21	17	14	14	29	45	68	89	103	129	129	128	119	163	141	162	152	134	90	73	48	44	47	31	1990N						
13	F	18	18	16	16	35	38	69	107	136	159	153	189	176	164	208	209	219	235	177	133	75	62	68	38	2718N						
14	A	25	17	13	14	27	38	69	97	128	163	187	138	148	137	144	136	115	98	79	74	61	42	37	20	2007N						
15	S	17	13	6	4	22	13	32	31	61	120	139	178	156	148	149	177	174	149	99	87	55	48	16	17	1911N						
16	M	10	9	12	12	37	70	90	91	138	122	149	145	152	130	137	128	130	117	84	73	56	58	27	29	2006N						
17	T	24	16	11	15	21	47	80	111	112	119	128	135	141	136	161	134	134	127	108	102	48	42	37	27	2016N						
18	W	18	19	9	18	23	48	80	94	167	121	123	106	148	151	160	124	122	143	107	72	56	42	32	33	2016N						
19	R	21	8	14	14	24	50	85	95	147	125	154	139	157	131	144	142	176	112	107	76	58	60	22	31	2092N						
20	F	23	22	14	23	23	40	95	110	113	164	160	174	178	175	208	220	234	214	163	120	86	64	62	49	2734N						
21	A	26	16	15	10	19	38	100	106	163	197	181	183	123	135	125	141	123	138	117	83	73	58	27	27	2224N						
22	S	12	6	11	4	14	18	35	48	71	123	165	158	151	140	144	162	163	168	156	112	81	60	25	22	2049N						
23	M	12	7	9	10	42	50	96	123	142	148	145	158	118	140	122	143	115	105	80	82	51	54	32	23	2007N						
24	T	25	9	14	14	18	50	78	113	107	125	121	117	130	135	141	135	115	115	97	68	53	43	29	33	1885N						
25	W	24	15	18	9	30	57	72	88	110	128	115	117	128	138	121	150	128	113	82	73	48	34	36	23	1857N						
26	R	20	15	11	17	26	46	73	115	117	108	124	148	162	157	144	154	149	149	97	90	53	58	40	27	2100N						
27	F	28	14	12	17	31	54	73	127	136	146	169	172	193	195	193	255	229	225	183	147	100	67	58	41	2865N						
28	A	29	18	12	18	29	49	75	128	171	182	176	150	125	153	149	146	152	113	107	99	84	46	39	23	2273N						
29	S	21	8	16	7	13	24	31	54	87	122	130	137	147	158	161	185	165	179	130	114	79	51	29	26	2074N						
30	M	11	8	11	8	34	55	85	94	110	128	130	134	144	137	161	134	132	107	89	73	62	46	30	28	1951N						
=====																																
WEEKDAY AVERAGE =		2195				SATURDAY AVERAGE =				2115				SUNDAY AVERAGE =				1997				NUMBER OF GOOD DAYS				30		TOTAL MONTHLY COUNT =		64508		
MONTHLY AVERAGE =		2156				=====																										

COMMENTS:
9/2/2013, LABOR DAY

"B"=====> BAD DAY
"N"=====> NORMAL DAY
"A"=====> ATYPICAL DAY
"H"=====> ATYPICAL DAY (HOLIDAY)
"S"=====> ATYPICAL DAY (SPECIAL EVENT)

NOTE: ATYPICAL DAYS HAVE COUNTS THAT ARE HIGHER OR LOWER THAN NORMAL, BUT STILL REASONABLE, AND NO LOCAL SPECIAL EVENTS ARE KNOWN.

DATE 03/26/14

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC COUNTS
HOURLY CONTINUOUS COUNTS FINAL REPORT
OCTOBER 2013

COUNTY NAME: INDIAN RIVER STATION: 0139 DIRECTION: E LANE: 0
DESCRIPTION: SR 60-1.5 MI E OF BLUE CYPRESS LK RD INDIAN RIV CO
LOCATION: COUNTY 88 SECTION 060 SUBSECTION 000 MILEPOST 6.051 ROUTES: SR-60

DY	D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAILY
1	T	21	18	22	29	57	61	100	113	110	124	136	104	144	112	118	122	104	119	70	79	47	50	47	36	1943N
2	W	19	21	27	36	41	62	104	109	88	123	135	113	150	109	113	154	125	124	93	55	59	39	43	38	1980N
3	R	26	22	32	32	51	68	105	108	109	115	137	130	115	140	121	131	150	130	111	73	71	55	41	33	2106N
4	F	26	26	23	35	47	68	89	102	127	111	150	153	155	155	175	193	171	189	192	130	94	64	56	45	2576N
5	A	27	28	21	25	14	30	57	53	73	117	170	189	175	141	167	158	135	133	120	120	97	67	60	66	2243N
6	S	36	37	18	12	18	16	37	27	40	86	138	215	200	199	188	201	199	196	222	157	130	84	54	36	2546N
7	M	21	29	30	38	60	82	117	136	118	125	126	139	139	136	120	142	118	106	86	78	54	46	45	27	2118N
8	T	16	31	34	30	48	69	108	99	113	120	146	146	116	101	113	113	129	105	85	79	54	41	48	36	1980N
9	W	26	20	36	42	50	66	97	108	86	113	142	128	122	124	118	142	136	121	95	70	52	47	48	33	2022N
10	R	30	24	29	28	54	69	117	99	103	118	127	143	126	127	123	127	133	139	108	103	56	52	47	38	2120N
11	F	30	26	36	26	47	60	101	117	102	113	140	157	162	172	203	180	205	181	192	146	96	74	65	52	2683N
12	A	33	24	22	22	28	30	56	65	84	125	144	186	177	153	155	142	170	162	127	120	111	73	53	42	2304N
13	S	30	26	17	20	13	16	19	35	60	102	130	188	184	200	203	229	205	216	212	154	151	94	63	43	2610N
14	M	34	23	32	27	49	92	126	138	119	141	143	196	192	191	160	154	142	148	110	84	67	46	59	37	2510N
15	T	25	22	26	29	48	59	103	124	95	125	134	132	128	142	134	124	137	121	116	77	51	55	40	34	2081N
16	W	28	20	24	41	52	69	103	117	107	132	126	142	150	132	131	130	144	126	144	85	50	46	53	29	2181N
17	R	37	24	26	34	46	53	107	102	97	127	138	145	143	147	132	133	143	124	116	87	63	60	51	35	2170N
18	F	24	31	23	32	53	55	116	89	98	137	126	185	162	184	172	182	185	173	191	157	105	88	70	48	2686N
19	A	35	32	23	20	26	23	57	92	106	133	144	171	240	173	181	174	167	138	169	117	107	70	66	52	2516N
20	S	24	23	21	12	17	16	27	42	50	82	130	203	234	205	204	232	217	250	175	158	139	83	55	49	2648N
21	M	28	27	31	30	55	83	134	121	105	127	143	151	145	151	151	142	153	105	102	73	58	43	38	34	2230N
22	T	27	30	26	42	46	71	111	135	91	134	124	146	153	132	126	109	128	116	94	56	54	49	46	35	2081N
23	W	31	23	19	43	32	59	121	104	118	95	153	164	132	116	144	153	132	149	87	77	52	38	45	29	2116N
24	R	22	23	31	27	60	69	94	120	101	111	137	146	141	159	135	176	164	160	130	97	80	56	42	50	2331N
25	F	33	26	34	43	47	60	109	112	84	124	134	148	186	207	194	195	213	227	207	131	104	78	70	41	2807N
26	A	28	28	26	22	27	44	59	56	93	124	159	147	178	162	166	174	180	167	154	130	97	86	50	43	2400N
27	S	35	19	19	25	19	20	19	29	53	101	129	218	219	240	255	241	248	226	199	175	137	94	80	37	2837N
28	M	28	24	30	34	55	80	154	119	139	104	132	172	159	139	127	138	147	126	114	90	69	46	42	25	2293N
29	T	31	18	24	30	54	49	103	113	114	127	136	132	129	136	123	131	119	127	113	79	46	43	33	26	2036N
30	W	25	21	31	37	39	70	109	102	116	127	139	143	127	152	133	172	151	139	123	82	67	46	43	39	2233N
31	R	27	21	30	34	50	58	121	112	100	129	143	131	128	126	128	146	134	154	126	104	61	50	47	29	2189N

WEEKDAY AVERAGE = 2258 SATURDAY AVERAGE = 2366 SUNDAY AVERAGE = 2660 NUMBER OF GOOD DAYS 31 TOTAL MONTHLY COUNT = 71576
MONTHLY AVERAGE = 2331

COMMENTS:
10/14, COLUMBUS DAY - 10/31, HALLOWEEN

"B"====> BAD DAY
"N"====> NORMAL DAY
"A"====> ATYPICAL DAY
"H"====> ATYPICAL DAY (HOLIDAY)
"S"====> ATYPICAL DAY (SPECIAL EVENT)

NOTE: ATYPICAL DAYS HAVE COUNTS THAT ARE HIGHER OR LOWER THAN NORMAL, BUT STILL REASONABLE, AND NO LOCAL SPECIAL EVENTS ARE KNOWN.

DATE 03/26/14

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC COUNTS
HOURLY CONTINUOUS COUNTS FINAL REPORT
OCTOBER 2013

COUNTY NAME: INDIAN RIVER STATION: 0139 DIRECTION: W LANE: 0
DESCRIPTION: SR 60-1.5 MI E OF BLUE CYPRESS LK RD INDIAN RIV CO
LOCATION: COUNTY 88 SECTION 060 SUBSECTION 000 MILEPOST 6.051 ROUTES: SR-60

DY	D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAILY
1	T	23	12	13	17	28	52	86	106	138	128	143	165	151	126	149	150	132	127	89	66	47	37	32	33	2050N
2	W	16	15	11	17	27	50	60	106	123	118	115	123	130	153	171	143	152	115	76	73	55	42	36	35	1962N
3	R	23	16	14	14	23	46	88	97	125	134	130	132	155	164	159	157	142	133	103	84	76	56	35	33	2139N
4	F	17	18	14	8	36	53	102	99	113	143	158	198	196	209	226	197	203	254	163	136	81	64	53	36	2777N
5	A	30	18	10	13	31	44	64	102	130	171	198	149	134	154	163	133	150	123	112	101	64	68	42	25	2229N
6	S	11	10	11	6	4	25	47	52	72	133	155	171	170	159	198	153	167	154	124	106	88	48	22	16	2102N
7	M	18	14	7	10	30	48	107	110	122	143	167	137	159	149	146	157	128	113	88	83	54	31	31	17	2069N
8	T	19	14	6	10	32	37	94	92	144	132	123	135	152	145	141	136	153	131	90	66	51	49	52	31	2035N
9	W	17	16	17	17	21	44	84	115	123	146	115	125	131	158	132	126	131	145	95	83	54	40	29	27	1991N
10	R	20	16	12	19	21	58	93	133	129	144	143	149	150	141	147	201	158	128	109	79	63	60	35	29	2237N
11	F	27	28	8	16	20	52	89	102	136	163	161	199	189	197	230	253	238	237	185	143	79	63	47	36	2898N
12	A	24	8	18	11	24	41	76	122	157	169	193	142	160	159	172	161	132	117	92	100	65	62	48	31	2284N
13	S	17	12	7	7	14	21	45	72	108	145	174	171	191	164	155	173	154	165	139	108	78	45	40	27	2232N
14	M	21	9	15	18	37	66	80	126	124	117	150	140	154	209	143	148	154	137	103	64	69	46	28	28	2186N
15	T	19	12	9	15	29	52	91	121	141	148	131	139	142	131	159	149	145	121	111	76	55	40	33	27	2096N
16	W	18	16	10	21	19	46	94	113	138	118	121	114	144	135	166	167	160	146	99	74	58	53	26	33	2089N
17	R	26	15	22	12	27	64	86	109	131	121	147	143	184	179	170	170	185	177	103	68	72	59	30	22	2295N
18	F	20	10	10	16	18	62	83	130	139	180	178	194	222	201	212	248	242	243	192	142	82	61	54	36	2975N
19	A	21	23	20	19	15	51	80	129	165	199	202	193	169	184	146	164	132	136	116	86	68	46	52	56	2472N
20	S	28	7	13	17	9	19	52	65	87	133	172	161	162	192	173	169	182	171	138	124	96	62	31	31	2294N
21	M	21	17	7	23	30	65	116	110	130	125	162	132	146	150	154	164	148	117	104	67	49	54	40	36	2167N
22	T	19	16	17	17	16	52	103	111	124	145	153	149	127	132	144	124	127	149	85	62	58	41	34	25	2030N
23	W	20	20	10	20	24	49	86	107	118	138	116	135	145	154	168	149	129	135	107	71	68	49	40	33	2091N
24	R	37	20	10	16	32	39	90	112	138	151	174	130	195	187	156	179	199	174	123	88	88	52	34	43	2467N
25	F	20	14	11	26	32	57	91	126	156	174	154	216	200	204	253	239	220	244	206	147	107	79	42	33	3051N
26	A	33	7	14	26	18	41	75	131	162	166	174	182	146	182	177	152	128	131	125	91	63	30	33	27	2314N
27	S	21	11	9	8	11	22	39	45	78	137	166	160	190	182	203	216	163	158	152	122	61	68	27	20	2269N
28	M	23	18	13	18	33	66	97	127	122	130	141	139	134	162	137	147	147	139	94	85	58	40	40	28	2138N
29	T	18	12	11	11	33	53	76	133	161	140	158	134	149	155	142	146	147	127	89	62	53	49	31	25	2115N
30	W	19	14	13	10	19	41	82	125	140	130	128	125	148	152	150	172	154	183	82	84	61	45	39	23	2139N
31	R	25	18	13	10	17	51	81	112	120	129	147	174	160	169	177	137	176	151	99	59	68	61	28	22	2204N

WEEKDAY AVERAGE = 2290 SATURDAY AVERAGE = 2325 SUNDAY AVERAGE = 2224 NUMBER OF GOOD DAYS 31 TOTAL MONTHLY COUNT = 70397
MONTHLY AVERAGE = 2286

COMMENTS:
10/14, COLUMBUS DAY - 10/31, HALLOWEEN

"B"====> BAD DAY
"N"====> NORMAL DAY
"A"====> ATYPICAL DAY
"H"====> ATYPICAL DAY (HOLIDAY)
"S"====> ATYPICAL DAY (SPECIAL EVENT)

NOTE: ATYPICAL DAYS HAVE COUNTS THAT ARE HIGHER OR LOWER THAN NORMAL, BUT STILL REASONABLE, AND NO LOCAL SPECIAL EVENTS ARE KNOWN.

