UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 4
Atlanta, Georgia

Preliminary Determination & Statement of Basis
Prevention of Significant Deterioration Permit PSD-EPA-4010
for Greenhouse Gas Emissions

for

Florida Power & Light Company
Port Everglades Next Generation Clean Energy Center Project

May 29, 2013

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1.0 Introduction

Florida Power & Light Company (the Applicant or FPL) has applied for a Prevention of Significant Deterioration (PSD) air permit for the emission of Greenhouse Gases (GHGs) pursuant to the Clean Air Act (CAA) from the United States Environmental Protection Agency (EPA) Region 4 for the proposed Port Everglades Project (Project). FPL is proposing a major modification which would result in modernizing the existing Port Everglades Plant using higher efficiency, combined cycle combustion turbine technology. The PSD application consists of the retirement and replacement of four existing oil-fired units with one nominal 1,250 megawatt (MW) 3-on-1 combined cycle unit, which will rely primarily upon natural gas. The Project will result in a decrease of sulfur dioxide (SO_2), particulate matter (PM), particulate matter with an aerodynamic diameter equal to or less than 10 microns (PM_{10}), particulate matter with an aerodynamic diameter equal to or less than 2.5 microns ($PM_{2.5}$), nitrogen dioxides (NO_x), and lead emissions and an increase of 69 tons per year (TPY) of carbon monoxide (CO) and 28 TPY of volatile organic compound (VOC) emissions. GHG emissions will experience a net increase of 1,932,047 TPY on a carbon dioxide-equivalent (CO_2e) basis. The existing facility and proposed Project is located within the City of Hollywood, in Broward County, Florida. The existing plant is situated within approximately 92.5 acres of land owned by FPL.

EPA Region 4 is the agency responsible for implementing and enforcing CAA requirements for GHG sources in Florida. EPA has completed review of the application and supplemental materials and is proposing to issue Permit No. PSD-EPA-R4010 to FPL for the project subject to the terms and conditions described in the permit. The draft permit incorporates the applicable requirements from the federal PSD program.

This document serves as a fact sheet, preliminary determination and statement of basis for the draft permit. It provides an overview of the project, a summary of the applicable requirements, the legal and factual basis for the draft permit conditions, and EPA's analysis of key aspects of the application and permit such as the best available control technology (BACT) analysis for GHG emissions. Additional information can be found in the draft permit accompanying this document as well as in the application materials and administrative record for this project, as discussed in Section 8.0.[1]

[1] The procedures governing the issuance of PSD permits are set forth at 40 CFR part 124, subparts A and C. *See* 40 CFR §§ 52.21(q) and 124.1. Accordingly, EPA has followed the procedures of 40 CFR part 124 in issuing this draft permit. This Preliminary Determination describes the derivation of the permit conditions and the reasons for them as provided in 40 CFR § 124.7, and also serves as a Fact Sheet as provided in 40 CFR § 124.8.

2.0 Applicant Information

2.1 Applicant Name and Address

Florida Power & Light Company
700 Universe Boulevard
Juno Beach, FL 33408

2.2 Facility Location

FPL is proposing to modify the existing Port Everglades Plant located within the City of Hollywood, in Broward County, Florida. The site location is illustrated in Figure 2-1 below.

