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

FPL

RECEIVED

JUN 30 2009

BUREAU OF AIR REGULATION

FPLNNP-09-0497

June 29, 2009

Ms. Trina Vielhauer, Chief, Bureau of Air Regulation
Florida Department of Environmental Protection
Bureau of Air Regulation
111 South Magnolia St.
Tallahassee, FL 32399

Re: FPL Turkey Point Units 6 & 7 Project
Air Permit Application and Prevention of Significant Deterioration Analysis

Dear ~~Ms.~~ Trina Vielhauer:

Please find enclosed the Air Permit Application and Prevention of Significant Deterioration (PSD) analysis prepared by Golder Associates Inc. for the Turkey Point Units 6 & 7. A check for $7,500 for the application fee is also enclosed with this submittal.

The Project involves adding two new nuclear generating units (Units 6 & 7) and supporting facilities at a Site within the existing Turkey Point plant property boundaries. An air construction permit and PSD approval is required for emission units to support the construction and operation of the nuclear units. PSD review is only triggered for PM and PM_{10} from the circulating water cooling towers and the air quality impacts are less than the significant impact levels. FPL is separately filing an application for site certification of the Project pursuant to the Florida Electrical Power Plant Siting Act.

If you have any comments or questions regarding the attached, please feel free to contact me at (561) 691-7518 or Matt Raffenberg at (561) 691-2808.

Sincerely,
FLORIDA POWER & LIGHT COMPANY

Barbara P. Linkiewicz

Barbara P. Linkiewicz
Environmental Licensing Manager

Attachment

cc: Timothy Gray, FDEP Southeast District Office
Michael Halpin, FDEP Siting Office
Peter Cunningham, Hopping Green & Sams
Kennard Kosky, Golder Associates Inc.
Dee Morris, National Park Service, Air Resources Division

APPENDIX 10.2.5

AIR PERMIT APPLICATION AND PSD REPORT

AIR PERMIT APPLICATION AND PREVENTION OF SIGNIFICANT DETERIORATION ANALYSIS FOR TURKEY POINT UNITS 6 & 7 PROJECT MIAMI-DADE COUNTY, FLORIDA

Prepared For:
Florida Power & Light Company
700 Universe Boulevard
Juno Beach, Florida 33408

Prepared By:
Golder Associates Inc.
6026 NW 1st Place
Gainesville, Florida 32607

June 2009

0838-7584

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APPLICATION FOR AIR PERMIT

LONG FORM

Department of Environmental Protection

Division of Air Resource Management

APPLICATION FOR AIR PERMIT - LONG FORM

I. APPLICATION INFORMATION

Air Construction Permit – Use this form to apply for an air construction permit:

- For any required purpose at a facility operating under a federally enforceable state air operation permit (FESOP) or Title V air operation permit;
- For a proposed project subject to prevention of significant deterioration (PSD) review, nonattainment new source review, or maximum achievable control technology (MACT);
- To assume a restriction on the potential emissions of one or more pollutants to escape a requirement such as PSD review, nonattainment new source review, MACT, or Title V; or
- To establish, revise, or renew a plantwide applicability limit (PAL).

Air Operation Permit – Use this form to apply for:

- An initial federally enforceable state air operation permit (FESOP); or
- An initial, revised, or renewal Title V air operation permit.

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To ensure accuracy, please see form instructions.

Identification of Facility

1. Facility Owner/Company Name: **Florida Power & Light Company**	
2. Site Name: **Turkey Point Plant**	
3. Facility Identification Number: **0250003**	
4. Facility Location... Street Address or Other Locator: **9.5 miles east of Homestead on SW 344th Street** City: **Homestead** County: **Miami-Dade** Zip Code: **33035**	
5. Relocatable Facility? ☐ Yes ☒ No	6. Existing Title V Permitted Facility? ☒ Yes ☐ No

Application Contact

1. Application Contact Name: **Matthew J. Raffenberg, Manager of Environmental Licensing**
2. Application Contact Mailing Address... Organization/Firm: **Florida Power & Light Company** Street Address: **700 Universe Blvd.** City: **Juno Beach** State: **FL** Zip Code: **33408**
3. Application Contact Telephone Numbers... Telephone: **(561) 691-2808** ext. Fax: **(561) 694-3647**
4. Application Contact E-mail Address: **Matthew.Raffenberg@fpl.com**

Application Processing Information (DEP Use)

1. Date of Receipt of Application: 6/30/09	3. PSD Number (if applicable): 409
2. Project Number(s): 0250003-013-AC	4. Siting Number (if applicable):

APPLICATION INFORMATION

Purpose of Application

This application for air permit is being submitted to obtain: (Check one)

Air Construction Permit

☒ Air construction permit.

☐ Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL).

☐ Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL), and separate air construction permit to authorize construction or modification of one or more emissions units covered by the PAL.

Air Operation Permit

☐ Initial Title V air operation permit.

☐ Title V air operation permit revision.

☐ Title V air operation permit renewal.

☐ Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is required.

☐ Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is not required.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit (Concurrent Processing)

☐ Air construction permit and Title V permit revision, incorporating the proposed project.

☐ Air construction permit and Title V permit renewal, incorporating the proposed project.

Note: By checking one of the above two boxes, you, the applicant, are requesting concurrent processing pursuant to Rule 62-213.405, F.A.C. In such case, you must also check the following box:

☐ I hereby request that the department waive the processing time requirements of the air construction permit to accommodate the processing time frames of the Title V air operation permit.

Application Comment

This application is for the emission units associated with the Turkey Point Units 6 & 7. See PSD Report.

APPLICATION INFORMATION

Scope of Application

Emissions Unit ID Number	Description of Emissions Unit	Air Permit Type	Air Permit Processing Fee
	Standby Diesel Generators	AC1E	
	Ancillary Diesel Generators	AC1F	
	Diesel Fire Pump Engines	AC1F	
	General Purpose Engines	AC1E	
	Circulating Water Cooling Towers	AC1A	
	Service Water Cooling Towers	AC1F	
	Standby Diesel Generator Storage Tanks	AC1F	
	Miscellaneous Tanks	AC1F	
	Temporary Construction Boilers	AC1F	
	Concrete Batch Plant	AC1F	

Application Processing Fee

Check one: ☒ Attached - Amount: $ 7,500 ☐ Not Applicable

APPLICATION INFORMATION

Owner/Authorized Representative Statement

Complete if applying for an air construction permit or an initial FESOP.

1. Owner/Authorized Representative Name :
   Randall R. LaBauve, Vice President, Environmental Services
2. Owner/Authorized Representative Mailing Address...
   Organization/Firm: **Florida Power & Light Company**
   Street Address: **700 Universe Boulevard, P.O. Box 14000**
   City: **Juno Beach** State: **FL** Zip Code: **33408**
3. Owner/Authorized Representative Telephone Numbers...
   Telephone: **(561) 691-7001** ext. Fax: **(561) 691-7070**
4. Owner/Authorized Representative E-mail Address: **Randall_R_LaBauve@fpl.com**
5. Owner/Authorized Representative Statement:

   I, the undersigned, am the owner or authorized representative of the corporation, partnership, or other legal entity submitting this air permit application. To the best of my knowledge, the statements made in this application are true, accurate and complete, and any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department.

   Signature Date 6-24-09

APPLICATION INFORMATION

Application Responsible Official Certification

Complete if applying for an initial, revised, or renewal Title V air operation permit or concurrent processing of an air construction permit and revised or renewal Title V air operation permit. If there are multiple responsible officials, the "application responsible official" need not be the "primary responsible official."

1. Application Responsible Official Name:

2. Application Responsible Official Qualification (Check one or more of the following options, as applicable):
   - ☐ For a corporation, the president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit under Chapter 62-213, F.A.C.
   - ☐ For a partnership or sole proprietorship, a general partner or the proprietor, respectively.
   - ☐ For a municipality, county, state, federal, or other public agency, either a principal executive officer or ranking elected official.
   - ☐ The designated representative at an Acid Rain source, CAIR source, or Hg Budget source.

3. Application Responsible Official Mailing Address...
   Organization/Firm:
   Street Address:
   City: State: Zip Code:

4. Application Responsible Official Telephone Numbers...
   Telephone: ( ) ext. Fax: ( )

5. Application Responsible Official E-mail Address:

6. Application Responsible Official Certification:

I, the undersigned, am a responsible official of the Title V source addressed in this air permit application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other applicable requirements identified in this application to which the Title V source is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit. Finally, I certify that the facility and each emissions unit are in compliance with all applicable requirements to which they are subject, except as identified in compliance plan(s) submitted with this application.

_________________________ _________________

Signature Date

APPLICATION INFORMATION

Professional Engineer Certification

1.	Professional Engineer Name: **Kennard F. Kosky** Registration Number: **14996**
2.	Professional Engineer Mailing Address... Organization/Firm: **Golder Associates Inc.**** Street Address: **6026 NW 1st Place** City: **Gainesville** State: **FL** Zip Code: **32607**
3.	Professional Engineer Telephone Numbers... Telephone: **(352) 336-5600** ext. **21156** Fax: **(352) 336-6603**
4.	Professional Engineer E-mail Address: **kkosky@golder.com**
5.	Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this application for air permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

(3) If the purpose of this application is to obtain a Title V air operation permit (check here ☐, if so), I further certify that each emissions unit described in this application for air permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance plan and schedule is submitted with this application.

(4) If the purpose of this application is to obtain an air construction permit (check here ☒, if so) or concurrently process and obtain an air construction permit and a Title V air operation permit revision or renewal for one or more proposed new or modified emissions units (check here ☐, if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

(5) If the purpose of this application is to obtain an initial air operation permit or operation permit revision or renewal for one or more newly constructed or modified emissions units (check here ☐, if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

Kennard F. Kosky — Signature

6/23/09 — Date

(seal) STATE OF FLORIDA

* Attach any exception to certification statement.

**Board of Professional Engineers Certificate of Authorization #00001670.

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates... Zone **17** East (km) **566.59** North (km) **2813.21**		2. Facility Latitude/Longitude... Latitude (DD/MM/SS) **25/26/09** Longitude (DD/MM/SS) **80/19/52**	
3. Governmental Facility Code: **0**	4. Facility Status Code: **A**	5. Facility Major Group SIC Code: **49**	6. Facility SIC(s): **4911**
7. Facility Comment : **Project consists of six circulating water cooling towers for Units 6 & 7, two service water cooling towers, four standby diesel generators, four ancillary diesel generators, two diesel fire pump engines, various general purpose engines, and associated diesel fuel storage tanks. Also included are a temporary concrete batch plant and construction boilers. Current facility Title V Permits Nos. 0250003-010-AV and 0250003-011-AV.**			

Facility Contact

1. Facility Contact Name: **Matthew J. Raffenberg, Manager of Environmental Licensing**
2. Facility Contact Mailing Address... Organization/Firm: **Florida Power & Light Company** Street Address: **700 Universe Blvd.** City: **Juno Beach** State: **FL** Zip Code: **33408**
3. Facility Contact Telephone Numbers: Telephone: **(561) 691-2808** ext. Fax: **(561) 694-3647**
4. Facility Contact E-mail Address: **Matthew.Raffenberg@fpl.com**

Facility Primary Responsible Official

Complete if an "application responsible official" is identified in Section I that is not the facility "primary responsible official."

1. Facility Primary Responsible Official Name:
2. Facility Primary Responsible Official Mailing Address... Organization/Firm: Street Address: City: State: Zip Code:
3. Facility Primary Responsible Official Telephone Numbers... Telephone: ( ) ext. Fax: ( )
4. Facility Primary Responsible Official E-mail Address:

Facility Regulatory Classifications

Check all that would apply *following* completion of all projects and implementation of all other changes proposed in this application for air permit. Refer to instructions to distinguish between a "major source" and a "synthetic minor source."

1. ☐ Small Business Stationary Source	☐ Unknown
2. ☐ Synthetic Non-Title V Source	
3. ☒ Title V Source	
4. ☒ Major Source of Air Pollutants, Other than Hazardous Air Pollutants (HAPs)	
5. ☐ Synthetic Minor Source of Air Pollutants, Other than HAPs	
6. ☒ Major Source of Hazardous Air Pollutants (HAPs)	
7. ☐ Synthetic Minor Source of HAPs	
8. ☒ One or More Emissions Units Subject to NSPS (40 CFR Part 60)	
9. ☐ One or More Emissions Units Subject to Emission Guidelines (40 CFR Part 60)	
10. ☒ One or More Emissions Units Subject to NESHAP (40 CFR Part 61 or Part 63)	
11. ☐ Title V Source Solely by EPA Designation (40 CFR 70.3(a)(5))	
12. Facility Regulatory Classifications Comment: **Standby and ancillary diesel generators and diesel fire pump engines are subject to NSPS Subpart IIII. Standby diesel generators are subject to NESHAP Subpart ZZZZ for notification only (see PSD Report).**	

List of Pollutants Emitted by Facility

1. Pollutant Emitted	2. Pollutant Classification	3. Emissions Cap [Y or N]?
PM	A	N
PM10	A	N
VOC	A	N
SO2	A	N
NOx	A	N
CO	A	N

B. EMISSIONS CAPS

Facility-Wide or Multi-Unit Emissions Caps

1. Pollutant Subject to Emissions Cap	2. Facility-Wide Cap [Y or N]? (all units)	3. Emissions Unit ID's Under Cap (if not all units)	4. Hourly Cap (lb/hr)	5. Annual Cap (ton/yr)	6. Basis for Emissions Cap

7. Facility-Wide or Multi-Unit Emissions Cap Comment:

C. FACILITY ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1.	Facility Plot Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☐ Attached, Document ID:________ ☒ Previously Submitted, Date: **June 2008**
2.	Process Flow Diagram(s): (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☐ Attached, Document ID:________ ☒ Previously Submitted, Date: **June 2008**
3.	Precautions to Prevent Emissions of Unconfined Particulate Matter: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☐ Attached, Document ID:________ ☒ Previously Submitted, Date: **June 2008**

Additional Requirements for Air Construction Permit Applications

1.	Area Map Showing Facility Location: ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable (existing permitted facility)
2.	Description of Proposed Construction, Modification, or Plantwide Applicability Limit (PAL): ☒ Attached, Document ID: **PSD Report**
3.	Rule Applicability Analysis: ☒ Attached, Document ID: **PSD Report**
4.	List of Exempt Emissions Units: ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable (no exempt units at facility)
5.	Fugitive Emissions Identification: ☐ Attached, Document ID:________ ☒ Not Applicable
6.	Air Quality Analysis (Rule 62-212.400(7), F.A.C.): ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable
7.	Source Impact Analysis (Rule 62-212.400(5), F.A.C.): ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable
8.	Air Quality Impact since 1977 (Rule 62-212.400(4)(e), F.A.C.): ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable
9.	Additional Impact Analyses (Rules 62-212.400(8) and 62-212.500(4)(e), F.A.C.): ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable
10.	Alternative Analysis Requirement (Rule 62-212.500(4)(g), F.A.C.): ☐ Attached, Document ID:________ ☒ Not Applicable

C. FACILITY ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for FESOP Applications

1. List of Exempt Emissions Units: ☐ Attached, Document ID:__________ ☐ Not Applicable (no exempt units at facility)

Additional Requirements for Title V Air Operation Permit Applications

1. List of Insignificant Activities: (Required for initial/renewal applications only) ☐ Attached, Document ID:__________ ☐ Not Applicable (revision application)
2. Identification of Applicable Requirements: (Required for initial/renewal applications, and for revision applications if this information would be changed as a result of the revision being sought) ☐ Attached, Document ID:__________ ☐ Not Applicable (revision application with no change in applicable requirements)
3. Compliance Report and Plan: (Required for all initial/revision/renewal applications) ☐ Attached, Document ID:__________ Note: A compliance plan must be submitted for each emissions unit that is not in compliance with all applicable requirements at the time of application and/or at any time during application processing. The department must be notified of any changes in compliance status during application processing.
4. List of Equipment/Activities Regulated under Title VI: (If applicable, required for initial/renewal applications only) ☐ Attached, Document ID:__________ ☐ Equipment/Activities Onsite but Not Required to be Individually Listed ☐ Not Applicable
5. Verification of Risk Management Plan Submission to EPA: (If applicable, required for initial/renewal applications only) ☐ Attached, Document ID:__________ ☐ Not Applicable
6. Requested Changes to Current Title V Air Operation Permit: ☐ Attached, Document ID:__________ ☐ Not Applicable

C. FACILITY ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Facilities Subject to Acid Rain, CAIR, or Hg Budget Program

1. Acid Rain Program Forms:

   Acid Rain Part Application (DEP Form No. 62-210.900(1)(a)):
   ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:__________
   ☒ Not Applicable (not an Acid Rain source)

   Phase II NO_X Averaging Plan (DEP Form No. 62-210.900(1)(a)1.):
   ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:__________
   ☒ Not Applicable

   New Unit Exemption (DEP Form No. 62-210.900(1)(a)2.):
   ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:__________
   ☒ Not Applicable

2. CAIR Part (DEP Form No. 62-210.900(1)(b)):
   ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:__________
   ☒ Not Applicable (not a CAIR source)

3. Hg Budget Part (DEP Form No. 62-210.900(1)(c)):
   ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:__________
   ☒ Not Applicable (not a Hg Budget unit)

Additional Requirements Comment

Turkey Point Units 6 & 7 and associated emissions are not subject to Acid Rain, CAIR, or Mercury Budget Program requirements.

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

EMISSIONS UNIT INFORMATION
Section [1]
Standby Diesel Generators

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   ☐ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   ☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   ☒ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:
   Four Standby Diesel Generators

3. Emissions Unit Identification Number:

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	**2011**	**2018 Unit 6 - SDG** **2020 Unit 7 - SDG**	**49**

8. Federal Program Applicability: (Check all that apply)

   ☐ Acid Rain Unit

   ☐ CAIR Unit

   ☐ Hg Budget Unit

9. Package Unit:
   Manufacturer: **Caterpillar (or equivalent)** Model Number:

10. Generator Nameplate Rating: **4.1** MW

11. Emissions Unit Comment:
    Four 4,100-kW Standby Generators. Information based on Caterpillar Diesel Generator Set since unit not yet selected. Information in the form based on one generator. Any differences in the information contained in the form and the emission calculations contained in the PSD Report are due to round-off. The values in the PSD Report govern.

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: **Good combustion practices - Ultra low sulfur diesel fuel fired.**	
2. Control Device or Method Code: **NA**	

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:	
2. Control Device or Method Code:	

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:	
2. Control Device or Method Code:	

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:	
2. Control Device or Method Code:	

B. EMISSIONS UNIT CAPACITY INFORMATION
(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1.	Maximum Process or Throughput Rate:
2.	Maximum Production Rate:
3.	Maximum Heat Input Rate: **39.12** million Btu/hr
4.	Maximum Incineration Rate: pounds/hr tons/day
5.	Requested Maximum Operating Schedule: hours/day days/week **52** weeks/year **96** hours/year
6.	Operating Capacity/Schedule Comment: **Maximum heat input per standby generator. The standby generators will meet the requirements of 40 CFR Part 60, Subpart IIII.**

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: **See PSD Report.**	2. Emission Point Type Code: **1**
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:	
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:	

5. Discharge Type Code: **V**	6. Stack Height: **40** feet	7. Exit Diameter: **2.41** Feet
8. Exit Temperature: **874°F**	9. Actual Volumetric Flow Rate: **16,428** acfm	10. Water Vapor: %

11. Maximum Dry Standard Flow Rate: dscfm	12. Nonstack Emission Point Height: Feet
13. Emission Point UTM Coordinates... Zone: **17** East (km): **567.27** North (km): **2812.13**	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)

15. Emission Point Comment:

Two stacks per unit.
Emission Point Coordinates above for Unit 6 Standby Generator No. 1.
Unit 6 Standby Generator No. 2 – East (km): 567.28
North (km): 2812.13
Unit 7 Standby Generator No. 1 – East (km): 567.01
North (km): 2812.13
No. 2 – East (km): 567.02
North (km): 2812.13

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): **Internal Combustion, Electrical Generation; Distillate Oil (Diesel) - Exhaust**		
2. Source Classification Code (SCC): **2-10-001-07**	3. SCC Units: **1,000 Gallons Burned**	
4. Maximum Hourly Rate: **0.29**	5. Maximum Annual Rate: **27.8**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.0015**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **135.1**
10. Segment Comment: **Maximum annual rate for each standby generator based on 96 hr/yr.**		

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

EMISSIONS UNIT INFORMATION
Section [1]
Standby Diesel Generators

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
CO			EL
NOx			EL
SO2	Fuel Quality		EL
PM/PM10			EL
VOC			EL

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **109.3** lb/hour **5.24** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **8.5 grams per horsepower hour (g/hp-hr)** Reference: **40 CFR Part 60, Subpart IIII**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 2-3 in PSD Report.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions for each standby generator.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **8.5 g/hp-hr**	4. Equivalent Allowable Emissions: **109.3** lb/hour **5.24** tons/year
5. Method of Compliance: **Manufacturer certification of Subpart IIII standards.**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **NOx**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **88.7** lb/hour **4.26** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **6.9 g/hp-hr** Reference: **40 CFR Part 60, Subpart IIII**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 2-3 in PSD Report.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions for each standby generator.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **6.9 g/hp-hr**	4. Equivalent Allowable Emissions: **88.7** lb/hour **4.26** tons/year
5. Method of Compliance: **Manufacturer certification of Subpart IIII standards.**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS
(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **SO2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.06** lb/hour **0.003** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.0015% S fuel oil** Reference: **See PSD Report**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 2-3 in PSD Report.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions for each standby generator.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.0015% S fuel oil**	4. Equivalent Allowable Emissions: **0.06** lb/hour **0.003** tons/year
5. Method of Compliance: **Fuel vendor information.**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM/PM10**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **5.1** lb/hour **0.25** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.4 g/hp-hr** Reference: **40 CFR Part 60, Subpart IIII**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 2-3 in PSD Report.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions for each standby generator.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.4 g/hp-hr**	4. Equivalent Allowable Emissions: **5.1** lb/hour **0.25** tons/year
5. Method of Compliance: **Manufacturer certification of Subpart IIII standards.**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **12.9** lb/hour **0.62** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **1.0 g/hp-hr** Reference: **40 CFR Part 60, Subpart IIII**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 2-3 in PSD Report.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions for each standby generator.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **1.0 g/hp-hr**	4. Equivalent Allowable Emissions: **12.9** lb/hour **0.62** tons/year
5. Method of Compliance: **Manufacturer certification of Subpart IIII standards.**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: **100** % Maximum Period of Excess Opacity Allowed: **60** min/hour	
4. Method of Compliance: **EPA method 9**	
5. Visible Emissions Comment: **FDEP Rule 62-296.320(4)(b)1, F.A.C. requires 20 percent opacity. Excess emissions provided by Rule 62-210.700(1), F.A.C.**	

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ____ of ____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Continuous Monitoring System: Continuous Monitor ____ of ____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **FPL-EU1-I1** ☐ Previously Submitted, Date ___________

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **PSD Report** ☐ Previously Submitted, Date ___________

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **PSD Report** ☐ Previously Submitted, Date ___________

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: __________ ☐ Previously Submitted, Date ___________
   ☒ Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: __________ ☐ Previously Submitted, Date ___________
   ☒ Not Applicable

6. Compliance Demonstration Reports/Records:
   ☐ Attached, Document ID: __________
   Test Date(s)/Pollutant(s) Tested: ___________________________

   ☐ Previously Submitted, Date: _______
   Test Date(s)/Pollutant(s) Tested: ___________________________

   ☐ To be Submitted, Date (if known): __________
   Test Date(s)/Pollutant(s) Tested: ___________________________

   ☒ Not Applicable

   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
   ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1.	Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☒ Attached, Document ID: PSD Report ☐ Not Applicable
2.	Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: ____ ☒ Not Applicable
3.	Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: ____ ☒ Not Applicable

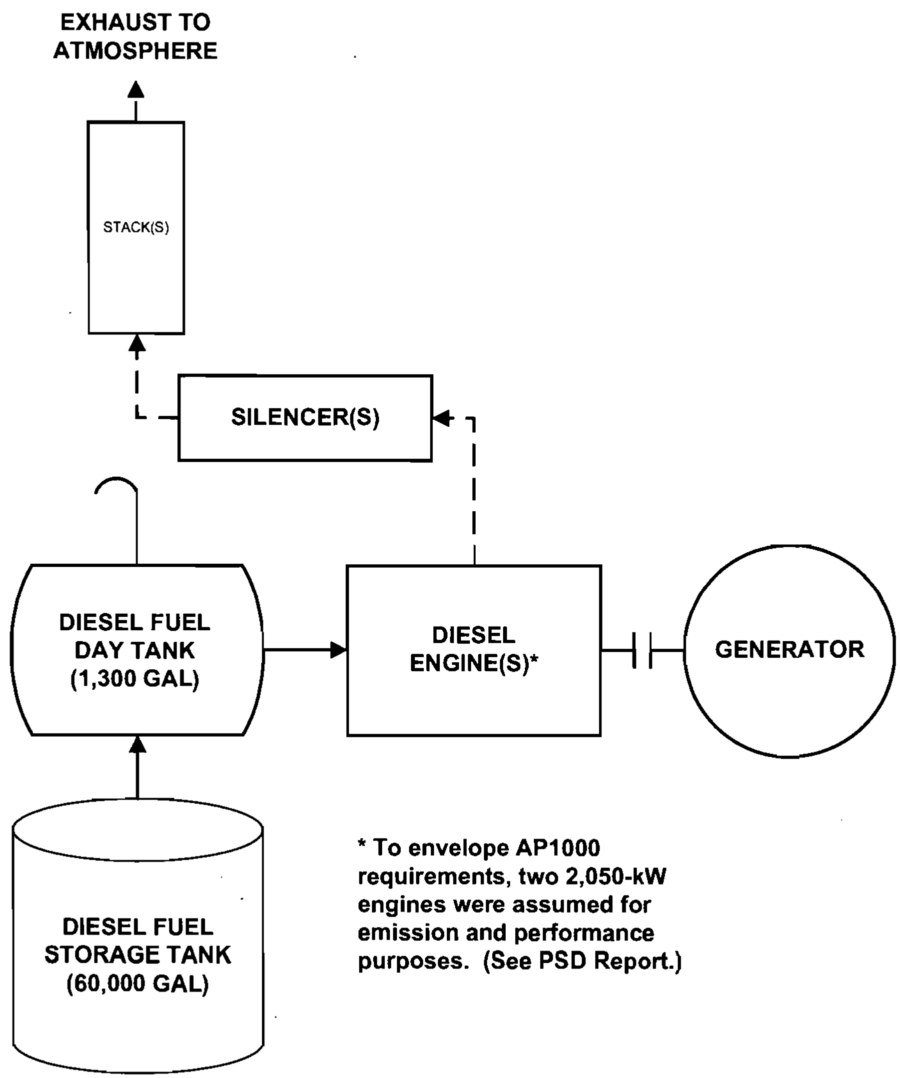
Additional Requirements for Title V Air Operation Permit Applications

1.	Identification of Applicable Requirements: ☐ Attached, Document ID: ____
2.	Compliance Assurance Monitoring: ☐ Attached, Document ID: ____ ☐ Not Applicable
3.	Alternative Methods of Operation: ☐ Attached, Document ID: ____ ☐ Not Applicable
4.	Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: ____ ☐ Not Applicable

Additional Requirements Comment

ATTACHMENT FPL-EU1-I1

PROCESS FLOW DIAGRAM



*** To envelope AP1000 requirements, two 2,050-kW engines were assumed for emission and performance purposes. (See PSD Report.)**

Attachment FPL-EU1-I1
Process Flow Diagram
Standby Diesel Generator (4.1 MW)
Turkey Point Units 6 & 7
Rev. 0

Process Flow Legend
Solid/Liquid
Gas
Steam

FPL

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

EMISSIONS UNIT INFORMATION
Section [2]
Ancillary Diesel Generators

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   ☐ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   ☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   ☒ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:
   Four Ancillary Diesel Generators

3. Emissions Unit Identification Number:

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	**2011**	**2018 Unit 6 - ADG** **2020 Unit 7 - ADG**	**49**

8. Federal Program Applicability: (Check all that apply)

   ☐ Acid Rain Unit

   ☐ CAIR Unit

   ☐ Hg Budget Unit

9. Package Unit:
   Manufacturer: **Caterpillar (or equivalent)** Model Number:

10. Generator Nameplate Rating: **0.036** MW

11. Emissions Unit Comment:
   Four 36-kW Ancillary Generators. Information based on Caterpillar Diesel Generator Set since unit not yet selected. Information in the form based on one generator. Any differences in the information contained in the form and the emission calculations contained in the PSD Report are due to round-off. The values in the PSD Report govern.

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: **Good combustion practices - Ultra low sulfur diesel fuel fired.**	
2. Control Device or Method Code: **NA**	

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:	
2. Control Device or Method Code:	

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:	
2. Control Device or Method Code:	

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:	
2. Control Device or Method Code:	

B. EMISSIONS UNIT CAPACITY INFORMATION
(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1.	Maximum Process or Throughput Rate:
2.	Maximum Production Rate:
3.	Maximum Heat Input Rate: **0.39** million Btu/hr
4.	Maximum Incineration Rate: pounds/hr tons/day
5.	Requested Maximum Operating Schedule: hours/day days/week **52** weeks/year **96** hours/year
6.	Operating Capacity/Schedule Comment: **Maximum heat input per ancillary generator. The ancillary diesel generators will meet the requirements of 40 CFR Part 60, Subpart IIII.**

C. EMISSION POINT (STACK/VENT) INFORMATION

(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: **See PSD Report.**		2. Emission Point Type Code: **1**
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: **V**	6. Stack Height: **93** feet	7. Exit Diameter: **0.33** Feet
8. Exit Temperature: **1,040**°F	9. Actual Volumetric Flow Rate: **311** acfm	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: Feet
13. Emission Point UTM Coordinates... Zone: **17** East (km): **567.25** North (km): **2812.13**		14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)

15. Emission Point Comment:

Emission point coordinates above for Unit 6 Ancillary Diesel Generator No. 1
Unit 6 Ancillary Generator No. 2 – East (km): 567.25
North (km): 2812.12
Unit 7 Ancillary Generator No. 1 – East (km): 566.99
North (km): 2812.13
No. 2 – East (km): 566.99
North (km): 2812.12
Locations are approximate.