DATE 03/26/14

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC COUNTS
HOURLY CONTINUOUS COUNTS FINAL REPORT
NOVEMBER 2013

COUNTY NAME: INDIAN RIVER STATION: 0139 DIRECTION: E LANE: 0
DESCRIPTION: SR 60-1.5 MI E OF BLUE CYPRESS LK RD INDIAN RIV CO
LOCATION: COUNTY 88 SECTION 060 SUBSECTION 000 MILEPOST 6.051 ROUTES: SR-60

DY	D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAILY
1	F	38	23	28	32	54	43	103	104	114	129	157	182	163	159	184	180	225	200	211	154	105	71	58	37	2754N
2	A	29	31	19	13	19	27	43	58	81	128	156	164	155	222	190	186	189	154	153	119	75	52	48	49	2360N
3	S	34	12	7	6	20	13	22	41	76	107	182	212	224	239	234	239	228	208	246	215	106	80	46	39	2836N
4	M	32	25	28	28	60	71	159	130	120	145	142	152	144	113	141	124	152	125	96	71	64	44	48	21	2235N
5	T	18	29	28	27	43	70	125	118	116	110	136	115	129	138	142	140	121	132	105	85	60	46	46	23	2102N
6	W	24	31	22	33	49	62	110	103	108	125	135	128	118	133	138	130	150	154	113	75	73	58	43	31	2146N
7	R	26	28	32	27	55	64	136	113	118	121	143	151	172	144	134	157	176	163	128	82	63	67	59	37	2396N
8	F	33	26	24	32	55	64	99	125	122	143	124	198	199	184	197	183	232	218	187	180	113	80	75	31	2924N
9	A	28	30	18	20	20	33	50	75	90	155	158	182	191	166	183	185	189	164	156	130	100	83	42	40	2488N
10	S	26	14	12	8	23	16	31	43	59	84	174	238	266	183	350	224	251	238	192	138	112	80	52	32	2846A
11	M	30	28	22	32	57	84	158	128	135	141	159	183	178	200	177	177	169	146	129	108	69	55	60	44	2669N
12	T	33	22	36	35	53	73	133	137	101	121	144	143	155	151	154	153	137	128	93	82	68	42	45	35	2274N
13	W	18	21	23	25	37	74	114	103	102	129	121	131	140	144	144	106	130	125	111	72	54	46	48	41	2059N
14	R	26	23	27	29	50	68	116	116	114	147	151	149	155	141	130	160	149	153	110	83	62	49	46	34	2288N
15	F	31	27	24	33	64	95	102	109	97	127	152	157	163	165	182	194	227	242	171	123	101	86	52	54	2778N
16	A	48	52	32	21	36	31	55	77	100	130	156	176	214	145	159	153	146	151	114	114	75	49	51	34	2319N
17	S	22	21	12	17	22	23	29	37	50	87	150	226	177	206	200	230	232	229	192	160	97	75	51	48	2593N
18	M	34	20	24	35	61	72	148	130	141	126	164	176	166	160	144	142	163	128	121	72	60	40	45	25	2397N
19	T	28	26	32	33	55	68	130	121	110	121	114	131	142	149	127	123	144	137	97	70	47	45	55	34	2139N
20	W	28	27	28	34	42	76	127	124	118	134	161	128	117	131	122	123	134	138	110	83	63	53	44	38	2183N
21	R	34	21	28	40	61	77	111	113	105	128	123	166	152	147	155	118	142	137	96	72	62	59	46	38	2231N
22	F	30	21	32	41	45	78	102	83	93	123	133	153	167	198	172	173	207	204	198	119	114	70	77	33	2666N
23	A	38	36	33	23	33	32	46	67	101	134	151	205	211	184	164	188	186	171	142	106	116	91	71	40	2569N
24	S	25	32	14	21	24	17	25	29	75	104	151	224	212	238	251	269	281	238	198	124	115	70	62	24	2823N
25	M	25	24	30	32	49	98	135	133	119	135	152	177	201	186	193	164	169	142	135	110	62	72	59	48	2650N
26	T	33	29	31	37	56	66	112	127	116	143	161	161	190	186	169	209	175	173	119	111	97	110	100	49	2760A
27	W	36	30	30	49	58	65	101	92	107	138	217	259	266	243	291	294	297	276	295	244	157	121	104	67	3837A
28	R	46	39	29	28	14	12	27	36	91	184	338	354	347	202	150	139	140	197	205	199	157	115	68	48	3165H
29	F	25	20	20	26	41	56	80	77	111	149	201	211	315	237	219	226	220	186	186	124	89	85	66	66	3036A
30	A	40	23	24	26	18	24	43	61	91	126	218	282	270	274	255	238	223	219	209	148	108	119	85	45	3169A

WEEKDAY AVERAGE = 2543 SATURDAY AVERAGE = 2581 SUNDAY AVERAGE = 2775 NUMBER OF GOOD DAYS 30 TOTAL MONTHLY COUNT = 77692
MONTHLY AVERAGE = 2582

COMMENTS:
11/3: DAYLIGHT SAVINGS TIME ENDS
11/11, VETERAN'S DAY - 11/28, THANKSGIVING DAY

"B"====> BAD DAY
"N"====> NORMAL DAY
"A"====> ATYPICAL DAY
"H"====> ATYPICAL DAY (HOLIDAY)
"S"====> ATYPICAL DAY (SPECIAL EVENT)

NOTE: ATYPICAL DAYS HAVE COUNTS THAT ARE HIGHER OR LOWER THAN NORMAL, BUT STILL REASONABLE, AND NO LOCAL SPECIAL EVENTS ARE KNOWN.

DATE 03/26/14

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC COUNTS
HOURLY CONTINUOUS COUNTS FINAL REPORT
NOVEMBER 2013

COUNTY NAME: INDIAN RIVER STATION: 0139 DIRECTION: W LANE: 0
DESCRIPTION: SR 60-1.5 MI E OF BLUE CYPRESS LK RD INDIAN RIV CO
LOCATION: COUNTY 88 SECTION 060 SUBSECTION 000 MILEPOST 6.051 ROUTES: SR-60

DY	D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAILY
1	F	29	15	18	18	22	54	90	118	204	147	227	186	213	222	258	293	268	272	181	144	100	66	47	29	3221N
2	A	27	9	19	15	30	68	119	177	193	207	191	177	145	148	163	129	135	152	83	74	58	42	33	22	2416N
3	S																									2198B
4	M	7	11	8	18	37	60	109	133	137	142	151	154	176	140	150	145	139	119	91	65	52	45	31	24	2144N
5	T	21	15	14	9	17	47	104	116	140	136	168	151	139	154	148	141	166	131	94	54	55	42	30	18	2110N
6	W	12	8	15	18	29	52	91	126	151	130	135	146	112	151	162	158	148	117	100	64	48	53	38	24	2088N
7	R	23	17	14	18	35	58	99	127	165	153	142	184	133	181	136	164	199	174	124	93	66	57	32	31	2425N
8	F	35	18	11	17	32	59	127	148	154	229	214	228	207	295	266	262	249	220	175	141	84	63	60	47	3341N
9	A	31	15	13	10	36	38	90	145	202	202	215	172	165	174	153	159	126	146	85	69	50	46	35	19	2396N
10	S	9	11	12	10	16	24	31	78	103	153	180	186	178	180	169	168	162	142	118	85	64	45	36	17	2177N
11	M	21	11	8	18	30	65	77	109	186	162	175	197	197	173	196	192	180	151	120	82	52	57	34	25	2518N
12	T	19	11	12	15	28	51	102	145	148	150	177	145	130	130	152	151	149	147	105	89	46	34	29	24	2189N
13	W	20	15	13	11	36	62	80	121	150	140	122	147	151	141	147	157	158	135	90	60	63	36	35	23	2113N
14	R	28	13	14	19	31	58	103	121	138	125	164	154	160	152	155	179	178	145	99	94	77	47	35	20	2309N
15	F	28	12	22	11	33	62	94	137	180	150	212	205	222	234	204	240	271	225	180	110	89	59	44	47	3071N
16	A	44	16	15	11	27	43	75	115	153	165	187	187	177	150	135	140	132	131	146	68	59	35	37	19	2267N
17	S	15	13	7	9	24	20	40	75	129	160	169	167	162	161	166	165	168	148	97	96	72	55	26	15	2159N
18	M	16	8	6	14	28	57	105	130	151	161	161	148	151	161	127	145	155	135	105	63	46	40	28	31	2172N
19	T	23	12	22	22	27	52	103	129	140	163	143	147	135	137	154	178	162	140	90	70	55	27	30	29	2190N
20	W	25	17	14	11	22	40	97	120	139	144	169	159	185	162	170	151	153	148	73	64	43	25	29	15	2175N
21	R	16	15	16	18	23	58	79	114	148	133	148	154	169	153	177	181	140	132	105	62	46	54	40	35	2216N
22	F	27	22	10	16	24	55	104	109	155	180	177	178	200	211	220	255	247	253	187	123	85	66	42	46	2992N
23	A	31	17	20	21	33	55	112	154	178	219	226	186	186	175	153	161	163	149	101	72	68	56	21	23	2580N
24	S	11	16	11	14	11	19	46	53	109	124	168	140	145	160	194	160	167	134	88	85	53	50	42	28	2028N
25	M	13	10	13	18	26	58	95	134	149	180	163	193	190	164	204	150	148	158	123	75	64	47	36	25	2436N
26	T	30	19	13	25	25	39	97	134	167	156	171	184	183	212	155	196	198	179	141	111	70	52	46	45	2648A
27	W	27	13	14	16	41	54	93	130	170	205	250	265	273	267	284	268	293	214	202	166	141	82	50	53	3571A
28	R	30	20	19	16	18	36	49	93	181	288	356	300	202	136	101	104	153	187	187	157	131	75	55	31	2925H
29	F	30	16	10	14	23	55	78	113	171	222	296	354	301	288	288	263	232	228	171	131	109	89	49	41	3572A
30	A	32	18	16	10	23	39	94	122	203	215	299	274	268	262	211	258	207	161	132	104	89	44	49	23	3153A

WEEKDAY AVERAGE = 2559 SATURDAY AVERAGE = 2562 SUNDAY AVERAGE = 2121 NUMBER OF GOOD DAYS 29 TOTAL MONTHLY COUNT = 73602
MONTHLY AVERAGE = 2497

COMMENTS:
11/3: DAYLIGHT SAVINGS TIME ENDS
11/11, VETERAN'S DAY - 11/28, THANKSGIVING DAY

"B"====> BAD DAY
"N"====> NORMAL DAY
"A"====> ATYPICAL DAY
"H"====> ATYPICAL DAY (HOLIDAY)
"S"====> ATYPICAL DAY (SPECIAL EVENT)

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DATE 03/26/14

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC COUNTS
HOURLY CONTINUOUS COUNTS FINAL REPORT
DECEMBER 2013

COUNTY NAME: INDIAN RIVER STATION: 0139 DIRECTION: E LANE: 0
DESCRIPTION: SR 60-1.5 MI E OF BLUE CYPRESS LK RD INDIAN RIV CO
LOCATION: COUNTY 88 SECTION 060 SUBSECTION 000 MILEPOST 6.051 ROUTES: SR-60

DY	D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAILY
1	S	44	26	18	18	16	22	41	46	59	124	235	287	310	501	531	473	429	431	359	362	331	327	344	70	5404A
2	M	41	38	33	41	56	100	121	137	110	123	145	179	166	160	143	146	150	151	129	82	67	64	48	36	2466N
3	T	23	29	25	45	59	72	105	132	103	134	152	140	143	156	127	107	145	131	124	86	60	47	45	2252N	
4	W	37	23	36	50	43	74	111	122	111	138	150	130	157	158	136	135	141	135	122	80	59	52	46	34	2280N
5	R	27	33	36	36	57	74	111	109	92	118	153	140	142	161	150	156	147	130	96	88	66	64	56	35	2277N
6	F	18	32	30	31	54	57	110	109	113	127	158	137	165	193	163	173	201	185	174	141	108	73	67	36	2655N
7	A	39	22	20	22	21	34	46	87	117	126	134	183	190	181	161	150	132	126	135	84	68	75	58	45	2256N
8	S	28	19	14	16	17	14	25	56	75	132	189	213	200	191	208	202	225	188	175	130	106	80	70	34	2607N
9	M	22	32	24	28	47	89	127	135	131	136	139	165	138	146	133	145	125	138	136	98	66	41	53	34	2328N
10	T	29	27	30	33	55	77	112	127	109	146	147	162	137	155	133	131	136	126	111	94	60	55	54	39	2285N
11	W	34	37	34	34	46	74	131	133	110	125	138	148	125	155	161	154	159	145	133	76	60	53	45	33	2343N
12	R	26	28	28	43	53	69	126	133	106	132	155	152	153	152	134	172	179	136	144	95	68	64	80	31	2459N
13	F	33	26	36	32	48	65	110	132	101	112	155	165	157	182	183	199	189	228	193	143	123	104	87	51	2854N
14	A	36	26	26	22	32	46	63	73	96	131	157	207	176	175	183	189	187	184	135	125	97	72	67	47	2552N
15	S	47	21	18	22	17	19	29	46	64	100	89	144	139	131	202	227	187	201	174	170	106	75	49	46	2323N
16	M	30	22	35	32	49	93	148	131	113	134	152	176	160	157	139	157	152	123	142	74	75	61	59	39	2453N
17	T	26	25	36	41	44	62	123	119	137	129	154	150	165	140	155	130	151	124	106	92	56	56	46	41	2308N
18	W	37	39	29	38	38	83	115	127	101	124	151	154	165	141	143	140	141	145	109	87	65	57	43	42	2314N
19	R	29	34	23	54	55	72	104	120	135	134	147	166	172	138	168	135	152	143	136	98	76	70	78	39	2478N
20	F	27	36	39	41	43	79	112	129	113	145	154	173	197	181	188	220	238	194	166	154	118	89	86	53	2975N
21	A	42	22	26	24	33	39	52	79	119	169	180	217	234	251	245	218	220	214	147	139	90	94	86	68	3008N
22	S	38	28	19	16	15	21	25	41	70	117	173	270	248	247	207	224	220	198	165	143	89	112	69	54	2809N
23	M	37	29	21	31	38	59	122	125	141	170	175	248	253	219	206	167	272	209	179	136	88	107	78	51	3161A
24	T	41	33	36	36	52	59	65	94	119	124	188	241	237	255	244	249	180	178	153	124	92	96	60	41	2997A
25	W	30	19	14	13	4	9	18	29	59	109	145	229	232	215	192	175	183	177	173	141	138	110	65	40	2519H
26	R	28	19	21	20	31	61	111	99	106	124	200	302	279	284	264	232	242	197	167	148	95	95	83	60	3268A
27	F	51	43	37	35	59	73	102	96	101	169	189	261	273	247	269	262	226	231	183	154	109	106	68	65	3409A
28	A	38	33	27	25	24	17	55	71	89	130	196	274	277	267	248	242	220	199	175	136	100	92	110	78	3123A
29	S	48	35	29	32	11	20	27	42	52	116	173	233	244	250	263	243	206	200	161	135	94	111	68	56	2849A
30	M	44	31	28	41	41	66	112	116	121	143	151	226	229	193	229	185	183	183	183	137	105	88	68	55	2958A
31	T	58	42	48	49	48	57	86	85	102	109	134	156	193	193	186	201	209	164	118	111	95	57	49	28	2578A
WEEKDAY AVERAGE = 2623 SATURDAY AVERAGE = 2735 SUNDAY AVERAGE = 3198 NUMBER OF GOOD DAYS 31 TOTAL MONTHLY COUNT = 84548																										
MONTHLY AVERAGE = 2721																										