Figure 2-1 – Port Everglades Plant

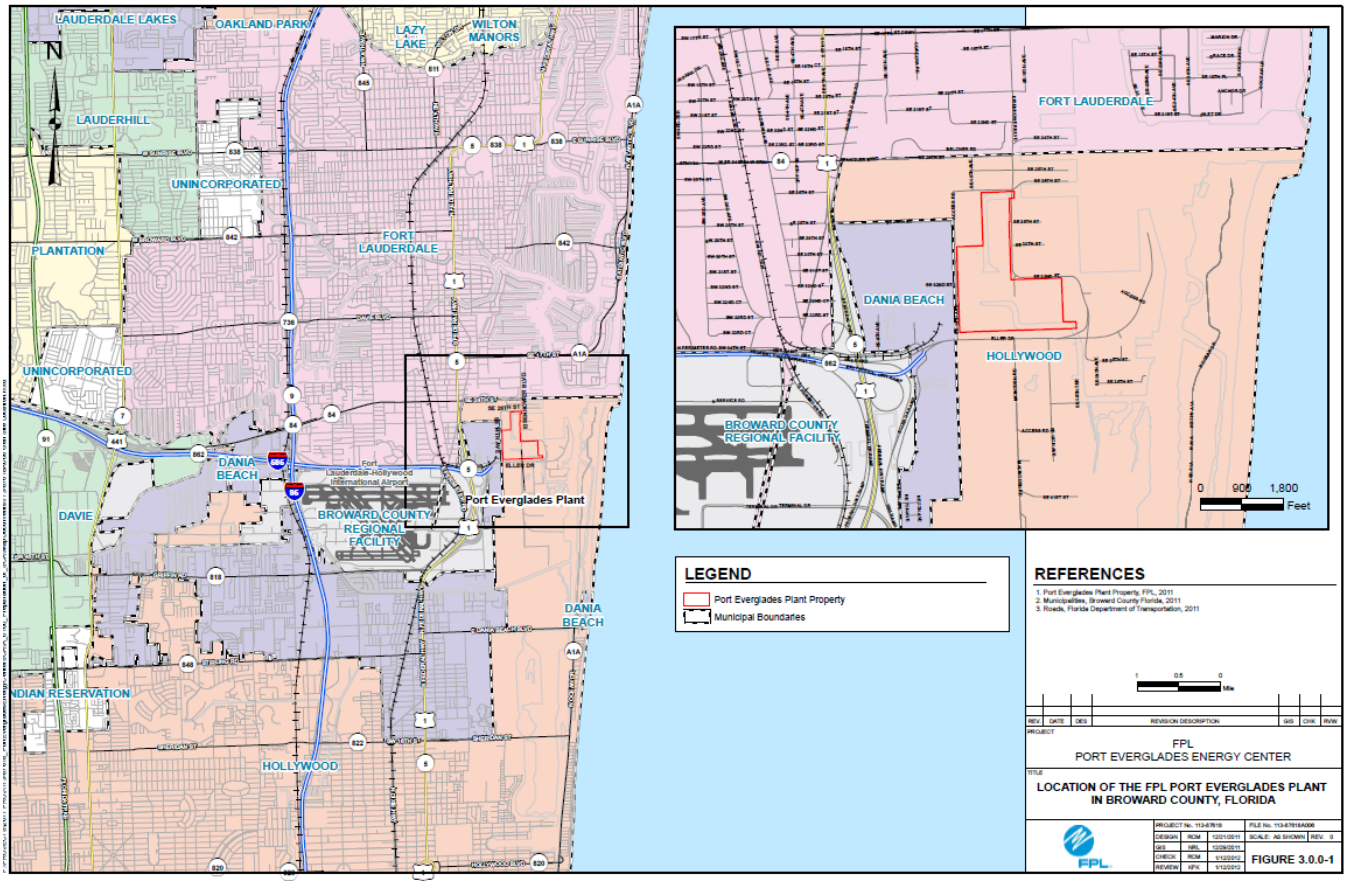

Image Source: FPL PSD Application

3.0 Proposed Project

FPL has applied for a GHG PSD air permit pursuant to the CAA from the United States EPA Region 4 for the proposed Project. FPL is proposing a major modification which would result in modernizing the existing Port Everglades Plant using a higher efficiency combined cycle combustion turbine technology. The PSD Application consists of the retirement and replacement of four existing oil-fired units with one nominal 1,250 MW 3-on-1 combined cycle unit, which will rely primarily upon natural gas with ultra low sulfur distillate (ULSD) fuel oil as backup.

The Project will result in a decrease of SO_2, PM, PM_{10}, $PM_{2.5}$, NO_x, and lead emissions and an increase of 69 TPY in CO and 28 TPY in VOC emissions. The existing facility is situated within approximately 92.5 acres of land owned by FPL within the City of Hollywood in Broward County, Florida. Based on emissions estimates and the applicable permitting thresholds, the Project will have significant emissions of GHGs on a mass and CO_2e basis and is subject to the PSD program for GHGs as the measured pollutant. Based on FPL's permit application, GHG emissions will experience a net increase of 1,932,047 TPY CO_2e.

FPL's existing facility consists of two nominal 200 MW fossil fuel-fired steam generating units (FFFSGU) (Units 1 and 2), two nominal 400 MW FFFSGU (Units 3 and 4), and 12 simple cycle natural gas turbines (GT1 - GT12). Units 1 through 4 are authorized to operate pursuant to Florida Department of Environmental Protection (FDEP) Final Title V Permit No. 0110036-009-AV on natural gas, No. 6 fuel oil, No. 2 fuel oil, propane, and on-specification used oil from FPL operations. Existing Units 1 through 4 will be retired and replaced with one nominal 1,250 MW 3-on-1 combined cycle unit. The 3-on-1 unit will consist of three nominal 250 MW advanced combustion turbines (CTs) and three heat recovery steam generators (HRSGs), which will utilize the waste heat from the CTs to produce steam to be utilized in a single nominal 500 MW steam turbine generator.

Each CT will utilize inlet air cooling and may utilize evaporative cooling or an alternative system. The CTs will use natural gas as the primary fuel with ULSD used as a backup fuel for up to the equivalent of 1,000 hours per year (hr/yr) per CT at baseload conditions. Natural gas for the Project will be transported to the facility via pipeline. No onsite storage will be provided for natural gas. Natural gas compressors will be installed to raise the natural gas pressure to the appropriate level for the CTs. ULSD oil will be delivered to the facility by truck or pipeline and will be stored in a new fuel oil storage tank.

Dismantlement of the existing generation units will be required prior to the construction of the Project. Consequently, there will be no overlap of operation between the removal of the existing units and the Project, which is anticipated to commence commercial operation in June 2016. Two temporary construction boilers will be utilized during construction, but will be removed prior to commercial operation.

The emissions units to be used in the Project are detailed in Sections 4.0 and 5.0.

4.0 Legal Authority and Regulatory Applicability

4.1 EPA Jurisdiction

In 2010, EPA established a federal implementation plan (FIP) to apply in each state that had not submitted, by their established deadline, a corrective state implementation plan (SIP) revision to apply

the CAA PSD program to sources of GHGs. *See* FR Vol. 75, No. 250, 82246. The state of Florida does not currently have a corrective SIP that is applicable to GHG sources under the CAA PSD program; therefore EPA is issuing this GHG PSD permit. FDEP is responsible for issuing a separate construction and title V operating permit for the Project for applicable non-GHG emissions.

4.2 Prevention of Significant Deterioration (PSD)

The PSD program, as set forth at 40 CFR § 52.21, is applicable to major sources such as this proposed project. The objective of the PSD program is to prevent significant adverse environmental impact from air emissions by a proposed new or modified source. The PSD program limits degradation of air quality to that which is not considered "significant." The PSD program requires the utilization of BACT as determined on a case-by-case basis taking into account energy, environmental and economic impacts, and other costs.

Under the PSD regulations, a stationary source is "major" if, among other things, it emits or has the potential to emit (PTE) 100 or 250 TPY or more (depending on source category) of a "regulated New Source Review (NSR) pollutant" as defined in 40 CFR § 52.21(b)(50). *See* 40 CFR § 52.21(b)(l). "Potential to emit" is defined as the maximum capacity of a source to emit a pollutant under its physical and operational design. "Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is enforceable." *See* 40 CFR § 52.21(b)(4).

Beginning on January 2, 2011, GHGs became subject to regulation under the PSD major source permitting program as a regulated NSR pollutant when emitted in amounts greater than certain applicability thresholds. GHGs are a single air pollutant defined in 40 CFR 52.21(b)(49)(i) as the aggregate group of the following six gases:

- Carbon dioxide (CO_2);
- Nitrous oxide (N_2O);
- Methane (CH_4);
- Hydrofluorocarbons (HFCs);
- Perfluorocarbons (PFCs); and
- Sulfur hexafluoride (SF_6).

Due to the nature of GHGs and their incorporation into the definition of "subject to regulation," the determination of whether a source is emitting GHGs in an amount that triggers PSD applicability involves a calculation of the source's CO_2e emissions as well as its GHG mass emissions. See 40 CFR § 52.21(b)(49). Consequently, when determining the applicability of PSD to GHGs, there is a two-part applicability process that evaluates both:

- The sum of the CO_2e emissions in TPY of the six GHGs, in order to determine whether the source's emissions are a regulated NSR pollutant; and, if so;
- The sum of the mass emissions in TPY of the six GHGs, in order to determine if there is a major source or major modification of such emissions.

For PSD permits issued on or after July 1, 2011, PSD applies to the GHG emissions from an existing source if either of the following are true: (1) the modification is subject to PSD for another pollutant and

the potential to emit GHGs is greater than or equal to 75,000 TPY on a CO_2e basis and greater than zero TPY on a mass basis; or (2) the potential emissions of GHGs from the new source would be equal to or greater than 100,000 TPY on a CO_2e basis and the GHG emissions from the modification are greater than or equal to 75,000 TPY CO_2e and greater than zero TPY on a mass basis.