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment **1** of **1**

1. Segment Description (Process/Fuel Type): **Internal Combustion, Electrical Generation; Distillate Oil (Diesel) - Exhaust**		
2. Source Classification Code (SCC): **2-10-001-07**	3. SCC Units: **1,000 Gallons Burned**	
4. Maximum Hourly Rate: **0.0029**	5. Maximum Annual Rate: **0.278**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.0015**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **135.1**
10. Segment Comment: **Maximum annual rate for each ancillary generator based on 96 hr/yr.**		

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
CO			EL
NOx			EL
SO2	Fuel Quality		EL
PM/PM10			EL
VOC			EL

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **1.0** lb/hour **0.046** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **8.5 grams per horsepower hour (g/hp-hr)** Reference: **40 CFR Part 60, Subpart IIII**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 2-3 in PSD Report.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions for each ancillary generator.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **8.5 g/hp-hr**	4. Equivalent Allowable Emissions: **1.0** lb/hour **0.046** tons/year
5. Method of Compliance: **Manufacturer certification of Subpart IIII standards.**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **NOx**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.78** lb/hour **0.037** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **6.9 g/hp-hr** Reference: **40 CFR Part 60, Subpart IIII**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 2-3 in PSD Report.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions for each ancillary generator.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **6.9 g/hp-hr**	4. Equivalent Allowable Emissions: **0.78** lb/hour **0.037** tons/year
5. Method of Compliance: **Manufacturer certification of Subpart IIII standards.**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **SO2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **6.1×10^{-4}** lb/hour **2.92×10^{-5}** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.0015% S fuel oil** Reference: **See PSD Report**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 2-3 in PSD Report.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions for each ancillary generator.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.0015% S fuel oil**	4. Equivalent Allowable Emissions: **6.1×10^{-4}** lb/hour **2.92×10^{-5}** tons/year
5. Method of Compliance: **Fuel vendor information.**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM/PM10**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.05** lb/hour **0.002** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.4 g/hp-hr** Reference: **40 CFR Part 60, Subpart IIII**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 2-3 in PSD Report.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions for each ancillary generator.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.4 g/hp-hr**	4. Equivalent Allowable Emissions: **0.05** lb/hour **0.002** tons/year
5. Method of Compliance: **Manufacturer certification of Subpart IIII standards.**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.11** lb/hour **0.005** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **1.0 g/hp-hr** Reference: **40 CFR Part 60, Subpart IIII**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 2-3 in PSD Report.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions for each ancillary generator.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **1.0 g/hp-hr**	4. Equivalent Allowable Emissions: **0.11** lb/hour **0.005** tons/year
5. Method of Compliance: **Manufacturer certification of Subpart IIII standards.**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: **100** % Maximum Period of Excess Opacity Allowed: **60** min/hour	
4. Method of Compliance: **EPA method 9**	
5. Visible Emissions Comment: **FDEP Rule 62-296.320(4)(b)1, F.A.C. requires 20 percent opacity. Excess emissions provided by Rule 62-210.700(1), F.A.C.**	

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ____ of ____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Continuous Monitoring System: Continuous Monitor ____ of ____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **FPL-EU2-I1** ☐ Previously Submitted, Date ___________

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **PSD Report** ☐ Previously Submitted, Date ___________

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **PSD Report** ☐ Previously Submitted, Date ___________

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: ___________ ☐ Previously Submitted, Date ___________
   ☒ Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: ___________ ☐ Previously Submitted, Date ___________
   ☒ Not Applicable

6. Compliance Demonstration Reports/Records:
   ☐ Attached, Document ID: ___________
   Test Date(s)/Pollutant(s) Tested: ___________

   ☐ Previously Submitted, Date: ________
   Test Date(s)/Pollutant(s) Tested: ___________

   ☐ To be Submitted, Date (if known): ___________
   Test Date(s)/Pollutant(s) Tested: ___________

   ☒ Not Applicable

   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
   ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☒ Attached, Document ID: PSD Report ☐ Not Applicable	
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: ______ ☒ Not Applicable	
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: ______ ☒ Not Applicable	

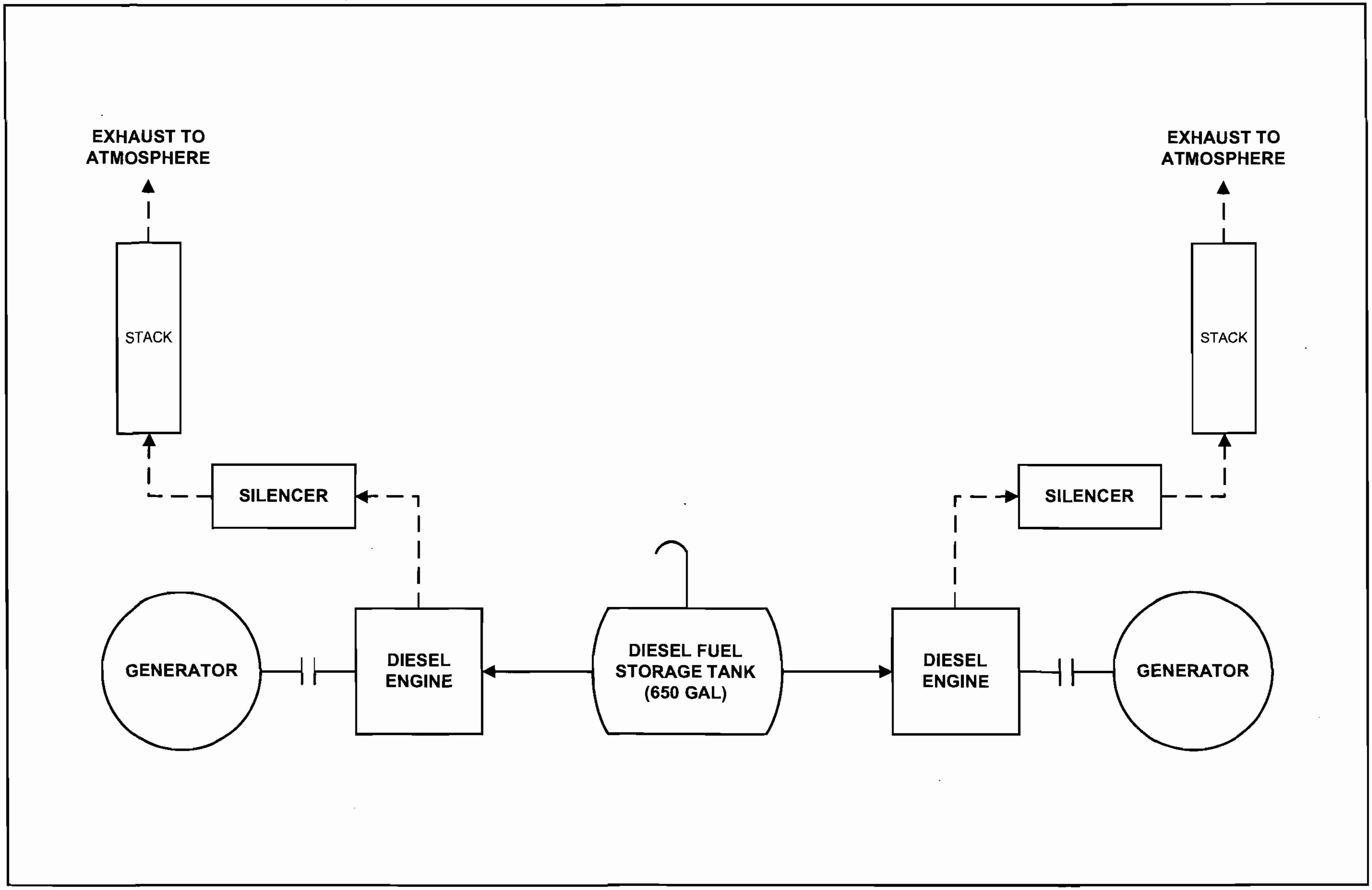
Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements: ☐ Attached, Document ID: ______	
2. Compliance Assurance Monitoring: ☐ Attached, Document ID: ______ ☐ Not Applicable	
3. Alternative Methods of Operation: ☐ Attached, Document ID: ______ ☐ Not Applicable	
4. Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: ______ ☐ Not Applicable	

Additional Requirements Comment

ATTACHMENT FPL-EU2-I1

PROCESS FLOW DIAGRAM



Attachment FPL-EU2-I1
Process Flow Diagram
Ancillary Diesel Generators (36 kW per unit)
Turkey Point Units 6 & 7
Rev. 0

Process Flow Legend
Solid/Liquid
Gas
Steam

FPL

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   ☐ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   ☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   ☒ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:
   Two Diesel Fire Pump Engines

3. Emissions Unit Identification Number:

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	**2011**	**2018 Unit 6 - DFP** **2020 Unit 7 - DFP**	**49**

8. Federal Program Applicability: (Check all that apply)

   ☐ Acid Rain Unit

   ☐ CAIR Unit

   ☐ Hg Budget Unit

9. Package Unit:
   Manufacturer: **Fairbanks Morse (or equivalent)** Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:
    Two 330-hp Diesel Fire Pump Engines. Information based on Fairbanks Morse Fire Pumps since units have not yet been selected. Information in the form based on one fire pump engine. Any differences in the information contained in the form and the emission calculations contained in the PSD Report are due to round-off. The values in the PSD Report govern.

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: **Good combustion practices - Ultra low sulfur diesel fuel fired.**
2. Control Device or Method Code: **NA**

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION
(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1.	Maximum Process or Throughput Rate:
2.	Maximum Production Rate:
3.	Maximum Heat Input Rate: **2.32** million Btu/hr
4.	Maximum Incineration Rate: pounds/hr tons/day
5.	Requested Maximum Operating Schedule: hours/day days/week **52** weeks/year **96** hours/year
6.	Operating Capacity/Schedule Comment: **Maximum heat input per fire pump engine. The diesel fire pump engines will meet the requirements of 40 CFR Part 60, Subpart IIII.**

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: **See PSD Report.**	2. Emission Point Type Code: **1**	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: **V**	6. Stack Height: **17** feet	7. Exit Diameter: **0.79** Feet
8. Exit Temperature: **744**°F	9. Actual Volumetric Flow Rate: **1,750** acfm	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate: dscfm	12. Nonstack Emission Point Height: Feet	
13. Emission Point UTM Coordinates... Zone: **17** East (km): **567.14** North (km): **2812.21**	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: **Emission point coordinates above for Unit 6 Fire Pump Engine No. 1** **Unit 7 Fire Pump Engine No. 1 – East (km): 566.88** **North (km): 2812.22**		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): **Internal Combustion, Industrial; Distillate Oil (Diesel) - Reciprocating: Exhaust**		
2. Source Classification Code (SCC): **2-02-001-07**	3. SCC Units: **1,000 Gallons Burned**	
4. Maximum Hourly Rate: **0.017**	5. Maximum Annual Rate: **1.65**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.0015**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **135.1**
10. Segment Comment: **Maximum annual rate based on 96 hr/yr operation for each fire pump engine.**		

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
CO			EL
NOx			EL
SO2	Fuel Quality		EL
PM/PM10			EL
VOC			EL

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **1.9** lb/hour **0.091** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **2.6 grams per horsepower hour (g/hp-hr)** Reference: **40 CFR Part 60, Subpart IIII**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 2-3 in PSD Report.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions for each fire pump engine.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **2.6 g/hp-hr**	4. Equivalent Allowable Emissions: **1.9** lb/hour **0.091** tons/year
5. Method of Compliance: **Manufacturer certification of Subpart IIII standards.**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **NOx**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **4.95** lb/hour **0.237** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **6.8 g/hp-hr** Reference: **40 CFR Part 60, Subpart IIII**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 2-3 in PSD Report.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions for each fire pump engine.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **6.8 g/hp-hr**	4. Equivalent Allowable Emissions: **4.95** lb/hour **0.237** tons/year
5. Method of Compliance: **Manufacturer certification of Subpart IIII standards.**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

<u>Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions</u>

1. Pollutant Emitted: **SO2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **3.61 x 10^{-3}** lb/hour **1.73 x 10^{-4}** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.0015% S fuel oil** Reference: **See PSD Report**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 2-3 in PSD Report.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions for each fire pump engine.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.0015% S fuel oil**	4. Equivalent Allowable Emissions: **3.61×10^{-3}** lb/hour **1.73×10^{-4}** tons/year
5. Method of Compliance: **Fuel vendor information.**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM/PM10**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.29** lb/hour **0.014** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.4 g/hp-hr** Reference: **40 CFR Part 60, Subpart IIII**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 2-3 in PSD Report.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions for each fire pump engine.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.4 g/hp-hr**	4. Equivalent Allowable Emissions: **0.29** lb/hour **0.014** tons/year
5. Method of Compliance: **Manufacturer certification of Subpart IIII standards.**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.73** lb/hour **0.035** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **1.0 g/hp-hr** Reference: **40 CFR Part 60, Subpart IIII**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 2-3 in PSD Report.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions for each fire pump engine.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **1.0 g/hp-hr**	4. Equivalent Allowable Emissions: **0.73** lb/hour **0.035** tons/year
5. Method of Compliance: **Manufacturer certification of Subpart IIII standards.**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: **100** % Maximum Period of Excess Opacity Allowed: **60** min/hour	
4. Method of Compliance: **EPA method 9**	
5. Visible Emissions Comment: **FDEP Rule 62-296.320(4)(b)1, F.A.C. requires 20 percent opacity. Excess emissions provided by Rule 62-210.700(1), F.A.C.**	

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ____ of ____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Continuous Monitoring System: Continuous Monitor ____ of ____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☒ Attached, Document ID: **FPL-EU3-I1** ☐ Previously Submitted, Date ____

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☒ Attached, Document ID: **PSD Report** ☐ Previously Submitted, Date ____

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☒ Attached, Document ID: **PSD Report** ☐ Previously Submitted, Date ____

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ____ ☐ Previously Submitted, Date ____
☒ Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ____ ☐ Previously Submitted, Date ____
☒ Not Applicable

6. Compliance Demonstration Reports/Records:
☐ Attached, Document ID: ____
Test Date(s)/Pollutant(s) Tested: ____

☐ Previously Submitted, Date: ____
Test Date(s)/Pollutant(s) Tested: ____

☐ To be Submitted, Date (if known): ____
Test Date(s)/Pollutant(s) Tested: ____

☒ Not Applicable

Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
☒ Attached, Document ID: **PSD Report** ☐ Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☒ Attached, Document ID: PSD Report ☐ Not Applicable	
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: ______ ☒ Not Applicable	
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: ______ ☒ Not Applicable	

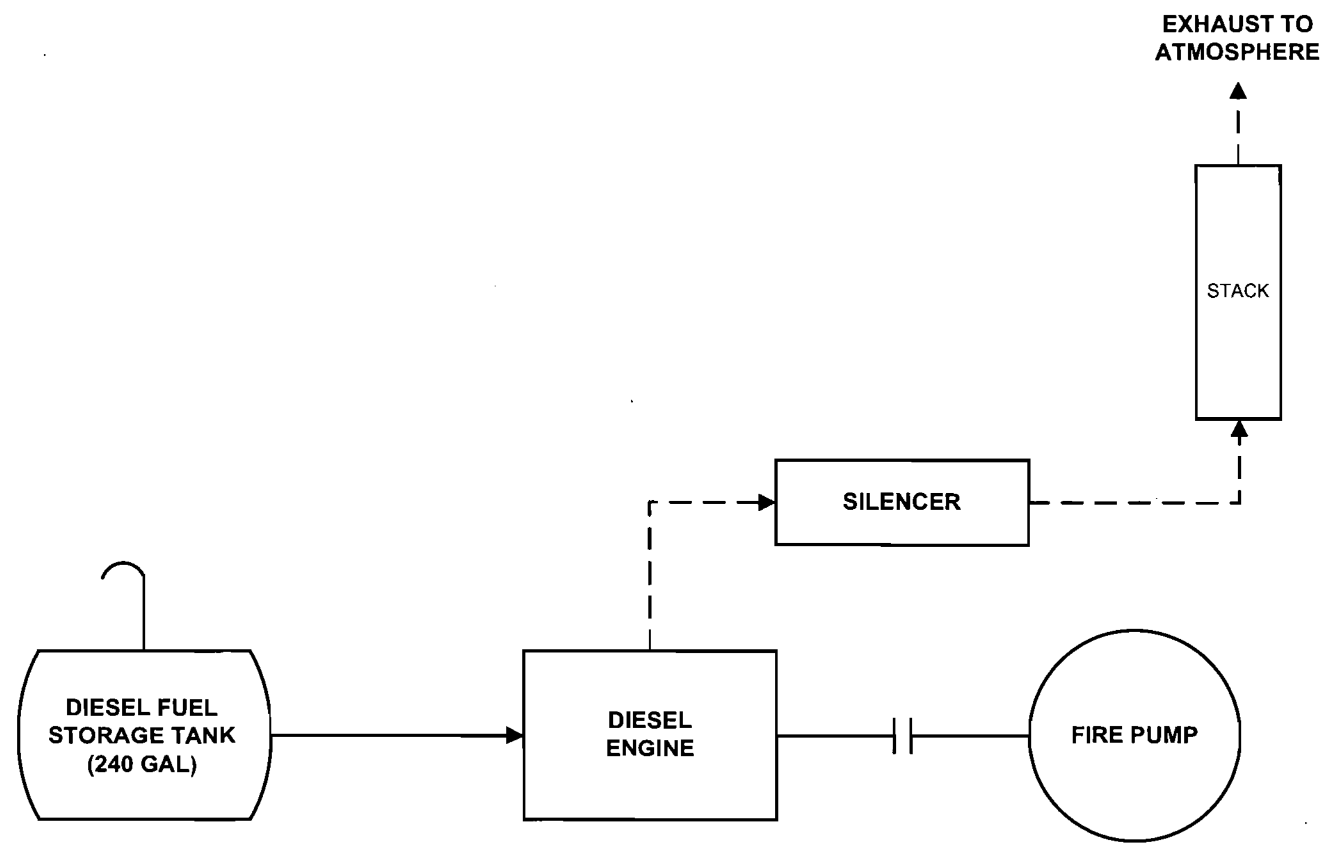
Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements: ☐ Attached, Document ID: ______	
2. Compliance Assurance Monitoring: ☐ Attached, Document ID: ______ ☐ Not Applicable	
3. Alternative Methods of Operation: ☐ Attached, Document ID: ______ ☐ Not Applicable	
4. Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: ______ ☐ Not Applicable	

Additional Requirements Comment

ATTACHMENT FPL-EU3-I1

PROCESS FLOW DIAGRAM



Attachment FPL-EU3-I1
Process Flow Diagram
Diesel Fire Pump (330 hp)
Turkey Point Units 6 & 7
Rev. 0

Process Flow Legend

Solid/Liquid →
Gas - - →
Steam ---→

FPL

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   ☐ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   ☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   ☒ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:
   Various General Purpose Diesel Engines used throughout the year for maintenance, and for refueling outages.

3. Emissions Unit Identification Number:

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	**2011**	**2018 Unit 6 - GPE** **2020 Unit 7 - GPE**	**49**

8. Federal Program Applicability: (Check all that apply)

   ☐ Acid Rain Unit

   ☐ CAIR Unit

   ☐ Hg Budget Unit

9. Package Unit:
   Manufacturer: **Various** Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:
    Various general purpose diesel engines rated <600-hp. Information in the form based on all general purpose engines. Any differences in the information contained in the form and the emission calculations contained in the PSD Report are due to round-off. The values in the PSD Report govern.

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: **Good combustion practices - Ultra low sulfur diesel fuel fired.**
2. Control Device or Method Code: **NA**

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION
(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:			
2. Maximum Production Rate:			
3. Maximum Heat Input Rate:	million Btu/hr		
4. Maximum Incineration Rate:	pounds/hr tons/day		
5. Requested Maximum Operating Schedule:	**24** hours/day **52** weeks/year	**7** days/week **8,760** hours/year	
6. Operating Capacity/Schedule Comment: **Various <600-hp**			

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: **See PSD Report.**		2. Emission Point Type Code: **1**
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code:	6. Stack Height: feet	7. Exit Diameter: Feet
8. Exit Temperature: °F	9. Actual Volumetric Flow Rate: acfm	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: Feet
13. Emission Point UTM Coordinates... Zone: East (km): North (km):		14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment: **See PSD Report.**		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): **Internal Combustion, Industrial; Distillate Oil (Diesel) - Reciprocating: Exhaust**		
2. Source Classification Code (SCC): **2-02-001-07**	3. SCC Units: **1,000 Gallons Burned**	
4. Maximum Hourly Rate:	5. Maximum Annual Rate: **60.0**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.0015**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **135.1**
10. Segment Comment: **Maximum annual usage based on usages from FPL St. Lucie Nuclear Plant, FDEP Annual Operating Reports. See PSD Report.**		

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
CO			EL
NO_x			EL
SO2	Fuel Quality		EL
PM/PM10			EL
VOC			EL

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

<u>Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions</u>

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour **3.85** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.95 lb/MMBtu** Reference: **AP-42, Section 3.3**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 2-3 in PSD Report.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions for all general purpose engines.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour **3.85** tons/year
5. Method of Compliance: **Limit annual fuel usage.**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **NOx**	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour **17.87** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **4.41 lb/MMBtu** Reference: **AP-42, Section 3.3**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 2-3 in PSD Report.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions for all general purpose engines.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour **17.87** tons/year
5. Method of Compliance: **Limit annual fuel usage.**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

<u>Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions</u>

1. Pollutant Emitted: **SO2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour **6.3×10^{-3}** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.0015% S fuel oil** Reference: **See PSD Report**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 2-3 in PSD Report.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions for all general purpose engines.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour **6.3×10^{-3}** tons/year
5. Method of Compliance: **Limit annual fuel usage.**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

<u>Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions</u>

1. Pollutant Emitted: **PM/PM10**	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour **1.26** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.31 lb/MMBtu** Reference: **AP-42, Section 3.3**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 2-3 in PSD Report.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions for all general purpose engines.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour **1.26** tons/year
5. Method of Compliance: **Limit annual fuel usage.**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour **1.46** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.36 lb/MMBtu** Reference: **AP-42, Section 3.3**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 2-3 in PSD Report.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions for all general purpose engines.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour **1.46** tons/year
5. Method of Compliance: **Limit annual fuel usage.**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

EMISSIONS UNIT INFORMATION
Section [4]
General Purpose Engines

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: **100** % Maximum Period of Excess Opacity Allowed: **60** min/hour	
4. Method of Compliance: **EPA method 9**	
5. Visible Emissions Comment: **FDEP Rule 62-296.320(4)(b)1, F.A.C. requires 20 percent opacity. Excess emissions provided by Rule 62-210.700(1), F.A.C.**	

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ____ of ____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Continuous Monitoring System: Continuous Monitor ____ of ____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **FPL-EU4-I1** ☐ Previously Submitted, Date __________

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **PSD Report** ☐ Previously Submitted, Date __________

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **PSD Report** ☐ Previously Submitted, Date __________

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: __________ ☐ Previously Submitted, Date __________
   ☒ Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: __________ ☐ Previously Submitted, Date __________
   ☒ Not Applicable

6. Compliance Demonstration Reports/Records:
   ☐ Attached, Document ID: __________
   Test Date(s)/Pollutant(s) Tested: ____________________

   ☐ Previously Submitted, Date: _______
   Test Date(s)/Pollutant(s) Tested: ____________________

   ☐ To be Submitted, Date (if known): __________
   Test Date(s)/Pollutant(s) Tested: ____________________

   ☒ Not Applicable

   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
   ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable

EMISSIONS UNIT INFORMATION
Section [4]
General Purpose Engines

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1.	Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☒ Attached, Document ID: PSD Report ☐ Not Applicable
2.	Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: ______ ☒ Not Applicable
3.	Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: ______ ☒ Not Applicable

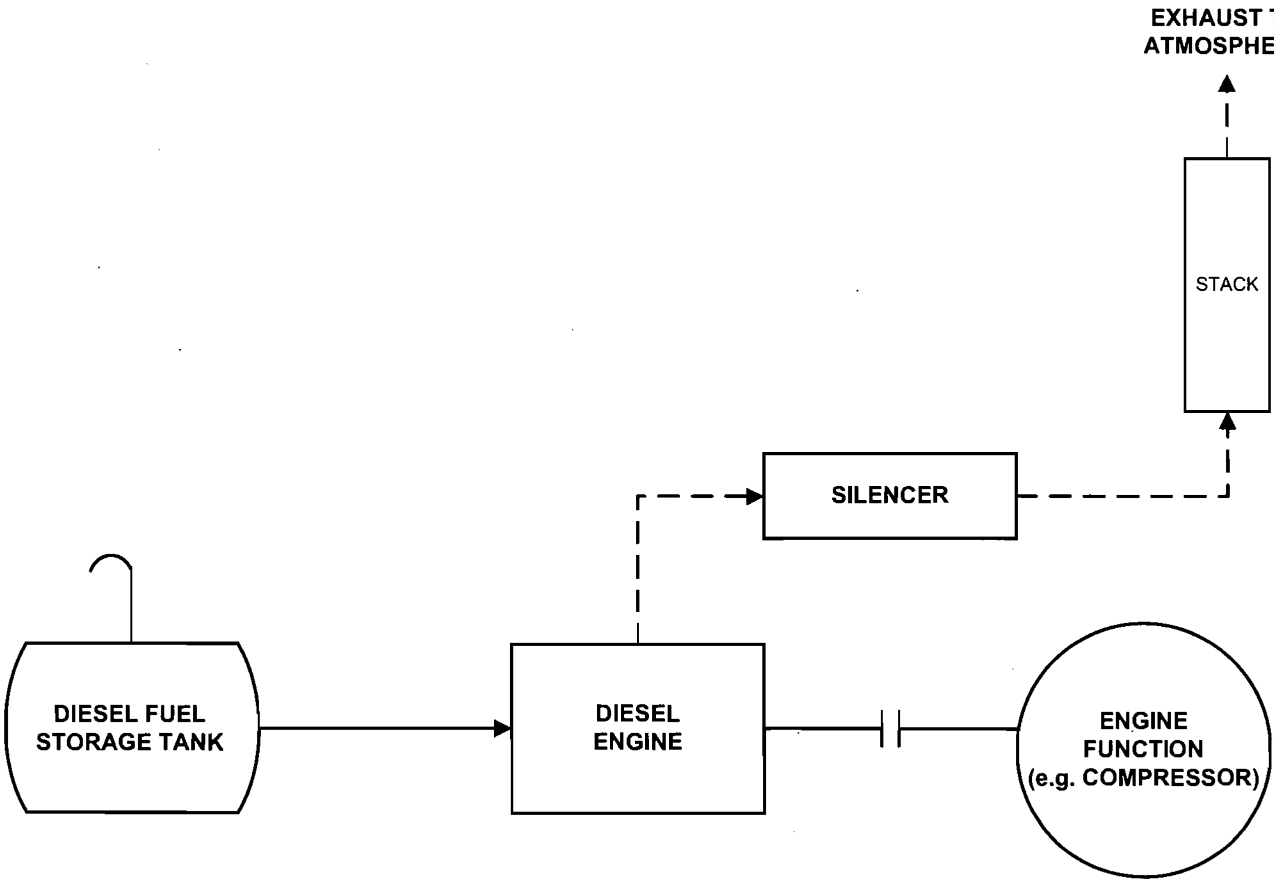
Additional Requirements for Title V Air Operation Permit Applications

1.	Identification of Applicable Requirements: ☐ Attached, Document ID: ______
2.	Compliance Assurance Monitoring: ☐ Attached, Document ID: ______ ☐ Not Applicable
3.	Alternative Methods of Operation: ☐ Attached, Document ID: ______ ☐ Not Applicable
4.	Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: ______ ☐ Not Applicable

Additional Requirements Comment

ATTACHMENT FPL-EU4-I1

PROCESS FLOW DIAGRAM



Attachment FPL-EU4-I1
Process Flow Diagram
General Purpose Diesel Engine (< 600 hp)
Turkey Point Units 6 & 7
Rev. 0

Process Flow Legend
Solid/Liquid
Gas
Steam

FPL

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   ☐ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   ☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   ☒ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:
Circulating Water Cooling Towers associated with Turkey Point Units 6 & 7 (three towers per unit).

3. Emissions Unit Identification Number:

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	**2011**	**2018 Unit 6 - CT** **2020 Unit 7 - CT**	**49**

8. Federal Program Applicability: (Check all that apply)

   ☐ Acid Rain Unit

   ☐ CAIR Unit

   ☐ Hg Budget Unit

9. Package Unit:
   Manufacturer: **SPX Cooling Technologies** Model Number: **F41010A-6.6-12 PLUS**

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:
Manufacturer and model are on an "or equivalent" basis. Six 12-cell wet circulating water cooling towers serving Units 6 & 7. Any differences in the information contained in the form and the emission calculations contained in the PSD Report are due to round-off. The values in the PSD Report govern.