COMMENTS:

WINTER BREAK: COLLEGES 12/16 - 1/6/14 - PUBLIC SCHOOLS 12/23 - 1/6/14
12/25, CHRISTMAS DAY; 12/31, NEW YEAR'S EVE

"B"-----> BAD DAY

"N"-----> NORMAL DAY

"A"-----> ATYPICAL DAY

"H"-----> ATYPICAL DAY (HOLIDAY)

"S"-----> ATYPICAL DAY (SPECIAL EVENT)

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DATE 03/26/14

FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC COUNTS
HOURLY CONTINUOUS COUNTS FINAL REPORT
DECEMBER 2013

COUNTY NAME: INDIAN RIVER STATION: 0139 DIRECTION: W LANE: 0
DESCRIPTION: SR 60-1.5 MI E OF BLUE CYPRESS LK RD INDIAN RIV CO
LOCATION: COUNTY 88 SECTION 060 SUBSECTION 000 MILEPOST 6.051 ROUTES: SR-60

DY	D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAILY
1	S	17	13	6	9	6	40	58	92	120	207	229	250	289	357	425	406	360	330	332	259	98	65	32	24	4024A
2	M	15	18	12	21	38	59	126	114	137	168	175	181	143	171	196	153	144	125	111	88	70	48	39	29	2381N
3	T	23	12	12	25	33	52	88	133	160	141	152	148	143	138	148	180	159	144	117	68	72	53	39	39	2279N
4	W	33	13	11	14	34	50	95	116	145	131	142	161	168	153	153	159	159	144	97	67	49	43	44	33	2214N
5	R	24	20	11	19	34	62	95	122	128	139	152	146	178	144	162	193	168	171	124	91	66	56	39	26	2370N
6	F	21	9	5	31	30	57	86	113	156	157	168	186	213	224	233	239	217	234	169	131	80	61	46	47	2913N
7	A	32	12	9	18	30	50	94	115	145	206	174	182	165	167	189	144	144	122	99	63	74	47	46	22	2349N
8	S	20	13	13	6	17	22	45	84	99	147	167	154	163	159	124	171	151	154	117	102	73	47	28	31	2107N
9	M	15	10	8	15	32	81	108	126	153	135	149	141	140	149	176	128	146	130	101	76	65	48	37	26	2195N
10	T	29	11	13	20	26	49	75	141	144	140	141	153	159	145	179	200	156	143	109	65	58	46	35	25	2262N
11	W	27	11	19	16	31	53	87	120	138	145	132	157	160	161	165	181	150	131	94	77	58	59	35	25	2232N
12	R	28	14	10	18	19	46	84	136	135	149	175	178	178	163	204	159	171	182	105	94	75	64	41	21	2449N
13	F	35	14	6	15	27	55	94	100	163	158	203	178	192	206	230	240	244	243	179	128	78	58	46	40	2932N
14	A	32	18	12	14	28	53	81	111	152	205	235	210	173	182	174	174	153	144	116	85	64	47	48	21	2532N
15	S	12	13	8	9	18	32	37	64	107	168	163	150	173	156	153	129	131	116	118	106	76	40	34	23	2036N
16	M	17	10	13	15	33	79	81	119	140	135	150	165	147	165	158	158	139	136	120	66	76	52	50	34	2258N
17	T	28	11	9	20	20	62	83	122	142	131	148	154	153	144	151	176	164	133	99	75	62	59	25	26	2197N
18	W	22	13	18	12	18	50	79	142	119	146	163	163	159	170	171	155	141	129	116	73	51	63	42	31	2246N
19	R	30	20	20	17	38	61	87	122	149	148	158	165	185	170	176	161	163	185	109	84	76	55	37	40	2456N
20	F	24	13	8	13	29	65	83	135	140	168	198	199	177	211	232	245	289	243	168	138	84	51	73	53	3039N
21	A	26	24	16	16	26	41	71	124	195	211	227	228	212	191	172	206	194	151	139	99	76	51	36	23	2755N
22	S	17	18	14	9	17	20	38	72	96	183	210	211	175	201	157	175	165	154	104	75	83	46	26	31	2297N
23	M	30	14	5	21	31	54	88	131	130	171	209	205	223	224	212	232	203	171	146	97	89	64	49	43	2842A
24	T	36	12	12	23	25	45	67	92	148	195	221	227	259	234	217	196	169	136	98	94	73	46	54	36	2715A
25	W	17	11	9	4	7	18	34	74	91	149	210	190	157	155	141	155	167	185	198	160	119	69	37	23	2380H
26	R	17	6	9	16	24	71	97	150	164	240	268	316	289	245	265	249	232	213	163	100	74	67	48	38	3361A
27	F	28	10	11	15	19	54	78	139	209	267	287	286	261	258	242	260	227	208	148	132	96	82	47	33	3397A
28	A	23	20	11	15	23	48	70	154	201	234	282	291	281	242	243	238	223	189	122	111	72	65	38	34	3230A
29	S	9	14	8	10	16	23	46	66	107	169	203	249	217	210	202	181	185	166	124	122	81	61	35	25	2529A
30	M	34	10	9	18	23	54	88	127	202	175	232	223	210	209	191	240	201	178	142	106	81	75	53	30	2911A
31	T	30	16	16	20	24	41	75	105	127	164	214	192	199	222	216	215	199	182	135	81	45	32	28	23	2601A
WEEKDAY AVERAGE = 2585 SATURDAY AVERAGE = 2717 SUNDAY AVERAGE = 2599 NUMBER OF GOOD DAYS 31 TOTAL MONTHLY COUNT = 80489																										
MONTHLY AVERAGE = 2606																										

COMMENTS:

WINTER BREAK: COLLEGES 12/16 - 1/6/14 - PUBLIC SCHOOLS 12/23 - 1/6/14
12/25, CHRISTMAS DAY; 12/31, NEW YEAR'S EVE

"B"-----> BAD DAY

"N"-----> NORMAL DAY

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APPENDIX B

Roadway Link Capacity Tables (Source: FDOT)

Generalized **Peak Hour Two-Way** Volumes for Florida's
Rural Undeveloped Areas and
Developed Areas Less Than 5,000 Population¹

12/18/12

TABLE 6

INTERRUPTED FLOW FACILITIES						UNINTERRUPTED FLOW FACILITIES					
STATE SIGNALIZED ARTERIALS						FREEWAYS					
Lanes	Median	B	C	D	E	Lanes	B	C	D	E	
2	Undivided	*	1,220	1,350	**	4	3,020	4,510	5,490	6,300	
4	Divided	*	2,790	2,890	**	6	4,510	6,720	8,220	9,720	
6	Divided	*	4,300	4,350	**	8	6,040	8,970	10,960	12,970	
Non-State Signalized Roadway Adjustments						Freeway Adjustments					
(Alter corresponding state volumes by the indicated percent.)						Auxiliary Lanes					
Non-State Signalized Roadways - 10%						Present in Both Directions + 1,800					
Median & Turn Lane Adjustments						UNINTERRUPTED FLOW HIGHWAYS					
Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors		Rural Undeveloped					
2	Divided	Yes	No	+5%		Lanes	Median	B	C	D	E
2	Undivided	No	No	-20%		2	Undivided	440	790	1,350	2,710
Multi	Undivided	Yes	No	-5%		4	Divided	2,440	3,820	4,840	5,500
Multi	Undivided	No	No	-25%		6	Divided	3,680	5,730	7,280	8,240
-	-	-	Yes	+5%		Developed Areas					
One-Way Facility Adjustment						Lanes	Median	B	C	D	E
Multiply the corresponding two-directional volumes in this table by 0.6						2	Undivided	820	1,550	2,190	2,990
						4	Divided	2,460	3,860	4,970	5,660
						6	Divided	3,680	5,790	7,440	8,500
BICYCLE MODE²						Passing Lane Adjustments					
(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)						Alter LOS B-D volumes in proportion to the passing lane length to the highway segment length					
Rural Undeveloped						Uninterrupted Flow Highway Adjustments					
Paved Shoulder/Bicycle	Lane Coverage	B	C	D	E	Lanes	Median	Exclusive left lanes	Adjustment factors		
	0-49%	*	120	190	300	2	Divided	Yes	+5%		
	50-84%	100	200	310	>1,010	Multi	Undivided	Yes	-5%		
	85-100%	250	370	1,760	>1,760	Multi	Undivided	No	-25%		
Developed Areas						¹ Values shown are presented as peak hour two-way volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual and the Transit Capacity and Quality of Service Manual.					
Paved Shoulder/Bicycle	Lane Coverage	B	C	D	E	² Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.					
	0-49%	*	220	460	1,480	* Cannot be achieved using table input value defaults.					
	50-84%	170	430	1,270	>1,760	** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.					
	85-100%	560	1,760	>1,760	**	Source: Florida Department of Transportation Systems Planning Office www.dot.state.fl.us/planning/systems/sm/los/default.shtm					
PEDESTRIAN MODE²											
(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)											
Sidewalk Coverage		B	C	D	E						
	0-49%	*	*	220	840						
	50-84%	*	120	780	1,390						
	85-100%	320	940	1,560	>1,820						

Generalized **Peak Hour Directional** Volumes for Florida's
Rural Undeveloped Areas and
Developed Areas Less Than 5,000 Population¹

12/18/12

TABLE 9

INTERRUPTED FLOW FACILITIES						UNINTERRUPTED FLOW FACILITIES					
STATE SIGNALIZED ARTERIALS						FREEWAYS					
Lanes	Median	B	C	D	E	Lanes	B	C	D	E	
1	Undivided	*	670	740	**	2	1,680	2,500	3,040	3,500	
2	Divided	*	1,530	1,580	**	3	2,500	3,720	4,560	5,400	
3	Divided	*	2,360	2,400	**	4	3,360	4,980	6,080	7,200	
Non-State Signalized Roadway Adjustments						Freeway Adjustments					
(Alter corresponding state volumes by the indicated percent.)						Auxiliary Lanes					
Non-State Signalized Roadways						Present in Both Directions					
						+ 1,000					
Median & Turn Lane Adjustments						UNINTERRUPTED FLOW HIGHWAYS					
						Rural Undeveloped					
Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors		Lanes	Median	B	C	D	E
1	Divided	Yes	No	+5%		1	Undivided	240	430	740	1,490
1	Undivided	No	No	-20%		2	Divided	1,340	2,100	2,660	3,020
Multi	Undivided	Yes	No	-5%		3	Divided	2,020	3,150	4,000	4,530
Multi	Undivided	No	No	-25%		Developed Areas					
—	—	—	Yes	+5%		Lanes	Median	B	C	D	E
One-Way Facility Adjustment						1	Undivided	450	850	1,200	1,640
Multiply the corresponding directional volumes in this table by 1.2						2	Divided	1,350	2,120	2,730	3,110
						3	Divided	2,020	3,180	4,090	4,670
BICYCLE MODE²						Passing Lane Adjustments					
(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)						Alter LOS B-D volumes in proportion to the passing lane length to the highway segment length					
Rural Undeveloped						Uninterrupted Flow Highway Adjustments					
Paved Shoulder/Bicycle						Lanes	Median	Exclusive left lanes	Adjustment factors		
Lane Coverage	B	C	D	E		1	Divided	Yes	+5%		
0-49%	*	70	110	170		Multi	Undivided	Yes	-5%		
50-84%	60	120	180	580		Multi	Undivided	No	-25%		
85-100%	140	210	1,000	>1,000		¹ Values shown are presented as peak hour directional volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual and the Transit Capacity and Quality of Service Manual.					
Developed Areas						² Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.					
Paved Shoulder/Bicycle						* Cannot be achieved using table input value defaults.					
Lane Coverage	B	C	D	E		** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.					
0-49%	*	120	260	840		<i>Source:</i>					
50-84%	100	240	720	1,000		Florida Department of Transportation					
85-100%	320	1,000	>1,000	**		Systems Planning Office					
PEDESTRIAN MODE²						www.dot.state.fl.us/planning/systems/sm/los/default.shtm					
(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)											
Sidewalk Coverage	B	C	D	E							
0-49%	*	*	120	460							
50-84%	*	80	430	770							
85-100%	180	520	860	>1,000							