Table 5-3 lists the PTE for each regulated NSR pollutant from the Project, as well as the significant emission rate for each regulated NSR pollutant. The permit application and Section 5.0 of this document contain information on the emissions factors used to determine the PTE for the Project. The Project is an existing PSD source with a PTE greater than 100,000 TPY CO_2e and the net increase in GHG emissions associated with the modification exceeds the threshold of 75,000 TPY CO_2e and is greater than zero TPY on a mass basis.

EPA Region 4 applies the policies and practices reflected in the EPA document "PSD and Title V Permitting Guidance for Greenhouse Gases" (March 2011). Consistent with that guidance, we have not required the applicant to model or conduct ambient monitoring for GHGs, and we have not required any assessment of impacts of GHGs in the context of the additional impacts analysis or Class I area provisions of 40 CFR 52.21 (o) and (p), respectively. Instead, EPA has determined that compliance with the selected BACT is the best technique that can be employed at present to satisfy the additional impacts analysis and Class I area requirements of the rules, with respect to emissions of GHGs. Section 6.0 of this document contains a discussion of the BACT analysis.

4.3 Title V

Upon issuance of this PSD permit, the State of Florida will incorporate these permit conditions into the existing title V permit for the facility.

4.4 New Source Performance Standards (NSPS)

On April 13, 2012, EPA published a *Federal Register* notice (77 FR 22392) which proposes a GHG emission standard under a new subpart TTTT of 40 CFR Part 60 (New Source Performance Standards), of 1,000 lb/MWh (gross output) for combined cycle CTs, on a 12-month annual average basis, at electric utility power plants. This standard would be applicable to sources which commence construction after April 13, 2013. The definition of BACT in PSD rules at 40 CFR 52.21(b)(12) states that "in no event shall application of best available control technology [BACT] result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR parts 60 and 61." If the currently proposed version of the NSPS becomes final, the Project would be subject to the standard; however, the GHG emissions from the new units subject to the rule (combustion turbines) are expected to be below the 1,000 lb/MWh standard on a rolling 12-month basis averaged for all fuels utilized.

5.0 Project Emissions

The maximum annual potential emissions for the Project include GHG emissions from the CT/HRSGs, fuel heater, emergency generators, auxiliary boiler, fire pump engine, fuel oil storage tank, natural gas compressor station, and circuit breakers. While two CT options are being proposed, the worst case emissions scenario for each pollutant has been used in the annual potential emissions calculations. Tables 5-1 and 5-2 present the maximum annual potential Project emissions with the Mitsubishi Power Systems (MPS) "J" and Siemens "H" CTs, respectively. These tables address the relevant regulated NSR pollutants, as required under NSR.

Table 5-1 Project Potential to Emit Emissions, (using MPS 501J CTs)

Emission Unit Description	SO_2 (TPY)	PM (TPY)	PM_{10} (TPY)	$PM_{2.5}$ (TPY)	NO_x	CO (TPY)	VOC (as methane) (TPY)	Sulfuric Acid Mist (TPY)	Lead (TPY)	GHGs (CO_2e) (TPY)
CTs/HRSGs with Duct Burners (3)	208	120	120	120	337	914	86.2	40.4	0.049	4,410,327
Auxiliary Boiler (1)	0.56	0.74	0.74	0.74	4.99	7.98	0.54	Neg.	Neg.	11,670
Emergency Generators (2)	0.003	0.28	0.28	0.28	4.87	6.00	0.71	Neg.	Neg.	687
Gas Compressors (2)	2.60	2.98	2.98	2.98	25.2	25.6	7.3	Neg.	Neg.	55,313
Fire Pump Engine (1)	0.00018	0.013	0.013	0.01	0.22	0.086	0.033	Neg.	Neg.	15.2
Fuel Oil Storage Tank (1)	NA	NA	NA	NA	NA	NA	5.82	NA	NA	NA
Circuit Breakers (2)	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.5
Temporary Construction Boilers (2)*	0.6	2.7	2.7	2.7	15.4	9.3	0.6	NA	NA	36,700
Total Project	**210**	**123**	**123**	**123**	**371**	**954**	**100.6**	**40.4**	**0.049**	**4,478,017**

* Temporary construction boilers will be used during construction, but will be removed prior to commercial operation. These emissions were not included in the PTE calculations.

Table 5-2 Project Potential to Emit Emissions, (using Siemens H CTs)

Emission Unit Description	SO_2 (TPY)	PM (TPY)	PM_{10} (TPY)	$PM_{2.5}$ (TPY)	NO_x	CO (TPY)	VOC (as methane) (TPY)	Sulfuric Acid Mist (TPY)	Lead (TPY)	GHGs (CO_2e) (TPY)
CTs/HRSGs (3)	187	242	242	242	348	631	92.1	36.4	0.052	4,058,754
Emergency Generators (2)	0.003	0.28	0.28	0.28	4.87	6.00	0.71	Neg.	Neg.	687
Gas Compressors (2)	2.60	2.98	2.98	2.98	25.2	25.6	7.3	Neg.	Neg.	55,313
Fire Pump Engine (1)	0.00018	0.013	0.013	0.013	0.22	0.086	0.033	Neg.	Neg.	15.2
Fuel Oil Storage Tank (1)	NA	NA	NA	NA	NA	NA	5.82	NA	NA	NA
Circuit Breakers (2)	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.5
Temporary Construction Boilers (2)*	0.6	2.7	2.7	2.7	15.4	9.3	0.6	NA	NA	36,700
Total Project	**189**	**245**	**245**	**245**	**377**	**662**	**105**	**36.4**	**0.052**	**4,114,774**

* Temporary construction boilers will be used during construction, but will be removed prior to commercial operation. These emissions were not included in the PTE calculations.

Table 5-3 Summary of Maximum Net Emissions Increases

Pollutant	PTE (TPY)	Net Emissions (TPY)	Significant Emission Rate (TPY)	PSD Review Required
SO_2	210	-9,284	40	No
PM	245	-358	25	No
PM_{10}	245	-358	15	No
$PM_{2.5}$	245	-157	10	No
NO_x	377	-3,883	40	No
CO	954	69	100	No
VOC (as methane)	105	28	40	No
Sulfuric Acid Mist	40.4	-382	7	No
Lead	0.052	-0.046	0.6	No
GHGs (CO_2e)	4,478,017	1,926,979	75,000 (subject to regulation threshold)	Yes

As seen in the emissions summary tables, the emissions limits are based upon net changes to emissions associated with existing equipment and future equipment. Further, FPL confirms that there are no other creditable emissions increases or decreases during the contemporaneous period as defined in 40 CFR 52.21 (b)(3)(ii) beyond the planned shutdown of existing boiler units 1-4. PTE emissions were based upon the net change in the highest 2-year average of actual emissions from 2006 to 2010. For GHGs, the highest 2-year baseline actual emissions were 2,551,038 TPY CO_2e.