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: **Mist Eliminators**
2. Control Device or Method Code: **014**

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION
(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:			
2. Maximum Production Rate:			
3. Maximum Heat Input Rate:	million Btu/hr		
4. Maximum Incineration Rate:	pounds/hr tons/day		
5. Requested Maximum Operating Schedule:	**24** hours/day **52** weeks/year		**7** days/week **8,760** hours/year
6. Operating Capacity/Schedule Comment:			

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: **See PSD Report**	2. Emission Point Type Code:	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: **12 Cells Per Cooling Tower; 3 Cooling Towers Per Unit**		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: **V**	6. Stack Height: **67** feet	7. Exit Diameter: **33.67** Feet
8. Exit Temperature: **104.7**°F	9. Actual Volumetric Flow Rate: **1,764,500** acfm	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate: dscfm	12. Nonstack Emission Point Height: Feet	
13. Emission Point UTM Coordinates... Zone: **17** East (km): **567.28** North (km): **2811.7**	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: **Stack dimensions per cell. Emission point coordinates above located at center of Unit 6 Cooling Towers. Unit 7 center of Cooling Towers – East (km): 566.95 North (km): 2811.70**		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): **Industrial Processes, Cooling Tower, Process Cooling; Circulating Water Cooling Towers**		
2. Source Classification Code (SCC): **3-85-001-01**	3. SCC Units: **1,000 Gallons**	
4. Maximum Hourly Rate: **37,866**	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment: **Circulating water flow rate above for 3 cooling towers (631,100 gal/min)**		

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM	014		WP
PM10	014		WP

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

<u>Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions</u>

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **107.7** lb/hour **471.6** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.0005 Percent Drift Rate** Reference: **See PSD Report**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 2-1 in PSD Report.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions for each set of three cooling towers. PM based on the high range of total dissolved solids (TDS) in circulating water.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.0005 percent of CW**	4. Equivalent Allowable Emissions: **107.7** lb/hour **471.6** tons/year
5. Method of Compliance: **Design certification from manufacturer.**	
6. Allowable Emissions Comment (Description of Operating Method): **CW = circulating water**	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM10**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **2.42** lb/hour **10.6** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.0005 Percent Drift Rate** Reference: **Reisman/Frisbie (see Appendix A of PSD Report)**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 2-1 in PSD Report.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions for each set of three cooling towers. PM_{10} based on the low range of total dissolved solids (TDS) in circulating water.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.0005 percent of CW**	4. Equivalent Allowable Emissions: **2.42** lb/hour **10.6** tons/year
5. Method of Compliance: **Design certification from manufacturer.**	
6. Allowable Emissions Comment (Description of Operating Method): **CW = circulating water**	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ____ of ____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Continuous Monitoring System: Continuous Monitor ____ of ____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

EMISSIONS UNIT INFORMATION
Section [5]
Circulating Water Cooling Towers

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☒ Attached, Document ID: **FPL-EU5-I1** ☐ Previously Submitted, Date ______

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ______ ☐ Previously Submitted, Date ______

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☒ Attached, Document ID: **PSD Report** ☐ Previously Submitted, Date ______

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ______ ☐ Previously Submitted, Date ______
☒ Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
☐ Attached, Document ID: ______ ☐ Previously Submitted, Date ______
☒ Not Applicable

6. Compliance Demonstration Reports/Records:
☐ Attached, Document ID: ______
Test Date(s)/Pollutant(s) Tested: ______

☐ Previously Submitted, Date: ______
Test Date(s)/Pollutant(s) Tested: ______

☐ To be Submitted, Date (if known): ______
Test Date(s)/Pollutant(s) Tested: ______

☒ Not Applicable

Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
☒ Attached, Document ID: **PSD Report** ☐ Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable	
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable	
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: ________ ☒ Not Applicable	

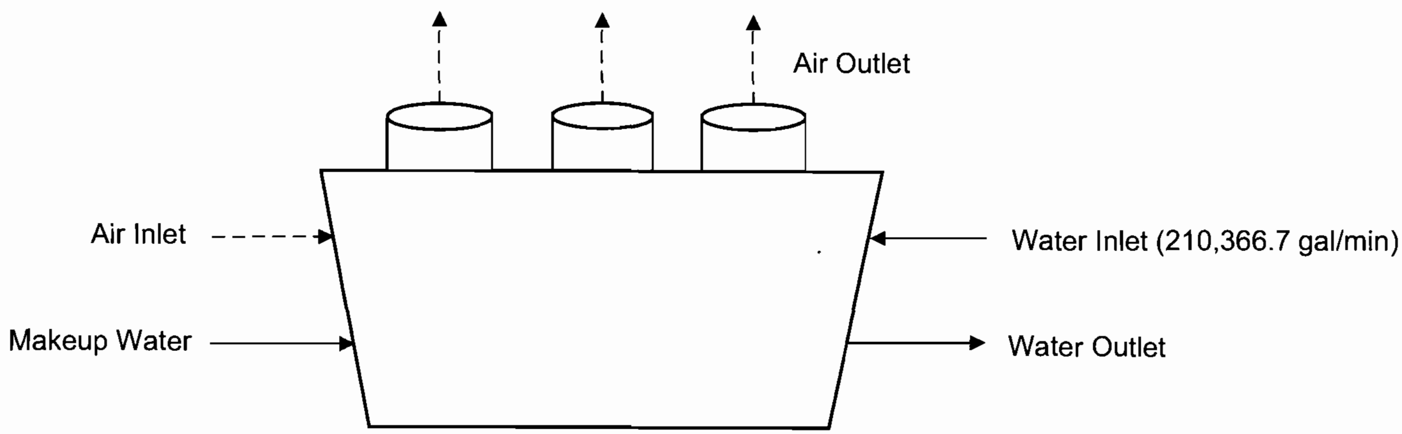
Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements: ☐ Attached, Document ID: ________	
2. Compliance Assurance Monitoring: ☐ Attached, Document ID: ________ ☐ Not Applicable	
3. Alternative Methods of Operation: ☐ Attached, Document ID: ________ ☐ Not Applicable	
4. Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: ________ ☐ Not Applicable	

Additional Requirements Comment

ATTACHMENT FPL-EU5-I1

PROCESS FLOW DIAGRAM



Attachment FPL-EU5-I1
Process Flow Diagram
Twelve Cell Wet Circulating Water Cooling Tower
Turkey Point Units 6 & 7
Rev. 0

Process Flow Legend
Solid/Liquid
Gas
Steam

FPL.

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   ☐ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   ☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   ☒ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:
   Service Water Cooling Towers associated with Turkey Point Units 6 & 7 (one tower per unit).

3. Emissions Unit Identification Number:

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	**2011**	**2018 Unit 6 - SWCT** **2020 Unit 7 - SWCT**	**49**

8. Federal Program Applicability: (Check all that apply)

   ☐ Acid Rain Unit

   ☐ CAIR Unit

   ☐ Hg Budget Unit

9. Package Unit:
   Manufacturer: **Not Yet Selected** Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:
    Two 2-cell service water cooling towers serving Units 6 & 7. Any differences in the information contained in the form and the emission calculations contained in the PSD Report are due to round-off. The values in the PSD Report govern.

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: **Mist Eliminators**	
2. Control Device or Method Code: **014**	

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:	
2. Control Device or Method Code:	

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:	
2. Control Device or Method Code:	

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:	
2. Control Device or Method Code:	

B. EMISSIONS UNIT CAPACITY INFORMATION
(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:			
2. Maximum Production Rate:			
3. Maximum Heat Input Rate:	million Btu/hr		
4. Maximum Incineration Rate:	pounds/hr tons/day		
5. Requested Maximum Operating Schedule:	**24** hours/day **52** weeks/year		**7** days/week **8,760** hours/year
6. Operating Capacity/Schedule Comment:			

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

<table>
<tr><td colspan="2">1. Identification of Point on Plot Plan or Flow Diagram: See PSD Report</td><td colspan="2">2. Emission Point Type Code:</td></tr>
<tr><td colspan="4">3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:
2 Cells Per Cooling Tower; One Cooling Tower Per Unit</td></tr>
<tr><td colspan="4">4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:</td></tr>
<tr><td>5. Discharge Type Code:
V</td><td colspan="2">6. Stack Height:
63 feet</td><td>7. Exit Diameter:
35 Feet</td></tr>
<tr><td>8. Exit Temperature:
96.9°F</td><td colspan="2">9. Actual Volumetric Flow Rate:
1,358,000 acfm</td><td>10. Water Vapor:
%</td></tr>
<tr><td colspan="2">11. Maximum Dry Standard Flow Rate:
dscfm</td><td colspan="2">12. Nonstack Emission Point Height:
Feet</td></tr>
<tr><td colspan="2">13. Emission Point UTM Coordinates...
Zone: East (km):
North (km):</td><td colspan="2">14. Emission Point Latitude/Longitude...
Latitude (DD/MM/SS)
Longitude (DD/MM/SS)</td></tr>
<tr><td colspan="4">15. Emission Point Comment:
Stack dimensions per cell. See Table 6-2 in PSD Report for coordinates.</td></tr>
</table>

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): **Industrial Processes, Cooling Tower, Process Cooling; Service Water Cooling Towers**		
2. Source Classification Code (SCC): **3-85-001-01**	3. SCC Units: **1,000 Gallons**	
4. Maximum Hourly Rate: **630**	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment: **Circulating flow rate above for each cell (10,500 gal/min). Rate represents normal operation. Circulating flow rate for cooldown and startup operation is 21,000 gal/min with two cooling tower cell operation.**		

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

EMISSIONS UNIT INFORMATION
Section [6]
Service Water Cooling Towers

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM	014		WP
PM10	014		WP

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.21** lb/hour **1.84** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.0005 Percent Drift Rate** Reference: **See PSD Report**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 2-2 in PSD Report.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions for each cooling tower based on cool down performance.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.0005 percent of CW**	4. Equivalent Allowable Emissions: **0.21** lb/hour **1.84** tons/year
5. Method of Compliance: **Design certification from manufacturer.**	
6. Allowable Emissions Comment (Description of Operating Method): **CW = circulating water**	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM10**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.08** lb/hour **0.35** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.0005 Percent Drift Rate** Reference: **Reisman/Frisbie (see Appendix A of PSD Report)**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 2-2 in PSD Report.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions for each cooling tower based on cool down performance.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.0005 percent of CW**	4. Equivalent Allowable Emissions: **0.08** lb/hour **0.35** tons/year
5. Method of Compliance: **Design certification from manufacturer.**	
6. Allowable Emissions Comment (Description of Operating Method): **CW = circulating water**	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation ____ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

Visible Emissions Limitation: Visible Emissions Limitation ____ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ____ of ____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Continuous Monitoring System: Continuous Monitor ____ of ____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **FPL-EU6-I1** ☐ Previously Submitted, Date ______

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: ______ ☐ Previously Submitted, Date ______

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **PSD Report** ☐ Previously Submitted, Date ______

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: ______ ☐ Previously Submitted, Date ______
   ☒ Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: ______ ☐ Previously Submitted, Date ______
   ☒ Not Applicable

6. Compliance Demonstration Reports/Records:
   ☐ Attached, Document ID: ______
   Test Date(s)/Pollutant(s) Tested: ______

   ☐ Previously Submitted, Date: ______
   Test Date(s)/Pollutant(s) Tested: ______

   ☐ To be Submitted, Date (if known): ______
   Test Date(s)/Pollutant(s) Tested: ______

   ☒ Not Applicable

   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
   ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: ______ ☒ Not Applicable

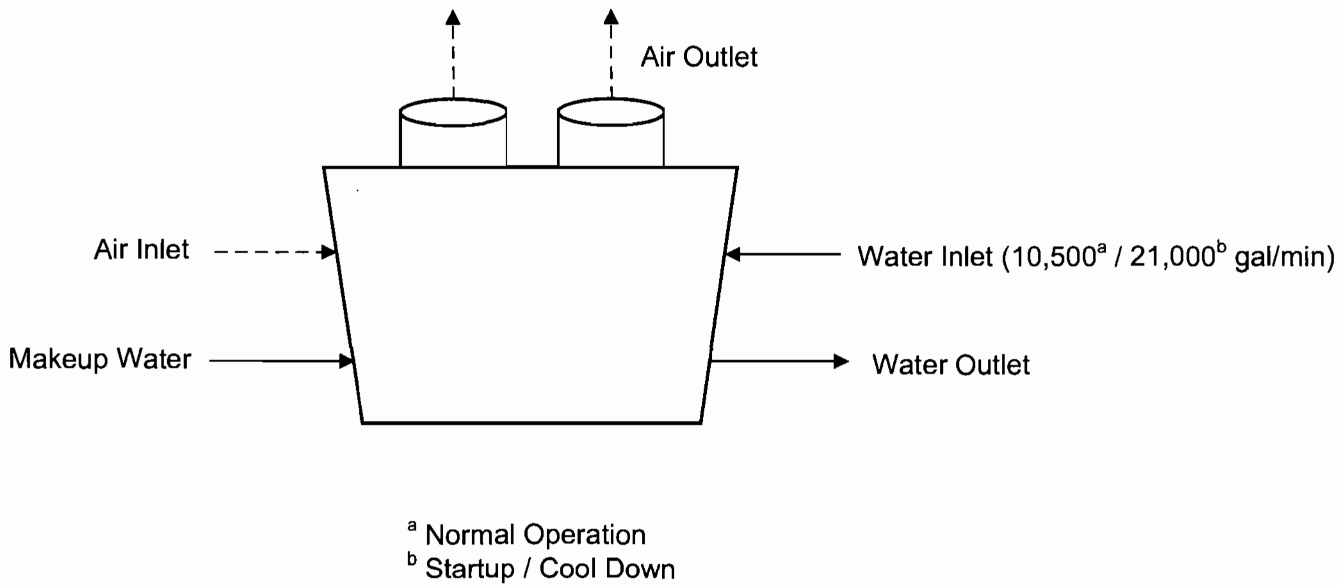
Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements: ☐ Attached, Document ID: ______
2. Compliance Assurance Monitoring: ☐ Attached, Document ID: ______ ☐ Not Applicable
3. Alternative Methods of Operation: ☐ Attached, Document ID: ______ ☐ Not Applicable
4. Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: ______ ☐ Not Applicable

Additional Requirements Comment

ATTACHMENT FPL-EU6-I1

PROCESS FLOW DIAGRAM



Attachment FPL-EU6-I1
Process Flow Diagram
Two Cell Wet Cooling Water Circulating Towers, Service Water Cooling Tower
Turkey Point Units 6 & 7
Rev. 0

Process Flow Legend
Solid/Liquid
Gas
Steam

FPL.

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   ☐ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   ☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   ☒ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:
   Four 60,000 gallon diesel fuel storage tanks associated with standby diesel generators.

3. Emissions Unit Identification Number:

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	**2011**	**2018 Unit 6 - SDGT** **2020 Unit 7 - SDGT**	**49**

8. Federal Program Applicability: (Check all that apply)

   ☐ Acid Rain Unit

   ☐ CAIR Unit

   ☐ Hg Budget Unit

9. Package Unit:
   Manufacturer: Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:
    Four 60,000 gallon diesel fuel storage tanks associated with standby diesel generators. Any differences in the information contained in the form and the emission calculations contained in the PSD Report are due to round-off. The values in the PSD Report govern.

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION
(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: **111,206 gallons diesel fuel throughput per year**	
2. Maximum Production Rate:	
3. Maximum Heat Input Rate: million Btu/hr	
4. Maximum Incineration Rate: pounds/hr tons/day	
5. Requested Maximum Operating Schedule: **24** hours/day **52** weeks/year	 **7** days/week **8,760** hours/year
6. Operating Capacity/Schedule Comment: **Maximum annual throughput based on maximum annual fuel usage for standby diesel generators.**	

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: **See PSD Report**		2. Emission Point Type Code: **4**
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code:	6. Stack Height: feet	7. Exit Diameter: Feet
8. Exit Temperature: °F	9. Actual Volumetric Flow Rate: acfm	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: Feet
13. Emission Point UTM Coordinates... Zone: East (km): North (km):		14. Emission Point Latitude/Longitude… Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment:		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): **Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Oil and Gas Field Storage and Working Tanks; Fixed Roof Tank, Diesel - working and breathing losses**		
2. Source Classification Code (SCC): **4-04-003-16**	3. SCC Units: **1,000 Gallons of Diesel Fuel Throughput**	
4. Maximum Hourly Rate:	5. Maximum Annual Rate: **111.2**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment: **Diesel throughput for all four tanks.**		

Segment Description and Rate: Segment ____ of ____

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
VOC			NS

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

<u>Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions</u>

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour **0.009** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference: **EPA TANKS Program version 4.0.9d**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:
Working Losses = 1.16 lb/yr
Breathing Losses = 3.17 lb/yr
Total Emissions (per tank) = 4.33 lb/yr
Total Emissions for four tanks: 4.33 lb/yr x 4 tanks x 1 ton/2000 lbs = 0.009 TPY

11. Potential, Fugitive, and Actual Emissions Comment:
Emissions calculated using EPA TANKS Program, version 4.0.9d.

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **FPL-EU1-I1** ☐ Previously Submitted, Date ___________

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **PSD Report** ☐ Previously Submitted, Date ___________

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **PSD Report** ☐ Previously Submitted, Date ___________

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: __________ ☐ Previously Submitted, Date ___________
   ☒ Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: __________ ☐ Previously Submitted, Date ___________
   ☒ Not Applicable

6. Compliance Demonstration Reports/Records:
   ☐ Attached, Document ID: __________
   Test Date(s)/Pollutant(s) Tested: ________________________________

   ☐ Previously Submitted, Date: ________
   Test Date(s)/Pollutant(s) Tested: ________________________________

   ☐ To be Submitted, Date (if known): ___________
   Test Date(s)/Pollutant(s) Tested: ________________________________

   ☒ Not Applicable

   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
   ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable	
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: ______ ☒ Not Applicable	
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: ______ ☒ Not Applicable	

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements: ☐ Attached, Document ID: ______	
2. Compliance Assurance Monitoring: ☐ Attached, Document ID: ______ ☐ Not Applicable	
3. Alternative Methods of Operation: ☐ Attached, Document ID: ______ ☐ Not Applicable	
4. Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: ______ ☐ Not Applicable	

Additional Requirements Comment

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

EMISSIONS UNIT INFORMATION
Section [8]
Miscellaneous Tanks

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)
   - ☐ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.
   - ☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)
   - ☐ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).
   - ☒ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.
   - ☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:
   Four 1,300 gallon diesel day tanks for standby diesel generators, two 650 gallon diesel tanks for ancillary diesel generators, and four 240 gallon diesel tanks for fire pump engines.

3. Emissions Unit Identification Number:

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	**2011**	**2018 Unit 6 - MT** **2020 Unit 7 - MT**	**49**

8. Federal Program Applicability: (Check all that apply)
   - ☐ Acid Rain Unit
   - ☐ CAIR Unit
   - ☐ Hg Budget Unit

9. Package Unit:
   Manufacturer: Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:
    Any differences in the information contained in the form and the emission calculations contained in the PSD Report are due to round-off. The values in the PSD Report govern.

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION
(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: **115,622 gallons diesel fuel throughput per year**	
2. Maximum Production Rate:	
3. Maximum Heat Input Rate: million Btu/hr	
4. Maximum Incineration Rate: pounds/hr tons/day	
5. Requested Maximum Operating Schedule: **24** hours/day **52** weeks/year	 **7** days/week **8,760** hours/year
6. Operating Capacity/Schedule Comment: **Maximum annual throughput based on maximum fuel usage for standby diesel generators (day tanks), ancillary diesel generators, and diesel fire pump engines.**	

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: **See PSD Report**	2. Emission Point Type Code: **4**
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:	
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:	

5. Discharge Type Code:	6. Stack Height: feet	7. Exit Diameter: Feet
8. Exit Temperature: °F	9. Actual Volumetric Flow Rate: acfm	10. Water Vapor: %

11. Maximum Dry Standard Flow Rate: dscfm	12. Nonstack Emission Point Height: Feet
13. Emission Point UTM Coordinates... Zone: East (km): North (km):	14. Emission Point Latitude/Longitude… Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment:	

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): **Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Oil and Gas Field Storage and Working Tanks; Fixed Roof Tank, Diesel - working and breathing losses**		
2. Source Classification Code (SCC): **4-04-003-16**	3. SCC Units: **1,000 Gallons of Diesel Fuel Throughput**	
4. Maximum Hourly Rate:	5. Maximum Annual Rate: **115.6**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment: **Diesel throughput for all miscellaneous tanks.**		

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
VOC			NS

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour **0.004** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference: **EPA TANKS Program version 4.0.9d**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Four 1,300-gallon day tanks: Total emissions = 4 x 1.86 lb/yr = 7.44 lbs/yr
Two 650-gallon ancillary diesel tanks: Total emissions = 2 x 0.37 lbs/yr = 0.74 lb/yr
Two 240-gallon fire pump diesel tanks: Total emissions = 2 x 0.22 lbs/yr = 0.44 lb/yr

Total emissions (all tanks) = (7.44 lb/yr + 0.74 lb/yr + 0.44 lb/yr) x 1 ton/2,000 lbs = 0.004 TPY

11. Potential, Fugitive, and Actual Emissions Comment:

Emissions estimated for each tank with EPA TANKS Program, version 4.0.9d.

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **FPL-EU1-I1, FPL-EU2-I1, and FPL-EU3-I1**
   ☐ Previously Submitted, Date _____

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **PSD Report** ☐ Previously Submitted, Date __________

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **PSD Report** ☐ Previously Submitted, Date __________

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: __________ ☐ Previously Submitted, Date __________
   ☒ Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: __________ ☐ Previously Submitted, Date __________
   ☒ Not Applicable

6. Compliance Demonstration Reports/Records:
   ☐ Attached, Document ID: __________
   Test Date(s)/Pollutant(s) Tested: ____________________

   ☐ Previously Submitted, Date: _______
   Test Date(s)/Pollutant(s) Tested: ____________________

   ☐ To be Submitted, Date (if known): __________
   Test Date(s)/Pollutant(s) Tested: ____________________

   ☒ Not Applicable

   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
   ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1.	Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable
2.	Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: ____________ ☒ Not Applicable
3.	Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: ____________ ☒ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1.	Identification of Applicable Requirements: ☐ Attached, Document ID: ____________
2.	Compliance Assurance Monitoring: ☐ Attached, Document ID: ____________ ☐ Not Applicable
3.	Alternative Methods of Operation: ☐ Attached, Document ID: ____________ ☐ Not Applicable
4.	Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: ____________ ☐ Not Applicable

Additional Requirements Comment

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

EMISSIONS UNIT INFORMATION
Section [9]
Temporary Construction Boilers

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   ☐ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   ☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   ☒ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:
   2 Temporary Construction Boilers (to be used during construction periods only).

3. Emissions Unit Identification Number:

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	**2011**	**2011 through 2017**	**49**

8. Federal Program Applicability: (Check all that apply)

   ☐ Acid Rain Unit

   ☐ CAIR Unit

   ☐ Hg Budget Unit

9. Package Unit:
   Manufacturer: **Nebraska boiler (or equivalent)** Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:
    2 Temporary Construction Boilers to be used during construction periods only.

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: **Low NOx burners**
2. Control Device or Method Code: **205**

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:
2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:	
2. Maximum Production Rate:	
3. Maximum Heat Input Rate: **220** million Btu/hr	
4. Maximum Incineration Rate: pounds/hr tons/day	
5. Requested Maximum Operating Schedule: **24** hours/day **7** days/week **52** weeks/year **2,500** hours/year	
6. Operating Capacity/Schedule Comment: **Maximum heat rate based on two temporary construction boilers, each 110 MMBtu/hr and fired with propane or ultra-low sulfur diesel fuel.**	

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram:	2. Emission Point Type Code: **1**

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:

5. Discharge Type Code: **V**	6. Stack Height: **19** feet	7. Exit Diameter: Feet
8. Exit Temperature: °F	9. Actual Volumetric Flow Rate: acfm	10. Water Vapor: %

11. Maximum Dry Standard Flow Rate: dscfm	12. Nonstack Emission Point Height: Feet
13. Emission Point UTM Coordinates... Zone: East (km): North (km):	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)

15. Emission Point Comment: **This temporary emissions units will only be used during the project construction period. Once the Turkey Point Units 6 & 7 commences commercial operation, these units will no longer be operated.**

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type): **External Combustion Boilers, Electric Generation; Liquified Petroleum Gas - Propane**		
2. Source Classification Code (SCC): **1-01-010-02**	3. SCC Units: **1,000 Gallons Burned**	
4. Maximum Hourly Rate: **2.404**	5. Maximum Annual Rate: **6,010**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **91.5**
10. Segment Comment: **Maximum hourly rate = 2 x 110 MMBtu/hr / 91.5 MMBtu/1,000 gal = 2,404 gal/hr.** **Maximum annual rate based on 2,500 hr/yr.**		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type): **External Combustion Boilers, Electric Generation; Distillate Oil - Grades 1 and 2 Oil**		
2. Source Classification Code (SCC): **1-01-005-01**	3. SCC Units: **1,000 Gallons Burned**	
4. Maximum Hourly Rate: **1.628**	5. Maximum Annual Rate: **4,070**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.0015**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **135.1**
10. Segment Comment: **Maximum hourly rate = 2 x 110 MMBtu/hr / 135.1 MMBtu/1,000 gal = 1,628 gallons/hr.** **Maximum annual rate based on 2,500 hr/yr.**		

EMISSIONS UNIT INFORMATION
Section [9]
Temporary Construction Boilers

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM	Fuel Quality		EL
PM10	Fuel Quality		EL
SO2	Fuel Quality		EL
NOx	205		EL
CO	Good Combustion		EL
VOC	Good Combustion		EL

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS
(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **Total Particulate Matter - PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **5.37** lb/hour **6.72** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **3.3 lb/10^3 gal** Reference: **Table 1.3-1, AP-42**	7. Emissions Method Code: **3**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table EU9-F1.10.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions are for two temporary construction boilers. Potential emissions based on ultra low-sulfur diesel fuel firing.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **10% Opacity**	4. Equivalent Allowable Emissions: **1.68** lb/hour **2.10** tons/year
5. Method of Compliance: **EPA Method 9**	
6. Allowable Emissions Comment (Description of Operating Method): **Equivalent allowable emissions based on propane firing.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **10% Opacity**	4. Equivalent Allowable Emissions: **5.37** lb/hour **6.72** tons/year
5. Method of Compliance: **EPA Method 9**	
6. Allowable Emissions Comment (Description of Operating Method): **Equivalent allowable emissions based on ultra low-sulfur diesel firing.**	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **Particulate Matter - PM10**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **5.37** lb/hour **6.72** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **3.3 lb/10^3 gal** Reference: **Table 1.3-1, AP-42**	7. Emissions Method Code: **3**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table EU9-F1.10.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions are for two temporary construction boilers.** **Potential emissions based on ultra low-sulfur diesel fuel firing.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **10% Opacity**	4. Equivalent Allowable Emissions: **1.68** lb/hour **2.10** tons/year
5. Method of Compliance: **EPA Method 9**	
6. Allowable Emissions Comment (Description of Operating Method): **Equivalent allowable emissions based on propane firing.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **10% Opacity**	4. Equivalent Allowable Emissions: **5.37** lb/hour **6.72** tons/year
5. Method of Compliance: **EPA Method 9**	
6. Allowable Emissions Comment (Description of Operating Method): **Equivalent allowable emissions based on ultra low-sulfur diesel firing.**	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **Sulfur Dioxide - SO2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.38** lb/hour **0.48** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.2 grains S/100 scf propane gas vapor** Reference: **Table 1.3-1, AP-42**	7. Emissions Method Code: **3**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table EU9-F1.10.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions are for two temporary construction boilers. Potential emissions based on ultra low-sulfur diesel fuel firing.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.2 grains S/100 scf.**	4. Equivalent Allowable Emissions: **0.05** lb/hour **0.06** tons/year
5. Method of Compliance: **Fuel sampling and analysis**	
6. Allowable Emissions Comment (Description of Operating Method): **Equivalent allowable emissions based on propane firing.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.2 grains S/100 scf.**	4. Equivalent Allowable Emissions: **0.38** lb/hour **0.48** tons/year
5. Method of Compliance: **Fuel sampling and analysis**	
6. Allowable Emissions Comment (Description of Operating Method): **Equivalent allowable emissions based on ultra low-sulfur diesel firing.**	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **Nitrogen Oxides - NOx**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **31.26** lb/hour **39.1** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **13.0 lb/10^3 gal** Reference: **Table 1.5-1, AP-42**	7. Emissions Method Code: **3**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table EU9-F1.10.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions are for two temporary construction boilers. Potential emissions based on propane firing.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **13.0 lb/10^3 gal**	4. Equivalent Allowable Emissions: **31.26** lb/hour **39.1** tons/year
5. Method of Compliance: **EPA Method 7e or Vendor Certification**	
6. Allowable Emissions Comment (Description of Operating Method): **Equivalent allowable emissions based on propane firing.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **10.0 lb/10^3 gal**	4. Equivalent Allowable Emissions: **16.28** lb/hour **20.4** tons/year
5. Method of Compliance: **EPA Method 7e or Vendor Certification**	
6. Allowable Emissions Comment (Description of Operating Method): **Equivalent allowable emissions based on ultra low-sulfur diesel firing.**	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **Carbon Monoxide - CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **18.03** lb/hour **22.5** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **7.5 lb/10^3 gal** Reference: **Table 1.5-1, AP-42**	7. Emissions Method Code: **3**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table EU9-F1.10.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions are for two temporary construction boilers. Potential emissions based on propane firing.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **7.5 lb/10^3 gal**	4. Equivalent Allowable Emissions: **18.03** lb/hour **22.5** tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method): **Equivalent allowable emissions based on propane firing.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **5.0 lb/10^3 gal**	4. Equivalent Allowable Emissions: **8.14** lb/hour **10.2** tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method): **Equivalent allowable emissions based on ultra low-sulfur diesel firing.**	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **Volatile Organic Compounds - VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **1.92** lb/hour **2.40** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.8 lb/10^3 gal** Reference: **Table 1.5-1, AP-42**	7. Emissions Method Code: **3**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table EU9-F1.10.**	
11. Potential, Fugitive, and Actual Emissions Comment: **Emissions are for two temporary construction boilers. Potential emissions based on propane firing.**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.8 lb/10^3 gal**	4. Equivalent Allowable Emissions: **1.92** lb/hour **2.40** tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method): **Equivalent allowable emissions based on propane firing.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.2 lb/10^3 gal**	4. Equivalent Allowable Emissions: **0.33** lb/hour **0.41** tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method): **Equivalent allowable emissions based on ultra low-sulfur diesel firing.**	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation 1 of 2