APPENDIX C

Driveway Capacity/Level of Service Analyses

Intersection						
Intersection Delay, s/veh		5.4				
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	130	75	425	90	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	600	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	141	82	462	98	0	0
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	223	0	1155	111
Stage 1	-	-	-	-	182	-
Stage 2	-	-	-	-	973	-
Follow-up Headway	-	-	2	-	4	3
Pot Capacity-1 Maneuver	-	-	1343	-	190	921
Stage 1	-	-	-	-	831	-
Stage 2	-	-	-	-	327	-
Time blocked-Platoon, %	-	-	-	-	-	-
Mov Capacity-1 Maneuver	-	-	1343	-	125	921
Mov Capacity-2 Maneuver	-	-	-	-	125	-
Stage 1	-	-	-	-	831	-
Stage 2	-	-	-	-	215	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	8	0			
Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	0	-	-	1343	-	
HCM Lane V/C Ratio	Error	-	-	0.344	-	
HCM Control Delay (s)	0	-	-	9.079	-	
HCM Lane LOS	A			A		
HCM 95th %tile Q(veh)	Error	-	-	1.551	-	
Notes						

~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection						
Intersection Delay, s/veh		8.7				
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	166	0	0	195	75	425
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	600	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	180	0	0	212	82	462
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	180	0	286	90
Stage 1	-	-	-	-	180	-
Stage 2	-	-	-	-	106	-
Follow-up Headway	-	-	2	-	4	3
Pot Capacity-1 Maneuver	-	-	1393	-	681	950
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	907	-
Time blocked-Platoon, %	-	-	-	-	-	-
Mov Capacity-1 Maneuver	-	-	1393	-	681	950
Mov Capacity-2 Maneuver	-	-	-	-	681	-
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	907	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0	15			
Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	897	-	-	1393	-	
HCM Lane V/C Ratio	0.606	-	-	-	-	
HCM Control Delay (s)	15	-	-	0	-	
HCM Lane LOS	C			A		
HCM 95th %tile Q(veh)	4.211	-	-	0	-	
Notes						

~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

APPENDIX 10.8

**STORMWATER MANAGEMENT SYSTEM DESIGN,
DEWATERING PLANS, AND CALCULATIONS**

(See Volume IV)

APPENDIX 10.9
GROUNDWATER MODELING REPORT

**OKEECHOBEE CLEAN ENERGY CENTER (OCEC)
SITE CERTIFICATION APPLICATION (SCA)
GROUNDWATER MODELING REPORT**

September 21, 2015



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1 Introduction

1.1 Background

Florida Power & Light Company (FPL) is applying for site certification of an approximately 1600 megawatt (nominal) natural gas combined cycle power plant in northeastern Okeechobee County, Florida (Figure 1) under Florida's Electrical Power Plant Siting Act (PPSA), s. 403.501-.518, F.S. The plant will use groundwater from the Upper Floridan Aquifer (UFA) and the Surficial Aquifer System (SAS) for Project purposes as described in the SCA. The quantity of water needed from the UFA is 9 million gallons per day (mgd) on an annual basis (3,287 million gallons per year) with a peak day usage of 11 mgd. A small quantity of water (0.046 mgd annual average and 0.08 mgd peak day) will also be withdrawn from the SAS. During the PPSA process, FPL will demonstrate the feasibility of withdrawing the stated quantities of water without adversely impacting the water source, the use of groundwater by prior existing legal users, and existing off-site land uses such as lakes, streams, or wetlands. This report describes the selection of, and simulations with, an existing groundwater flow model to determine potential impacts resulting from the groundwater withdrawals.

1.2 Scope

The scope of this analysis is to identify an appropriate existing regional groundwater flow model and apply it to determine drawdown, flow, and potential groundwater quality impacts from the proposed withdrawals by FPL. The modeling must meet the minimum requirements of the St. Johns River Water Management District (SJRWMD) outlined in Chapter 40C-2, F.A.C., and the Applicant's Handbook: Consumptive Uses of Water incorporated by reference in rule 40C-2.101(1)(a), F.A.C.

1.3 Report Organization

This report provides a summary of the methodology used in selecting the groundwater flow model and the results of its application. The modeling methodology, as it applies to this study, is described in Section 2. Section 3 describes the model predictions of impact and presents analyses of aquifer drawdown due to FPL pumping alone, analysis of aquifer drawdown due to cumulative impacts of UFA pumping from FPL and other existing legal users, and finally analysis of potential change in UFA water quality. Section 4 presents conclusions from the study. This report is intended to provide details of the modeling to support the Site Certification Application (SCA).

2 Methodology

2.1 General

The methodology for conducting this study follows standard groundwater modeling protocols. As outlined in Anderson and Woessner (1992), the steps involved with model application include:

- Definition of purpose
- Conceptual model development
- Code selection
- Model design
- Calibration / verification
- Prediction
- Presentation of results

The methodology for accomplishing each of these items in the context of this study is described below. The selection of the groundwater flow model and modeling set up was based upon input and direction obtained from numerous meetings with SJRWMD staff. After assessing available models, an existing calibrated model developed by the SJRWMD was selected for evaluation of the proposed withdrawal by FPL. Therefore, only a brief discussion of the model design and calibration is provided in this report. The reader is referred to the original report on the transient version of the selected model for details on the model (CFWI Hydrologic Analysis Team, 2014).

2.2 Definition of Purpose

The primary purpose of the model analysis is to assess potential drawdown resulting from pumping water from the UFA and SAS for Project water uses as described in the SCA. The drawdown determined from the model is used with the methodology recommended by the SJRWMD staff to determine potential impacts to prior existing legal users, existing off-site land uses, and UFA water quality.

2.3 Conceptual Model Development

The OCEC site characteristics are described in detail in the SCA. The following is a description of the hydrogeologic framework of Okeechobee County that is reflected in the groundwater flow model used in the assessment.

Reese and Richardson (2008) revised the hydrogeologic framework of central and south Florida. They describe the Floridan Aquifer system as consisting of the UFA,

Avon Park Permeable Zone (APPZ) also known as the Middle Floridan Aquifer (MFA), and Lower Floridan Aquifer (LFA), which are separated by semi-confining units referred to as the Middle Confining Units 1 and 2 (MC1 and MC2). Within the LFA there is a high permeability layer known as the Boulder Zone. In past studies the APPZ was either combined with the UFA (O'Reilly, et al., 2002), the LFA (Lukasiewicz, 1992), or the Middle Confining Unit (Sepúlveda, 2002). Recent modeling efforts, including the East Central Florida Steady State (ECFS) model, the Lower Kissimmee Basin Groundwater Model (Radin, et al., 2005) and Army Corps of Engineers Aquifer Storage and Recovery Model (USACE, 2011) include the APPZ as a separate unit.

Water quality of groundwater in the area surrounding the OCEC site varies considerably with location and aquifer system. The primary factor that controls water quality is the presence of saline water, which forms a wedge where depth to poor quality water generally increases with increasing distance from the Atlantic Ocean. Water quality data in the SJRWMD database from wells near the OCEC site suggest that TDS concentrations in the UFA range from <1,000 to <2,500 mg/L. A regional study by the U.S. Army Corps of Engineers (2011) shows TDS concentrations of less than 500 mg/L immediately beneath the site and in the range of 500 to 1,000 mg/L east of the site (Figure 3).

Data from LFA are more limited. Figure 4 suggests a TDS concentration range from 10,000 to 20,000 mg/L beneath the site, increasing to the east, based on a regional interpretation of data.

2.4 Code Selection

Based on the conceptual model, project objectives, and input from the SJRWMD staff, the essential elements of the simulator are the following:

- Three dimensional, saturated groundwater flow,
- Single density fluid is appropriate,
- Can represent the conceptual model as described above and in the SCA,
- Can represent the proposed pumping at a scale that is appropriate for impact analysis,
- Publically available, widely accepted by professionals working in the field and
- Familiar to project staff and reviewers.

The United States Geological Survey (USGS) modular, finite difference groundwater flow model [MODFLOW, Harbaugh, et al (2005)] was selected for application to the OCEC site. MODFLOW is a widely used and is well supported by the many authors of the main

code and subroutine codes; it has been tested in numerous modeling applications; it has been peer reviewed and the results of modeling subject to peer review in accepted professional publications, and it is available at no cost from the USGS. MODFLOW can be configured to solve nearly any problem of single density groundwater flow and many problems of groundwater and surface water interaction.

2.5 *Model Design*

Using the MODFLOW code, the SJRWMD and South Florida Water Management District (SFWMD) have developed regional groundwater flow models that they use for planning and permitting purposes. Several of these models include the OCEC site and could be used with minimal adaptation to evaluate impacts from the proposed withdrawal. The East Central Florida Steady (ECFS) model is an adaptation of the U.S. Geological Survey transient model ECFT (Sepulveda, et al., 2012), which was subsequently modified by CFWI Hydrologic Analysis Team (2014). The SJRWMD adapted the CFWI model by, among other things, making it steady state, rather than transient. Based, in part, upon direction provided by the SJRWMD staff, the ECFS was selected by FPL over other models that included the South East Central (SEC) model, the peninsular Florida or “mega model”, and East Central Florida Model (ECFM). The primary reasons for selecting the ECFS model over the others are the following:

- The APPZ is represented as a discrete model layer,
- SAS layer is active (not a boundary condition),
- Appropriate grid resolution,
- Steady-state approximation is consistent with SJRWMD permitting procedures,
- Has been used for water use permitting purposes,
- Documented,
- Developed and supported by SJRWMD, and
- Peer reviewed.

The ECFS model covers a 9,000 square mile domain, as shown in Figure 5. This domain is discretized into a finite difference grid system with 1,250 ft cells. Vertically, the model is divided into seven layers: one for each of the SAS, ICU, UFA, MC1, APPZ, MC2, and LFA. Each layer is active and has boundary conditions to represent flow into and out of the model domain, including along the perimeter of the study area. Field data from numerous borings were used to establish the structure of the model layering, which represents the hydrostratigraphic layers. In addition, field data from Aquifer Performance

Tests (APTs) were used to guide the initial choice of hydraulic parameters that were used in the model calibration.

2.6 Calibration / Verification

The ECFS model is calibrated to 1995 hydrologic conditions. Details on the calibrated parameters are provided in Table 1.

Table 1. Hydraulic parameters in the vicinity of the OCEC site.

Layer	Kx (ft/d)	Kz (ft/d)	Thickness (ft)	Transmissivity (ft ² /d)	Top elevation (ft)	Unit
1	11.6	0.3	92.5	1,070	37	SAS
2	7	0.00187	276.8	1,940	-55.5	IAS/ICU
3	216.8	2.17	389.2	84,400	-332.3	UFA
4	20	5.086	149.7	2,990	-721.5	MC1
5	3982	39.8	416.6	1,660,000	-871	APPZ
6	1	0.142	232.6	233	-1287.8	MC2
7	194.1	1.55	327.3	63,500	-1520	LFA

3 Model Predictions of Impact

3.1 Evaluation Methodology

Based, in part, from direction provided by SJRWMD staff, the following modeling simulations and corresponding graphical presentations were conducted to evaluate the potential impact upon the groundwater flow system of a proposed consumptive use. Four scenarios are requested:

- Scenario A – all permitted users at 1995 estimated actual flow rates
- Scenario B – Applicant at 1995 rate and other permitted users at current end-of-permit allocation
- Scenario C – Applicant at current end-of-permit allocation and other permitted users at current end-of-permit allocation (all users at permitted allocation)
- Scenario D – Applicant at new or modified requested allocation and all other users at current end-of-permit allocation

The results of these simulations, which are hydraulic heads, are subtracted from initial conditions to determine head differences or drawdown for the UFA and SAS. The change in head or drawdown resulting from the new withdrawal, rather than absolute heads, defines impact. The head difference computations requested by the SJRWMD are:

1. Current permitted cumulative drawdown = Scenario A - Scenario C
2. Applicant's current permitted drawdown = Scenario B - Scenario C
3. Applicant only requested allocation (new or modified) drawdown from 1995 = Scenario B - Scenario D
4. Applicant only additional drawdown for requested allocation from current permitted allocation = Scenario C - Scenario D
5. New cumulative drawdown (from 1995) with applicant's new or modified use = Scenario A - Scenario D

Because the proposed FPL withdrawal is new, the applicant's 1995 rate in Scenarios A & B is zero, as is the applicant's current end-of-permit allocation in Scenario C. Therefore Scenarios B and C are identical and interchangeable in the above list. As such, head difference computation (2) is zero and therefore irrelevant while head computations (3) and (4) are identical. Because of these simplifications, only head difference computations (1), (3), and (5) are required.

SJRWMD staff directed that 2005 be the base year for this analysis due to more recent data. Therefore, the 2005 base year is substituted for 1995 in Scenario A, and affecting

head difference calculations (1) and (5). Finally, the SJRWMD staff directed FPL to evaluate the predicted drawdowns using USGS potentiometric surface maps for the relevant area in the months of May 2005 and September 2005 as May corresponds to the driest month of the year and thus would represent a “worse case” condition, and September corresponds to the month FPL is most likely to withdraw the maximum daily allocation.

To consider whether FPL’s proposed UFA withdrawals would interfere with prior existing legal users, the SJRWMD rules require an examination of potential reduction in flow of a well of a prior existing legal user. The SJRWMD rules consider interference to occur when any individual withdrawal facility of a presently existing legal user of water experiences a 10% or greater reduction in withdrawal capability. All of the UFA wells of prior existing legal users located within the area potentially affected by OCEC UFA withdrawals are artesian wells not equipped with pumps or other equipment to facilitate withdrawals. Because flow through a well is proportional to the square root of the head loss, for artesian wells in this area a 10% reduction in flow corresponds to a 19% reduction in head, or drawdown. Sections 3.2, 3.3, and 3.4 describe the results of the drawdown analysis requested by the SJRWMD staff.