5.1 Unit Analysis

Emissions calculations for equipment used during operation of the Project were made based on the assumptions described below.

Unit ID: CTs/HRSGs
The Project will include the retirement and replacement of four existing oil-fired units with one nominal 1,250 megawatt (MW) 3-on-1 combined cycle unit, which will rely primarily upon natural gas. Maximum potential annual emissions for the CTs/HRSGs for regulated air pollutants are based on operation at baseload conditions (100 percent load) with an ambient temperature of 75°F. This turbine inlet temperature is conservative, since the annual average temperature is slightly higher than 75°F. To produce the maximum annual emissions, it is assumed that each CT/HRSG would operate for 8,760 hours per year. Of the 8,760 operating hours, an average of 7,760 hr/yr is based on natural gas firing, and the remaining average of 1,000 hr/yr is based on ULSD fuel oil operation. Emissions limits were based upon the simultaneous operation of all three CT/HRSGs.

Unit ID: Auxiliary Boiler
An auxiliary boiler will be used with the MPS "J" CTs, as necessary, for startup. The combustor requires steam for combustor cooling, which normally comes from the HRSG. The limited use auxiliary boiler will operate up to 2,000 hr/yr, and will have a maximum heat input of 99.8 MMBtu/hr, higher heating value (HHV), firing natural gas.

Unit ID: Emergency Generators
The Project will be equipped with two 2,250 kilowatt (kW) emergency generators firing ULSD fuel oil. These emergency generators will be used when electric power is not available. This primarily would occur during catastrophic events such as hurricanes. These emergency generators may be operated up to 2 hours per month for maintenance and reliability testing.

Unit ID: Gas Compressors
The Project will include a new natural gas compressor station to increase pressure from the existing Florida Gas Transmission Company, LLC (FGT) pipeline to the CTs. Pending a final agreement between FPL and the natural gas provider, the natural gas compressor station may be installed either onsite or offsite. However, the Project emissions limits include those anticipated from the compressor station in the event that the compressors are installed onsite. The natural gas compressor station would consist of three Solar Centaur 50 compressor sets or equivalent, with each set including a natural gas turbine and natural gas compressor. During normal operation, only two of the three compressor sets will operate at any given time.

Unit ID: Fire Pump Engine
The Project will be equipped with a 300 horsepower (hp) fire pump engine using ULSD fuel oil. This engine will be used when necessary during catastrophic events such as fires. The fire pump engine may be operated up to 2 hours per month for maintenance and reliability testing.

Unit ID: Fuel Oil Storage Tank
ULSD fuel oil will be either trucked or barged to the facility and stored in a new fuel oil tank at the facility. This tank is a vertical fixed roof design, with a rated storage capacity of approximately 7 million gallons (165,000 barrels).

Unit ID: Circuit Breakers
The Project will include two circuit breakers containing SF_6, with a guaranteed leak rate not to exceed 0.5 lb/yr. Each breaker will be equipped with low density alarms and thoroughly leak tested with helium prior to delivery.

Unit ID: Temporary Construction Boilers
The Project will include two temporary construction boilers, rated up to approximately 150 MMBtu/hr, which will be brought onsite for use only during construction. The boilers will provide steam for HRSG, cleaning and associated steam blows. Each boiler will be fired with natural gas only and will operate for no more than 1,500 hr/yr. The boilers will be permanently shut down and removed once commercial operation begins.

5.2 Compliance Methodology (Monitoring, Recordkeeping, and Reporting)

The owner/operator shall install, operate, and maintain a continuous emission monitoring system (CEMS) to monitor CO_2 emissions. The installation of the CO_2 monitor shall meet the performance specifications of 40 CFR Part 60, Appendix B, Performance Specification No. 3. A single, dedicated ASTM certified natural gas flow meter for the CTs/HRSGs shall be installed and operated, as well as a single, dedicated ASTM certified ULSD flow meter for the CTs/HRSGs. The heat input to the CTs/HRSGs shall be calculated for each hour of operation by using the fuel flow meters and the corresponding fuel's heat content. A non-resettable operating hour meter or the equivalent software to accurately indicate the elapsed operating time of the CTs/HRSGs, including periods of when the unit is in startup and shutdown operations shall be installed and maintained.

6.0 Best Available Control Technology (BACT) and Recordkeeping Requirements

A major modification of a major stationary source subject to PSD requirements is required to apply BACT for each pollutant subject to regulation under the CAA that it would have the potential to emit in significant amounts. *See* 40 CFR § 52.21(j). Based on the emission inventory for the Project, summarized in Table 5-3, GHGs are a CAA-regulated pollutant that FPL has the potential to emit in quantities that equal or exceed the significant emission rate. Therefore, BACT must be determined for each new emission unit which emits GHGs.

The 3-on-1 combined cycle unit is included in the source's potential to emit, as required by 40 CFR 52.21(b)(4), and is subject to operating limits, monitoring, recordkeeping and reporting requirements to ensure they will not exceed the potential emissions assumed in the application and impact review. In addition, the application includes an auxiliary boiler, emergency generators, a natural gas compressor station, a diesel fire pump engine, a fuel oil storage tank, circuit breakers, and temporary construction boilers, which are necessary support equipment for the 3-on-1 combined cycle unit. These are also subject to operating limits, monitoring, recordkeeping and reporting requirements.

BACT is defined in the applicable permitting regulations at 40 CFR § 52.21(b)(12), in part, as:

> an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under the Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant. In no event, shall application of best available control technology result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR parts 60 and 61. If the Administrator determines that technological or economic limitations on the application of measurement technology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirement for the application of best available control technology.

The CAA contains a similar BACT definition, although the 1990 CAA amendments added "clean fuels" after "fuel cleaning or treatment" in the above definition. *See* CAA § 169(3).

On December 1, 1987, the EPA issued a memorandum describing the top-down approach for determining BACT. *See, e.g., In re Prairie State Generating Co.*, 13 E.A.D. 1 (EAB 2006). In brief, the top-down approach provides that all available control technologies be ranked in descending order of control effectiveness. Each alternative is then evaluated, starting with the most stringent, until BACT is determined. The top-down approach consists of the following steps:

Step 1: Identify all available control technologies.