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: **100** % Maximum Period of Excess Opacity Allowed: **60** min/hour	
4. Method of Compliance: **EPA method 9**	
5. Visible Emissions Comment: **FDEP Rule 62-296.320(4)(b)1, F.A.C. requires 20 percent opacity. Excess emissions provided by Rule 62-210.700(1), F.A.C.**	

Visible Emissions Limitation: Visible Emissions Limitation 2 of 2

1. Visible Emissions Subtype: **VE10**	2. Basis for Allowable Opacity: ☐ Rule ☒ Other
3. Allowable Opacity: Normal Conditions: **10** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **EPA Method 9**	
5. Visible Emissions Comment: **Proposed as emission limit for PM/PM10.**	

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **PSD Report** ☐ Previously Submitted, Date __________

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **PSD Report** ☐ Previously Submitted, Date __________

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: **PSD Report** ☐ Previously Submitted, Date __________

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: __________ ☐ Previously Submitted, Date __________
   ☒ Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: __________ ☐ Previously Submitted, Date __________
   ☒ Not Applicable

6. Compliance Demonstration Reports/Records:
   ☐ Attached, Document ID: __________
   Test Date(s)/Pollutant(s) Tested: __________

   ☐ Previously Submitted, Date: _______
   Test Date(s)/Pollutant(s) Tested: __________

   ☐ To be Submitted, Date (if known): __________
   Test Date(s)/Pollutant(s) Tested: __________

   ☒ Not Applicable

   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
   ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1.	Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable
2.	Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: ______ ☒ Not Applicable
3.	Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: ______ ☒ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1.	Identification of Applicable Requirements: ☐ Attached, Document ID: ______
2.	Compliance Assurance Monitoring: ☐ Attached, Document ID: ______ ☐ Not Applicable
3.	Alternative Methods of Operation: ☐ Attached, Document ID: ______ ☐ Not Applicable
4.	Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: ______ ☐ Not Applicable

Additional Requirements Comment

ATTACHMENT FPL-EU9-F1.10

EMISSIONS CALCULATIONS

TABLE EU9 - F1.10
ESTIMATED EMISSIONS DATA FOR THE TWO TEMPORARY CONSTRUCTION BOILERS ASSOCIATED WITH TURKEY POINT UNITS 6 & 7

Pollutant	No. of Units	Maximum Heat Input Rate/Unit (MMBtu/hr)	Hourly Fuel Usage [a] (10^3gal/hr)	Annual Operating Hours (hrs/yr)	Annual Fuel Usage [a] (10^3gal/yr)	AP-42 Emissions Factor [b]	Emission Rate Hourly (lb/hr)	Emission Rate Annual (TPY)
Propane Combustion								
PM/PM_{10}	2	110.0	2.404	2,500	6,010.9	0.7 lb/10^3gal	1.68	2.10
SO_2	2	110.0	2.404	2,500	6,010.9	0.1 *S lb/10^3gal [c]	0.05	0.06
NO_x	2	110.0	2.404	2,500	6,010.9	13.0 lb/10^3gal	31.26	39.1
CO	2	110.0	2.404	2,500	6,010.9	7.5 lb/10^3gal	18.03	22.5
VOC [d]	2	110.0	2.404	2,500	6,010.9	0.8 lb/10^3gal	1.92	2.40
Ultra Low-Sulfur Diesel Combustion								
PM/PM_{10}	2	110.0	1.628	2,500	4071.1	3.3 lb/10^3gal	5.37	6.72
SO_2	2	110.0	1.628	2,500	4071.1	157 *S lb/10^3gal [e]	0.38	0.48
NO_x	2	110.0	1.628	2,500	4071.1	10.0 lb/10^3gal	16.28	20.4
CO	2	110.0	1.628	2,500	4071.1	5.0 lb/10^3gal	8.14	10.2
VOC [d]	2	110.0	1.628	2,500	4071.1	0.2 lb/10^3gal	0.33	0.41

Footnotes:

[a] Based on the propane heat content of 91,500 Btu/gal and ultra low-sulfur diesel heat content of 131,500 Btu/gal.

[b] Propane combustion emission factors are based on Table 1.5-1, AP-42, Section 1.5, July 2008. Ultra Low-Sulfur diesel combustion emission factors are based on Tables 1.3-1, 1.3-2, and 1.3-3, AP-42, Section 1.3, September 1998.

[c] "S" is sulfur content of propane gas vapor. A sulfur content of 0.2 gr/100 ft^3 of gas vapor was used in the calculation.

[d] Non-methane total organic compounds.

[e] "S" is weight percent of sulfur in oil. A sulfur content of 0.0015% by weight was used in the calculation.

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application -- Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   ☐ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   ☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   ☒ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:
   Concrete Batch Plant

3. Emissions Unit Identification Number:

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	**2011**	**2011 through 2017**	**49**

8. Federal Program Applicability: (Check all that apply)

   ☐ Acid Rain Unit

   ☐ CAIR Unit

   ☐ Hg Budget Unit

9. Package Unit:
   Manufacturer: Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:
   The concrete batch plant will be equipped with baghouse(s) (or equivalent) to control particulate matter emissions from the batching operations. The baghouse efficiency is approximately 99.9%.

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: **Baghouses**	
2. Control Device or Method Code: **018**	

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:	
2. Control Device or Method Code:	

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:	
2. Control Device or Method Code:	

Emissions Unit Control Equipment/Method: Control ____ of ____

1. Control Equipment/Method Description:	
2. Control Device or Method Code:	

B. EMISSIONS UNIT CAPACITY INFORMATION
(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: **103,551 tons concrete/year**	
2. Maximum Production Rate:	
3. Maximum Heat Input Rate: million Btu/hr	
4. Maximum Incineration Rate: pounds/hr tons/day	
5. Requested Maximum Operating Schedule: **24** hours/day **7** days/week **52** weeks/year **8,760** hours/year	
6. Operating Capacity/Schedule Comment: **Maximum process rate based on 154,400 yd^3 or 310,653 tons of concrete required for 3 years for Turkey Point Units 6 & 7. For the purpose of determining maximum annual emissions, the concrete batch plant was assumed to operate for 3 years.** **Annual rate = 154,400 yd^3 concrete/3 = 154,400/3 x 4,024 lb/yd^3 x ton/2,000 lb = 103,551 tons concrete** **103,551 tons concrete = 103,551 x 1,865 lb aggregate/4,024 lb concrete = 47,993 tons aggregate** **103,551 tons concrete = 103,551 x 1,428 lb sand/4,024 lb concrete = 36,747 tons sand** **103,551 tons concrete = 103,551 x 491 lb cement/4,024 lb concrete = 12,635 tons cement** **103,551 tons concrete = 103,551 x 73 lb cement supplement/4,024 lb concrete = 1,879 tons cement supplement** **Concrete ingredients based on Table 11.12-2, AP-42.**	

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

<table>
<tr><td colspan="2">1. Identification of Point on Plot Plan or Flow Diagram:</td><td colspan="2">2. Emission Point Type Code:</td></tr>
<tr><td colspan="4">3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:</td></tr>
<tr><td colspan="4">4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:</td></tr>
<tr><td>5. Discharge Type Code:</td><td colspan="2">6. Stack Height:
feet</td><td>7. Exit Diameter:
Feet</td></tr>
<tr><td>8. Exit Temperature:
°F</td><td colspan="2">9. Actual Volumetric Flow Rate:
acfm</td><td>10. Water Vapor:
%</td></tr>
<tr><td colspan="2">11. Maximum Dry Standard Flow Rate:
dscfm</td><td colspan="2">12. Nonstack Emission Point Height:
Feet</td></tr>
<tr><td colspan="2">13. Emission Point UTM Coordinates...
Zone: East (km):
North (km):</td><td colspan="2">14. Emission Point Latitude/Longitude...
Latitude (DD/MM/SS)
Longitude (DD/MM/SS)</td></tr>
<tr><td colspan="4">15. Emission Point Comment:</td></tr>
</table>

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): **Industrial Processes, Mineral Products; Concrete Batching - General**		
2. Source Classification Code (SCC): **3-05-011-01**	3. SCC Units: **Tons Concrete Batched**	
4. Maximum Hourly Rate: **11.82**	5. Maximum Annual Rate: **103,551**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment: **Maximum annual rate = 154,400 yd^3/3 years x 2.012 tons/yd^3 = 103,551 TPY** **Maximum hourly rate = 103,551 tons/yr / 8,760 hrs/yr = 11.82 tons/hr**		

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

EMISSIONS UNIT INFORMATION
Section [10]
Concrete Batch Plant

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM	018		EL
PM10	018		EL

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **Total Particulate Matter - PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.934** lb/hour **4.09** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.079 lb/ton concrete** Reference: **AP-42**	7. Emissions Method Code: **3**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Aggregate loading emissions = 0.0069 lb/ton x 47,993 tons /2,000 lb/ton = 0.166 ton
Sand loading emissions = 0.0021 lb/ton x 36,747 tons /2,000 lb/ton = 0.039 ton
Cement loading emissions = 0.00099 lb/ton x 12,635 tons /2,000 lb/ton = 0.0063 ton
Cement supplement loading emissions = 0.0089 lb/ton x 1,879 tons /2,000 lb/ton = 0.0084 ton
Concrete loading emissions = 0.0173 lb/ton x 103,551 tons /2,000 lb/ton = 0.896 ton
Truck loading emissions = 0.0568 lb/ton x 103,551 tons /2,000 lb/ton = 2.941 ton

Fugitive PM emissions factor for material handling = $0.74 \times 0.0032 \times (8.7/5)^{1.3} / (8/2)^{1.4}$ = 0.0006986 lb/ton, where 8.7 is the average wind speed from Miami International in mph and 8 is the moisture content in %.

Fugitive emissions = 0.0006986 lb/ton x 84,740 tons (sand+aggregate) /2,000 lb/ton = 0.03 ton
Total annual PM emissions = (0.166+0.039+0.0063+0.0084+0.896+2.941+0.03) ton = 4.09 ton
Total hourly PM emissions = 4.09 TPY x 2000 lb/ton / 8,760 hrs/yr = 0.934 lb/hr

11. Potential, Fugitive, and Actual Emissions Comment:

Emissions factors based on Table 11.12-1, AP-42, June 2006.
Fugitive PM emission factor based on Section 13.2.4, AP-42, January 1995.

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **10% Opacity**	4. Equivalent Allowable Emissions: **0.934** lb/hour **4.09** tons/year
5. Method of Compliance: **EPA Method 9**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS
(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **Particulate Matter - PM10**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.272** lb/hour **1.19** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.023 lb/ton concrete** Reference: **AP-42**	7. Emissions Method Code: **3**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Aggregate loading emissions = 0.0033 lb/ton x 47,993 tons /2,000 lb/ton = 0.079 ton
Sand loading emissions = 0.00099 lb/ton x 36,747 tons /2,000 lb/ton = 0.018 ton
Cement loading emissions = 0.00034 lb/ton x 12,635 tons /2,000 lb/ton = 0.0021 ton
Cement supplement loading emissions = 0.0049 lb/ton x 1,879 tons /2,000 lb/ton = 0.0046 ton
Concrete loading emissions = 0.0048 lb/ton x 103,551 tons /2,000 lb/ton = 0.249 ton
Truck loading emissions = 0.016 lb/ton x 103,551 tons /2,000 lb/ton = 0.828 ton

Fugitive PM10 emissions factor for material handling = 0.35 x 0.0032 x $(8.7/5)^{1.3}$ /$(8/2)^{1.4}$ = 0.00033 lb/ton, where 8.7 is the average wind speed from Miami International in mph and 8 is the moisture content in %.

Fugitive emissions = 0.00033 lb/ton x 84,740 tons (sand+aggregate) /2,000 lb/ton = 0.014 ton
Total annual PM10 emissions=(0.079+0.018+0.0021+0.0046+0.249+0.828+0.014) ton=1.19 ton
Total hourly PM10 emissions = 1.19 TPY x 2000 lb/ton / 8,760 hrs/yr = 0.272 lb/hr

11. Potential, Fugitive, and Actual Emissions Comment:

Emissions factors based on Table 11.12-1, AP-42, June 2006.
Fugitive PM10 emission factor based on Section 13.2.4, AP-42, January 1995.

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **10% Opacity**	4. Equivalent Allowable Emissions: **0.272** lb/hour **1.19** tons/year
5. Method of Compliance: **EPA Method 9**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation 1 of 2

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: **100** % Maximum Period of Excess Opacity Allowed: **60** min/hour	
4. Method of Compliance: **EPA method 9**	
5. Visible Emissions Comment: **FDEP Rule 62-296.320(4)(b)1, F.A.C. requires 20 percent opacity. Excess emissions provided by Rule 62-210.700(1), F.A.C.**	

Visible Emissions Limitation: Visible Emissions Limitation 2 of 2

1. Visible Emissions Subtype: **VE10**	2. Basis for Allowable Opacity: ☐ Rule ☒ Other
3. Allowable Opacity: Normal Conditions: **10** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **EPA Method 9**	
5. Visible Emissions Comment: **Proposed as emission limit for PM/PM10.**	

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ____ of ____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Continuous Monitoring System: Continuous Monitor ____ of ____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1.	Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☒ Attached, Document ID: **PSD Report** ☐ Previously Submitted, Date ____
2.	Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☐ Attached, Document ID: ____ ☐ Previously Submitted, Date ____
3.	Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☒ Attached, Document ID: **PSD Report** ☐ Previously Submitted, Date ____
4.	Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☐ Attached, Document ID: ____ ☐ Previously Submitted, Date ____ ☒ Not Applicable (construction application)
5.	Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☐ Attached, Document ID: ____ ☐ Previously Submitted, Date ____ ☒ Not Applicable
6.	Compliance Demonstration Reports/Records: ☐ Attached, Document ID: ____ Test Date(s)/Pollutant(s) Tested: ____ ☐ Previously Submitted, Date: ____ Test Date(s)/Pollutant(s) Tested: ____ ☐ To be Submitted, Date (if known): ____ Test Date(s)/Pollutant(s) Tested: ____ ☒ Not Applicable Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.
7.	Other Information Required by Rule or Statute: ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable

EMISSIONS UNIT INFORMATION
Section [10]
Concrete Batch Plant

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1.	Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☒ Attached, Document ID: PSD Report ☐ Not Applicable
2.	Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: ______ ☒ Not Applicable
3.	Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: ______ ☒ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1.	Identification of Applicable Requirements: ☐ Attached, Document ID: ______
2.	Compliance Assurance Monitoring: ☐ Attached, Document ID: ______ ☐ Not Applicable
3.	Alternative Methods of Operation: ☐ Attached, Document ID: ______ ☐ Not Applicable
4.	Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: ______ ☐ Not Applicable

Additional Requirements Comment

PSD REPORT

1.0 INTRODUCTION

FPL proposes to construct and operate two approximately 1,100 MW (net) nuclear units on the existing approximately 11,000-acre Turkey Point plant property located in unincorporated Miami-Dade County, Florida (Figure 1-1). The two nuclear units and associated facilities are referred to as the Project. Turkey Point Unit 6 is expected to be in commercial operation in 2018, with Unit 7 expected to be in commercial operation in 2020. The emission units associated with the Project will require an Air Construction/ PSD Permit from the FDEP.

The Turkey Point Plant consists of five electrical generating units and ancillary facilities. Units 1 and 2 began commercial operations in 1967 and 1968, respectively. Nuclear Units 3 and 4 began commercial operations in 1972 and 1973, respectively. Unit 5 began commercial operation in 2007. The plant consists of the following emission units:

- Units 1 & 2 – 400 MW each (nominal capacity) – Steam electric generating units firing residual oil and natural gas.
- Unit 5 – 1,150 MW (nominal capacity) – Combined cycle unit consisting of four GE 7FA CTs and associated electric generators, four HRSGs, and single steam turbine with associated electric generator.
- Diesel generating units associated with steam electric Units 1 & 2 - 2.75 MW (nominal capacity).
- Emergency diesel generators associated with Units 3 & 4 - 2.5 MW (nominal capacity).
- Emergency diesel generators associated with Unit 5 – 2.25 MW (nameplate capacity).
- Emergency diesel generators and general-purpose diesel engines.
- Mechanical draft cooling tower and distillate storage tank for Unit 5.
- Five other emergency diesel generators for Units 3 & 4 security system, wastewater treatment and meteorological assessment and 13 miscellaneous diesel generators.

These emission units operate under two separate Title V Air Operating Permits: one for the fossil fuel fired units, Units 1, 2, and 5 (FDEP Title V Permit No. 0250003-011-AV) and one for the emission units associated with Units 3 and 4 (FDEP Title V Permit No. 0250003-010-AV).

The Project will include emission units that will support the operation of Units 6 & 7. These emission units include circulating water cooling towers for main steam cycle condenser cooling and service cooling, standby diesel generators, ancillary diesel generators, diesel fire pump engines, diesel fuel storage tanks, and general purpose diesel engines. Turkey Point Units 6 & 7, similar to the existing Turkey Point Units 1 through 4, will also include insignificant emission units that meet the requirements for categorical or generic exemptions in Rule 62-210.300(a) and (b)1 F.A.C. These exempt units will be identified during the development of the Title V revision and include insignificant emission units on the Site, within the FPL reclaimed water treatment facility and radial collector wells.

The construction of the Project requires an Air Construction Permit and PSD review that is applicable to areas that are in compliance with AAQS. PSD review requires submission of assessments for determining the facility's compliance with applicable PSD requirements. Florida's PSD regulations are codified in Chapter 62-212 of the F.A.C. Under Florida's PSD Rules in Section 62-212.400, F.A.C., the potential assessments include an air quality impact analysis using appropriate air dispersion models and a determination of Best Available Control Technology (BACT).

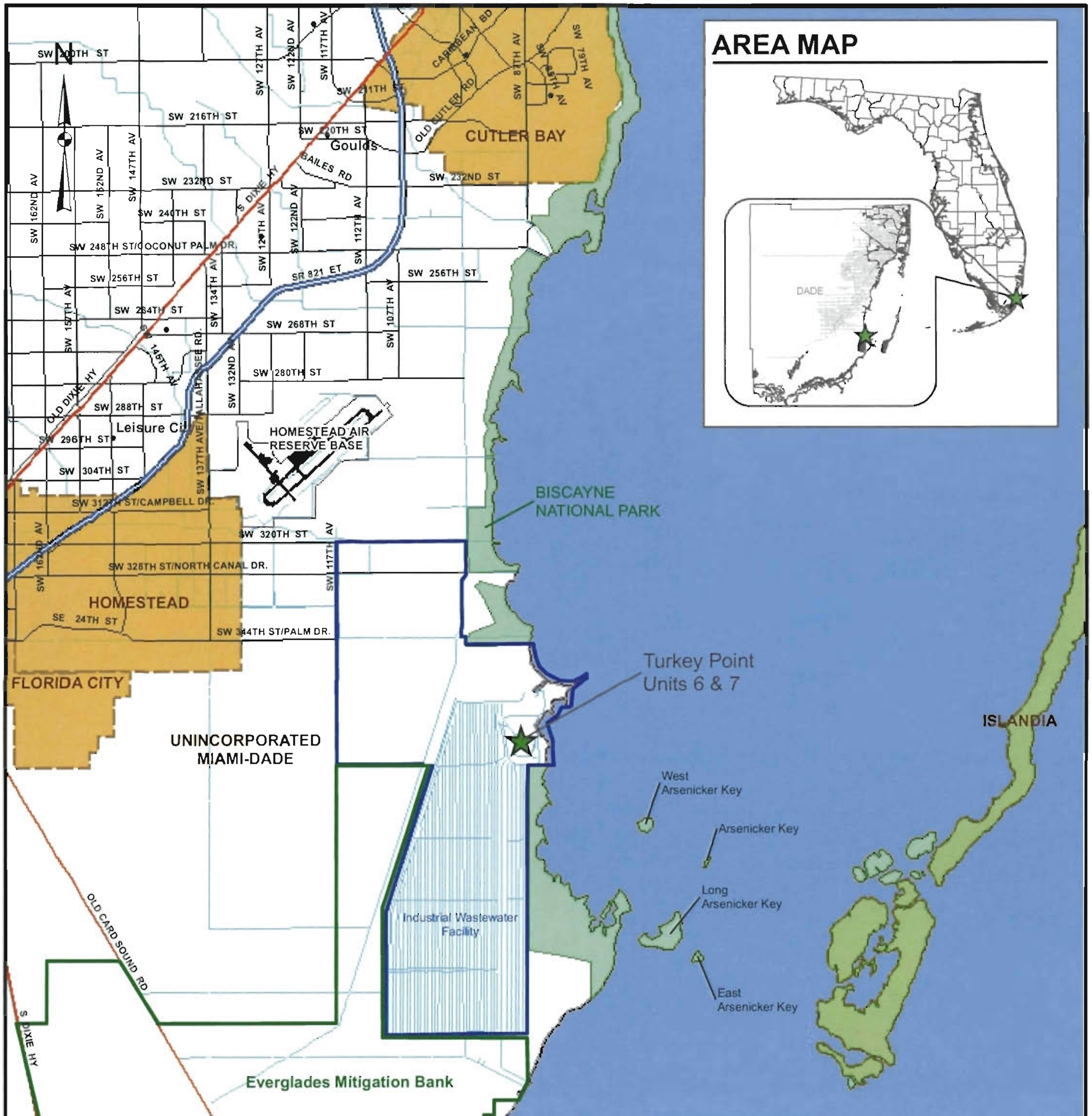
The existing Turkey Point Plant is a "major source", and the Project will be a "major modification", under Florida's PSD regulations. Based on the emissions from the Project, PSD review is required for PM as total suspended particulate matter (TSP) and PM_{10}.

Miami-Dade County has been designated as an attainment area for all criteria pollutants [i.e., in compliance with AAQS for O_3, PM_{10}, SO_2, CO, and NO_2; unclassifiable: lead] and is a PSD Class II area for PM_{10}, SO_2, and NO_2. Therefore, the PSD review will follow regulations pertaining to these designations.

This PSD Report is divided into seven (7) major sections:

- Section 1.0 presents an introduction.
- Section 2.0 presents a description of the Project, including air emissions and stack parameters.
- Section 3.0 provides a review of the PSD requirements applicable to the Project.
- Section 4.0 includes the control technology review with discussions on BACT.
- Section 5.0 discusses the ambient air monitoring analysis (pre-construction monitoring) required by PSD regulations.

- Section 6.0 presents a summary of the air modeling approach and results used in assessing compliance of the proposed facility with AAQS and PSD increments.
- Section 7.0 provides the additional impact analyses for soils, vegetation, and visibility.



12,000 0 12,000
Feet

LEGEND

- Turkey Point Units 6 & 7
- Turkey Point Plant Property
- Everglades Mitigation Bank
- Municipal Boundaries

REFERENCES

1. Local City Boundaries, Municipal Boundaries, Major Roads, Miami-Dade County GIS, 2006.

PROJECT	TURKEY POINT UNITS 6 & 7 PROJECT
TITLE	LOCATION MAP
FILE No.	083875841001
REV.	0
PLOT DATE	6/11/2009
FIGURE	1-1

FPL

2.0 PROJECT DESCRIPTION

2.1 Location Description

Figure 2-1 presents the facility plot plan, showing the locations of the buildings and emission units within the Turkey Point Units 6 & 7 plant area (the "plant area"). The plant area will have a nominal elevation of 22 to 25 ft. The terrain surrounding the plant area is flat.

2.2 Power Plant

The Project will include emission units that will support the operation of the nuclear units. These emission units include circulating water cooling towers for main steam cycle condenser cooling and service water cooling, standby diesel generators, ancillary diesel generators, diesel fire pumps, diesel fuel storage tanks, and general purpose diesel engines. The circulating water cooling towers (referred to as the main cooling towers) and service water cooling towers will be operated continuously to support Turkey Point Units 6 & 7 operation. The standby diesel generators, ancillary diesel generators, and diesel fire pump engines provide backup power to critical systems and are normally operated about four hours per month for reliability and maintenance. The fuel used in the diesel engines will be ultra low sulfur distillate fuel oil. There are diesel storage tanks to support these engines. General purpose diesel engines are used in various types of equipment to support the operation of the Project, including support of the refueling and maintenance cycle of the nuclear units. Refueling and maintenance activities occur about every 18 months for each unit. Refueling/maintenance activities may occur each year.

2.3 Source Emissions and Stack Parameters

The Project will have six circulating water cooling towers to support the operation of the nuclear units, with three circulating water cooling towers supporting operation of each unit. PM will be emitted from the circulating water cooling towers in the form of drift. Drift consists of small water droplets containing the minerals in the cooling tower circulating water. The amount of minerals in the cooling tower circulating water is based on the TDS in the cooling water. The minerals can become PM and PM_{10} emissions when the water within the drift droplets evaporates in the atmosphere. 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 towers. Table 2-1 presents information on the cooling towers and potential PM and PM_{10} from drift. The information presented in Table 2-1 is based on an SPX Cooling Technologies F41010A-6.6-12 Plus design (or equivalent). Each tower will have 12 cells with 33.67-ft diameter cooling fan stacks. The circulation water rate for each tower is about 210,000 gpm. The mist eliminators will be 3-pass Marley cellular type (Model TU12C) constructed of PVC (or equivalent).

The emissions of PM and PM_{10} as drift from the main cooling towers will depend upon the quality of water used as makeup to replace the water evaporated through cooling and the cycles of concentration of the cooling water in the circulating water system.

Two sources of makeup water are proposed as makeup to the circulating water cooling towers to replace water from evaporation, drift, and blowdown. One source will be reclaimed water from the MDWASD South District Wastewater Treatment Plant, conveyed via pipelines to an FPL reclaimed water treatment facility on the Turkey Point plant property. The FPL reclaimed water treatment facility will further treat the reclaimed water in the cooling system. The maximum TDS for treated reclaimed water in the circulating water is estimated to be 4,000 ppmw. A TDS of 4,000 ppmw results in the maximum potential emissions of PM_{10} for this water source.

The second source for makeup water will be obtained from radial collector wells. The substratum collectors of saltwater will recharge below Biscayne Bay, with a maximum TDS concentration in the circulating water of 65,000 ppmw. A TDS of 65,000 ppmw results in the maximum potential emissions of PM for this water source.

The PM and PM_{10} emissions are calculated using the approach of Reisman and Frisbie (2001) (see Appendix A). The method by Reisman and Frisbie was used to envelope the potential emissions using the two proposed sources of water. The maximum PM emissions are based on cooling water from the radial collector well system and the maximum PM_{10} emissions are based on using treated reclaimed water. The emissions from the main cooling towers are presented in Table 2-1 and the calculations using the approach by Reisman and Frisbie are presented in Appendix A.

The Project will also include two 2-cell service water system cooling towers, one for each nuclear unit. The service water cooling towers will utilize potable water obtained from Miami-Dade County. The expected TDS concentration in these water sources, and therefore in the circulating water, is low. Table 2-2 presents the maximum potential emissions for the service water cooling towers. The maximum PM and PM_{10} emissions are based on a TDS concentration of 4,000 ppmw in the circulating water. During normal operation, the circulating water rate for the service water cooling towers is 10,500 gpm using one cell. Under startup and cool down operation the circulating water rate can be as high as 21,000 gpm. The design parameters for the cooling towers have been estimated based on design of the mechanical cooling tower for Turkey Point Unit 5, which has a similar per-cell heat rejection rate. The maximum potential emissions were conservatively estimated based on the maximum circulating water rate of 21,000 gpm.

Each unit will be equipped with two nominal 4,000- kW standby diesel generators and two nominal 35-kW ancillary diesel generators. These generators will be used when electric power is not available to Turkey Point Units 6 & 7. Table 2-3 includes estimated information on performance and emissions from the standby and ancillary generators.

The potential emissions for each 4,000-kW standby generator were based on the emissions and performance for two 2,050-kW Caterpillar 3516C diesel engines that will envelope the generators ultimately purchased. This is slightly larger than the AP1000 requirements. Appendix A contains information for the Caterpillar engine used as the basis of the emission estimates. The emission rates for the standby generators are based on meeting the NSPS in Title 40, Part 60 of the Code of Federal Regulations (40 CFR 60), Subpart IIII for Stationary Compression Ignition Internal Combustion Engines (Stationary ICE). The potential emissions for these diesel engines are based on 96 hours of operation per year or about 8 hours per month. Normally, these generators would be operated 4 hours per month for maintenance and reliability testing.

The potential emissions for each 35-kW ancillary generator are based on a 36-kW Caterpillar D40-4 diesel engine, which is slightly larger than the AP1000 requirements to envelope the generators ultimately purchased. Appendix A contains information for the Caterpillar engine used as the basis of the emission estimates. The emission rates for the ancillary generators are based on meeting the NSPS in 40 CFR Part 60, Subpart IIII for Stationary ICE. The potential emissions for these diesel engines are based on 96 hours of operation per year or about 8 hours per month. Normally, these generators would be operated 4 hours per month for maintenance and reliability testing.