3.2 Current Permitted Cumulative Drawdown

This drawdown analysis (i.e. head difference calculation 1, above) represents the additional drawdown from 2005 baseline conditions due to the currently permitted allocations. It is the drawdown without the proposed FPL withdrawal that would occur if all existing legal users were to use their permitted quantities. It was derived from subtracting the UFA heads of Scenario C from those of Scenario A. The results of this drawdown analysis are shown in Figure 6. Cumulative permitted drawdown ranges from 6 ft in the northern part of the model domain to 1 ft in the south. The drawdown for this scenario is approximately 2.2 ft at the FPL site.

Table 2 summarizes the drawdown impact at the wells of existing legal users that are near the proposed OCEC site. These wells and their locations were identified from the permits of adjacent users. Artesian head for all permitted users at 2005 actual rates is computed at each well, based on subtracting the modeled land surface elevation from measured heads presented in U.S. Geological Survey potentiometric surface maps for May and September of 2005 (Kinnaman, 2006a and 2006b). The measured head for each permitted well was taken to be the average of heads at the Ft Drum and Blue Cypress Lake wells. The measured heads were therefore 43 ft in May (average of 44 ft at Ft Drum and 42 ft at Blue Cypress Lake) and 45 ft in September (45 ft at both wells).

According to Table 2, the May 2005 head conditions have a larger percent reduction in artesian head than the September 2005 conditions. The May 2005 conditions are carried forward in subsequent computations because they have the lesser amount of artesian head available of the two time periods analyzed. In this sense, the May 2005 period is conservative from a drawdown impact perspective. Note that neither period has a current percent reduction in artesian head that exceeds the 19% threshold for impact.

Table 2. Currently permitted cumulative drawdown at well locations near the OCEC site.

Data or Computation	Permitted wells									
	1A	2B	3C	4D	5E	6F	E	Torpedo South	60 pens	Surrency
Drawdown Calculation										
Heads (ft) for all permitted users at 2005 actual rates (Scenario A)	41.32	41.31	41.34	41.29	41.26	41.33	41.42	41.05	41.38	41.18
Heads (ft) for permitted users at current EOP allocation (Scenario C)	38.97	39.01	39.08	39.10	39.04	39.13	39.19	38.65	38.98	38.73
Current permitted cumulative drawdown (ft) (Scenario A- Scenario C)	2.35	2.30	2.26	2.19	2.22	2.20	2.23	2.40	2.40	2.45
May 2005 Artesian Head										
Measured head in May, 2005	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00
Land Surface (ft)	27.59	26.57	26.59	24.57	24.57	24.58	29.42	24.58	29.52	26.57
Artesian head (ft) for all permitted users at 2005 actual rates (Scenario A)	15.41	16.43	16.41	18.43	18.43	18.42	13.58	18.42	13.48	16.43
Current percent reduction in artesian head (cumulative drawdown / artesian head)	15.2%	14.0%	13.8%	11.9%	12.0%	11.9%	16.4%	13.0%	17.8%	14.9%
September 2005 Artesian Head										
Measured head in Sept, 2005	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Land Surface (ft)	27.59	26.57	26.59	24.57	24.57	24.58	29.42	24.58	29.52	26.57
Artesian head (ft) for all permitted users at 2005 actual rates (Scenario A)	17.41	18.43	18.41	20.43	20.43	20.42	15.58	20.42	15.48	18.43
Current percent reduction in artesian head (cumulative drawdown / artesian head)	13.5%	12.5%	12.3%	10.7%	10.9%	10.8%	14.3%	11.8%	15.5%	13.3%

3.3 Applicant Only Requested Peak Daily Allocation Drawdown From 2005

This drawdown analysis represents the predicted drawdown due to the proposed peak day FPL withdrawal of 11 mgd. It was derived by subtracting Scenario D from Scenario B (same as C). The results of this analysis are shown in Figure 7. The 1-ft drawdown contour is contained almost exclusively on the OCEC Site, with a part extending off-Site to the north. The 0.5 ft contour extends approximately to State Road 60 to the north. Table 3 summarizes the drawdown impact at the wells of prior existing legal users that are near the proposed OCEC site for FPL's requested allocation of 11 mgd. Table 3 indicates that the drawdown effect of FPL's proposed pumping on prior existing legal users is small, ranging from 0.33 ft and 0.79 ft for the 11 mgd peak allocation.

Table 3. Drawdown due to FPL's requested allocation of 11 mgd at well locations near the OCEC Site and percent reduction in artesian head for May 2005 conditions.

Data or Computation	Permitted wells									
	1A	2B	3C	4D	5E	6F	E	Torpedo South	60 pens	Surrency
Heads (ft) for permitted users at current end-of-permit allocation (Scenario B)	38.97	39.01	39.08	39.10	39.04	39.13	39.19	38.65	38.98	38.73
Applicant at requested allocation and all other users at current EOP allocation (Scenario D)	38.50	38.51	38.50	38.59	38.57	38.54	38.40	38.32	38.55	38.36
Drawdown for applicant only requested allocation (Scenario B- Scenario D)	0.47	0.50	0.58	0.51	0.47	0.59	0.79	0.33	0.43	0.37
Artesian head (ft) for all permitted users at 2005 actual rates (Scenario A)	15.41	16.43	16.41	18.43	18.43	18.42	13.58	18.42	13.48	16.43
Percent reduction in artesian head (drawdown for applicant only / artesian head)	3.0%	3.0%	3.5%	2.8%	2.6%	3.2%	5.8%	1.8%	3.2%	2.3%

3.4 New Cumulative Drawdown (from 2005) With Applicant's New Peak Daily Allocation

This drawdown analysis represents the additional drawdown from 2005 conditions due to the currently permitted allocations and the proposed FPL daily peak allocation of 11 mgd. It was derived by subtracting the UFA heads of Scenario D from those of Scenario A. The results of this analysis are shown in Figure 8. In this case the drawdown in the regional area near the OCEC Site is approximately 2.5 ft. The FPL drawdown superimposes on the cumulative drawdown to create a net drawdown of approximately 3.5 ft at the OCEC Site boundary. This drawdown decreases with distance from the OCEC Site until it stabilizes at the "background" condition of 2.5 ft. Table 4 summarizes the drawdown impact at the wells of existing legal users that are near the proposed OCEC Site. The new cumulative drawdown analysis indicates that two wells, "E" and "60 Pens" could be impacted by the daily peak pumping of 11 mgd in the theoretical, but unlikely, scenario that all other users were pumping at their maximum allocation. These wells have the largest current cumulative percent head reduction of the 11 wells, due in part to their location to the west, where the artesian head is naturally reduced. Well "E" has the largest drawdown of 0.79 ft due to its proximity to the OCEC Site.

Table 4. New cumulative drawdown with FPL's requested daily peak allocation of 11 mgd at well locations near the OCEC Site and percent reduction in artesian head for May 2005 conditions.

Data or Computation	Permitted wells									
	1A	2B	3C	4D	5E	6F	E	Torpedo South	60 pens	Surrency
Heads (ft) for all permitted users at 2005 actual rates (Scenario A)	41.32	41.31	41.34	41.29	41.26	41.33	41.42	41.05	41.38	41.18
Applicant at requested allocation and all other users at current EOP allocation (Scenario D)	38.50	38.51	38.50	38.59	38.57	38.54	38.40	38.32	38.55	38.36
New cumulative drawdown (ft) (Scenario A-Scenario D)	2.82	2.80	2.84	2.70	2.69	2.79	3.02	2.73	2.83	2.82
Artesian head (ft) for all permitted users at 2005 actual rates (Scenario A)	15.41	16.43	16.41	18.43	18.43	18.42	13.58	18.42	13.48	16.43
Percent reduction in artesian head (new cumulative drawdown / artesian head)	18.3%	17.0%	17.3%	14.7%	14.6%	15.1%	22.2%	14.8%	21.0%	17.2%

3.5 Water Quality Impacts

In addition to demonstrating that the proposed withdrawal will not cause drawdown that will impact existing legal users; FPL will also demonstrate that the source aquifer is capable of producing the requested amount of water without causing harmful saline water intrusion or harmful upconing. The ECFS groundwater flow model is not configured to compute concentrations or changes in concentration that could result from the proposed withdrawal. The model can however, provide insight into changes to the water budget as a result of the additional pumping.

To analyze potential changes to the UFA water budget, a 11,250 ft x 11,250 ft control volume was defined around the OCEC Site. This area encompasses the location of the proposed wellfield and is approximately 1.25 times the area of the 2,341 acre OCEC Site. This area will experience the largest changes in the water budget as a result of pumping and can be used to determine the source of the additional annual average withdrawal of 9 MGD of water. Note that the annual average withdrawal (9 mgd) is appropriate for determination of long-term water quality changes because the maximum daily withdrawal rate of 11 mgd will only occur for periods of time too short to affect groundwater quality changes. Similarly, current permitted conditions are used (rather than current cumulative permitted) because cumulative permitted quantity is only realized for short periods of time, if at all, and does not represent the long-term average conditions that affect water quality. A subregional water budget was developed using the cell-by-cell files for (a) 2005 conditions, (b) 2005 conditions plus the proposed 9 MGD withdrawal by FPL, and (c) the net of (b) minus (a). Figure 9 shows the subregional water balance for the control volume for each of these cases.

Figure 9a suggests that without the proposed FPL pumping, there is a lateral flow-through of approximately 0.6 mgd with a slight upward flow from the APPZ. When the FPL pumping of 9 mgd is imposed (Figure 9b), lateral inflow in the UFA increases and outflow is eliminated. In addition, a flow of approximately 5.6 mgd is induced from the APPZ. The APPZ in turn obtains this flow from increases in lateral inflow and decreases in lateral outflow. This response is more clearly seen in Figure 9c, which shows the net effect of FPL's pumping of 9 mgd.

Of most importance is to note that although upward flow is induced from the APPZ, there is only a small increase of 0.04 mgd in flow from the LFA. Water quality in the APPZ is locally equivalent or better than in the UFA. Water quality degradation in the UFA is expected to be minimal because there is only a minor amount of lower quality water that is induced to flow into the APPZ. However, if cooling water was pumped directly from the APPZ, the induced flow from the LFA would be larger and the water quality would be lower.

3.6 SAS Impacts

Drawdown in the SAS due to FPL's proposed 11 mgd of pumping from the UFA is minimal (0.00015 ft). This response is supported by the minimal flow and change in flow from above the UFA in Figure 9c.

As it relates to the proposed pumping from the SAS, Figure 10 shows the drawdown in the SAS due to pumping 0.08 mgd of water from the SAS. The outermost drawdown contour line is 0.1 ft in Figure 10 and is contained entirely on the OCEC Site. The contour line circumscribes an approximate 0.5 by 0.3 mile area. Because this drawdown does not extend off-Site, it will not impact any prior existing legal users and the drawdown amount on the Site is not significant enough to impact onsite wetlands or surface waters that will remain un-impacted from the construction of OCEC Unit 1.

3.7 Boundary Effects

The general head boundary of the ECFS model is approximately 10 miles south of the OCEC Site. Boundary effects appear to exist as indicated by the flattening of the 0.1 ft drawdown contour resulting from FPL's 11 mgd of pumping (Figure 11a). However, when drawdown in the subregional area around the OCEC Site is examined (Figure 11b), the drawdown contours become concentric at a level of approximately 0.3 ft. This analysis suggests that drawdown may be underestimated by tenths of a foot at distance between 2 and 3 miles south of the OCEC, but become less affected by the boundary

further to the north. Note that the potentially affected existing legal users are north of the OCEC Site and are minimally affected by the boundary placement. Thus boundary effects of the ECFS model do not prevent the model's use to accurately predict drawdown effects from the proposed UFA and SAS pumping.

3.7 *Effects on MFLs*

The model results shown in Figure 10 indicate that drawdown due to the proposed UFA pumping will be insignificant or inconsequential in wetlands or lakes subject to established minimum flows and levels. Most of these water bodies are in the northern part of the model. Drawdown in this area ranges from 0.00002 to 0.0002 ft. These drawdowns are insignificant and not expected to cause a violation of any established minimum flow or level.

4 Summary and Conclusions

Florida Power & Light Company (FPL) is applying for site certification of an approximately 1600 megawatt (nominal) natural gas combined cycle power plant in northeastern Okeechobee County, Florida under the PPSA. The plant will use groundwater from the UFA and SAS for Project water uses as described in the SCA. The quantity of water needed from the UFA is 9 million gallons per day (mgd) on an annual basis (3,287 million gallons per year) with a peak day usage of 11 mgd. A small component of water (0.08 mgd peak day, 0.046 mgd annual average) will also be withdrawn from the SAS.

Following standard groundwater modeling guidance, FPL developed a conceptual model of the OCEC Site and determined the most appropriate model code that would meet the objectives of the project and accurately represent the conceptual model. Following consultation with SJRWMD staff, FPL and SJRWMD determined that an existing groundwater flow model, the East Central Florida Steady (ECFS) model, was appropriate for impact assessment at the OCEC Site. FPL applied the model according to SJRWMD rule criteria, staff specifications, and prior SJRWMD consumptive use permitting practice, and determined that the May water level conditions (lowest) and peak day usage of 11 mgd (higher than annual average) provided the most conservative (maximum drawdown relative to available head) estimate of impact.

Three scenarios were evaluated: 1) the current permitted cumulative drawdown, 2) proposed FPL only drawdown, and 3) new cumulative drawdown with FPL's proposed new use. Per SJRWMD rule criteria a threshold of 10 percent reduction in flow in artesian wells, which is equivalent to a 19 percent reduction in artesian head, was used as an indicator of interference with prior existing legal users. The current permitted cumulative drawdown (all permitted uses not including FPL's proposed withdrawal) did not indicate a drawdown in neighboring wells of greater than 19 percent of artesian head. For scenario (2), drawdown due to FPL's proposed 11 mgd max day pumping ranged from 0.33 to 0.79 ft at neighboring permitted wells. These drawdowns, when combined with the current permitted drawdown in scenario (3), indicated that two wells, well "E" and "60 Pens" may be impacted by FPL's proposed pumping of 11 mgd. If actual interference occurs, FPL will mitigate for the interference its pumping causes to these wells.