Step 2: Evaluate technical feasibility of options from Step 1 and eliminate options that are technically infeasible based on physical, chemical and engineering principles.

Step 3: Rank the remaining control technologies from Step 2 by control effectiveness, in terms of emission reduction potential.

Step 4: Evaluate the most effective controls from Step 3, considering economic, environmental and energy impacts of each control option. If the top option is not selected, evaluate the next most effective control option.

Step 5: Select BACT (the most effective option from Step 4 not rejected).

6.1 GHG BACT Analyses for 3-on-1 Combined Cycle Unit

Step 1: Identify all available control technologies

The applicant identified the following available control technologies in their permit application dated January 23, 2012 for the proposed 3-on-1 combined cycle unit:

1. Energy Efficiency
2. Carbon Capture and Storage
3. Oxidation Catalyst
4. Fuel Source

In addition, EPA requested that FPL submit justification for the use of fuel oil as a backup, along with the appropriate BACT analysis, since a complete BACT analysis should also include the evaluation of clean fuels and combustion of natural gas generally results in lower GHG emissions than does the combustion of fuel oil.

Energy Efficiency: Energy efficiency falls under the general category of lower polluting processes/practices. Applying technologies, measures and options that are energy efficient translates not only in the reduction of emissions of the particular regulated NSR air pollutant undergoing BACT review, but it also may achieve collateral reductions of emissions of other pollutants. There are different categories of energy efficient improvements:

- Technologies or processes that maximize the efficiency of the individual emissions unit, and
- Options that could reduce emissions by improving the utilization of thermal energy and electricity that is generated and used onsite.

When the efficiency of the power generation process is increased, less fuel is burned to produce the same amount of electricity. This provides the benefits of lower fuel costs and reduced air pollutant emissions (including CO_2). Efficient power production is technically feasible and is proposed for the Project combined cycle unit.

Two CT types, the Mitsubishi Power Systems (MPS) “J” and Siemens “H”, are being considered for use in the Project. Only one type will ultimately be chosen. Energy efficiencies and heat rates for these units were evaluated and shown to be more efficient compared to other operating power generating facilities of similar size and class.

Carbon Capture and Storage (CCS): Carbon capture and storage (CCS) falls under the category of add-on controls, which are air pollution control technologies that remove pollutants from a facility's emissions stream. CCS is an add-on pollution control technology that is available for large CO_2 emitting facilities including fossil fuel-fired power plants and industrial facilities with high purity CO_2 streams. CCS is composed of three main components: CO_2 capture and/or compression, transport, and storage.

Oxidation Catalyst: Catalytic oxidation technology, which is primarily designed to reduce CO emissions will also reduce CH_4 emissions, but to a lesser extent. Oxidation catalysts operate at elevated temperatures where excess O_2 in the exhaust reacts with CH_4 to form CO_2. The surface of an oxidation catalyst is typically a precious metal. Oxidation catalysts are susceptible to fine particles suspended in the exhaust gases that can foul and poison the catalyst. Catalyst poisoning reduces catalyst activity and pollutant removal efficiencies. The most effective oxidation of CO and VOC emissions is achieved if the catalyst bed is located prior to the HRSG in the high temperature region of the CT exhaust.

Fuel Source: The use of natural gas as a fuel source is an inherently lower emitting practice than the use of fuel oil. The combustion of natural gas has the lowest emissions of GHGs of any fossil fuel and emits almost 30% less CO_2 than oil, and about 45% less CO_2 than coal on a lb/MMBtu basis.

Step 2: Eliminate technically infeasible control options

Energy Efficiency: Efficient power generation is technically feasible and is being proposed for the Project's combined cycle unit.

Carbon Capture and Storage (CCS): EPA recognizes the significant logistical hurdles that the installation and operation of a CCS system presents and that set it apart from other add-on controls that are typically used to reduce emissions of other regulated pollutants. Logistical hurdles for CCS include: obtaining contracts for offsite land acquisition (including the availability of land), the need for funding (including, for example, government subsidies), timing of available transportation infrastructure, developing a site for secure long term storage, and environmental permitting for underground GHG sequestration.

The Project will be replacing a nominal 1,200 MW oil and natural gas-fired steam electric plant with an nominal 1,250 MW advanced combined cycle unit on the same footprint. There is insufficient space at the existing plant property to provide the needed infrastructure for a CCS system. In addition, the Project is located within the industrialized Port with no additional space for CCS facilities. Based on these considerations, EPA has concluded that CCS is not applicable to the Project, and consequently not technically feasible for this particular facility.

Oxidation Catalyst: Catalytic oxidation is an available control technology for CH_4. While CH_4 emissions can be reduced using an oxidation catalyst, the amount of CO_2e reduced is less than 0.05 percent. Moreover, the amount of potential CO_2e that could be reduced from the Project's combined cycle unit is 40 times lower than the EPA GHG thresholds. Therefore, the addition of an oxidation catalyst to the Project for GHG control is neither practicable nor feasible to reduce CH_4 from this facility.

Fuel Source: The use of natural gas as the sole fuel source, while most desirable, is associated with numerous technical challenges. Based on the information provided by the applicant, factors that must be accounted for include: the need for electric system reliability and integrity, the need for fuel diversity and supply reliability, the need for base load generating capacity, the need for adequate electricity at a

reasonable cost, and whether it is the most cost-effective alternative available. FPL's natural gas supply is limited by the number of pipelines that serve the state. The limited number of independent pipelines represents a source of unique risk in system and fuel reliability. The potential for temporary disruption of supply at the critical entry points, primarily the Gulf of Mexico, could occur due to hurricanes or through gas industry operational issues. While the cost of electricity was identified by the applicant as one of the reasons for needing a varied fuel source, it was not the only reason. Based on the need for reliability and the risk associated with Florida's limited pipeline system, the use of natural gas as the sole fuel source is not technically feasible for this project.

Step 3 & 4: Rank remaining control technologies and evaluate energy, environmental and economic impacts

Based on the discussion in Steps 1 and 2, the only technically feasible control option for GHGs is energy efficiency. There are no anticipated adverse environmental impacts associated with the use of energy efficiency as BACT.