The potential emissions for each fire pump engine are based on the AP1000 requirements for the fire pump. The fire pump must be capable of a water flow of 2,000 gpm at 300 ft head. The emissions and performance for the fire pumps are based on Fairbanks Morse 900 series high head fire pumps, which were used to envelope the AP1000 requirements. Based the pump curves for a Fairbanks Morse 2,000 gpm fire pump at 300 ft of head, about 300 horsepower (hp) would be required. To envelop the engine requirements, a 330-hp Caterpillar model 3406B diesel engine as listed in the

Fairbanks Morse diesel engine data was used. Appendix A contains information for the Caterpillar engine used as the basis of the emission estimates. The emission rates for the fire pump diesel engines are based on meeting the NSPS in 40 CFR 60, Subpart IIII for Stationary ICE. The potential emissions are based on 96 hours of operation per year or about eight hours per month. Normally, these fire pump engines would be operated four hours per month for maintenance and reliability testing. Table 2-3 includes estimated performance and emissions information for the diesel fire pump engines.

During operation and refueling/maintenance cycles, there will be various general purpose diesel engines used in equipment such as cranes, compressors, etc. These diesel engines would be classified as an "emission unit" under FDEP rules (Rule 62-210.200, F.A.C), and their emissions were included in the total emissions for the Turkey Point Units 6 & 7 Project. FDEP previously limited the potential emissions of the FPL St. Lucie Plant with fuel use restrictions on general purpose diesel engines (Permit No. 1110071-005-AF). The emissions associated with these operations were estimated based on the Annual Operating reports submitted to FDEP for the FPL St. Lucie Plant. A margin was added for the Project. The U.S. EPA emission factors contained in EPA publication AP-42, Compilation of Air Pollutant Emission Factors, were used to estimate emissions for general purpose engines. EPA has established emission standards for these engines as non-road diesel engine limits in 40 CFR 89, which will become more stringent for engines manufactured in the future. EPA's non-road regulations require lower emission limits than the emission rates in EPA's emission factors. Since by the time Unit 6 begins operation in 2018, many of the diesel engines in equipment used on the plant area will meet EPA's non-road diesel engine limits in 40 CFR 89, the emission estimates are conservative using EPA's AP-42 emission factors. Table 2-3 includes emission estimates for the general purpose diesel engines.

There will be 12 diesel fuel storage tanks associated with the Project. Each standby generator will have a 60,000-gallon storage tank and a 1,300-gallon day tank. The ancillary generators for each unit will have a 650-gallon tank. Each diesel fire pump will have a 240-gallon tank. The VOC emissions from all tanks based on the EPA Tanks Program is 0.013 TPY. Appendix A contains copies of the output for the EPA Tanks Program.

A summary of the maximum total potential annual emissions estimated for the Project is given in Table 2-4. The information in this table represents a conservative estimate of potential emissions for the Project. The potential emissions for the Project are based on the range of operating conditions for the cooling towers, a higher than required operation for the standby and ancillary diesel generators and fire pump engines, and conservative estimate of emissions from general purpose engines. Together, the potential emissions would envelope the Project's emissions.

Temporary construction boilers may be required for steam cleaning of steam piping and tubing. The temporary construction boilers will be rated at approximately 110 MMBtu/hr and will be brought onsite for use only during the construction. The boilers will be fired with either propane or ultra low sulfur diesel fuel and will operate for no more than 2,500 hours per year per boiler. These boilers will be permanently shut down and removed once Unit 7 commences commercial operation.

The foundations and other structures for Turkey Point Units 6 & 7 will require a large volume of concrete. A temporary concrete batch plant will be installed on the Site. Emissions from the concrete batch plant are expected to be controlled using fabric filters for cement loading. The use of an on-Site concrete batch plant will require the concrete processing materials (i.e., cement, aggregate, etc.) to be transported to the Site in bulk shipments. This will reduce the air emissions from heavy equipment traffic (i.e., cement mixing trucks) entering and leaving the Site. The concrete batch plant will be removed once concrete production is no longer needed for Units 6 & 7.

Since the boilers and concrete batch plant will have no effect on the total project potential emissions once commercial operation begins, their emissions are not included in the project emissions summary tables. The boilers and concrete batch plant are included as emission units in the air application form [DEP Form No. 62-210.900(1)].

2.4 Plot Plan, Structures, and Process Flow Diagrams

The plot plan for Turkey Point Units 6 & 7 is presented in Figure 2-1. A profile of the major structures associated with Turkey Point Units 6 & 7 is presented in Figure 2-2. The dimensions of the buildings and structures are presented in Section 6.0. Attachments to the application form include process flow diagrams for each emission unit.

2.5 Proposed Compliance Provisions and Stack Sampling Facilities

The following are the suggested compliance provisions for the emission units suggested for the Project. These compliance provisions are based on similar conditions contained in the final West County Energy Center (WCEC) Unit 3 Air Construction / PSD Permit issued July 30, 2008, which included emission limits for similar sources (DEP File No. 099646-002-AC; PSD-FL-396).

Proposed compliance conditions:

- Drift Rate: Within 60 days of commencing operation, the permittee shall certify that the cooling tower was constructed to achieve the specified drift rate of no more than 0.0005 percent of the circulating water flowrate.
- Standby and Ancillary Diesel Generators and Fire Pump Engines Requirements: An EPA Certification of emissions characteristics of the purchased model that are at least as stringent as the values contained in the air construction permit and the use of ultra low sulfur distillate fuel oil shall be used to fulfill this requirement.

If required by permit, stack sampling facilities will be constructed in accordance with Rule 62-297.310(6), F.A.C.

TABLE 2-1

ESTIMATED PHYSICAL, PERFORMANCE, AND EMISSIONS DATA FOR THE CIRCULATING WATER COOLING TOWERS FOR TURKEY POINT UNITS 6 & 7

Parameter	Circulating Water Cooling Towers
Physical Data	
Number of Towers per Unit	3
Number of Cells per Tower	12
Cell Diameter, ft	33.67
Cell Stack Height, ft (fan stack height is 14 feet)	66.5
Tower Dimensions	
Height to Fan Deck, ft	53
Length, ft	259
Width, ft	240.7
Performance Data	
Discharge Velocity, ft/min per cell	1,982
Circulating Water Flow Rate (CWFR), gal/min (3 Cooling Towers)	631,100
Design hot water temperature, °F	115.4
Design cold water temperature, °F	91
Heat Rejected, million Btu/hr	7,628
Evaporation at Design Conditions, gal/min (3 Cooling Towers)	12,723
Design Air Flow Rate per cell, acfm	1,764,500
Liquid/Gas (Air Flow) (L/G) Ratio	1.272
Hours of operation	8,760
Temperature of Exit Air, °F	104.7
Emission Data	
Drift Rate[a] (DR), percent	0.0005
Total Dissolved Solids (TDS) Concentration[b], maximum ppmw	65,000
Solution Drift[c] (SD), lb/hr	1,656.6
PM Drift[d], lb/hr	107.7
tons/year/unit (3 towers)	471.6
tons/year (6 towers)	943.3
PM_{10} Drift[e]	
PM_{10} Emissions, lb/hr	2.42
tons/year/unit (3 towers)	10.6
tons/year (6 towers)	21.2

[a] Drift rate is the percent of circulating water.

[b] A TDS of 65,000 ppmw based on maximum design TDS.

[c] Includes water and based on circulating water flow rate and drift rate (CWFR x DR x 8.75 lb/gal x 60 min/hr; for 65,000 ppmw TDS; 8.34 lb/gal used for maximum PM_{10}).

[d] PM calculated based on total dissolved solids and solution drift (TDS x SD).

[e] PM_{10} based on Calculating Realistic PM_{10} Emissions from Cooling Towers, Joel Riesman and Gordon Frisbie (2001). TDS is 4,000 ppmw. Result is maximum PM_{10} emissions. See Appendix A.

TABLE 2-2
ESTIMATED PHYSICAL, PERFORMANCE, AND EMISSIONS DATA FOR THE SERVICE WATER COOLING TOWERS FOR TURKEY POINT UNITS 6 & 7

Parameter	Normal Operation	Cooldown
Physical Data		
Number of Cells Operating	1	2
Deck Dimensions, ft		
Length	108	108
Width	48	48
Height	49	49
Stack Dimensions		
Height, ft	63	63
Stack Top Effective Inner Diameter, per cell, ft	35	35
Effective Diameter, all cells, ft	35.0	49.5
Performance Data		
Discharge Velocity, ft/min per cell	1,411	1,411
Maximum Circulating Water Flow Rate (CWFR), gal/min	10,500	21,000
Design hot water temperature, °F	105.2	105.2
Design cold water temperature, °F	86.9	86.9
Maximum Heat Rejected, million Btu/hr per cell	103	173
Design Air Flow Rate per cell, acfm (maximum)	1,358,000	1,358,000
Liquid/ Gas (Air Flow) (L/G) Ratio	1.85	1.85
Hours of operation	8,760	8,760
Temperature of Exit Air, °F	96.9	96.9
Emission Data		
Drift Rate[a] (DR), percent	0.0005	0.0005
Total Dissolved Solids (TDS) Concentration[b], maximum ppmw	4,000	4,000
Solution Drift[c] (SD), lb/hr	26.3	52.5
PM Drift[d], lb/hr	0.11	0.21
tons/year/unit	0.46	0.92
tons/year (TP 6 & 7)	0.92	1.84
PM_{10} Drift[e]		
PM_{10} Emissions, lb/hr	0.04	0.08
tons/year/unit	0.18	0.35
tons/year (TP 6 & 7)	0.35	0.71

[a] Drift rate is the percent of circulating water.

[b] A TDS of 4,000 results in maximum PM_{10} emissions.

[c] Includes water and based on circulating water flow rate and drift rate (CWFR x DR x 8.34 lb/gal x 60 min/hr).

[d] PM calculated based on total dissolved solids and solution drift (TDS x SD).

[e] PM_{10} based on Calculating Realistic PM_{10} Emissions from Cooling Towers, Joel Reisman and Gordon Frisbie. See Appendix A.

Sources: Westinghouse, 2008; FPL, 2003, 2007; Golder, 2008.

TABLE 2-3
ESTIMATED PERFORMANCE AND EMISSION DATA FOR DIESEL GENERATORS AND GENERAL PURPOSE DIESEL ENGINES ASSOCIATED WITH TURKEY POINT UNITS 6 & 7

Parameter	Standby Diesel Generators	Ancillary Diesel Generators	Diesel Fire Pump Engines	General Purpose Engines	Total
Performance					
Number for TP 6 & 7	4	4	2	Various	
Rating (kW)	4,100	36			
Rating (hp)	5,831	51	330	<600	
Fuel	Diesel	Diesel	Diesel	Diesel	
Fuel Heat content (Btu/lb) (HHV)	19,300	19,300	19,300	19,300	
Fuel density (lb/gal)	7.0	7.0	7.0	7.0	
Heat input (MMBtu/hr)[a] (MMBtu)[b] (HHV)	39.12	0.39	2.32	8,106	
Fuel usage (gallons/hr)	289.6	2.9	17.2		
Maximum operation (hours)	96	96	96		
Maximum fuel usage (gallons/yr/unit)	27,802	278	1,651		
Maximum fuel usage (gallons/yr)[c]	111,206	1,114	3,302	60,000	
Stack Parameters					
Number of Stacks	2	1	1		
Exhaust Flow (cfm; each stack)	16,428	311	1,750		
Stack Velocity (ft/sec; each stack)	60	60	60		
Exhaust Temperature (°F: each stack)	874	1,040	744		
Stack Height (ft; each stack)	40	93	17		
Stack Diameter (ft; each stack)	2.41	0.33	0.79		
Emissions					
SO_2 - Basis (%S)	0.0015%	0.0015%	0.0015%	0.0015%	
Conversion of S to SO_2	100	100	100		
Molecular weight SO_2/ S (64/32)	2	2	2		
Emission rate (lb/hr)	0.06	6.09E-04	3.61E-03		
(tpy/diesel engine)	0.003	2.92E-05	1.73E-04		
(tpy/plant)	0.012	1.17E-04	3.47E-04	0.006	0.018
NO_x - Basis (g/hp-hr)[a] (lb/MMBtu)[b]	6.9	6.9	6.8	4.41	
Emission rate (lb/hr)	88.7	0.78	4.95		
(tpy/diesel engine)	4.26	0.037	0.237		
(tpy)	17.031	0.150	0.475	17.87	35.529
CO - Basis (g/hp-hr)[a] (lb/MMBtu)[b]	8.5	8.5	2.6	0.95	
Emission rate (lb/hr)	109.3	1.0	1.9		
(tpy/diesel engine)	5.24	0.046	0.091		
(tpy)	20.980	0.184	0.182	3.85	25.196
VOC - Basis (g/hp-hr)[a] (lb/MMBtu)[b]	1.0	1.0	1.0	0.36	
Emission rate (lb/hr)	12.9	0.11	0.73		
(tpy/diesel engine)	0.62	0.005	0.035		
(tpy)	2.468	0.022	0.070	1.46	4.019
PM/PM_{10} - Basis (g/hp-hr)[a] (lb/MMBtu)[b]	0.4	0.4	0.4	0.31	
Emission rate (lb/hr)	5.1	0.05	0.29		
(tpy/diesel engine)	0.25	0.002	0.014		
(tpy)	0.987	0.009	0.028	1.26	2.280

Sources: AP1000 Design Control Document; Chapter 8 http://www.nrc.gov/reactors/new-licensing/design-cert/ap1000.html; Caterpillar, 2008.
AP1000 DCD; Chapter 9; Table 9.5.4-1 2000 gpm fire pump; 300 ft head NFPA 20 Certified; Fairbanks Morse Fire Pumps, 2008.

[a] For standby generators and ancillary generators; emissions based on 40 CFR Part 60 Subpart IIII

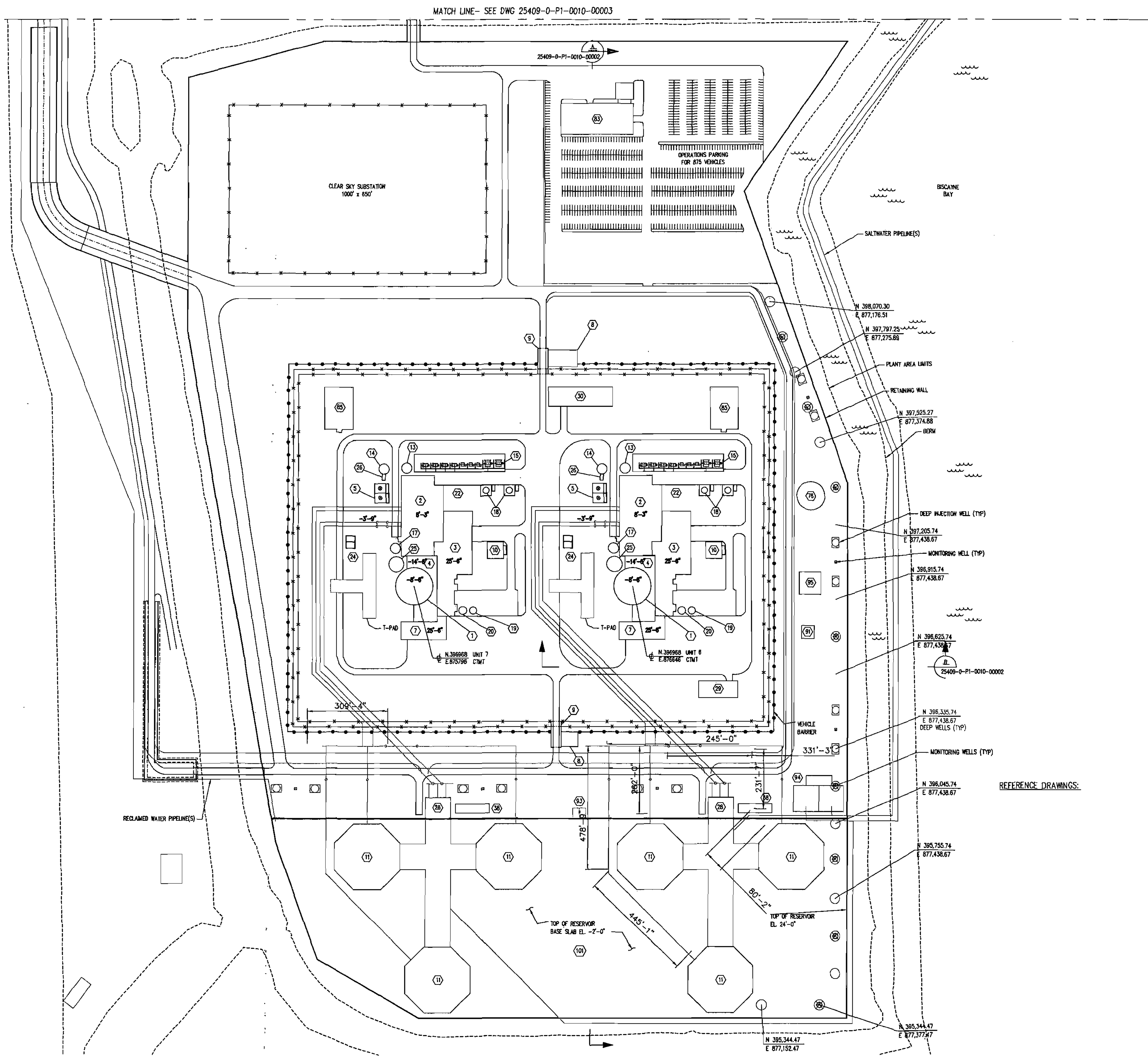
[b] For general purpose engines; emissions based on AP-42 Section 3.3 Gasoline and Diesel Industrial Engines; Table 3.3-1.

[c] For general purpose engines the annual usage based on usages from FPL St. Lucie Nuclear Plant, FDEP Annual Operating Reports with margin.

TABLE 2-4
MAXIMUM POTENTIAL ANNUAL EMISSIONS ASSOCIATED WITH TURKEY POINT UNITS 6 & 7

Pollutant	Annual Emissions (tons/year)								
	Units 6 & 7 Cooling Towers	Service Water Cooling Towers	Standby Diesel Generators	Ancillary Diesel Generators	Diesel Fire Pump Engines	General Purpose Diesel Engines	Diesel Fuel Tanks	Total	PSD Significant Emission Rates
Particulate Matter	943.29	1.84	0.99	0.01	0.03	1.26	--	947.41	25
PM_{10}	21.21	0.71	0.99	0.01	0.03	1.26	--	24.20	15
Sulfur Dioxide	--	--	0.01	0.00	0.00	0.01	--	0.02	40
Nitrogen Oxides	--	--	17.03	0.15	0.47	17.87	--	35.53	40
Carbon Monoxide	--	--	20.98	0.18	0.18	3.85	--	25.20	100
Volatile Organic Compounds	--	--	2.47	0.02	0.07	1.46	0.013	4.03	40

Note:
Refer to Tables 2-1 through 2-3 for specific emission unit information.



LEGEND

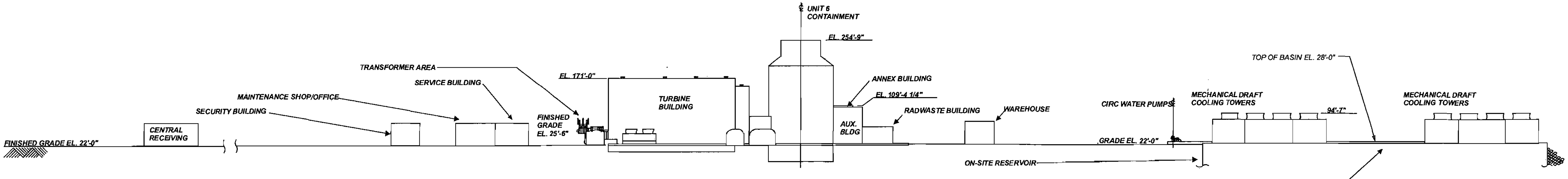
1. CONTAINMENT/SHIELD BUILDING
2. TURBINE BUILDING
3. ANNEX BUILDING
4. AUXILIARY BUILDING
5. SWS COOLING TOWERS
7. RADWASTE BUILDING
8. SECURITY BUILDING
9. SALLY PORT
10. DIESEL GENERATOR BUILDING
11. MECHANICAL DRAFT COOLING TOWERS
13. FIRE WATER/CLEARWELL STORAGE TANK
14. FIRE WATER STORAGE TANK
15. TRANSFORMER AREA
17. CONDENSATE STORAGE TANK
18. DIESEL GENERATOR STORAGE TANKS
19. DEMINERALIZED WATER STORAGE TANK
20. BORIC ACID STORAGE TANK
22. TURBINE BUILDING LAYDOWN AREA
24. WASTE WATER RETENTION BASIN
25. PASSIVE CONTAINMENT COOLING ANCILLARY WATER STORAGE TANK
26. DIESEL DRIVEN FIRE PUMP/ENCLOSURE
28. CIRCULATING WATER PUMPHOUSE
29. WAREHOUSE
30. MAINTENANCE SHOP/OFFICE
38. ELECTRICAL BUILDING
78. RAW WATER STORAGE TANK
81. DELETED
82. DELETED
83. CENTRAL RECEIVING
85. SERVICE BUILDING
91. SANITARY WASTE TREATMENT FACILITY
93. RECLAIMED WATER PUMP STRUCTURE
94. BLOWDOWN SUMP
95. PGS BULK GAS STORAGE AREA
101. MAKEUP WATER RESERVOIR

REFERENCE DRAWINGS:

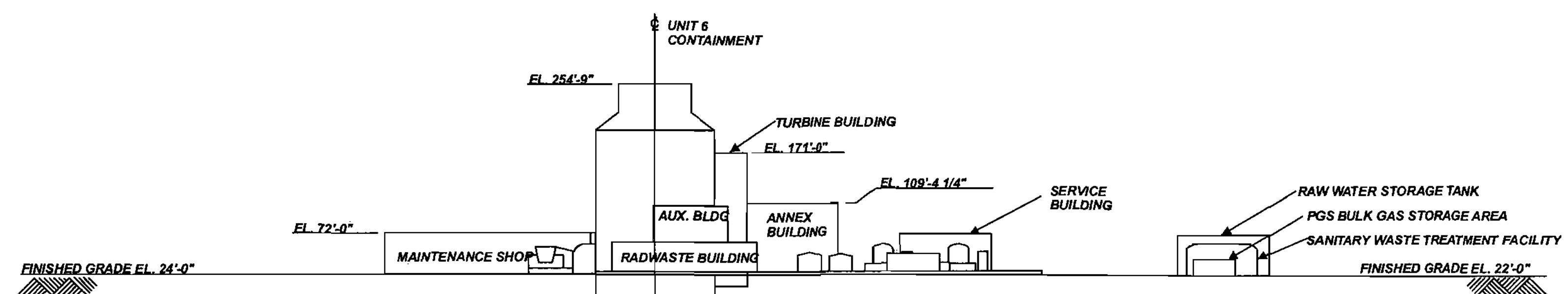
25409-0-P1-0010-00002 FPL TURKEY POINT COL PROJECT PLOT PLAN SECTION VIEWS

25409-0-P1-0010-00003 FPL TURKEY POINT COL PROJECT PLOT PLAN

PROJECT	TURKEY POINT UNITS 6 & 7 PROJECT
TITLE	PLOT PLAN
FPL	FILE No. 083875841004 / REV. 0 / PLOT PLAN 08/14/2009 — FIGURE 2-1



SECTION A - FACING EAST



SECTION B - FACING NORTH

LEGEND

REFERENCES

PROJECT	TURKEY POINT UNITS 6 & 7 PROJECT
TITLE	CONCEPTUAL ILLUSTRATION: PLAN PROFILE WITH UNITS 6 & 7
FILE: 0387584C002	FIGURE 2-2
REV. 0	
PLOT DATE 06/12/2009	

FPL.

3.0 AIR QUALITY REVIEW REQUIREMENTS AND APPLICABILITY

The following discussion pertains to the federal, state, and local air regulatory requirements and their applicability to the Project.

3.1 National, State, and Local AAQS

The national and State of Florida AAQS are presented in Table 3-1. Primary national AAQS were promulgated to protect the public health with an adequate margin of safety, and secondary national AAQS were promulgated to protect the public welfare from any known or anticipated adverse effects associated with the presence of pollutants in the ambient air. Areas of the country in compliance with AAQS are designated as attainment areas. New sources to be located in or near these areas may be subject to more stringent air permitting requirements.

The Project is located in Miami-Dade County, which is classified as an attainment area for all criteria pollutants. Therefore, nonattainment new source requirements are not applicable.

3.2 PSD Requirements

3.2.1 General Requirements

Under federally approved State of Florida PSD review requirements, all major new or modified sources of air pollutants regulated under the CAA must be reviewed, and a pre-construction permit issued.

PSD review is applicable to a "major facility" and certain "modifications" that occur at a major facility. A "major facility" is defined as any 1 of 28 named source categories that have the potential to emit 100 TPY or more, or any other stationary facility that has the potential to emit 250 TPY or more, of any pollutant regulated under CAA. "Potential to emit" means the capability, at maximum design capacity, to emit a pollutant after the application of control equipment. Net emission increases from a modification at a major facility that exceed the PSD significant emission rates are also subject to PSD review.

EPA has promulgated regulations providing that certain increases above an air quality baseline concentration level of SO_2, PM_{10}, and NO_2 concentrations would constitute significant deterioration. The EPA class designations and allowable PSD increments are presented in Table 3-1. The State of

Florida has adopted the EPA class designations and allowable PSD increments for SO_2, PM_{10}, and NO_2.

PSD review is used to determine whether significant air quality deterioration will result from the new or modified facility. The State of Florida's PSD regulations are found in Rule 62-212.400, F.A.C., and have been approved by EPA. Major new facilities are required to undergo the following analysis related to PSD for each pollutant emitted in significant amounts (see Table 3-2):

1. Control technology review,
2. Source impact analysis,
3. Air quality analysis (monitoring),
4. Source information, and
5. Additional impact analyses.

In addition to these analyses, a review with respect to Good Engineering Practice (GEP) stack height regulations must be conducted. Discussions concerning each of these requirements are presented in the following sections.

3.2.2 Control Technology Review

The control technology review requirements of the federal and state PSD regulations require that all applicable federal and state emission-limiting standards be met, and that BACT be applied to control emissions from the source (Rule 62-212.400, F.A.C.). The BACT requirements are applicable to all regulated pollutants for which the increase in emissions from the facility or modification exceeds the significant emission rate (see Table 3-2).

BACT is defined in Rule 62-210.200(40), F.A.C., as:

> *(a) An emission limitation, including a visible emissions standard, based on the maximum degree of reduction of each pollutant emitted which the Department, on a case by case basis, determines is achievable through application of production processes and available methods, systems and techniques (including fuel cleaning or treatment or innovative fuel combustion techniques) for control of each such pollutant taking into account:*
>
> *1. Energy, environmental and economic impacts, and other costs;*
>
> *2. All scientific, engineering, and technical material and other information available to the Department; and*
>
> *3. The emission limiting standards or BACT determinations of Florida and any other state.*

> *(b) If the Department determines that technological or economic limitations on the application of measurement methodology to a particular part of an emissions unit or facility would make the imposition of an emission standard infeasible, a design, equipment, work practice, operational standard or combination thereof, may be prescribed instead to satisfy the requirement for the application of BACT. Such standard shall, to the degree possible, set forth the emissions reductions achievable by implementation of such design, equipment, work practice or operation.*
> *(c) Each BACT determination shall include applicable test methods or shall provide for determining compliance with the standard(s) by means which achieve equivalent results.*
> *(d) 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, 61, and 63.*

BACT requirements were promulgated within the framework of the PSD provisions in the 1977 amendments of the CAA [Public Law 95-95; Part C, Section 165(a)(4)]. The primary purpose of BACT is to optimize consumption of PSD air quality increments and thereby enlarge the potential for future economic growth without significantly degrading air quality (EPA, 1978; 1980). Guidelines for the evaluation of BACT can be found in *Guidelines for Determining Best Available Control Technology (BACT)* (EPA, 1978) and in the *PSD Workshop Manual* (EPA, 1980). These guidelines were issued by EPA to provide a consistent approach to BACT and to ensure that the impacts of alternative emission control systems are measured by the same set of parameters. However, BACT in one area may not be identical to BACT in another area. According to EPA (1980), "BACT analyses for the same types of emissions unit and the same pollutants in different locations or situations may determine that different control strategies should be applied to the different sites, depending on site-specific factors. Therefore, BACT analyses must be conducted on a case-by-case basis."

The BACT requirements are intended to ensure that the control systems incorporated in the design of a proposed facility reflect the latest in control technologies used in a particular industry and take into consideration existing and future air quality in the vicinity of the proposed facility. BACT must, as a minimum, demonstrate compliance with NSPS for a source (if applicable). An evaluation of the air pollution control techniques and systems, including a cost-benefit analysis of alternative control technologies capable of achieving a higher degree of emission reduction than the proposed control technology, is required. The cost-benefit analysis requires the documentation of the materials, energy, and economic penalties associated with the proposed and alternative control systems, as well as the environmental benefits derived from these systems. A decision on BACT is to be based on sound judgment, balancing environmental benefits with energy, economic, and other impacts (EPA, 1978).

Historically, a "bottom-up" approach, consistent with the BACT Guidelines and the PSD Workshop Manual, was used. With this approach, an initial control level, which is usually NSPS, is evaluated against successively more stringent controls until a BACT level is selected. However, EPA developed a concern that the bottom-up approach was not providing the level of BACT decisions originally intended. As a result, in December 1987, the EPA Assistant Administrator for Air and Radiation mandated changes in the implementation of the PSD program, including the adoption of a new "top-down" approach to BACT decision making.