Other drawdown analyses show no adverse impact:

- SAS drawdown due to pumping from the UFA is 0.00015 ft, which will not cause any measurable change in any surface water feature;

- SAS drawdown due to pumping 0.08 mgd from the SAS is restricted to less than 0.1 ft outside the OCEC Site, which will not impact existing legal users and is not significant enough to impact on-Site or off-Site wetlands or surface waters; and
- Drawdown in water bodies with established minimum flows and levels (MFLs) is insignificant, ranging from 0.00002 to 0.0002 ft, and will not violate any established MFLs.

The potential of the UFA to produce the requested amount of water without causing harmful saline water intrusion or harmful upconing was assessed using the water balance from the ECFS model. The water balance indicated that approximately half of the water pumped by FPL will originate from the APPZ. However, this aquifer has been shown to have water quality similar or better than the UFA. Induced flow from the LFA was minimal. Thus, this water balance analysis indicates that water quality degradation in the UFA due to FPL's proposed pumping will be minimal and will not result in detrimental change in the geochemistry of the groundwater at the base of the aquifer or producing zone within the area of influence of the wellfield towards a saline water composition. Similarly, the extent of drawdown in the UFA is limited such that the proposed withdrawal will not move a particular saline water interface a greater distance inland or towards a wellfield than has historically occurred as a consequence of seasonal fluctuations or drought.

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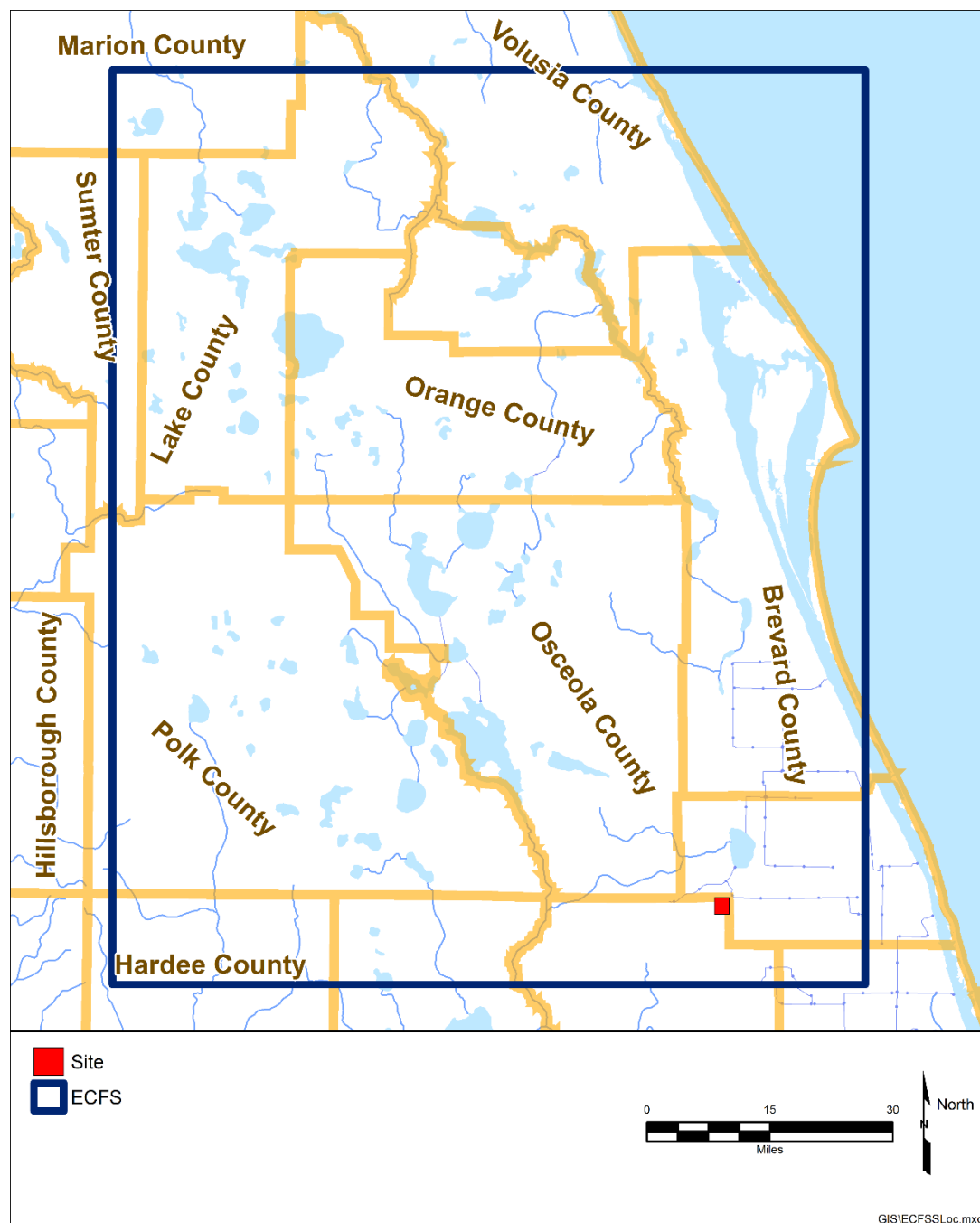


Figure 1. Location of the OCEC Site (red square) within the domain of the ECFS groundwater model.

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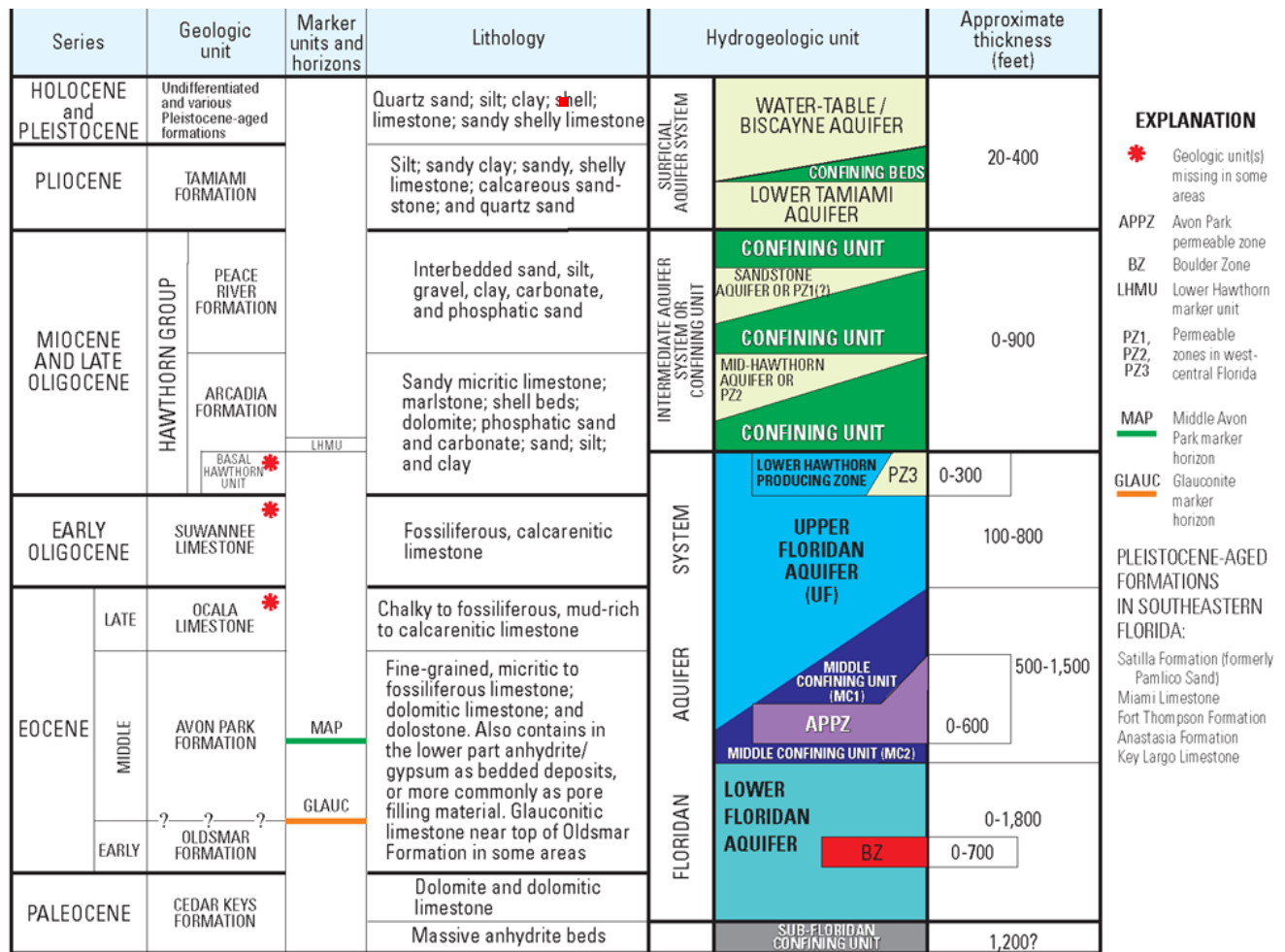


Figure 2. Hydrostratigraphy of southeastern Florida (from Reese and Richardson, 2008).

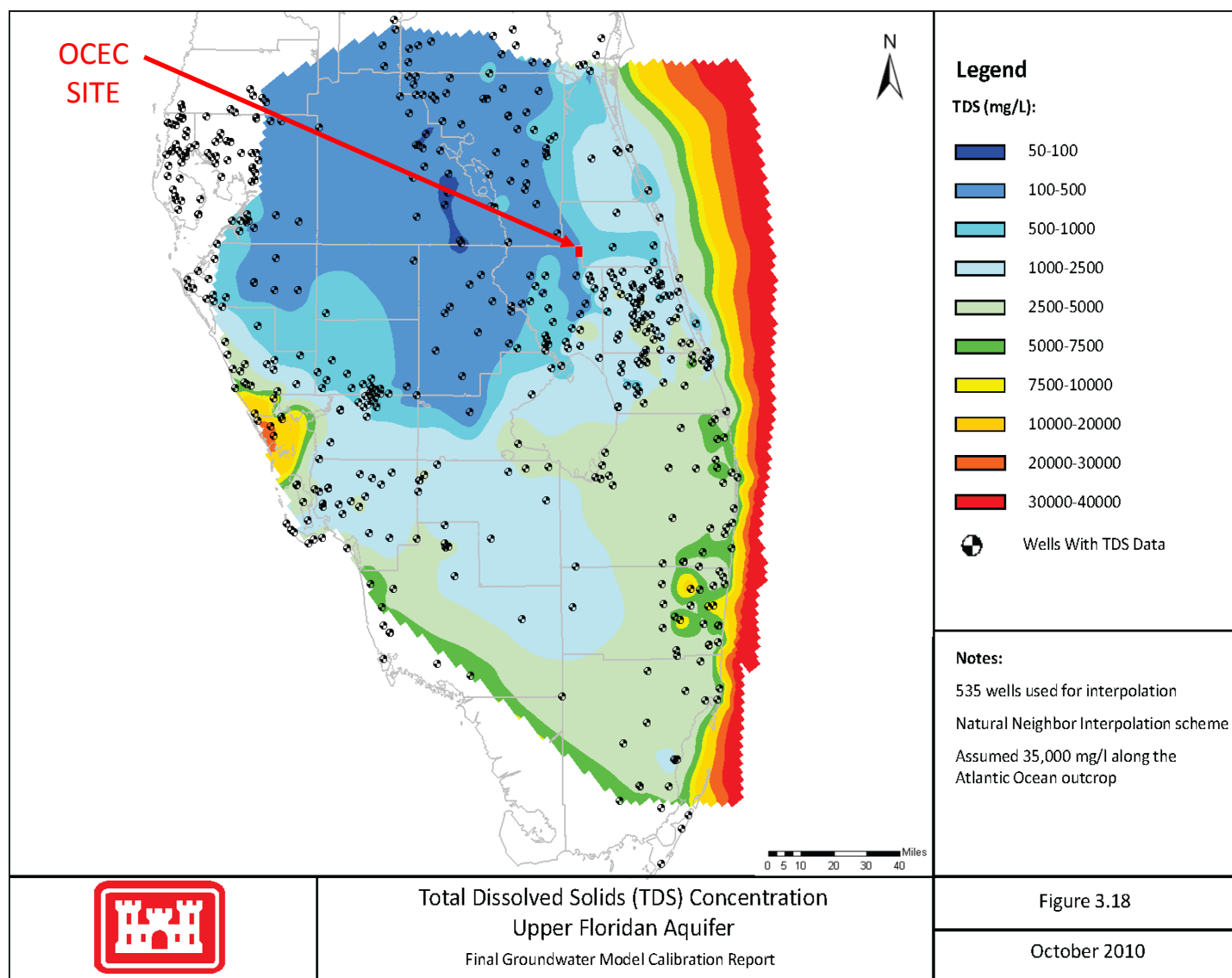


Figure 3. Total Dissolved Solids (TDS) concentration in the UF (from USACE, 2011).