Step 5: Select BACT

FPL proposed an output based GHG BACT limit of 877 lb CO_2e/MWh (net basis) on a 12-month rolling average when operating at 100% load using natural gas as the primary fuel source and fuel oil as the backup fuel source. However, EPA determined that combining both fuel types and proposing a single limit is not appropriate for this project. Therefore, EPA proposes a net output based GHG BACT limit of 832 lb CO_2e/MWh on a 12-month rolling average when using natural gas and a net output based GHG BACT limit of 1,176 lb CO_2e/MWh on a 12-month rolling average when using fuel oil. The BACT limits are based on an annual average turbine inlet temperature of 75°F, the range in operating loads, 8,760 hr/yr of natural gas operation, 1,000 hr/yr of ULSD oil operation, a 2 percent margin for the difference between guaranteed heat rates and actual heat rates (the vendor has not yet been selected), and a 5 percent margin for degradation over time. The estimated heat rate efficiency is 6,488 Btu/kWh and 7,171 Btu/kWh for natural gas and fuel oil, respectively.

Based on the BACT analysis, the proposed net GHG BACT limits of 832 lb CO_2e/MWh (natural gas) and 1,176 lb CO_2e/MWh (fuel oil) on a 12-month rolling average for the combined cycle unit is appropriate as BACT.

6.2 GHG BACT Analysis for Smaller Combustion Equipment: Auxiliary Boiler, Emergency Generators, Natural Gas Compressor Station, Diesel Fire Pump Engine, and Temporary Construction Boilers

CCS is not practical for control of CO_2 emissions from the auxiliary boiler, emergency generators, natural gas compressor station, diesel fire pump engine, and temporary construction boilers due to the small amount of CO_2 emissions potential from this equipment compared to the combined cycle system. Moreover, these units are not operated continuously or at their rated capacities making the addition of control equipment problematic. Therefore, CCS was not included as an available control technology in the following BACT analysis.

Step 1: Identify all available control technologies

The applicant identified the following available control technologies in their permit application dated January 23, 2012, for the proposed auxiliary boiler, emergency generators, natural gas compressor

station, and diesel fire pump engine. In their response to our request for additional information dated May 8, 2012, the applicant confirmed that BACT analyses for the following control options are also applicable to the temporary construction boilers:

1. Energy Efficiency
2. Cleaner Fuels

Energy Efficiency: The applicant provided information supporting the improved efficiency of the auxiliary boiler, emergency generators, natural gas compressor station and diesel fire pump engine. The auxiliary boiler will be used to provide steam to the steam cycle during the startup sequences. A boiler's efficiency is measured by its annual fuel utilization efficiency (AFUE). AFUE is the ratio of heat output of the boiler compared to the total energy consumed by the boiler. An AFUE of 90 percent means that 90 percent of the energy in the fuel becomes heat and the other 10 percent is lost in the system. In general, fossil fuel fired boilers have high AFUE rating around 90 percent. For example, based on data from Cleaver Brooks firetube boilers, the fuel to steam efficiencies for boilers are in the 90 percent range for natural gas. This energy efficiency assessment is also applicable to the temporary construction boilers.

The natural gas compressors are efficient natural gas turbines connected directly to natural gas compressors. These natural gas turbine/compressors are used to maintain the necessary pressure for natural gas piped to the CTs associated with combined cycle unit. The amount of compression necessary is regulated by matching the needed fuel to the natural gas turbines that produce the necessary pressure for the CTs.

The emergency generators and diesel fire pump are designed to meet the applicable NSPS and NESHAP for non-road engines. These units maximize efficiency while meeting the required emissions standards.

Cleaner Fuels: EPA recognizes that, with the exception of the emergency equipment (emergency generator and fire pump engine), all the combustion equipment in this BACT analysis utilize natural gas as the only fuel source, which is a cleaner fuel with respect to GHG emissions and constitutes a lower polluting method of operation. For the non-emergency equipment, the GHG emissions rate for natural gas firing is 116.9 lb CO_2e/MMBtu compared to 163.6 lb CO_2/MMBtu for distillate fuel oil firing based on Subpart C of 40 CFR Part 98, Mandatory Greenhouse Gas Reporting Rule. The emission factors include N_2O and CH_4 at the equivalent rates. Therefore, firing natural gas will generate less GHG emissions than firing oil.

Step 2: Eliminate technically infeasible control options

Energy efficiency through the regulation of the amount of fuel used is considered to be technically feasible CO_2 control option for the auxiliary boiler, emergency generators, natural gas compressor station, diesel fire pump engine, and temporary construction boilers.

The use of natural gas as the only fuel source is an inherently lower emitting practice than the use of fuel oil. For the auxiliary boiler, natural gas compressor station, and temporary construction boilers, the use of natural gas is also a technically feasible control option.

The use of natural gas in the emergency equipment (emergency generator and fire pump engine), is not considered technically feasible since the primary purpose of this equipment is to provide power in the case of an emergency, which may include the curtailment of the natural gas supply. For safety reasons,

EPA believes it is reasonable for this equipment to use diesel/No. 2 distillate oil as the primary fuel source.

Step 3 & 4: Rank remaining control technologies

Based on the discussion in Steps 1 and 2, the technically feasible control options for GHGs from the auxiliary boiler, emergency generators, natural gas compressor station, diesel fire pump engine, and temporary construction boilers is energy efficiency through the regulation of fuel and use of a cleaner fuel (for non-emergency equipment). There are no anticipated adverse environmental impacts associated with the use of energy efficiency or cleaner fuel as BACT.

Step 5: Select BACT

The auxiliary boiler, emergency generators, natural gas compressor station, diesel fire pump engine, and temporary construction boilers, together account for less than 2 percent of the total GHG emissions potential of the Project. The operation of these units will be limited: the auxiliary boiler will be based on 2,000 hr/yr; emergency generators and fire pump engine are limited to 100 hours or less; and only two of three natural gas turbine/compressors will normally be operated and only used to regulate natural gas pressure. Given the limited use of this equipment and the relatively small amount of GHG emissions, the EPA has determined that long-term BACT emission limits (in TPY on a 12-month rolling average) are more appropriate than short-term emission limits. See Table 6-1 below for the proposed BACT limits. The limits listed in Table 6-1 are on a per unit basis. Compliance with these limits will be shown by tracking the fuel use and/or hours of operation, as appropriate. Furthermore, to reduce the emissions and maintain consistency with the emission estimates in the permit application, the permit proposes to limit the use of these combustion units as described above.