The top-down BACT approach essentially starts with the most stringent (or top) technology and emission limits that have been applied elsewhere to the same or a similar source category. The applicant must next provide a basis for rejecting this technology in favor of the next most stringent technology or propose for using it. Rejection of control alternatives may be based on technical or economic infeasibility. Such decisions are made on the basis of physical differences (e.g., fuel type), locational differences (e.g., availability of water), or significant differences that may exist in the environmental, economic, or energy impacts. The differences between the proposed facility and the facility for which the control technique was applied previously must be justified. EPA has issued a draft guidance document on the top-down approach entitled *Top-Down Best Available Control Technology Guidance Document* (EPA, 1990). FDEP utilizes the "top-down" BACT approach.

FDEP performs BACT reviews based on EPA's regulations and guidance in which the most stringent control alternatives are evaluated to identify the "best available control technology" and a related appropriate emissions limitation for each pollutant requiring a BACT determination. EPA's BACT guidelines establish a specific five-step analytical process for conducting a BACT determination. The five steps consist of: 1) identifying the potentially applicable control technologies for the proposed process or source, 2) evaluating the technical options for feasibility taking into consideration source specific factors, 3) comparing the remaining control technologies based on effectiveness, 4) evaluating the remaining options taking into consideration energy, environmental and economic impacts, and 5) selecting BACT based on the above analyses.

3.2.3 Source Impact Analysis

A source impact analysis required pursuant to Rule 62-212.400(5), F.A.C., must be performed for a proposed major source or major modification subject to PSD review for each pollutant for which emissions exceed the significant emission rate (Table 3-2). The PSD regulations specifically provide for the use of atmospheric dispersion models in performing impact analyses, estimating baseline and future air quality levels, and determining compliance with AAQS and allowable PSD increments. Designated EPA models normally must be used in performing the impact analysis as required by Rule 62-212.400(6), F.A.C. Specific applications for other than EPA-approved models require EPA's consultation and prior approval. Guidance for the use and application of dispersion models is presented in the EPA publication *Guideline on Air Quality Models (Revised)*. The source impact analysis for criteria pollutants to address compliance with AAQS and PSD Class II increments may be limited to the modification if the impacts, as a result of the modification, are below significant impact levels, as presented in Table 3-1.

The EPA has proposed significant impact levels for Class I areas, as follows:

Pollutant	**Averaging Time**	**Proposed EPA PSD Class I Significant Impact Levels ($\mu g/m^3$)[a]**
SO_2	3-hour	1
	24-hour	0.2
	Annual	0.1
PM_{10}	24-hour	0.3
	Annual	0.2
NO_2	Annual	0.1

[a] $\mu g/m^3$ = micrograms per cubic meter.

Although these levels have not been officially promulgated as part of the federal PSD regulations and may not be binding for states in performing PSD reviews, the levels serve as a guideline in assessing a source's impact in a Class I area. FDEP has accepted the use of these significant impact levels.

Various lengths of meteorological data records can be used for impact analysis. A five-year period can be used with corresponding evaluation of highest, second-highest (HSH) short-term concentrations for comparison to AAQS or PSD increments. The term "highest, second-highest" refers to the highest of the second-highest concentrations at all receptors (i.e., the highest concentration at each receptor is discarded). The second-highest concentration is significant because short-term AAQS specify that the standard should not be exceeded at any location more than once a year. If fewer than five years of meteorological data are used in the modeling analysis, the highest concentration at each receptor normally must be used for comparison to air quality standards.

The term "baseline concentration" refers to a concentration level corresponding to a specified baseline date and certain additional baseline sources. By definition, in the PSD regulations as amended August 7, 1980, baseline concentration means the ambient concentration level that existed in the baseline area at the time of the applicable baseline date. A baseline concentration is determined for each pollutant for which a baseline date is established and includes:

1. The actual emissions representative of facilities in existence on the applicable baseline date; and
2. The allowable emissions of major stationary facilities that commenced construction before January 6, 1975, for SO_2 and PM (TSP) concentrations or February 8, 1988, for NO_2 concentrations, but that were not in operation by the applicable baseline date.

The following emissions are not included in the baseline concentration and, therefore, will affect PSD increment consumption.

1. Actual emissions from any major stationary facility on which construction commenced after January 6, 1975, for SO_2 and PM (TSP) concentrations and after February 8, 1988, for NO_2 concentrations; and
2. Actual emission increases and decreases at any stationary facility occurring after the baseline date.

In reference to the baseline concentration, the term "baseline date" actually includes three different dates:

1. The major facility baseline date, which is January 6, 1975, in the cases of SO_2 and PM (TSP) and February 8, 1988, in the case of NO_2.
2. The minor facility baseline date, which is the earliest date after the trigger date on which a major stationary facility or major modification subject to PSD regulations submits a complete PSD application.
3. The trigger date, which is August 7, 1977, for SO_2 and PM (TSP) and February 8, 1988, for NO_2.

The minor source baseline date for SO_2 and PM (TSP) has been set as December 27, 1977, for the entire State of Florida [Rules 62-204.200(22) and 204.360, F.A.C.]. The minor source baseline for NO_2 has been set as March 28, 1988 in Florida [Rules 62-204.200(22) and 204.360, F.A.C.]. It should be noted that references to PM (TSP) are also applicable to PM_{10}.

3.2.4 Air Quality Monitoring Requirements

In accordance with requirements of Rule 62-212.400(7), F.A.C., any application for a PSD permit must contain an analysis of continuous ambient air quality data in the area affected by the proposed major stationary facility. For a major modification, the affected pollutants are those that the facility potentially would emit in significant amounts.

Ambient air monitoring for a period of up to 1 year is generally appropriate to satisfy the PSD monitoring requirements. Data for a minimum of 4 months are required. Existing data from the vicinity of the proposed source may be used, if the data meet certain quality assurance requirements; otherwise, additional data may need to be gathered. Guidance in designing a PSD monitoring network is provided in *Ambient Monitoring Guidelines for Prevention of Significant Deterioration* (EPA, 1987a).

The regulations include an exemption that excludes or limits the pollutants for which an air quality analysis must be conducted. This exemption states that a proposed major stationary facility is exempt from the monitoring requirements with respect to a particular pollutant, if the emissions of the pollutant from the facility would cause, in any area, air quality impacts less than the *de minimis* levels presented in Rule 62-212.400(3)(e), F.A.C. If a facility's predicted impacts are less than the *de minimis* levels, then preconstruction monitoring is not required.

3.2.5 Source Information/GEP Stack Height

Source information must be provided to adequately describe the proposed facility according to Rule 62-212.400(4), F.A.C. The general information required for this facility is presented in Section 2.0.

The 1977 CAA Amendments require that the degree of emission limitation required for control of any pollutant cannot be affected by a stack height that exceeds GEP or any other dispersion technique. On July 8, 1985, EPA promulgated final stack height regulations (EPA, 1985a). Identical regulations have been adopted by FDEP (Rule 62-210.550, F.A.C.). GEP stack height is defined as the highest of:

1. 65 meters (m); or
2. A height established by applying the formula:

$$H_g = H + 1.5L$$

where: H_g = GEP stack height,

H = Height of the structure or nearby structure, and

L = Lesser dimension (height or projected width) of nearby structure(s); or

3. A height demonstrated by a fluid model or field study.

"Nearby" is defined as a distance up to five times the lesser of the height or width dimensions of a structure or terrain feature, but not greater than 0.8 km. Although GEP stack height regulations require that the stack height used in modeling for determining compliance with AAQS and PSD increments not exceed the GEP stack height, the actual stack height may be greater.

The stack height regulations also allow increased GEP stack height beyond that resulting from the above formula in cases where plume impaction occurs. Plume impaction is defined as concentrations measured or predicted to occur when the plume interacts with elevated terrain. Elevated terrain is defined as terrain that exceeds the height calculated by the GEP stack height formula.

3.2.6 Additional Impact Analysis

In addition to air quality impact analyses, State of Florida PSD regulations require analyses of the impairment to visibility and the impacts on soils and vegetation that would occur as a result of the proposed source or modification [Rule 62-212.400(8), F.A.C.]. Impacts as a result of general commercial, residential, industrial, and other growth associated with the source also must be addressed. These analyses are required for each pollutant emitted in significant amounts (see Table 3-2).

3.2.7 Air Quality Related Values

An Air Quality Related Value (AQRV) analysis is required to assess the potential impact on AQRVs in PSD Class I areas. The ENP is the closest Class I area to the Project, and is located about 20 km southwest of the plant area.

The U.S. Department of the Interior in 1978 administratively defined AQRVs to be:

> *All those values possessed by an area except those that are not affected by changes in air quality and include all those assets of an area whose vitality, significance, or integrity is dependent in some way upon the air environment. These values include visibility and those scenic, cultural, biological, and recreational resources of an area that are affected by air quality.*

> *Important attributes of an area are those values or assets that make an area significant as a national monument, preserve, or primitive area. They are the assets that are to be preserved if the area is to achieve the purposes for which it was set aside (Federal Register, 1978).*

The AQRVs include visibility, freshwater and coastal wetlands, dominant plant communities, unique and rare plant communities, soils and associated periphyton, and the wildlife dependent on these communities for habitat. Rare, endemic, threatened, and endangered species of the national park and bioindicators of air pollution (e.g., lichens) must also be evaluated.

3.3 Emission Standards

3.3.1 New Source Performance Standards

The NSPS are a set of national emission standards that apply to specific categories of new sources. As stated in the 1977 CAA Amendments, these standards "shall reflect the degree of emission limitation and the percentage reduction achievable through application of the best technological system of continuous emission reduction the Administrator determines has been adequately demonstrated."

The emission units associated with the Project may be subject to one or more NSPS. Stationary ICE depending on the date of manufacturer are subject to 40 CFR 60, Subpart IIII. The regulations apply to a Stationary ICE depending upon its operations (e.g., non-road, emergency, displacement, capacity, model year selected).

On October 15, 2003, EPA promulgated changes to 40 CFR Part 60, Subpart Kb, that would exempt light oil tanks containing No. 2 light oil by virtue of its vapor pressure (FR Vol. 68, No. 199, pages 59328 through 59333).

3.3.2 National Emission Standards for Hazardous Air Pollutants

The emergency generators are subject to 40 CFR 63 Subpart ZZZZ, the Reciprocating Internal Combustion Engine (RICE) Maximum Available Control Technology (MACT) Rule, if they will be located at a major source of hazardous air pollutant (HAP) emissions and will have a site rating of greater that 500 hp. Emergency generators qualifying for one of the following rule exemptions are only subject to the notification requirements of the RICE MACT (i.e., no emissions limitations will apply):

Emergency Generator – Any stationary RICE that operates in an emergency situation. Examples include stationary RICE used to produce power for critical networks or equipment (including power supplied to portions of a facility) when electric power from the local utility is interrupted, or stationary RICE used to pump water in case of fire or flood, etc. Emergency stationary RICE may be operated for the purpose of maintenance checks and readiness testing provided that the tests are recommended by the manufacturer, the vendor, or the insurance company associated with the engine. Required testing of such units should be minimized, but there is no time limit on the use of the emergency stationary RICE in emergency situations and for routine testing and maintenance. Emergency stationary RICE may also operate an additional 50 hours per year in non-emergency situations.

Limited Use – Any stationary RICE that operates less than 100 hours per year.

3.3.3 Florida Rules

The FDEP has adopted the EPA NSPS by reference in Rule 62-204.800(8), F.A.C.. FDEP has authority for implementing NSPS requirements in Florida. The facility is required to meet the emissions, performance testing, monitoring, reporting, and record keeping as described in Subsection 3.4.1.

The FDEP regulations require any new emission unit that is not exempt to obtain an air permit prior to construction. Major new or modified sources must meet the appropriate PSD and nonattainment requirements as discussed previously. Required permits and approvals for air pollution sources include PSD, NSR for nonattainment areas, NSPS, National Emission Standards for Hazardous Air Pollutants (NESHAP), Permit to Construct, and Permit to Operate. The requirements for construction permits and approvals are contained in Rules 62-4.030, 62-4.050, 62-4.210, 62-210.300(1), and 62-212.400, F.A.C.

Specific emission standards are set forth in Chapter 62-296, F.A.C., and testing and monitoring requirements are set forth in Chapter 62-297, F.A.C.

3.3.4 Local Air Regulations

Miami-Dade County Department of Environmental Management is the air compliance authority for the County, implementing FDEP regulations. Miami-Dade County has adopted emission limits for opacity, PM, and SO_2. The opacity limit is 20 percent (Section 24-14, Miami-Dade County Code) and similar to that adopted by FDEP and applicable to existing fossil fuel fired steam generators with a heat input of 250 million British thermal units per hour (MMBtu/hr) and greater [Rule 62-296.405(1), F.A.C.]. The PM emission limits are based on a process weight table that limits the PM emissions based on the process weight. Process weight is the total amount of all materials introduced into a process unit [Section 24-16 (1)]. It does not include uncombined water, liquid and gaseous fuels, combustion and other air introduced into the process. These PM limits would not apply to the Project. The SO_2 emission standards set limitations for stationary combustion sources. For existing sources greater than 250 MMBtu/hr heat input and firing liquid fuel, the limitation is 1.1 pounds per million British thermal units (lb/MMBtu) [Section 24-17 (2)(a)(ii)], the same as that established by FDEP in the Title V Operating Permit and applicable to Units 1 and 2.

3.4 Source Applicability

3.4.1 Area Classification

The Project is located in Miami-Dade County, which has been designated by EPA and FDEP as an attainment area (includes unclassifiable) for all criteria pollutants. Miami-Dade County and the surrounding counties are designated as PSD Class II areas for SO_2, PM (TSP), and NO_2. The nearest Class I area is the ENP located about 20 km (12 miles) and the nearest boundary of the ENP is southwest of the plant area.

3.4.2 PSD Review

3.4.2.1 Pollutant Applicability

The existing Turkey Point Plant is considered to be a major facility because the emissions of several regulated pollutants will exceed 100 TPY and the emissions units are one of the 28 listed major source categories under the PSD rules. The Project is defined as a major modification under the PSD rules, and PSD review is required for any pollutant for which the emissions exceed the PSD significant emission rates. As shown in Table 3-3, potential emissions from the Project will trigger PSD review for PM (TSP) and PM_{10}, since the emissions of these PSD pollutants exceed the significant emission rate. Emissions of SO_2, NO_x, CO, VOCs, and other PSD pollutants will be below the significant emission rates, and PSD review is not applicable to these pollutants.

3.4.2.2 Emission Standards

The standby and ancillary generators, and the fire pump will be subject to the Stationary ICE NSPS (40 CFR 60, Subpart IIII). These generators will comply with 40 CFR 60, Subpart IIII to the extent that the regulations apply to the emission unit and its operations (e.g., non-road, emergency, displacement, capacity, model year selected). The standby diesel generators will be subject to RICE MACT regulations in 40 CFR 63 Subpart ZZZZ, since they will be located at a major source of HAP emissions and will have a site rating of greater that 500 hp. The standby generators will only be subject to the notification requirements.

3.4.2.3 Ambient Monitoring

Based on the estimated pollutant emissions from the proposed plant (see Table 3-4), a pre-construction ambient monitoring analysis is required for PM_{10}. If the net increase in impact of other pollutants is less than the applicable *de minimis* monitoring concentration, then an exemption from the pre-construction ambient monitoring requirement is available by Rule 62-212.400(3)(e), F.A.C. In addition, if an acceptable ambient monitoring method for the pollutant has not been established by EPA, monitoring is not required.

As shown in Table 3-4, the proposed plant's impacts are predicted to be below the applicable *de minimis* monitoring concentration levels for PM_{10}. Therefore, pre-construction monitoring is not required to be submitted for this facility.

3.4.2.4 Air Quality Impacts Analyses

An air quality impact analysis, incorporating the impacts from other sources, is required for pollutants that are predicted to be above the significant impact levels. For the Project the only pollutant subject to PSD review and having AAQS and PSD Increments is PM_{10}. The predicted impacts are below significant impact levels (see Section 6.0). The GEP stack height regulations allow any stack to be at least 65 m (213 ft) high. The stacks for the Project will be below 213 ft and do not exceed the GEP stack height. As discussed in Section 6.0, Air Quality Modeling Approach, since the stack height is less than GEP, building downwash effects must be considered in the modeling analysis. As a result, the potential for downwash of the PM_{10} emissions caused by nearby structures are included in the modeling analysis.

3.4.3 Other Clean Air Act Requirements

The Project could be subject to the EPA Risk Management Plan under Section 112(r) of the CAA such as an oxidizing agent (e.g., chlorine) used in the cooling towers is stored above the threshold amount. The Project could be subject to reporting equipment containing ozone depleting substances regulated under Title IV of the CAA if this equipment contains amounts above the thresholds.

TABLE 3-1
NATIONAL AND STATE AAQS, ALLOWABLE PSD INCREMENTS, AND SIGNIFICANT IMPACT LEVELS ($\mu g/m^3$)

Pollutant	Averaging Time	AAQS[a] National Primary Standard	AAQS[a] National Secondary Standard	AAQS[a] Florida	AAQS[a] Miami-Dade County[a]	PSD Increments[a] Class I	PSD Increments[a] Class II	PSD Significant Impact Levels[b] Class I	PSD Significant Impact Levels[b] Class II
Particulate Matter (PM_{10})[c]	Annual Arithmetic Mean	NA	NA	50	NA	4	17	0.2	1
	24-Hour Maximum	150	150	150	NA	8	30	0.3	5
Particulate Matter ($PM_{2.5}$)[c]	Annual Arithmetic Mean	15	15	NA	NA	NA	NA	NA	NA
	24-Hour Maximum	35	35	NA	NA	NA	NA	NA	NA
Sulfur Dioxide	Annual Arithmetic Mean	80	NA	60	25	2	20	0.1	1
	24-Hour Maximum	365	NA	260	110	5	91	0.2	5
	3-Hour Maximum	NA	1,300	1,300	350	25	512	1.0	25
Carbon Monoxide	8-Hour Maximum	10,000	10,000	10,000	NA	NA	NA	NA	500
	1-Hour Maximum	40,000	40,000	40,000	NA	NA	NA	NA	2,000
Nitrogen Dioxide	Annual Arithmetic Mean	100	100	100	NA	2.5	25	0.1	1
Ozone[d]	1-Hour Maximum[d]	NA	NA	235	NA	NA	NA	NA	NA
	8-Hour Maximum[e]	147	147	NA	NA	NA	NA	NA	NA
Lead	Calendar Quarter Arithmetic Mean	1.5	1.5	1.5	NA	NA	NA	NA	NA

Note: PM_{10} = particulate matter (PM) with aerodynamic diameter ≤ 10 micrometers (μm). $PM_{2.5}$ = PM with aerodynamic diameter ≤ 2.5 μm.
NA = Not applicable, i.e., no standard exists or not promulgated yet.

[a] Short-term maximum concentrations are not to be exceeded more than once per year, except for PM_{10}, $PM_{2.5}$, and ozone AAQS, which are based on a number of expected exceedances.

[b] Maximum concentrations are not to be exceeded.

[c] $PM_{2.5}$: 24-hour standard based on the 3-year averages of the 98th percentile values; annual standard based on 3-year average at community monitors. These standards must be implemented in the 2007-2008 timeframe. On October 17, 2006, EPA finalized the PM AAQS (71 FR 61236). The 24-hour $PM_{2.5}$ standard was changed to 35 $\mu g/m^3$. Annual PM_{10} standard was revoked by EPA. The FDEP has not yet adopted the revised PM_{10} or $PM_{2.5}$ standards.

[d] 1-hour standard of 0.12 ppm was revoked by EPA on June 15, 2005; FDEP has not yet adopted this change.

[e] 8-hour standard was lowered by EPA from 0.08 to 0.075 ppm on March 27, 2008, achieved when the 3-year average of 99th percentile values is 0.075 ppm or less. FDEP had not yet adopted the revised standard.

Sources: Federal Register, Vol. 43, No. 118, June 19, 1978; 40 CFR 50; 40 CFR 52.21; Chapter 62.204, F.A.C.; Miami-Dade County Code of Ordinances, Chapter 24, Section 24-41.3(1).

TABLE 3-2
PSD SIGNIFICANT EMISSION RATES AND *DE MINIMIS* MONITORING CONCENTRATIONS

Pollutant	**Regulated Under**	**Significant Emission Rate (TPY)**	***De Minimis* Monitoring Concentration[a] ($\mu g/m^3$)**
Sulfur Dioxide	NAAQS, NSPS	40	13, 24-hour
Particulate Matter [PM(TSP)]	NSPS	25	10, 24-hour
Particulate Matter (PM_{10})	NAAQS	15	10, 24-hour
Nitrogen Dioxide	NAAQS, NSPS	40	14, annual
Carbon Monoxide	NAAQS, NSPS	100	575, 8-hour
Volatile Organic Compounds (Ozone)	NAAQS, NSPS	40	100 TPY[b]
Lead	NAAQS	0.6	0.1, 3-month
Sulfuric Acid Mist	NSPS	7	NM
Total Fluorides	NSPS	3	0.25, 24-hour
Total Reduced Sulfur	NSPS	10	10, 1-hour
Reduced Sulfur Compounds	NSPS	10	10, 1-hour
Hydrogen Sulfide	NSPS	10	0.2, 1-hour
Mercury	NESHAP	0.1	0.25, 24-hour

Note: Ambient monitoring requirements for any pollutant may be exempted if the impact of the increase in emissions is below *de minimis* monitoring concentrations.

NAAQS = National Ambient Air Quality Standards.
NM = No ambient measurement method established; therefore, no *de minimis* concentration has been established.
NSPS = New Source Performance Standards.
NESHAP = National Emission Standards for Hazardous Air Pollutants.
$\mu g/m^3$ = micrograms per cubic meter.

[a] Short-term concentrations are not to be exceeded.
[b] No *de minimis* concentration; an increase in VOC or NO_x emissions of 100 TPY or more will require monitoring analysis for ozone.

Source: Rule 62-212.400.

TABLE 3-3
MAXIMUM EMISSIONS DUE TO THE PROJECT COMPARED TO THE PSD SIGNIFICANT EMISSION RATES

	Pollutant Emissions (TPY)		
Pollutant	**Potential Emissions from Project[a]**	**Significant Emission Rate**	**PSD Review**
Sulfur Dioxide	<1	40	No
Particulate Matter [PM(TSP)]	943.3	25	Yes
Particulate Matter (PM_{10})	24	15	Yes
Nitrogen Dioxide	36	40	No
Carbon Monoxide	25	100	No
Volatile Organic Compounds	4	40	Yes
Lead	NEG	0.6	No
Sulfuric Acid Mist	NEG	7	No
Total Fluorides	NEG	3	No
Total Reduced Sulfur	NEG	10	No
Reduced Sulfur Compounds	NEG	10	No
Hydrogen Sulfide	NEG	10	No
Mercury	NEG	0.1	No

Note: NEG = Negligible.

[a] Refer to Table 2-4.

TABLE 3-4
PREDICTED NET INCREASE IN IMPACTS DUE TO THE PROPOSED PROJECT COMPARED TO PSD *DE MINIMIS* MONITORING CONCENTRATIONS FOR PM_{10}

Pollutant	Concentration ($\mu g/m^3$) Predicted Increase in Impacts[a]	*De Minimis* Monitoring Concentration
Particulate Matter (PM_{10})	4.93	10, 24-hour

[a] See Section 6.0 for air dispersion modeling results.

4.0 CONTROL TECHNOLOGY REVIEW

4.1 Applicability

The PSD regulations require new major stationary sources to undergo a control technology review for each pollutant that may potentially be emitted above significant amounts. The control technology review requirements of the PSD regulations are applicable to the emissions of PM/PM_{10} (see Section 3.0).

This section presents the applicable NSPS and the proposed BACT for these pollutants. The approach to the BACT analysis is based on the regulatory definitions of BACT, as well as consideration of EPA's current policy guidelines requiring a top-down approach. A BACT determination requires an analysis of the economic, environmental, and energy impacts of the proposed and alternative control technologies [Rules 62-210.200(40) and 62-212.400(4)(c), F.A.C.]. The analysis must, by definition, be specific to emission units associated with the Project (i.e., case by case).

4.2 New Source Performance Standards

On July 11, 2006, the EPA promulgated final *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.*[1] The new rules are contained in 40 CFR 60, Subpart IIII, and in Parts 85, 89, 94, 1039, 1065, and 1068, and were effective on September 11, 2006. The rule applies to engines that are constructed, reconstructed, or modified after the NSPS was proposed (July 11, 2005). The pollutants regulated under this rule include NO_x, PM, PM_{10}, $PM_{2.5}$, CO, and NMHCs. This rule uses NMHCs instead of VOCs as the regulated pollutant due to testing ease. VOC emissions are closely related to NMHC emissions.

This rule applies to all stationary compression ignition internal combustion (CI ICE) engines constructed, reconstructed, or modified after the July 11, 2005 proposed date of this rule. For the purposes of this rule, the construction date is considered the date that the CI ICE is ordered by an owner/operator. Many of the smaller ICE engines that are used as part of generator packages are commodity products, and this definition of construction date simplifies the potential applicability of this rule. An additional simplification is to limit the applicability of this rule to those non-fire pump engines manufactured after April 1, 2006, and fire pump engines manufactured after July 1, 2006.

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[1] FR July 11, 2006, Volume 71, Number 132, Pages 39154-39185.

In general, the requirements of this regulation will be met by the engine manufacturer in much the same manner as motor vehicle emission standards are met by the vehicle manufacturer. Additional requirements that are most likely to apply to the Project involve maintaining records of:

- Manufacturer certification that the engine meets the NSPS standards;
- Time and purpose of operation for emergency engines; and,
- Maintenance records related to backpressure alarms for engines equipped with diesel particulate filters.

For those engines that meet the emission standards for emergency engines, the owner/operator is required to maintain records of operation for the engines. The engine is required to have a non-resettable hour meter installed prior to engine startup. These records include all periods of operation and are to include:

- Hours of operation (from non-resettable engine meter); and
- Purpose of operation (e.g., maintenance, testing, or emergency).

The emission standards are based on up to 100 hours of operation per year for non-emergency situations. This 100-hour limit may be extended through petition to the EPA to allow for specific testing programs. The hours of operation for emergency situations are not limited.

If a Subpart IIII engine is equipped with a catalyzed diesel particulate filter for the purposes of meeting this standard, then the engine needs to have a backpressure monitor with alarm (i.e., notification) capabilities that indicates when the high backpressure limit of the engine is approached. Maintenance records need to be maintained for all alarm notifications indicating the corrective actions taken to return to the equipment to nominal operation.

4.3 Best Available Control Technology

4.3.1 Summary of Top-Down Process

The control technology review process and the "top-down" approach for BACT determination are summarized in Subsection 3.2. This procedure includes a five-step process for considering all available control technologies from most stringent to least stringent. The most stringent control technology is considered BACT unless the applicant demonstrates, and the permitting authority agrees, that technical considerations, or energy, environmental or economic impacts justify elimination of the most stringent technology and selection of a less stringent technology.

A summary of each of the five steps in the top-down process is described below. This process was repeated for each of the Project's emission units and for each pollutant emitted from the emission unit for which the control technology review requirements are applicable.

Step 1 - Identify All Control Technologies

The primary objective of Step 1 is to identify all potentially applicable control options. Potentially applicable control options are those air pollution control technologies, or techniques, with a practical potential for application to the emission unit and regulated pollutant under evaluation. Potentially applicable control options are categorized as lower emitting processes/practices or add-on controls.

A lower polluting process/practice is considered applicable if it has been demonstrated in a similar application. An add-on control is considered applicable if it can properly function given the physical and chemical characteristics of the pollutant-bearing emission stream. Combinations of control options should be considered whenever such combinations would provide more effective emissions control.

The range of potentially applicable control options was surveyed based on EPA's RACT/BACT/LAER Clearinghouse (RBLC) database in their Clean Air Technology Center (CATC) website and control technology vendors. A list of potentially applicable control technology options was developed for each emission unit emitted pollutant subject to control technology review.

Step 2 - Eliminate Technically Infeasible Options

The objective of Step 2 is to refine the list of potentially applicable control technology options developed in Step 1 by evaluating the technical feasibility of each of the control technology options.

Pursuant to EPA's Draft NSR Manual, control technologies that have been installed and operated successfully on the type of source under review are "demonstrated" and are considered technically feasible. For technologies that have not been demonstrated for a particular source type, EPA's Draft NSR Manual states the following regarding technical feasibility:

> *Two key concepts are important in determining whether an undemonstrated technology is feasible: "availability" and "applicability." As explained in more*

> *detail below, a technology is considered "available" if it can be obtained by the applicant through commercial channels or is otherwise available within the common sense meaning of the term. An available technology is "applicable" if it can reasonably be installed and operated on the source type under consideration. A technology that is available and applicable is technically feasible.*

Pursuant to this guidance, a technology is considered technically infeasible if it is not available or not applicable. EPA's Draft NSR Manual provides additional guidance on availability and applicability of a given technology for a particular source type:

> *A control technique is considered available if it has reached the licensing and commercial sales stage of development. A source would not be required to experience extended time delays or resource penalties to allow research to be conducted on a new technique. Neither is it expected that an applicant would be required to experience extended trials to learn how to apply a technology on a totally new and dissimilar source type. Consequently, technologies in the pilot scale testing stages of development would not be considered available for BACT review.*

Commercial availability by itself, however, is not necessarily sufficient basis for concluding a technology to be applicable and therefore technically feasible. Technical feasibility, as determined in Step 2, also means a control option may reasonably be deployed on or "applicable" to the source type under consideration. Technical judgment on the part of the applicant and the review authority is to be exercised in determining whether a control alternative is applicable to the source type under consideration.