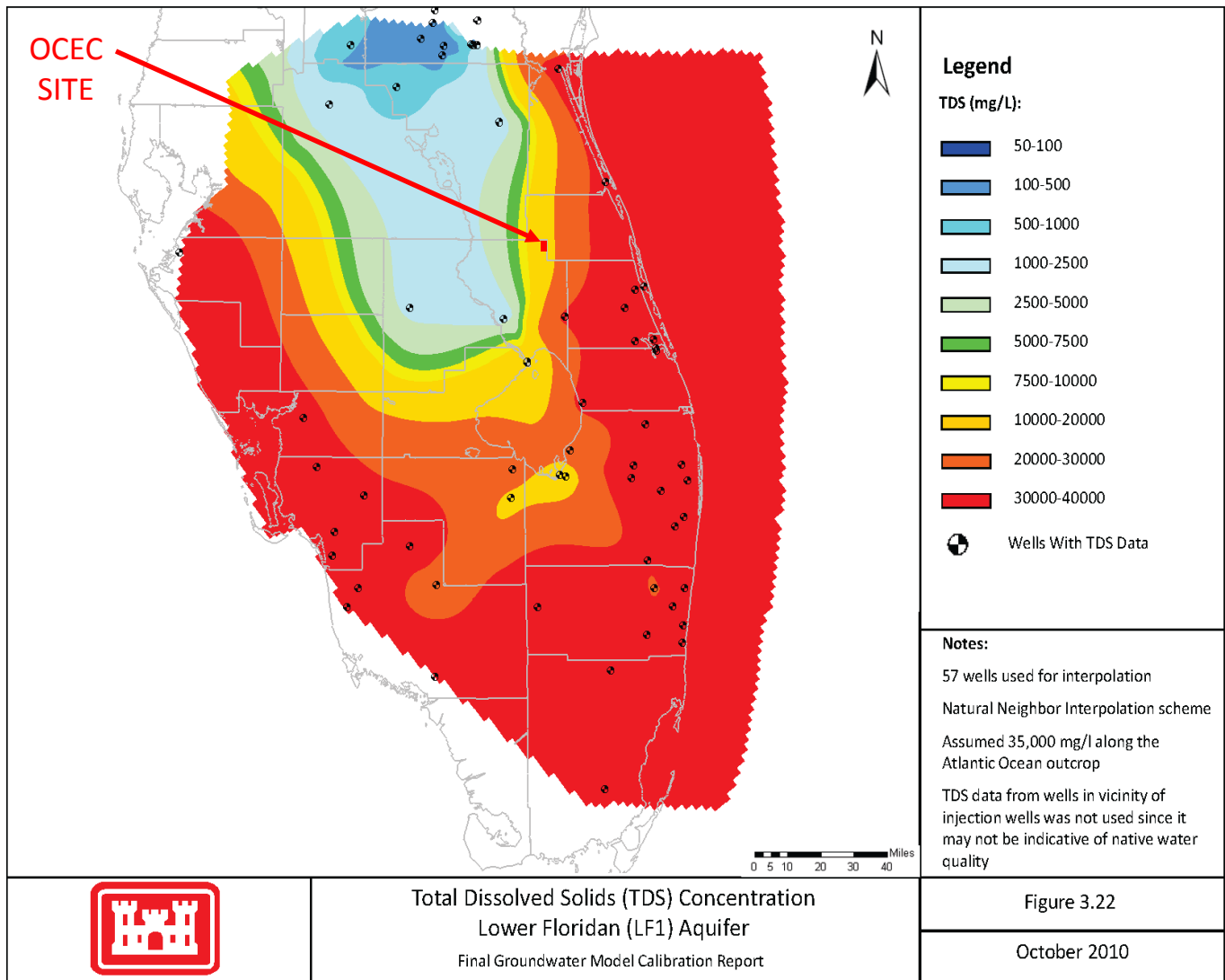


Figure 4. Total Dissolved Solids (TDS) concentration in the LF (from USACE, 2011).

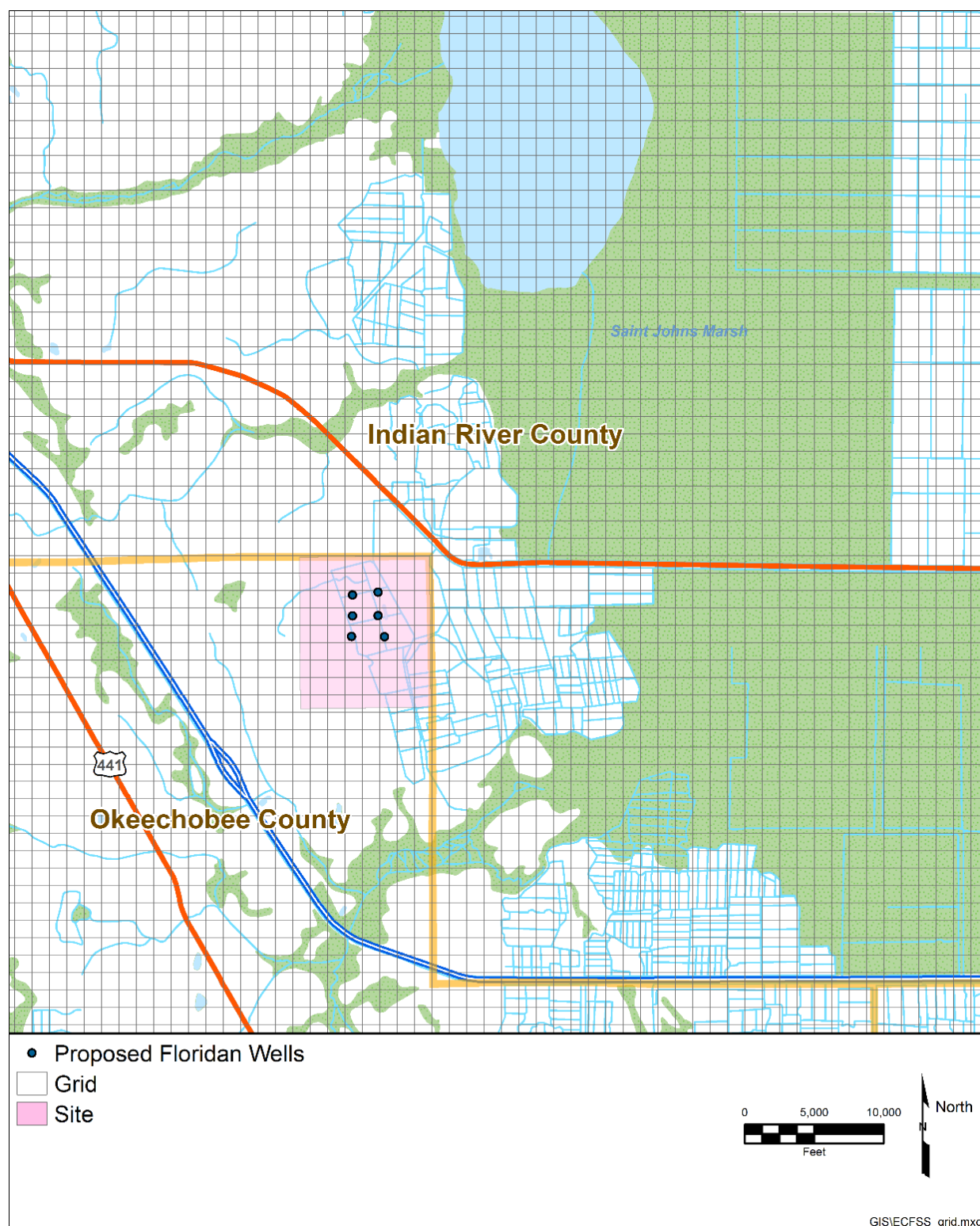


Figure 5. ECFS model grid in vicinity of OCEC Site.

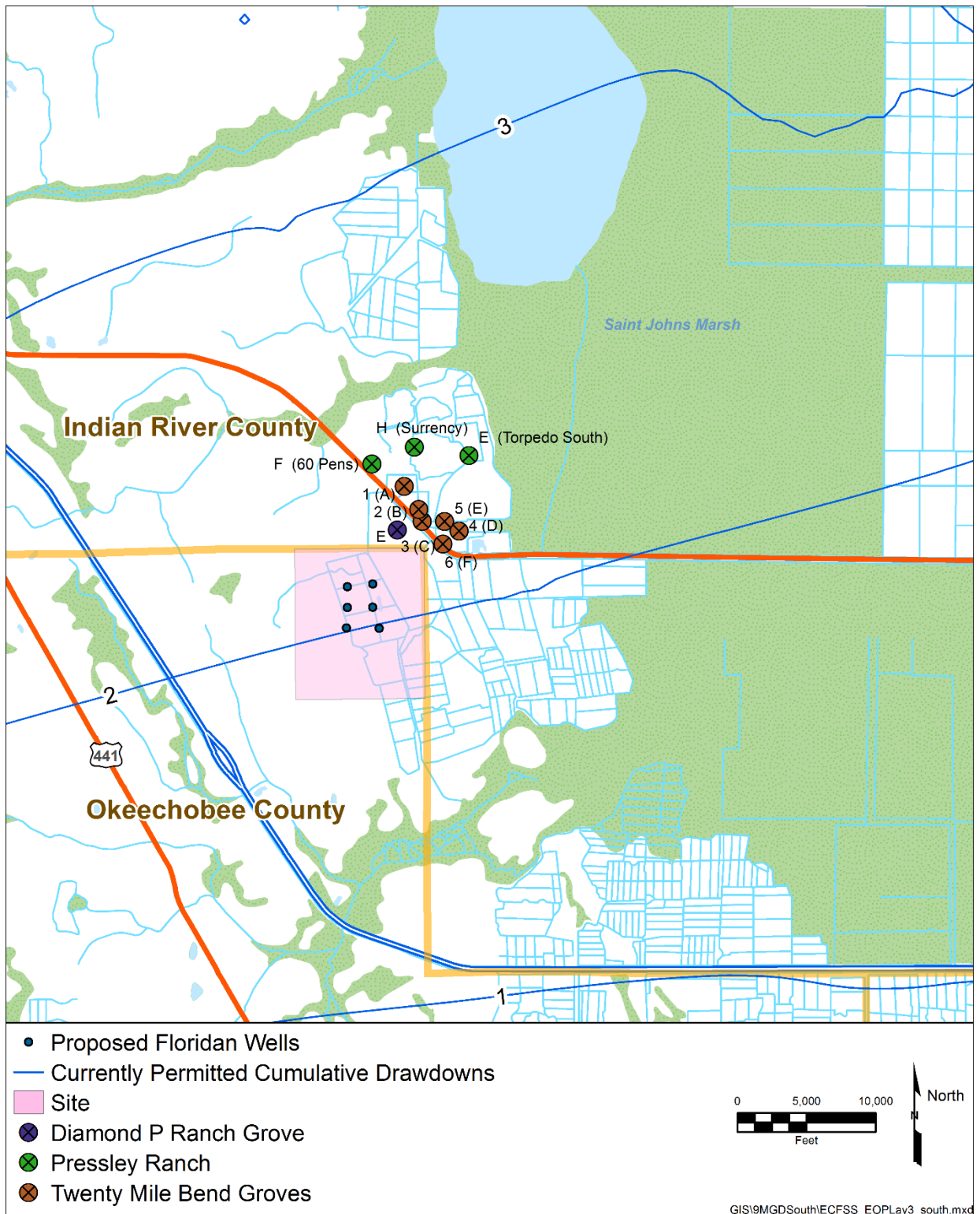


Figure 6. Current permitted cumulative drawdown (ft)

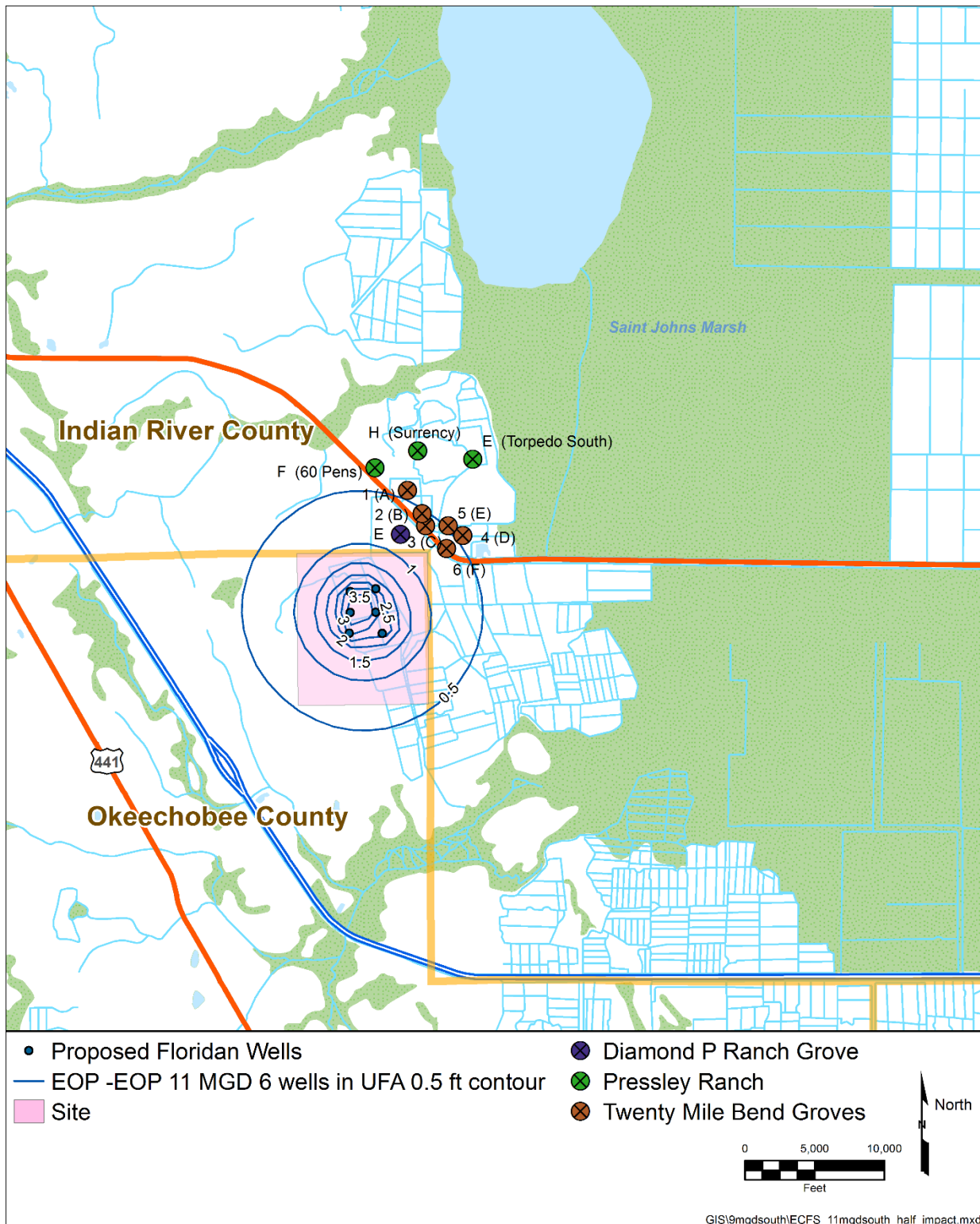


Figure 7. Drawdown due to FPL's requested peak day allocation of 11 mgd.