Table 6-1: Proposed BACT for Smaller Combustion Equipment

Emission Unit	BACT Limit (TPY CO_2e)	Operating Limit
Auxiliary Boiler (1)	11,670	**2,000 hours per 12 month rolling average**
Emergency Generators (2)	344	**24 hours per 12 month rolling average per generator**
Gas Compressors (2)	27,657	**Only 2 of 3 compressors shall operate at a time**
Fire Pump Engine (1)	15.2	**24 hours per 12 month rolling average**
Temporary Construction Boilers (2)	18,350	**1,500 hours per 12 month rolling average**

6.3 GHG BACT Analysis for Circuit Breakers

Step 1: Identify all available control technologies

The applicant identified the following available control technologies in their permit application dated January 23, 2012, and in a letter dated May 8, 2012, for the proposed circuit breakers:

1. Minimization of SF_6 Emissions and Alternative Dielectric Fluids

Modern SF_6 circuit breakers are designed as totally enclosed pressure systems with low potential SF_6 fugitive emissions. Leakage is typically guaranteed to be no more than 0.5% by weight. In addition, circuit breakers have density alarms that provide warnings if a leak is occurring. Further, this equipment is routinely inspected to insure proper operation since the equipment is necessary for safe operation of the Project.

Historically, dielectric fluids such as dielectric oils have been used in high voltage applications. However, the use of these materials in circuit breakers has been predominantly replaced with SF_6, which has superior dielectric and arc quenching properties.

Step 2: Eliminate technically infeasible control options

Circuit breakers using SF_6 with alarms and periodic inspection are technically feasible for the Project. The use of alternative dielectric fluids is not practical for high voltage applications. Circuit breakers using SF_6 are presently superior in their performance to alternative systems such as dielectric oil, high pressure air blast, or vacuum circuit breakers.

Step 3 & 4: Rank remaining control technologies

Based on the discussion in Steps 1 and 2, the only technically feasible control option for SF_6 in circuit breakers is the use of modern enclosed systems with alarms and periodic inspection. There are no anticipated adverse environmental impacts associated with the use of modern enclosed circuit breaker systems with alarms and periodic inspection.

Step 5: Select BACT

The most effective control of fugitive SF_6 emissions is using a totally enclosed system equipped with leak detection and periodic inspection and maintenance, as defined in the proposed permit. EPA has determined that the proposed BACT emission limit for the circuit breakers is 4.5 TPY of CO_2e based on the use of the proposed leak detection and periodic inspection and maintenance practices. The emissions of GHGs from the circuit breaker should be zero, unless a leak is actually occurring. The applicant will show compliance with this emission limit through the use of the proposed work practice standards to ensure no leakage occurs.

7.0 Additional Requirements

7.1 Endangered Species Act

Section 7(a)(2) of the Endangered Species Act (ESA) requires federal agencies, in consultation with the National Oceanic and Atmospheric Administration (NOAA) Fisheries Service and/or the U.S. Fish and Wildlife Service (collectively, “the Services”), to ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of a species listed as threatened or endangered, or result in the destruction or adverse modification of designated critical habitat of such species. *See* 16 U.S.C. §1536(a)(2); *see also* 50 CFR §§ 402.13 and 402.14. The federal agency is also required to confer with the Services on any action which is likely to jeopardize the continued existence of a species proposed for listing as threatened or endangered or which will result in the destruction or

adverse modification of critical habitat proposed to be designated for such species. *See* 16 U.S.C. §1536(a)(4); *see also* 50 CFR 402.10. Further, the ESA regulations provide that where more than one federal agency is involved in an action, the consultation requirements may be fulfilled by a designated lead agency on behalf of itself and the other involved agencies. *See* 50 CFR § 402.07.

In accordance with Section 7 of the ESA, EPA consults with NOAA Fisheries and FWS to ensure that the Project will not cause any protected species to be jeopardized. EPA received concurrence from the Fish and Wildlife Service that our Section 7 ESA consultation requirements were met on November 16, 2012. The proposed permit includes a condition requiring FPL to comply with the Biological Opinion issued by NOAA along with all other applicable federal regulations. The final Biological Opinion will be issued by NOAA prior to issuance of the final permit.

7.2 Essential Fish Habitat of Magnuson-Stevens Act

Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires federal agencies to consult with NOAA with respect to any action authorized, funded, or undertaken by the agency that may adversely affect any essential fish habitat identified under the MSA. EPA is the lead agency for ESA Section 7 and MSA compliance for the Project and is currently in consultation with NOAA regarding both Acts (*see* ESA discussion above).

7.3 National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to take into account the effects of their undertakings on historic properties. Section 106 requires the lead agency official to ensure that any federally funded, permitted, or licensed undertaking will have no effect on historic properties that are on or may be eligible for the National Register of Historic Places.

A desktop cultural resource survey was conducted by Archaeological and Historical Conservancy, Inc. in September 2011 of the Port Everglades Plant property and an area that extends approximately 1 mile from the Site. The survey included a review of relevant archives and literature that contained cultural resource reports for locations in coastal Broward County, a review of information from the Florida Master Site File, a site reconnaissance visit, examination of U.S. Geological Survey (USGS) maps (specifically for Port Everglades and Fort Lauderdale South Quadrangles), and the collection and review of aerial photographs (color and black/white). The survey determined that there are no previously recorded archaeological sites or historic standing structures within the Port Everglades Plant property and there is a low probability for archaeological sites and features. If historical or archaeological artifacts are discovered during construction, EPA's Office of Enforcement and Compliance Assurance (OECA) and FDEP will be notified and proper procedures will be followed.

In consultation with EPA's Office of Enforcement and Compliance Assurance (NHPA compliance group), it has been determined that no sites of historic or archaeological significance will be directly or indirectly impacted due to operation of the Project. No sites listed or eligible for listing in the *National Register of Historic Places* are located in close proximity to the existing Site. No direct or indirect impacts are anticipated from the operation of the Project.

7.4 Coastal Zone Management Act

According to the Coastal Zone Management Act of 1972 (CZMA), the State may develop and adopt a management program for its coastal zone in accordance with Federal rules and regulations promulgated by the Secretary, after notice, and with the opportunity of full participation by relevant Federal agencies,

State agencies, local governments, regional organizations, port authorities, and other interested parties and individuals, public and private, which is adequate to carry out the purposes of the CZMA and is consistent with the policy declared in the CZMA.

The Florida Coastal Management Act (§380.205-380.27, 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 §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. The issuance of Federal permits listed in §380.23(3)(c), Florida Statutes is not required for the Project. Nonetheless, issuance of the final Site Certification (issued by the FDEP Office of Siting Coordination) constitutes consistency with the CZMA. The final Site Certification for the Project was issued on October 8, 2012.