In general, a commercially available control option will be presumed applicable if it has been or is soon to be deployed (e.g., is specified in a permit) on the same or a similar source type. Absent a showing of this type, technical feasibility would be based on examination of the physical and chemical characteristics of the pollutant-bearing gas stream and comparison to the gas stream characteristics of the source types to which the technology had been applied previously. Deployment of the control technology on an existing source with similar gas stream characteristics is generally sufficient basis for concluding technical feasibility barring a demonstration to the contrary.

In the Step 2 analysis, each technology presented in Step 1 is evaluated to determine whether the technology is both available and applicable. Control technologies that are not available or not applicable are determined to be technically infeasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

In Step 3 of the "top-down" approach, control technologies not eliminated in Step 2 are ranked in order of control effectiveness.

The ranking of the control options initially involves the establishment of appropriate units of emission performance. Once a measure of performance is established, factors such as the operational characteristics of each of the control technologies and any operating assumptions are considered in establishing emissions reduction potential.

After identifying the appropriate performance units and establishing the emissions performance levels for each control technology, a table is developed to rank the control technology options by their respective emissions performance from lowest to highest emissions level (highest to lowest control effectiveness).

Step 3 of the analysis also includes a listing of the energy, environmental, and economic impacts associated with each control option. These impacts are evaluated in the next step of the analysis.

Step 4 - Evaluate Most Effective Controls and Document Results

The purpose of Step 4 is to either confirm the suitability of the top ranked control technology option as BACT, or provide clear justification for a determination that a lower-ranked control technology option is BACT for the case under consideration. In order to establish the suitability of a control technology option, a case-by-case evaluation of the energy, environmental, and economic impacts of the control technology is performed.

The energy impacts analysis determines the energy requirements of the control technology. The environmental impacts analysis considers site-specific impacts that would result from implementation of the control technology. These environmental impacts may be solid or liquid waste generated by the discharges or secondary emissions formed by the use of the control technology. The economic analysis considers the total and incremental cost effectiveness of applying the technology.

The case-by-case determinations consider both beneficial and adverse impacts from an energy, environmental, and economic standpoint. In cases where the determination establishes that there are significant energy, environmental, and/or economic issues that would preclude the selection of the evaluated alternative as BACT, the basis for this determination is clearly documented, and the next most effective alternative is similarly evaluated. This process continues until the evaluated alternative is not rejected and is selected as BACT.

Step 5 – Most effective control alternative not eliminated selected as BACT

In Step 5, the highest ranked control technology not eliminated in Step 4 is selected as BACT.

4.3.2 Cooling Tower BACT Analysis

This section contains the BACT analysis for the PM/PM_{10} emissions from the proposed 12-cell circulating water cooling towers for the Project. Water circulation rate for the proposed cooling towers is 631,100 gpm for the three towers associated with each nuclear unit. TDS concentration is a function of the source water, which will range from reclaimed water to saltwater. The maximum TDS in the water is 65,000 ppmw for saltwater. The cooling tower will be equipped with high-efficiency drift eliminators with a maximum drift rate of 0.0005 percent. PM emission from the tower is 107.7 pounds per hour (lb/hr) for three cooling towers associated with each nuclear unit when using marine water. The PM_{10} emission is highest when using reclaimed water and is 2.42 lb/hr for three cooling towers associated with each nuclear unit.

Step 1 – Identification of PM/PM_{10} Control Technologies

Table 4-1 presents a summary of BACT determinations for cooling towers from 2003 through 2008 from the EPA RBLC database. The following potential control options are evaluated in the BACT analysis for PM/PM_{10} emissions from the cooling tower.

4.3.2.1 High Efficiency Mist Eliminators

Wet circulating water cooling towers are the preferred technology for steam condenser cooling that minimizes the use of water and impacts to the environment. The use of this technology can generate particulate matter from the entrained water droplet that contains minerals in the circulating water. The minerals form particulate matter when the water evaporates from the droplet. Mist eliminators are a technology that minimizes the emissions of drift or mist from the cooling tower through inertial separation. The circulating water droplets formed from air flowing through the circulating water impact the mist eliminators and are returned back to the circulating water. Types of drift eliminator configurations include herringbone (blade-type), wave form, and cellular (or honeycomb) designs. The cellular units generally are the most efficient. This technology is a commercially proven technique to reduce PM/PM_{10} emissions.

4.3.2.2 Air Cooled Condensers

Air cooled condensers (ACC) cool circulating water through a non-contact heat exchanger using ambient air. In ACCs, water is circulated through a very large, finned-tube water-to-air heat exchanger in which large fans force ambient air through the heat exchanger tubes to remove heat from the circulating water. To achieve cooling, ACCs require a large surface area and are elevated above the ground to maximize introduction of ambient air through the tower. ACCs are typically used in cooler and arid climates where water is not available.

Step 2 - Technical Feasibility Analysis

Technical feasibility of the potential control options is evaluated below.

- High Efficiency Drift Eliminator. High efficiency drift eliminators are commercially available and a proven technology and are considered to be technically feasible for PM/PM_{10} emissions from the Project's cooling tower. Development of increasingly effective mist eliminators now allows a cooling tower to be specified to achieve drift release no higher than 0.0005 percent of the water circulation rate.
- ACC. For the Turkey Point Units 6 & 7 Project, the use of ACCs is not considered feasible. While ACCs are an available technology, no large power generating facility (nuclear or steam) has used ACCs in the southern U.S. There are significant energy and economic penalties for ACC compared to wet circulating water cooling towers. Based on EPA's Technical Development Document for the Proposed Section 316(b) Phase II Existing Facilities Rule, there is a 10.7-percent energy penalty for an ACC compared to a wet cooling tower. This is based on new tower comparisons for a nuclear unit located in the Jacksonville, Florida climate. The energy penalty for southern Florida would be even greater. This energy penalty would be about 120 MW per nuclear unit. This would greatly restrict the purpose of Units 6 & 7, which would provide fuel diversity in FPL's system and reduce greenhouse gases. The inefficiency of ACCs would result in millions of tons of greenhouse gas not being avoided as compared to mechanical draft cooling towers. In addition, compared to wet circulating water cooling towers, the capital costs of ACCs are much higher than those proposed for the Project. The cost differential for a circulating flow rate of 210,000 gpm is about 3.7 times or an additional $27 million (1999$). For the Project this would amount to over $160 million (1999$) for six cooling towers. Taking together the energy penalty, associated loss of nuclear power and reduced greenhouse gas avoidance, and high cost, ACCs are not technically feasible for the Units 6 & 7 Project.

Step 3 – Rank Control Technologies by Control Effectiveness

High efficiency drift eliminators are the only feasible technology to control PM/PM_{10} emissions from the wet circulating water cooling tower. High-efficiency drift eliminators are the most stringent control technology that has been established as BACT on other projects. Based on the review of EPA's RBLC database presented in Table 4-2, the most stringent BACT limit for cooling towers is drift eliminators with drift rate of 0.0005 percent of the circulating water rate. This is a control efficiency of greater than 99.99 percent. The energy, environmental, and economic impacts of the top control option are listed in accordance with EPA guidance.

- **Energy Impacts.** High efficiency drift eliminators are designed with low pressure drops, limiting the mechanical energy requirements.
- **Environmental Impacts.** Drift eliminators do not create negative environmental impacts.
- **Economic Impacts.** High-efficiency drift eliminators with 0.0005 percent drift rate are a minor overall cost of the cooling tower.

Step 4 – Evaluate the Most Effective Controls

There are no energy, environmental, or economic impacts that would preclude the use of high-efficiency drift eliminators for the proposed Project's wet circulating water cooling towers.

Step 5 – Select BACT

The use of high-efficiency drift eliminators is proposed as BACT for PM/PM_{10} emissions from the circulating water cooling towers. The BACT emissions limit for the cooling towers associated with the Project is proposed as a design standard. This design standard has been approved as BACT for WCEC Units 1 and 2, WCEC Unit 3, and Turkey Point Unit 5.

Proposed BACT:

> Drift Rate: Within 60 days of commencing operation, the permittee shall certify that the cooling tower was constructed to achieve the specified drift rate of no more than 0.0005 percent of the circulating water flow rate.

4.3.3 Standby Generators, Ancillary Generators, and Diesel Fire Pump Engines

This section contains the BACT analysis for the PM/PM_{10} emissions from the standby diesel generators, ancillary generators, and diesel fire pump engines. These engines are classified as "emergency" engines and generators under the NSPS Subpart IIII. Each engine will be fired by ultra-low sulfur diesel fuel with a sulfur content of 0.0015 percent. These engines will be operated for routine testing, maintenance, and inspection purposes. Maximum operation is limited to 96 hours per year for each.

Step 1 - Identification of PM/PM$_{10}$ Control Technologies

Table 4-2 presents a summary of BACT/LAER determinations for cooling towers from 2003 through 2008 from the EPA RBLC database. A small amount of particulate matter results from the combustion of diesel fuel in the emergency engines. EPA identifies two types of smoke that may be emitted from diesel engines during stable operations (i.e., black smoke and blue smoke). The primary constituent of black smoke is agglomerated carbon particles (soot) formed in regions of the combustion mixtures that are oxygen deficient. AP-42 Section 3.3, Gasoline and Diesel Industrial Engines, blue smoke is emitted when lubricating oil leaks, often past worn piston rings, into the combustion chamber and is partially burned.

The following control options are evaluated in the PM/PM$_{10}$ BACT analysis.

Combustion Controls

Carbon soot is formed in regions of combustion mixture that are oxygen deficient. Combustion controls, which includes optimization of the combustion chamber designs and operation practices that improve the oxidation process and minimize incomplete combustion is the primary mechanism available for lowering carbon soot formation. Good combustion system design, which includes continuous mixing of air and fuel in the proper proportions, extended residence time, and consistent high temperatures in the combustion chamber is a standard feature of modern engines.

Particulate Filters

Modern internal combustion engine designs include good combustion controls and the uncontrolled PM/PM$_{10}$ emissions are very low. Based on the review of the RBLC database presented in Table 4-2, no diesel engines of this type have been permitted with add-on controls. However, manufacturers are required to meet the Subpart IIII NSPS and may install catalyzed diesel particulate filters to meet this standard.

Ultra Low Sulfur Diesel Fuel Oil

The quality of the diesel fuel influences the particulate emissions, as more refined products typically have lower ash contents. Ultra low sulfur diesel fuel oil has the lowest sulfur content and will be readily available since this fuel is required for transportation diesel engines. A sulfur content of 0.0015 percent approaches that of natural gas.

Proper Maintenance

Blue smoke is emitted when lubricating oil leaks, often past worn piston rings, into the combustion chamber and is partially burned. Per EPA's AP-42 Section 3.3 (Gasoline and Diesel Industrial Engines), proper maintenance is the most effective method of preventing blue smoke emissions from all types of internal combustion engines.

Step 2 - Technical Feasibility Analysis

Technical feasibility of the potential control options is evaluated below.

- **Combustion Controls.** Combustion controls, which include combustion system design and proper engine operation and maintenance, have been applied successfully in similar engines proposed for the Project and are considered technically feasible.
- **Particulate Filters.** Conventional add-on PM/PM_{10} control devices such as fabric filters/baghouses and electrostatic precipitators are not considered for the diesel engines associated with the standby generators, ancillary generators, or fire pump engines. This is consistent with EPA's RBLC database presented in Table 4-2, which shows that no diesel engine associated with emergency use as defined in the regulations has been equipped with a conventional add-on control device. As noted above, a catalyzed diesel particulate filter may be installed to meet the requirements of Subpart IIII depending upon the vendor.
- **Ultra Low Sulfur Distillate Fuel Oil.** This fuel will be readily available for use in non-road diesel engines.
- **Proper Maintenance.** Proper maintenance is effective in minimizing particulate emissions and is considered technically feasible.

Step 3 – Rank Control Technologies by Control Effectiveness

Combustion controls, ultra low sulfur fuel oil, proper maintenance, and catalyzed diesel particulate filters (if installed to meet Subpart IIII) are the only feasible technologies to control PM/PM_{10} emissions from the diesel engines and together they represent the top control technology. Next, the energy, environmental, and economic impacts of the top control option are listed in accordance with EPA guidance.

- **Energy Impacts.** Combustion controls and proper maintenance are not expected to create any energy impacts. The use of a catalyzed diesel particulate filter would increase back pressure on the engine but have a nominal influence on performance.

- **Environmental Impacts.** Combustion controls and proper maintenance do not create negative environmental impacts. A catalyzed diesel particulate filter would have to be disposed of properly if changed. However, given the low utilization of these emission units, filter changes would be very infrequent.
- **Economic Impacts.** Combustion controls is part of the standard design of modern engines and does not create any economic impacts. Proper maintenance is not expected to create any adverse economic impacts.

Step 4 – Evaluate the Most Effective Controls

There are no energy, environmental, or economic impacts that would preclude the use of combustion controls, ultra low sulfur distillate fuel oil proper maintenance practices and, if applicable to the engine selected, the catalyzed diesel particulate filter for the proposed emergency engines.

Step 5 – Select BACT

A BACT emission limit for PM/PM_{10} meeting the requirements of Subpart IIII is proposed for the standby, ancillary and fire pump diesel engines. The proposed BACT emissions limit for PM/PM_{10} emissions from the diesel engines is listed below:

> Standby Generators, Ancillary Generators, and Fire Pump Engines: PM/PM_{10} – 0.4 gram per brake horsepower-hour (g/bhp-hr) based on an EPA Certification of emissions characteristics of the purchased model that are at least as stringent as the values contained in the air construction permit and the use of ultra low sulfur distillate fuel oil shall be used to fulfill this requirement.

This proposed emission limit is equivalent to the NSPS Subpart IIII PM emissions standards for the diesel engines.

TABLE 4-1
SUMMARY OF BACT DETERMINATIONS FOR COOLING TOWERS (2003-2008)

Facility Name	State	Permit Issued	Process Info	Throughput		Control Method	Pollutant Limit		Basis
FPL West County Energy Center (Unit 3)	FL	7/20/2008	Cooling Tower	306,000	gal/min		0.0005	% BY VOL	BACT-PSD
Arsenal Hill Power Plant	LA	3/20/2008	Cooling Tower	140,000	gal/min	Use of Mist Eliminators	1.4	LB/H	BACT-PSD
FPL West County Energy Center (Units 1 & 2)	FL	1/10/2007	Mechanical Draft Cooling Tower (2, 26 cell)	306,000	gal/min		0.0005	% BY VOL	BACT-PSD
Forsyth Energy Plant	NC	9/29/2005	Cooling Tower	3,834	gal/min		0.007	LB/H	BACT-PSD
Forsyth Energy Plant	NC	9/29/2005	Cooling Tower	3,834	gal/min		0.002	LB/H	BACT-PSD
Wanapa Energy Center	OR	8/8/2005	Cooling Tower	6	ft^3/s	Drift Eliminators, max 0.0005% Dr	3532	PPMW	BACT-PSD
Crescent City Power	LA	6/6/2005	Chiller Cooling Tower	35,000	gal/min		1.75	LB/H	BACT-PSD
Crescent City Power	LA	6/6/2005	Main Cooling Tower	290,200	gal/min	Marley Excel Drift Eliminators	2.61	LB/H	BACT-PSD
BP Cherry Point Cogeneration Project	WA	1/11/2005	Cooling Tower			Drift Eliminators, max 0.001% Dr			BACT-PSD
Duke Energy Hanging Rock Energy Facility	OH	12/28/2004	Cooling Tower, (2) 10 Cell Mechanical Draft			Drift Eliminators	2.6	LB/H	BACT-PSD
Wellton Mohawk Generating Station	AZ	12/1/2004	Mechanical Draft Cooling Towers	170,000	gal/min	Drift Eliminators, max 0.0005% Dr	5	% OPACITY	BACT-PSD
Wellton Mohawk Generating Station	AZ	12/1/2004	Mechanical Draft Cooling Towers	170,000	gal/min	Drift Eliminators, max 0.0005% Dr	3	LB/H	BACT-PSD
La Paz Generating Facility	AZ	9/4/2003	Mechanical Draft Cooling Towers for GE Turbines	173,870	gal/min	Drift Eliminators	0.0005	% BY VOL	BACT-PSD
La Paz Generating Facility	AZ	9/4/2003	Mechanical Draft Cooling Towers for Siemens Turbines	141,400	gal/min	Drift Eliminators	0.0005	% BY VOL	BACT-PSD
Duke Energy Washington County LLC	OH	8/14/2003	Cooling Tower				2.08	LB/H	BACT-PSD
Chocolate Bayou Plant	TX	3/24/2003	Cooling Water Tower (2 cells), Cogencwt			None Indicated	0.54	LB/H	Other Case-by-Case
Duke Energy Stephens, LLC Stephens Energy	OK	3/21/2003	Cooling Tower			Drift Eliminators	1.2	LB/H	BACT-PSD
Wallula Power Plant	WA	1/3/2003	Cooling Tower			Water Pretreatment, 0.0005% Dr	3.7	LB/H	Other Case-by-Case
Wallula Power Plant	WA	1/3/2003	Cooling Tower			Water Treatment, 0.0005% Dr	3.7	LB/H	LAER

Notes
0.0005% by vol is by volume of the circulating water rate in gal/min.
DR = Drift rate

Source: EPA 2008 (RBLC database)

TABLE 4-2
SUMMARY OF PM BACT/LAER DETERMINATIONS FOR EMERGENCY DIESEL GENERATORS AND FIRE WATER PUMP ENGINES (2003-2008)

Facility Name	State	Permit Issued	Process Info	Fuel	Throughput	Control Method	Pollutant Limit	Basis
Particulate Matter ($PM/PM_{10}/PM_{2.5}$)								
Arsenal Hill Power Plant	LA	3/20/2008	DFP Diesel Fire Pump	Diesel	310 HP	LSF, Limited Operation, Maintenance	0.00219 lb/hp-hr	BACT-PSD
Fairbault Energy Park	MN	6/5/2007	Emergency Generator	Diesel	1750 KW		0.0004 lb/hp-hr	BACT-PSD
Fairbault Energy Park	MN	6/5/2007	Emergency Fire Pump	Diesel		GCP	0.31 lb/MMBtu	BACT-PSD
Blythe Energy Project II	CA	4/25/2007	Fire Pump	Diesel	303 HP		0.00033 lb/hp-hr	BACT-PSD
FPL West County Energy Center	FL	1/10/2007	Four 2250 kW Liquid Fuel Emergency Generators	Diesel			0.4 GM/BHP-HR	BACT-PSD
FPL West County Energy Center	FL	1/10/2007	One Emergency Diesel Fired Pump and 500 Gallon Storage Tank	Diesel			0.4 GM/B-HP-H	BACT-PSD
Forsyth Energy Plant	NC	9/29/2005	IC Engine, Emergency Generator	Diesel	11.4 MMBTU/H		1.14 LB/H	BACT-PSD
Forsyth Energy Plant	NC	9/29/2005	IC Engine, Emergency Firewater Pump	Diesel	11.4 MMBTU/H		1.14 LB/H	BACT-PSD
Crescent City Power	LA	6/6/2005	Diesel Fired Water Pump	Diesel		GED, GOP	0.14 LB/H	BACT-PSD
Duke Energy Hanging Rock Energy Facility	OH	12/28/2004	Backup Generators (2)	Diesel	500 KW		0.00088 lb/hp-hr	BACT-PSD
Sabine Pass LNG Import Terminal	LA	11/24/2004	Firewater Pump Diesel Engines 1-3	Diesel	660 HP EA.	GCP	0.00188 lb/hp-hr	BACT-PSD
Sabine Pass LNG Import Terminal	LA	11/24/2004	Standby Generator Diesel Engines 1-2	Diesel	2220 HP EA.	GCP	0.00088 lb/hp-hr	BACT-PSD
Sabine Pass LNG Import Terminal	LA	11/24/2004	Firewater Booster Pump Diesel Engines 1-4	Diesel	300 HP EA.	GED, GOP, and LSF	0.0002 lb/hp-hr	BACT-PSD
Mankato Energy Center	MN	12/4/2003	Internal Combustion Engine, Large	Diesel	1850 HP	GCP	0.00015 lb/hp-hr	BACT-PSD
Mankato Energy Center	MN	12/4/2003	Internal Combustion Engine, Small	Diesel	290 HP	GCP	0.00015 lb/hp-hr	BACT-PSD
Chocolate Bayou Plant	TX	3/24/2003	Diesel Start-up Engine, GT-Sugen	Diesel		NONE INDICATED	0.63 LB/H	BACT-PSD
Duke Energy Stephens, LLC Stephens Energy	OK	3/21/2003	IC Engine, Backup Generator, Diesel	Diesel	749 BHP	CC, GED	0.124 LB/MMBTU	BACT-PSD
Duke Energy Stephens, LLC Stephens Energy	OK	3/21/2003	IC Engine, Fire Water Pump	Diesel	265 BHP	CC, GED	0.31 LB/MMBTU	BACT-PSD

Source: EPA 2008 (RBLC database)
Note: GED = Good Engine Design; GCP= good combustion practices; GOP = good operating practices; LSF= low sulfur fuel; CC = combustion control

5.0 AMBIENT MONITORING ANALYSIS

The PSD rules require that an air quality analysis be conducted for each criteria and non-criteria pollutant subject to regulation under the CAA before a major stationary source or major modification at a major stationary source is constructed. Criteria pollutants are those pollutants for which AAQS have been established. Non-criteria pollutants are those pollutants that may be regulated by emission standards, for which AAQS have not been established. This analysis may be performed by the use of modeling and/or by monitoring the air quality. In addition, if EPA has not established an acceptable ambient monitoring method for the pollutant, monitoring is not required.

Based on the potential emissions from the Project (see Table 3-3), pre-construction ambient monitoring analyses for PM_{10} may be required as part of the application. Ambient monitoring analyses are not required if it can be demonstrated that the proposed source's maximum air quality impacts will not exceed the PSD *de minimis* concentration level.

As shown in Section 6.3, the Project's maximum PM_{10} impacts are predicted to be below the PSD *de minimis* concentration level. As a result, preconstruction ambient monitoring is not required for this application.

Table 5-1 presents a summary of recent air quality data collected in the vicinity of the Turkey Point plant area.

TABLE 5-1
SUMMARY OF MAXIMUM MEASURED SO_2, PM_{10}, $PM_{2.5}$, O_3, NO_2, AND CO CONCENTRATIONS OBSERVED FROM REPRESENTATIVE MONITORING STATIONS
2005 THROUGH 2007

AIRS Site No.	Operator	Location	Measurement Period Year	Measurement Period Months	Concentration 1-Hour Highest	1-Hour 2nd Highest	3-Hour Highest	3-Hour 2nd Highest	8-Hour 3-year Average 99th Percentile	24-Hour Highest	24-Hour 2nd Highest	Annual Average
Sulfur dioxide		**Florida AAQS**			**NA**	**NA**	**NA**	**0.5 ppm**	**NA**	**NA**	**0.1 ppm**	**0.02 ppm**
12-086-0019	Miami - Dade County	FHP Route E US 27	2007	Jan-Dec	NA	NA	0.004	0.002	NA	0.002	0.001	0.001
		Miami	2006	Jan-Dec	NA	NA	0.002	0.001	NA	0.001	0.001	0.001
			2005	Jan-Dec	NA	NA	0.001	0.001	NA	0.002	0.002	0.001
PM_{10}		**Florida AAQS**			**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**150 µg/m³**	**50 µg/m³**
12-086-1016	Miami - Dade County	NW 20th St & 12th Ave., Fire Station	2007	Jan-Dec	NA	NA	NA	NA	NA	53	53	24.0
		Miami	2006	Jan-Dec	NA	NA	NA	NA	NA	53	43	26.3
			2005	Jan-Dec	NA	NA	NA	NA	NA	60	56	26.3
$PM_{2.5}$		**Florida AAQS**			**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**35 µg/m³** 98th Percentile	**15 µg/m³**
12-086-0033	Miami - Dade County	7700 NW 186th St.	2007	Jan-Dec	NA	NA	NA	NA	NA	31.9	20.0	7.57
			2006	Jan-Dec	NA	NA	NA	NA	NA	22.2	19.8	8.51
			2005	Jan-Dec	NA	NA	NA	NA	NA	17.9	17.9	8.48
12-086-1016	Miami - Dade County	NW 20th St & 12th Ave., Fire Station	2007	Jan-Dec	NA	NA	NA	NA	NA	42.1	21.4	8.86
		Miami	2006	Jan-Dec	NA	NA	NA	NA	NA	22.5	18.4	9.50
		Monitor 1	2005	Jan-Dec	NA	NA	NA	NA	NA	25.1	18.8	9.59
12-086-1016	Miami - Dade County	NW 20th St & 12th Ave., Fire Station	2007	Jan-Dec	NA	NA	NA	NA	NA	43.8	20.7	9.36
		Miami	2006	Jan-Dec	NA	NA	NA	NA	NA	19.5	19.2	8.93
		Monitor 2	2005	Jan-Dec	NA	NA	NA	NA	NA	18.7	18.4	10.41
12-086-6001	Miami - Dade County	Fire Station 325 NW 2nd St.	2007	Jan-Dec	NA	NA	NA	NA	NA	38.4	21.8	7.44
			2006	Jan-Dec	NA	NA	NA	NA	NA	20.5	18.0	8.25
			2005	Jan-Dec	NA	NA	NA	NA	NA	21.7	18.2	8.21
Ozone		**Florida AAQS**			**NA**	**0.12 ppm**	**NA**	**NA**	**0.08 ppm**	**NA**	**NA**	**NA**
12-086-0027	Miami - Dade County	Rosentiel School	2007	Jan-Dec	0.097	0.090	NA	NA	0.074	NA	NA	NA
			2006	Jan-Dec	0.076	0.073	NA	NA	0.072	NA	NA	NA
			2005	Jan-Dec	0.092	0.087	NA	NA	0.068	NA	NA	NA
12-086-0029	Miami - Dade County	Perdue Medical	2007	Jan-Dec	0.097	0.093	NA	NA	0.070	NA	NA	NA
			2006	Jan-Dec	0.072	0.068	NA	NA	0.068	NA	NA	NA
Nitrogen dioxide		**Florida AAQS**			**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**0.053 ppm**
12-086-0027	Miami - Dade County	Rosentiel School	2007	Jan-Dec	NA	NA	NA	NA	NA	NA	NA	0.0050
			2006	Jan-Dec	NA	NA	NA	NA	NA	NA	NA	0.0069
			2005	Jan-Dec	NA	NA	NA	NA	NA	NA	NA	0.0061
12-086-4002	Miami - Dade County	Metro Annex	2007	Jan-Dec	NA	NA	NA	NA	NA	NA	NA	0.0110
		Miami	2006	Jan-Dec	NA	NA	NA	NA	NA	NA	NA	0.0134
			2005	Jan-Dec	NA	NA	NA	NA	NA	NA	NA	0.0135
Carbon monoxide		**Florida AAQS**			**NA**	**35 ppm**	**NA**	**NA**	**9 ppm** 2nd Highest	**NA**	**NA**	**NA**
12-086-0031	Miami - Dade County	1600 South Dixie Highway	2007	Jan-Dec	1.8	1.8	NA	NA	1.1	NA	NA	NA
		Miami	2006	Jan-Dec	2.9	2.3	NA	NA	1.5	NA	NA	NA
			2005	Jan-Dec	2.9	2.8	NA	NA	1.8	NA	NA	NA
12-086-0034	Miami - Dade County	NW Corner of SW 88th St. Intersection	2007	Jan-Dec	2.2	2.1	NA	NA	1.6	NA	NA	NA
			2006	Jan-Dec	2.7	2.4	NA	NA	1.5	NA	NA	NA
			2005	Jan-Dec	2.6	2.5	NA	NA	1.8	NA	NA	NA
12-086-1019	Miami - Dade County	2201 SW 4th St.	2007	Jan-Dec	4.7	3.7	NA	NA	2.0	NA	NA	NA
		Miami	2006	Jan-Dec	3.8	3.8	NA	NA	2.0	NA	NA	NA
			2005	Jan-Dec	4.8	4.1	NA	NA	2.4	NA	NA	NA
12-086-4002	Miami - Dade County	Metro Annex 864 NW 3rd St.	2007	Jan-Dec	3.8	3.4	NA	NA	2.0	NA	NA	NA
		Miami	2006	Jan-Dec	5.2	4.2	NA	NA	2.2	NA	NA	NA
			2005	Jan-Dec	6.3	3.8	NA	NA	2.5	NA	NA	NA

Note: AAQS = ambient air quality standard.
NA = not applicable.

Source: EPA Aerametric Information Retrieval System, Air Quality Subsystem, Quick Look Report, Florida, 2005-2007.

6.0 AIR QUALITY IMPACT ANALYSIS

6.1 Introduction

As discussed in Section 3, an air quality impact analysis meeting the requirements of FDEP's PSD rules and EPA/FDEP modeling guidance is required for the PM_{10} emissions from the Project. This analysis must demonstrate that the air quality impacts of PM_{10} do not exceed the significant impact levels or, alternatively, a cumulative impact analysis is performed to demonstrate compliance with AAQS and PSD Increments. This section presents an air quality impact analysis for PM_{10} meeting the EPA/FDEP guidance. An air quality modeling analysis is not required for SO_2, NO_2, and CO since these air pollutants do not exceed the PSD significant emission rates. As a supplement to the PSD/Air Construction Application, this section also presents air quality impacts for these pollutants. The air quality impact analysis for SO_2, NO_2, and CO is a comparison of the Project's impacts for these pollutants with the AAQS and applicable PSD Class I and II Increments.

6.2 Air Modeling Analysis Methodology

6.2.1 General Procedures

As stated in the previous sections, air modeling analyses are required to determine if the Turkey Point Units 6 & 7 Project's impacts are predicted to be greater than the significant impact levels and *de minimis* monitoring levels for each pollutant that is emitted above the significant emission rate. These analyses consider the Project's impacts alone. Air quality impacts are predicted using five years of meteorological data and selecting the highest predicted ground-level concentrations for comparison to the significant impact levels and *de minimis* monitoring levels.