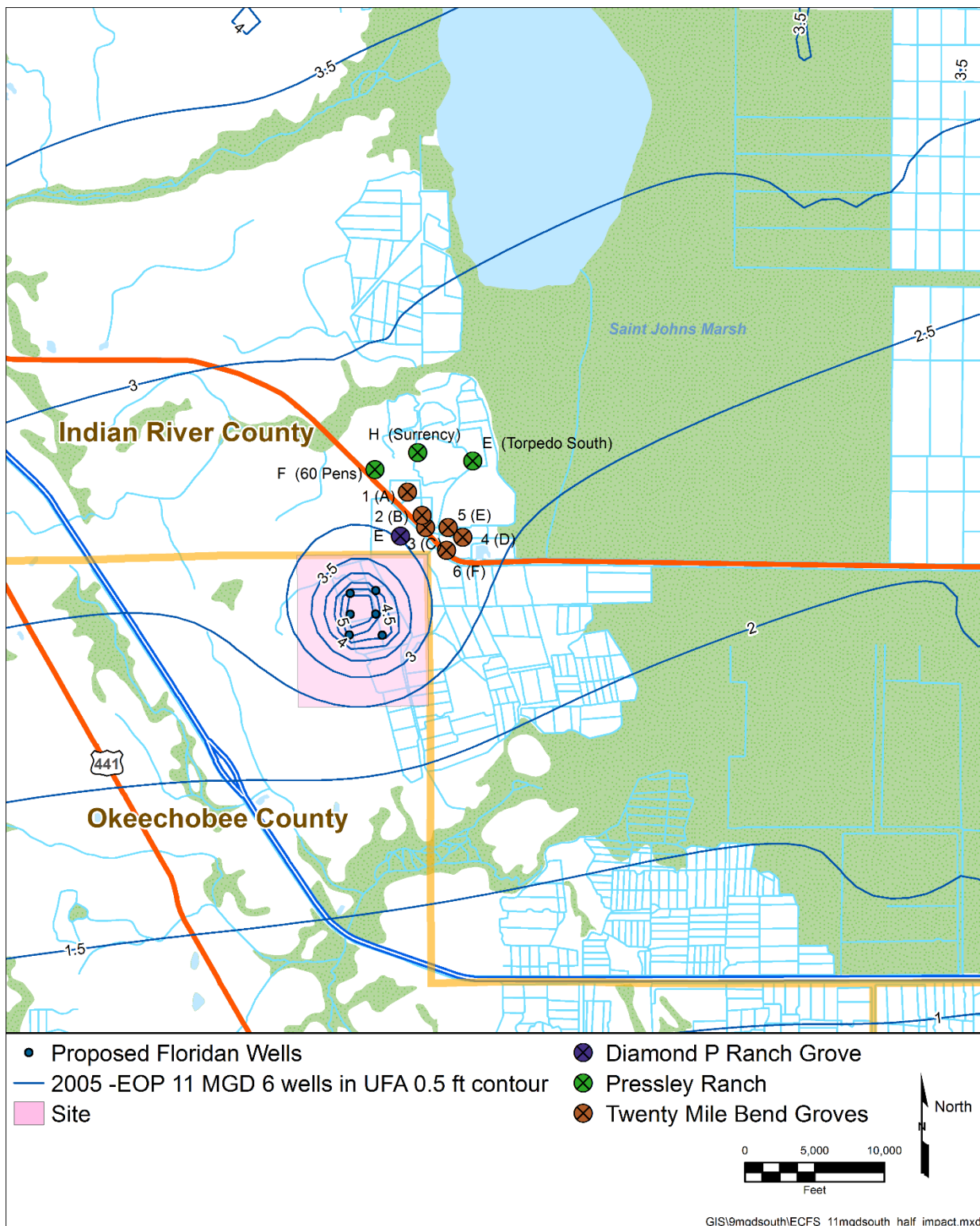


Figure 8. New cumulative drawdown (ft) with FPL's requested peak day allocation of 11 mgd.

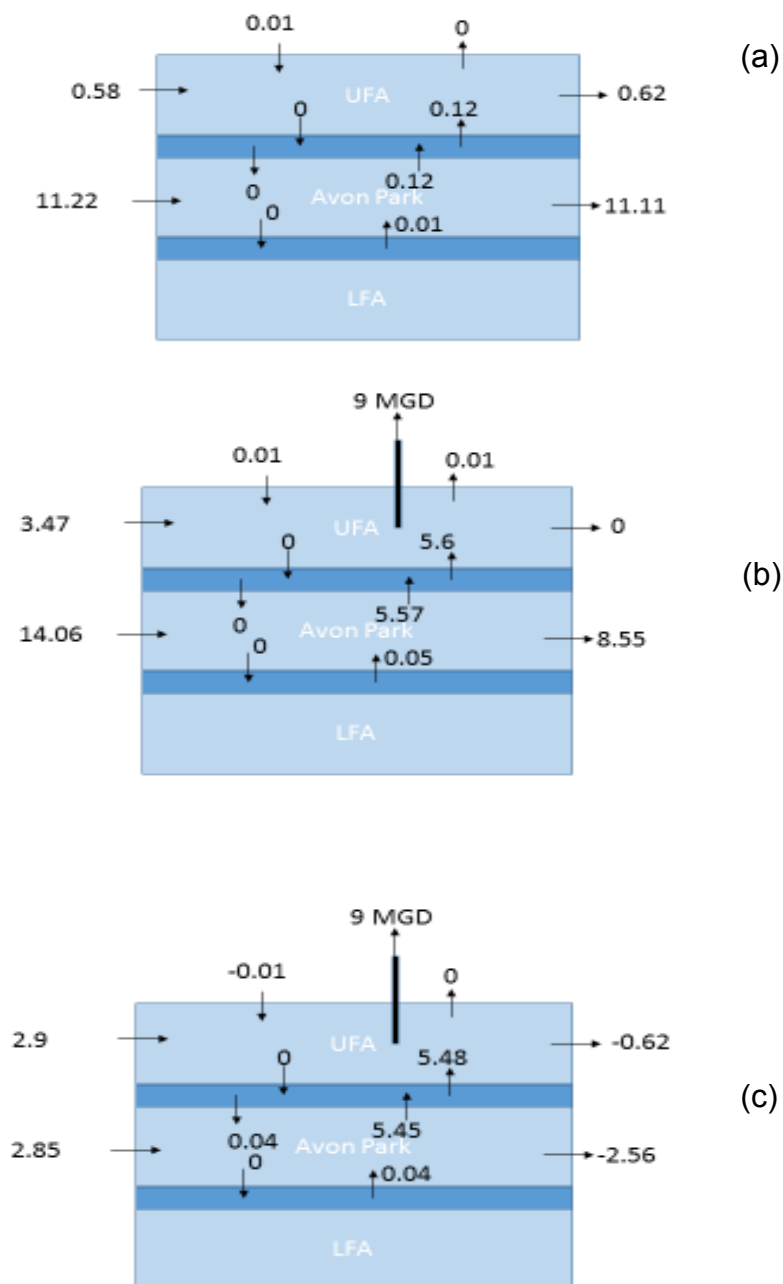


Figure 9. Water balance in mgd for (a) permitted users at current end-of-permit allocation, b) FPL's requested allocation of 9 mgd annual average and all other users at current end-of-permit allocation, c) net (b-a).

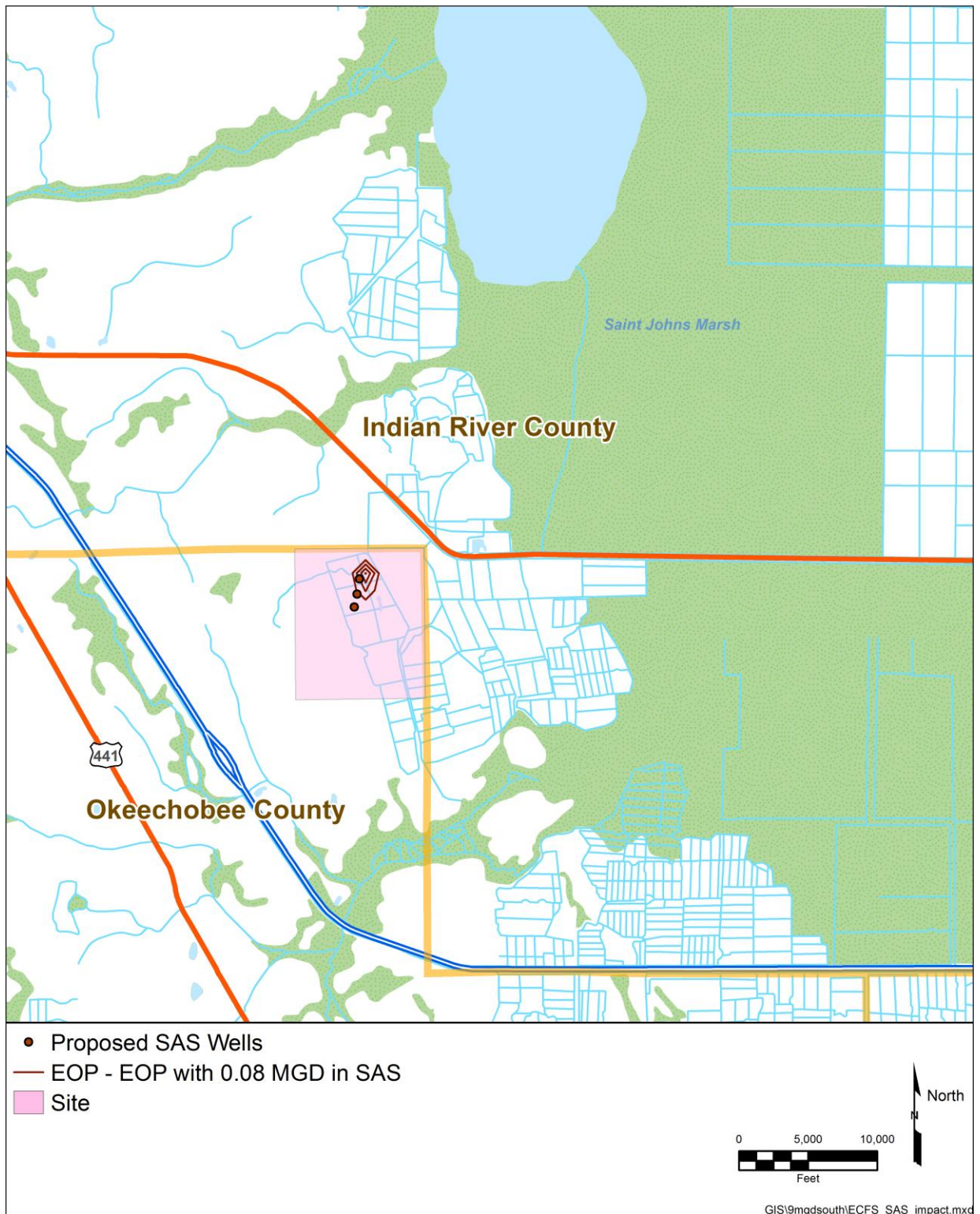
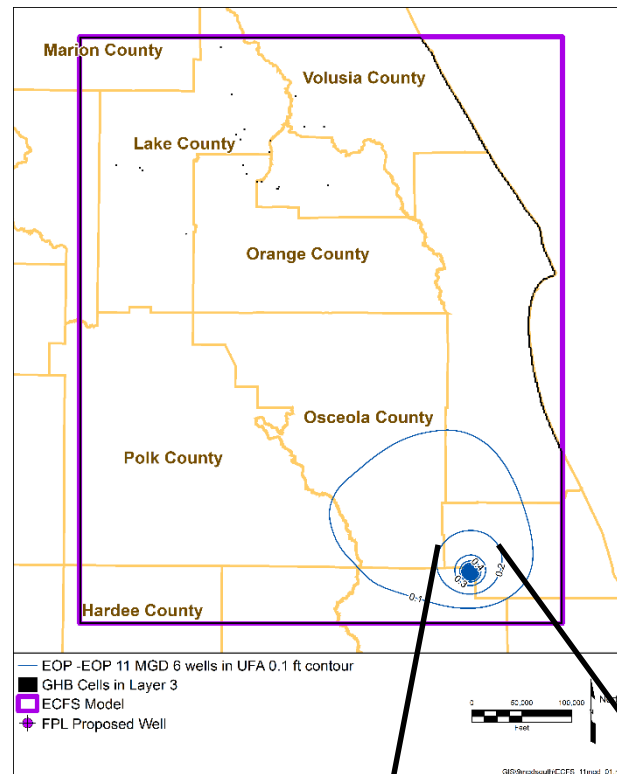


Figure 10. Drawdown in the SA due to service water pumping by FPL.

(a)



(b)

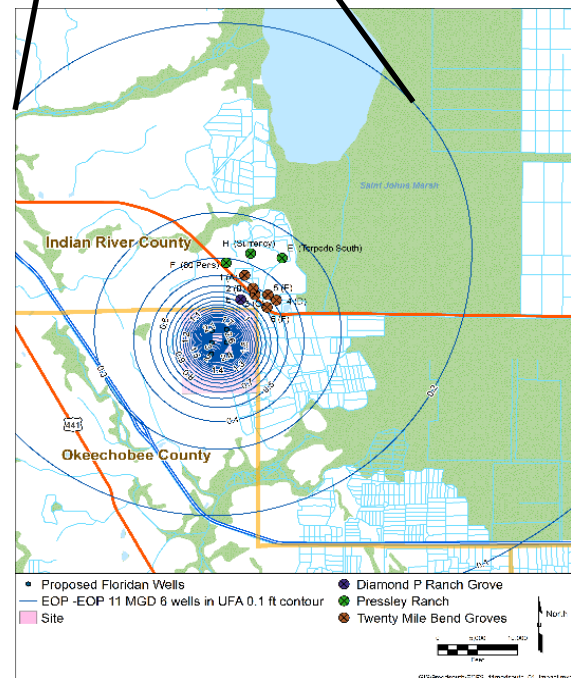


Figure 11. Drawdown within model domain (a) and OCEC Site (b).