7.5 Executive Order 12898 - Environmental Justice

Executive Order (EO) 12898 (59 FR 7629 (Feb. 16, 1994)) establishes federal executive branch policy on environmental justice. Based on this Executive Order, the EPA's Environmental Appeals Board (EAB) has held that environmental justice issues must be considered in connection with the issuance of federal Prevention of Significant Deterioration (PSD) permits issued by EPA Regional Offices [See, *e.g.*, *In re Prairie State Generating Company*, 13 E.A.D. 1, 123 (EAB 2006); *In re Knauf Fiber Glass*, Gmbh, 8 E.A.D. 121, 174-75 (EAB 1999)]. This permitting action, if finalized, authorizes emissions of GHG, controlled by what we have determined is the BACT for those emissions. It does not select environmental controls for any other pollutants. Unlike the criteria pollutants for which EPA has historically issued PSD permits, there is no National Ambient Air Quality Standard (NAAQS) for GHG. The global climate-change inducing effects of GHG emissions, according to the "Endangerment and Cause or Contribute Finding", are far-reaching and multi-dimensional (75 FR 66497). Climate change modeling and evaluations of risks and impacts are typically conducted for changes in emissions that are orders of magnitude larger than the emissions from individual projects that might be analyzed in PSD permit reviews. Quantifying the exact impacts attributable to a specific GHG source obtaining a permit in specific places and points would not be possible. *See* page 48 of EPA's "PSD and Title V Permitting Guidance for Greenhouse Gases". Thus, we conclude it would not be meaningful to evaluate impacts of GHG emissions on a local community in the context of a single permit. Accordingly, we have determined an environmental justice analysis is not necessary for the permitting record.

7.6 Executive Order 13175 – Tribal Consultation

In accordance with EO 13175 and the EPA Policy on Consultation and Coordination with Indian Tribes, the Miccosukee Tribe of Indians of Florida (Miccosukee Tribe) and the Seminole Tribe of Florida (Seminole Tribe) were offered the opportunity to consult regarding EPA's consideration of the PSD permit application submitted by FPL. Neither Tribe requested formal consultation on the Project permit action. EPA informed both tribes that regardless of whether they elected to consult on the permit application, they would also have the opportunity to submit comments during any forthcoming public comment period.

The objective of such consultation, in EPA's view, is to improve EPA's understanding of the perspectives of the Seminole Tribe and Miccosukee Tribe and to identify any issues or concerns they may have regarding EPA's consideration of FPL's application. During the course of any consultation on this matter, the EPA can offer such things as education and outreach, solicitation of comments on the

action, holding conference call(s) to discuss issues and concerns, and providing feedback through written communication explaining how EPA considered any issues and concerns raised.

8.0 Public Participation

8.1 Opportunity for Public Comment

These proceedings are subject to EPA Procedures for Decision-making, set forth at 40 CFR part 124. As provided in part 124, EPA is seeking public comment on the Project draft air permit (PSD-EPA-R4010) during the public comment period as specified in the public notice.

Any interested person may submit written comments on the draft permit during the public comment period. If you believe that any condition of the permit is inappropriate, you must raise all reasonably ascertainable issues and submit all reasonably available arguments supporting your position by the end of the comment period. Any documents supporting your comments must be included in full and may not be incorporated by reference unless they are already part of the record for this permit or consist of state or federal statutes or regulations, EPA documents of general applicability, or other generally available referenced materials.

Comments should focus on the proposed air quality permit and the GHG permit terms. Comments related to the other criteria pollutants and the preconstruction permitting under the jurisdiction of the State of Florida are outside the scope of this action. All timely comments will be considered in making the final decision, included in the record, and responded to by EPA. EPA may group similar comments together in our response, and will not respond to individual commenters directly.

All comments on the draft permit must be received by email, submitted electronically via www.regulations.gov, which can be accessed through the EPA Region 4 website listed above, or postmarked by July 2, 2013. An extension of the 30-day comment period may be granted if the request for an extension adequately demonstrates why additional time is required to prepare comments. Comments must be sent or delivered in writing to the address above. All comments will be included in the public docket without change and will be made available to the public, including any personal information provided, unless the comment includes Confidential Business Information or other information whose disclosure is restricted by statute. Information that you consider Confidential Business Information or otherwise protected should be clearly identified as such and should not be submitted through email. If you send email directly to EPA, your email address will be captured automatically and included as part of the public comment. Please note that an email or postal address must be provided with your comments if you wish to receive direct notification of EPA's final decision regarding the permit and responses to comments submitted during the public comment period. All timely comments will be considered in making the final decision and included in the public record. EPA will respond to all significant comments. Similar comments may be grouped together in our response, and EPA will not respond to individual commenters directly. For questions on the draft permit, please contact: Mr. Andrew Parks at 404-562-8122 or parks.andrew@epa.gov. Submit comments on the draft permit and requests for a public hearing to:

EPA Region 4, APTMD
61 Forsyth Street, SW
Atlanta, GA 30303
ATTN: Andrew Parks

Fax: (404) 562-9019
Email: parks.andrew@epa.gov

8.2 Public Hearing

EPA will hold a public hearing if the Agency determines there is a significant degree of public interest in the draft permit. Requests for a public hearing must be received by EPA by email or mail by June 17, 2013, at the address given above, and state the nature of the issues proposed to be raised in the hearing. You may submit oral or written comments on the draft permit at the public hearing. You do not need to attend the public hearing to submit written comments. If EPA determines there is a significant degree of public interest, EPA will hold a public hearing on the draft PSD permit on July 2, 2013, at the location given in the public notice. If no timely request for a public hearing is received, or EPA determines that there is not a significant degree of public interest, *the hearing will be cancelled.* An announcement of cancellation will be posted on the EPA's website at: http://www.epa.gov/region4/air/permits/ghgpermits/ghgpermits.html, or you may call EPA at the contact number above to determine if the public hearing will be held.

8.3 Administrative Record

The administrative record contains the application, supplemental information submitted by FPL, and correspondence, including emails, between FPL and its consultants and EPA clarifying various aspects of FPL's application. The draft permit and the administrative record are available for public review at the EPA Region 4 office and at the addresses listed below. Please call in advance for available viewing times.

Broward County Library
100 South Andrews Avenue
Fort Lauderdale, FL 33301
(954) 357-4444

EPA Region 4 Office
61 Forsyth Street, SW
Atlanta, GA 30303
Phone: (404) 562-9643

The administrative record and draft permit are also available on EPA's website at: http://www.epa.gov/region4/air/permits/ghgpermits/ghgpermits.html.

8.4 Final Determination

A decision to issue a final permit, or to deny the application for the permit, shall be made after all timely comments have been considered. Notice of the final decision shall be sent to each person who has submitted written comments or requested notice of the final permit decision, provided the EPA has adequate contact information.