6.2.2 PSD Class II Analysis

If the Project's maximum predicted impacts are greater than the significant impact levels, the air modeling analyses must consider other nearby sources and background concentrations to predict a total concentration for comparison to AAQS.

Generally, when using five years of meteorological data for the analysis, the highest annual and the HSH short-term (i.e., 24 hours or less) concentrations are compared to the applicable AAQS and allowable PSD increments. The HSH concentration is calculated each year for a receptor field by:

1. Eliminating the highest concentration predicted at each receptor,
2. Identifying the second-highest concentration at each receptor, and
3. Selecting the highest concentration among these second-highest concentrations.

The HSH approach is consistent with AAQS and allowable PSD increments, which permit a short-term average concentration to be exceeded once per year at each receptor.

It should be noted that for determining compliance with the 24 hour AAQS for PM_{10}, the highest of the sixth-highest concentrations predicted in five years (i.e., H6H), instead of the HSH concentration predicted for each year, is used to compare to the 24-hour AAQS.

The AAQS analysis is a cumulative source analysis that evaluates whether the concentrations from all sources will comply with the AAQS. These concentrations include the modeled impacts from sources at the plant area and from other nearby facility sources added to a background concentration. The background concentration accounts for sources not included in the modeling analysis.

The PSD Class II increment analysis is a cumulative source analysis that evaluates whether the concentrations for increment-affecting sources will comply with the allowable PSD Class II increments. These concentrations include the modeled impacts from PSD increment-affecting sources at the plant area, plus nearby PSD increment-affecting sources at other facilities.

6.2.3 PSD Class I Analysis

If a major new facility is located within 200 km of a PSD Class I area, then a significant impact analysis is also performed to evaluate the impact due to the Project alone at the PSD Class I area. The existing Turkey Point Plant and vicinity is mostly rural and flat and is located approximately 20 km northeast of the nearest sections of the PSD Class I area of the ENP. Because the second nearest PSD Class I area, the Chassahowitzka National Wildlife Area (NWA), is located over 200 km from the plant area, the PSD Class I analysis addressed impacts only at the ENP.

The maximum predicted PM_{10} impacts at the ENP are compared to EPA's proposed significant impact levels for PSD Class I areas. These recommended levels are the currently accepted criteria to determine whether a proposed project will incur a significant impact on a PSD Class I area. If the Project-only PM_{10} impacts at the PSD Class I area are above the proposed EPA PSD Class I significant impact levels, then a cumulative source analysis is performed to demonstrate compliance with allowable PSD Class I impacts at the PSD Class I area.

The maximum predicted impacts for non-PSD pollutants SO_2 and NO_2 at the ENP were compared to EPA's proposed significant impact levels for PSD Class I areas. These recommended levels are the currently accepted criteria to determine whether a proposed project will incur a significant impact on a PSD Class I area. If the Project-only impacts for these pollutants are above the proposed EPA PSD Class I significant impact levels but are less than one-half of the allowable PSD Class I increments, it is assumed that these pollutants are in compliance with the allowable PSD Class I increments. Otherwise, a cumulative source analysis is performed to demonstrate compliance with allowable PSD Class I impacts at the PSD Class I area.

In addition, the Project's maximum concentrations are evaluated at the PSD Class I area for pollutants whose emissions are greater than the significant emission rate, to address potential impacts on AQRV. This analysis includes evaluations of visibility and deposition impacts.

6.2.4 Pre-Construction Monitoring Analysis Approach

The modeling approach followed EPA and FDEP modeling guidelines for evaluating a project's impacts relative to the *de minimis* monitoring levels to determine the need to submit ambient monitoring data prior to construction. Current FDEP policies stipulate that the predicted highest annual average and highest short-term concentrations are to be compared to the applicable *de minimis* monitoring levels.

6.2.5 Model Selection

The selection of air quality models to calculate air quality impacts for the Units 6 & 7 Project must be based on the models' ability to simulate impacts in areas surrounding the plant area as well as at the PSD Class I area of the ENP, located approximately 20 km from the plant area. The EPA and FDEP recommend the using the AERMOD dispersion model to address air quality impacts within 50 km of a project. The AERMOD dispersion model (Version 07026) is available on the EPA's Internet web site, Support Center for Regulatory Air Models (SCRAM), within the Technology Transfer Network (TTN). A listing of AERMOD model features is presented in Table 6-1.

The AERMOD model calculates hourly concentrations based on hourly meteorological data. The AERMOD model is applicable for most applications since it is recognized as containing the latest scientific algorithms for simulating plume behavior in all types of terrain.

The AERMOD model was used to predict the maximum pollutant concentrations due to the Project in all areas of interest located within 50 km of the plant area. Then, if necessary, AERMOD would be used to predict the maximum pollutant concentrations due to the Project's emissions together with appropriate background sources. The predicted concentrations would then be compared to the applicable AAQS and PSD Class II increments.

Because the nearest parts of the ENP are located within 50 km from the plant area, the AERMOD model was used to perform the significant impact analysis at the ENP PSD Class I area.

For modeling analyses that will undergo regulatory review, such as PSD permit applications, the following model features are recommended by EPA for rural mode and are referred to as the regulatory default options in the AERMOD model:

1. Final plume rise at all receptor locations,
2. Stack-tip downwash,
3. Buoyancy-induced dispersion,
4. Default wind speed profile coefficients for rural mode,
5. Default vertical potential temperature gradients, and
6. Calm wind processing.

The EPA regulatory default options were used to address maximum impacts.

6.2.6 Meteorological Data

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 National Weather Service (NWS) office located at the MIA and upper air sounding data collected at the FIU in Miami. The 5-year period of the meteorological data was from 2001 through 2005. The NWS office at MIA is located approximately 40 km (25 miles) north of the plant area and is the closest primary weather station to the study area considered to have meteorological data appropriate for the plant area by FDEP.

As the terrain between the MIA meteorological station and the plant area is mostly flat, the wind direction and wind speed frequencies that are experienced at MIA are considered to be very similar to that experienced at the plant area.

A comparison of the average land use parameters at MIA and the plant area 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 average land use parameters around MIA are as follows:

- Albedo – 0.17
- Bowen ratio – 0.47
- Surface roughness – 0.08 m

The average land use parameters around the plant area are as follows:

- Albedo – 0.12
- Bowen ratio – 0.13
- Surface roughness – 0.06 m

Based on the apparent similarities between the land use parameters at MIA and the plant area, as well as the generally flat terrain between these two locations, the MIA meteorological record is considered representative of the areas in the vicinity of the plant area.

6.2.7 Emission Inventory

The following support equipment will be required for each of the nuclear units.

- 3 circulating water cooling towers;
- 1 service water cooling towers;
- 2 Standby Diesel Generators;
- 2 Ancillary Diesel Generators; and
- 1 Diesel Fire Pump Engine.

The cooling towers operate continuously while the generators and fire pump engines are only operated for routine testing and maintenance.

Each circulating water cooling tower has 12 cells and each service water cooling tower has two cells. Table 6-2 presents a summary of the emission sources at the plant area, including modeling IDs, locations, and stack parameter data used in the air modeling analysis. The site elevation at the southern section of the plant area where the six circulating water cooling towers are to be located is 22 ft, while the site elevation where the generators, engines, and service water cooling towers will be located is 25.5 ft.

A summary of the source emission rates used in the significant impact analysis is presented in Table 6-3. From Table 2-3, the generators and engines operate a maximum of 96 hours per year or eight hours per month. This is approximately twice the anticipated actual monthly operation for equipment testing. The calculated TPY emissions of these sources were used for predicting annual average PM_{10} and NO_2 impacts. To predict annual average and 24-hour SO_2 impacts, 24-hour PM_{10} impacts, and 8-hour CO impacts, it was conservatively assumed that half of the 8 monthly operating hours for these machines (i.e., four hours) would occur simultaneously during a 24-hour period. For predicting one-hour CO impacts, the maximum short-term (i.e., lb/hr) emissions were used.

6.2.8 Building Downwash Effects

All significant building structures in the Project area were identified by the plant area plot plan (see Figure 2-1). 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 listing of the height and horizontal dimensions for each structure is summarized in Table 6-4. The relative location of the sources and building structures included in the modeling analysis is shown in Figure 6-1.

6.2.9 Receptor Locations

6.2.9.1 Plant Vicinity

A Cartesian receptor grid was used to predict maximum concentrations due to the project for the significant impact analysis. The grid included receptors located on the restricted property boundary and beyond the restricted property boundary at the following ambient receptor spacing:

- Along the restricted property boundary – 50 m;
- Beyond the restricted property boundary to 2 km – 100 m; and
- From 2 km to 5 km – 250 m.

If the maximum impacts for the Project are predicted in an area where receptor resolution is greater than 100 m, additional 100-m receptor spacing would be used. Receptor elevations were extracted using AERMAP Version 06431 and one-degree Digital Elevation Model (DEM) data that is available for this area. Figure 6-2 shows the location of the receptor grid used for near-field modeling analysis.

6.2.9.2 Class I Area

The Project's impacts at the PSD Class I area of the ENP were predicted with an array of 901 discrete receptors and elevations covering the entire NP that were obtained from the National Park Service (NPS) Class I extraction program. The receptors were converted to UTM coordinates NAD83 datum for input to AERMOD.

6.2.10 Background Concentrations

Background concentrations are necessary to determine total ambient air quality impacts to demonstrate compliance with the AAQS. "Background concentrations" are defined as concentrations due to sources other than those specifically included in the modeling analysis. For all pollutants, background would include other point sources not included in the modeling (i.e., distant sources or small sources), fugitive emission sources, and natural background sources. In general, monitoring data collected near the area in which the air quality impact is performed is used for this purpose.

6.3 Model Results

6.3.1 Air Quality Impacts for PM_{10}

6.3.1.1 PSD Class II

The maximum PM_{10} concentrations predicted for the Project are summarized by year in Table 6-5. The maximum PM_{10} concentrations are compared to the PSD Class II significant impact levels in Table 6-6. The modeling results indicate that the maximum concentrations from the Project are predicted to be less than the significant impact levels. Therefore, additional modeling is not required.

6.3.1.2 PSD Class I

The maximum PM_{10} concentrations predicted for the Project at the ENP are summarized by year in Table 6-7. The maximum PM_{10} concentrations are compared to the PSD Class I significant impact levels in Table 6-8. The modeling results indicate that the maximum concentrations from the Project are predicted to be less than the significant impact levels. Therefore, additional modeling is not required.

6.3.2 Air Quality Impacts for SO_2, NO_2, and CO

6.3.2.1 PSD Class II

Table 6-5 also presents the maximum SO_2, NO_2, and CO concentrations predicted for the Project for each year evaluated. The maximum concentrations for these pollutants are compared to the PSD Class II significant impact levels in Table 6-6. The modeling results in Table 6-6 indicate that the maximum concentrations from the Project are predicted to be less than the significant impact levels for SO_2 and NO_2, and for the 8-hour averaging period for CO. The results of the comparison for the project's 1-hour CO emissions are presented in Table 6-9. The predicted total 1-hour CO concentration is less than one-fourth of the AAQS.

6.3.2.2 PSD Class I

The maximum SO_2 and NO_2 concentrations predicted for the Project at the ENP are also shown in Table 6-7. These maximum concentrations are compared to the PSD Class I significant impact levels in Table 6-8. The modeling results indicate that the maximum concentrations from the Project are predicted to be less than the significant impact levels for all pollutants.

6.4 Conclusions

The air modeling results indicate that the air emissions from the addition of Turkey Point Units 6 & 7 will not have a significant effect on air quality and will comply with all applicable AAQS and allowable PSD increments.

TABLE 6-1

MAJOR FEATURES OF THE AERMOD MODEL, VERSION 07026

AERMOD Model Features
• Plume dispersion/growth rates are determined by the profile of vertical and horizontal turbulence, vary with height, and use a continuous growth function.
• In a convective atmosphere, uses three separate algorithms to describe plume behavior as it comes in contact with the mixed layer lid; in a stable atmosphere uses a mechanically mixed layer near the surface.
• Polar or Cartesian coordinate systems for receptor locations can be included directly or by an external file reference.
• Urban model dispersion is input as a function of city size and population density; sources can also be modeled individually as urban sources.
• Stable plume rise: uses Briggs equations with winds and temperature gradients at stack top up to half way up to plume rise. Convective plume rise: plume superimposed on random convective velocities.
• Procedures suggested by Briggs (1974) for evaluating stack-tip downwash.
• Has capability of simulating point, volume, area, and multi-sized area sources.
• Accounts for the effects of vertical variations in wind and turbulence (Brower et al., 1998).
• Uses measured and computed boundary layer parameters and similarity relationships to develop vertical profiles of wind, temperature, and turbulence (Brower et al., 1998).
• Concentration estimates for 1-hour to annual average times.
• Creates vertical profiles of wind, temperature, and turbulence using all available measurement levels.
• Terrain features are depicted by use of a controlling hill elevation and a receptor point elevation.
• Modeling domain surface characteristics are determined by selected direction and month/season values of surface roughness length, Albedo, and Bowen ratio.
• Contains both a mechanical and convective mixed layer height, the latter based on the hourly accumulation of sensible heat flux.
• The method of Pasquill (1976) to account for buoyancy-induced dispersion.
• A default regulatory option to set various model options and parameters to EPA-recommended values.
• Contains procedures for calm-wind and missing data for the processing of short term averages.

Note: AERMOD = The American Meteorological Society and Environmental Protection Agency Regulatory Model.

Source: EPA, 2007.

TABLE 6-2
SOURCE LOCATIONS AND SOURCE PARAMETER DATA USED FOR THE MODELING ANALYSIS - TURKEY POINT UNITS 6 & 7

Source Description	Model ID	UTM NAD83 East (m)	UTM NAD83 North (m)	Physical Height (ft)	Physical Height (m)	Physical Diameter (ft)	Physical Diameter (m)	Operating Temperature (°F)	Operating Temperature (K)	Operating Velocity (ft/s)	Operating Velocity (m/s)
Turkey Point Unit 6											
Standby Diesel Generator No. 1	TP6EG01	567,270	2,812,133	40.0	12.2	2.4	0.73	874.0	740.9	60.0	18.29
Standby Diesel Generator No. 2	TP6EG02	567,279	2,812,133	40.0	12.2	2.4	0.73	874.0	740.9	60.0	18.29
Ancillary Diesel Generator No. 1	TP6AG01	567,252	2,812,134	93.0	28.4	0.3	0.10	1040.1	833.2	60.0	18.29
Ancillary Diesel Generator No. 2	TP6AG02	567,252	2,812,126	93.0	28.4	0.3	0.10	1040.1	833.2	60.0	18.29
Diesel Fire Pump Engine No. 1	TP6DFP1	567,143	2,812,216	17.0	5.2	0.8	0.24	744.0	668.7	60.0	18.29
Diesel Fire Pump Engine No. 2*	TP6DFP2	567,143	2,812,213	17.0	5.2	0.8	0.24	744.0	668.7	60.0	18.29
Service Water System Cooling Tower (North Cell)	SWSCT6N	567,139	2,812,202	63.0	19.2	35.0	10.67	96.9	309.2	23.5	7.17
Service Water System Cooling Tower (South Cell)	SWSCT6S	567,139	2,812,191	63.0	19.2	35.0	10.67	96.9	309.2	23.5	7.17
Mechanical Draft Cooling Tower											
East Tower, Cell 1	TP6E01	567,370	2,811,789	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
East Tower, Cell 2	TP6E02	567,383	2,811,804	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
East Tower, Cell 3	TP6E03	567,395	2,811,790	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
East Tower, Cell 4	TP6E04	567,384	2,811,775	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
East Tower, Cell 5	TP6E05	567,396	2,811,761	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
East Tower, Cell 6	TP6E06	567,382	2,811,747	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
East Tower, Cell 7	TP6E07	567,370	2,811,762	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
East Tower, Cell 8	TP6E08	567,358	2,811,747	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
East Tower, Cell 9	TP6E09	567,343	2,811,761	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
East Tower, Cell 10	TP6E10	567,356	2,811,775	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
East Tower, Cell 11	TP6E11	567,343	2,811,789	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
East Tower, Cell 12	TP6E12	567,356	2,811,803	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
South Tower, Cell 1	TP6S01	567,287	2,811,645	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
South Tower, Cell 2	TP6S02	567,300	2,811,660	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
South Tower, Cell 3	TP6S03	567,312	2,811,646	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
South Tower, Cell 4	TP6S04	567,301	2,811,631	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
South Tower, Cell 5	TP6S05	567,313	2,811,617	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
South Tower, Cell 6	TP6S06	567,299	2,811,603	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
South Tower, Cell 7	TP6S07	567,287	2,811,618	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
South Tower, Cell 8	TP6S08	567,275	2,811,603	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
South Tower, Cell 9	TP6S09	567,260	2,811,617	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
South Tower, Cell 10	TP6S10	567,273	2,811,631	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
South Tower, Cell 11	TP6S11	567,260	2,811,645	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
South Tower, Cell 12	TP6S12	567,273	2,811,659	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
West Tower, Cell 1	TP6W01	567,202	2,811,789	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
West Tower, Cell 2	TP6W02	567,215	2,811,804	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
West Tower, Cell 3	TP6W03	567,227	2,811,790	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
West Tower, Cell 4	TP6W04	567,216	2,811,775	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
West Tower, Cell 5	TP6W05	567,228	2,811,761	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
West Tower, Cell 6	TP6W06	567,214	2,811,747	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
West Tower, Cell 7	TP6W07	567,202	2,811,762	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
West Tower, Cell 8	TP6W08	567,190	2,811,747	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
West Tower, Cell 9	TP6W09	567,175	2,811,761	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
West Tower, Cell 10	TP6W10	567,188	2,811,775	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
West Tower, Cell 11	TP6W11	567,175	2,811,789	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
West Tower, Cell 12	TP6W12	567,188	2,811,803	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07

TABLE 6-2
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Source Description	Model ID	UTM NAD83 East (m)	UTM NAD83 North (m)	Physical Height (ft)	Physical Height (m)	Physical Diameter (ft)	Physical Diameter (m)	Operating Temperature (°F)	Operating Temperature (K)	Operating Velocity (ft/s)	Operating Velocity (m/s)
Turkey Point Unit 7											
Standby Diesel Generator No. 1	TP7EG01	567,012	2,812,135	40.0	12.2	2.4	0.73	874.0	740.9	60.0	18.29
Standby Diesel Generator No. 2	TP7EG02	567,021	2,812,134	40.0	12.2	2.4	0.73	874.0	740.9	60.0	18.29
Ancillary Diesel Generator No. 1	TP7AG01	566,992	2,812,136	93.0	28.4	0.3	0.10	1040.1	833.2	60.0	18.29
Ancillary Diesel Generator No. 2	TP7AG02	566,992	2,812,127	93.0	28.4	0.3	0.10	1040.1	833.2	60.0	18.29
Diesel Fire Pump Engine No. 1	TP7DFP1	566,884	2,812,217	17.0	5.2	0.8	0.24	744.0	668.7	60.0	18.29
Diesel Fire Pump Engine No. 2*	TP7DFP2	566,884	2,812,213	17.0	5.2	0.8	0.24	744.0	668.7	60.0	18.29
Service Water System Cooling Tower (North Cell)	SWSCT7N	566,879	2,812,202	63.0	19.2	35.0	10.67	96.9	309.2	23.5	7.17
Service Water System Cooling Tower (South Cell)	SWSCT7S	566,879	2,812,191	63.0	19.2	35.0	10.67	96.9	309.2	23.5	7.17
Mechanical Draft Cooling Tower											
East Tower, Cell 1	TP7E01	567,034	2,811,789	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
East Tower, Cell 2	TP7E02	567,047	2,811,804	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
East Tower, Cell 3	TP7E03	567,059	2,811,790	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
East Tower, Cell 4	TP7E04	567,048	2,811,775	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
East Tower, Cell 5	TP7E05	567,060	2,811,761	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
East Tower, Cell 6	TP7E06	567,046	2,811,747	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
East Tower, Cell 7	TP7E07	567,034	2,811,762	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
East Tower, Cell 8	TP7E08	567,022	2,811,747	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
East Tower, Cell 9	TP7E09	567,007	2,811,761	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
East Tower, Cell 10	TP7E10	567,020	2,811,775	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
East Tower, Cell 11	TP7E11	567,007	2,811,789	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
East Tower, Cell 12	TP7E12	567,020	2,811,803	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
South Tower, Cell 1	TP7S01	566,951	2,811,645	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
South Tower, Cell 2	TP7S02	566,964	2,811,660	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
South Tower, Cell 3	TP7S03	566,976	2,811,646	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
South Tower, Cell 4	TP7S04	566,965	2,811,631	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
South Tower, Cell 5	TP7S05	566,977	2,811,617	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
South Tower, Cell 6	TP7S06	566,963	2,811,603	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
South Tower, Cell 7	TP7S07	566,951	2,811,618	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
South Tower, Cell 8	TP7S08	566,939	2,811,603	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
South Tower, Cell 9	TP7S09	566,924	2,811,617	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
South Tower, Cell 10	TP7S10	566,937	2,811,631	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
South Tower, Cell 11	TP7S11	566,924	2,811,645	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
South Tower, Cell 12	TP7S12	566,937	2,811,659	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
West Tower, Cell 1	TP7W01	566,866	2,811,789	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
West Tower, Cell 2	TP7W02	566,879	2,811,804	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
West Tower, Cell 3	TP7W03	566,891	2,811,790	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
West Tower, Cell 4	TP7W04	566,880	2,811,775	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
West Tower, Cell 5	TP7W05	566,892	2,811,761	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
West Tower, Cell 6	TP7W06	566,878	2,811,747	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
West Tower, Cell 7	TP7W07	566,866	2,811,762	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
West Tower, Cell 8	TP7W08	566,854	2,811,747	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
West Tower, Cell 9	TP7W09	566,839	2,811,761	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
West Tower, Cell 10	TP7W10	566,852	2,811,775	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
West Tower, Cell 11	TP7W11	566,839	2,811,789	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07
West Tower, Cell 12	TP7W12	566,852	2,811,803	66.5	20.3	33.7	10.26	104.6	313.5	33.0	10.07

Note: UTM = Universal Transverse Mercator

TABLE 6-3
MAXIMUM SOURCE EMISSIONS DATA - TURKEY POINT UNITS 6 & 7

	Short Term Emissions										Annual Emissions			
	PM_{10}		SO_2				CO				PM_{10}		NO_x	
Model	24-hour		3-hour		24-hour[a]		1-hour		8-hour[b]		Annual		Annual	
ID	lb/hr	g/s	lb/hr	g/s	lb/hr	g/s	lb/hr	g/s	lb/hr	g/s	TPY	g/s	TPY	g/s
TP6EG01	0.85	0.107	0.06	0.008	0.01	0.001	109.3	13.77	18.22	2.295	0.250	0.007	4.260	0.123
TP6EG02	0.85	0.107	0.06	0.008	0.01	0.001	109.3	13.77	18.22	2.295	0.250	0.007	4.260	0.123
TP7EG01	0.85	0.107	0.06	0.008	0.01	0.001	109.3	13.77	18.22	2.295	0.250	0.007	4.260	0.123
TP7EG02	0.85	0.107	0.06	0.008	0.01	0.001	109.3	13.77	18.22	2.295	0.250	0.007	4.260	0.123
TP6AG01	0.008	0.001	negl	negl	negl	negl	1.00	0.126	0.17	0.021	0.002	0.0000575	0.037	0.001
TP6AG02	0.008	0.001	negl	negl	negl	negl	1.00	0.126	0.17	0.021	0.002	0.0000575	0.037	0.001
TP7AG01	0.008	0.001	negl	negl	negl	negl	1.00	0.126	0.17	0.021	0.002	0.0000575	0.037	0.001
TP7AG02	0.008	0.001	negl	negl	negl	negl	1.00	0.126	0.17	0.021	0.002	0.0000575	0.037	0.001
TP6DFP1	0.048	0.0061	negl	negl	negl	negl	1.9	0.24	0.32	0.040	0.014	0.0004	0.237	0.007
TP6DFP2*	0.048	0.0061	negl	negl	negl	negl	1.9	0.24	0.32	0.040	0.014	0.0004	0.237	0.007
TP7DFP1	0.048	0.0061	negl	negl	negl	negl	1.9	0.24	0.32	0.040	0.014	0.0004	0.237	0.007
TP7DFP2*	0.048	0.0061	negl	negl	negl	negl	1.9	0.24	0.32	0.040	0.014	0.0004	0.237	0.007
SWSCT6N	0.040	0.0051	--	--	--	--	--	--	--	--	0.177	0.0051	--	--
SWSCT6S	0.040	0.0051	--	--	--	--	--	--	--	--	0.177	0.0051	--	--
SWSCT7N	0.040	0.0051	--	--	--	--	--	--	--	--	0.177	0.0051	--	--
SWSCT7S	0.040	0.0051	--	--	--	--	--	--	--	--	0.177	0.0051	--	--
TP6E01-12	0.807	0.102	--	--	--	--	--	--	--	--	3.53	0.102	--	--
TP6S01-12	0.807	0.102	--	--	--	--	--	--	--	--	3.53	0.102	--	--
TP6W01-12	0.807	0.102	--	--	--	--	--	--	--	--	3.53	0.102	--	--
TP7E01-12	0.807	0.102	--	--	--	--	--	--	--	--	3.53	0.102	--	--
TP7S01-12	0.807	0.102	--	--	--	--	--	--	--	--	3.53	0.102	--	--
TP7W01-12	0.807	0.102	--	--	--	--	--	--	--	--	3.53	0.102	--	--

[a] Based on generators and engines operating a maximum of 0.06 lb/hr and 4 hrs/day
[b] Based on maximum lb/hr rate for generators and engines

negl = negligible
TPY = tons per year

* Note open item to be removed after final modeling.

TABLE 6-4
BUILDING DIMENSIONS FOR TURKEY POINT UNITS 6 & 7

Building Description	Model ID	Height (ft)	Height (m)	Length (ft)	Length (m)	Width (ft)	Width (m)
Maintenance	MAINT	50.0	15.24	249.92	76.18	74.97	22.85
Administration	ADMIN	50.0	15.24	199.90	60.93	199.90	60.93
Service Water System Cooling Tower 6	SWSCT6	49.0	14.94	108.00	32.92	48.00	14.63
Service Water System Cooling Tower 7	SWSCT7	49.0	14.94	108.00	32.92	48.00	14.63
Turkey Point Unit 6							
East MDCT	TP6E	53.0	16.15	253.98	77.41	253.98	77.41
South MDCT	TP6S	53.0	16.15	253.98	77.41	253.98	77.41
West MDCT	TP6W	53.0	16.15	253.98	77.41	253.98	77.41
Containment Building[a]	TP6CONT	228.8	69.72	133.73	40.76	--	--
Turbine Building	TP6TURB	146.3	44.58	313.85	95.66	162.17	49.43
Annex Building	TP6ANX	83.3	25.41	406.14	123.79	148.03	45.12
Auxiliary Building	TP6AUX	80.8	24.61	262.47	80.00	116.77	35.59
Diesel Generator Building	TP6DGEN	21.5	6.55	64.07	19.53	64.07	19.53
Fire Water Storage Tank[a]	TP6FWST	36.3	11.07	40.00	12.19	--	--
Fire Water/Clearwell Storage Tank[a]	TP6FWCST	36.3	11.07	40.00	12.19	--	--
Rad-Waste Building	TP6RAD	36.3	11.07	176.71	53.86	91.54	27.90
Diesel Fire Pump	TP6DFP	9.7	2.96	24.15	7.36	11.94	3.64
Circulating Water Pump	TP6CWP	6.0	1.83	529.95	161.53	295.28	90.00
Service Building	TP6SERV	50.0	15.24	160.24	48.84	112.80	34.38
Turkey Point Unit 7							
East MDCT	TP7E	53.0	16.15	253.98	77.41	253.98	77.41
South MDCT	TP7S	53.0	16.15	253.98	77.41	253.98	77.41
West MDCT	TP7W	53.0	16.15	253.98	77.41	253.98	77.41
Containment Building[a]	TP7CONT	228.8	69.72	133.73	40.76	--	--
Turbine Building	TP7TURB	146.3	44.58	313.85	95.66	162.17	49.43
Annex Building	TP7ANX	83.3	25.41	406.14	123.79	148.03	45.12
Auxiliary Building	TP7AUX	80.8	24.61	262.47	80.00	116.77	35.59
Diesel Generator Building	TP7DGEN	21.5	6.55	64.07	19.53	64.07	19.53
Fire Water Storage Tank[a]	TP7FWST	36.3	11.07	40.00	12.19	--	--
Fire Water/Clearwell Storage Tank[a]	TP7FWCST	36.3	11.07	40.00	12.19	--	--
Rad-Waste Building	TP7RAD	36.3	11.07	176.71	53.86	91.54	27.90
Diesel Fire Pump	TP7DFP	9.7	2.96	24.15	7.36	11.94	3.64
Circulating Water Pump	TP7CWP	6.0	1.83	529.95	161.53	295.28	90.00
Service Building	TP7SERV	50.0	15.24	160.24	48.84	112.80	34.38

MDCT = mechanical draft cooling tower

[a] Length is Diameter

TABLE 6-5
MAXIMUM PREDICTED PROJECT-ONLY CONCENTRATIONS
TURKEY POINT UNITS 6 & 7

Pollutant / Averaging Time	Concentration[a] ($\mu g/m^3$)	Receptor Location UTM Coordinates (m) East	North	Time Period (YYMMDDHH)
PM_{10}				
Annual	0.097	567,350	2,811,495	01123124
	0.097	567,350	2,811,495	02123124
	0.106	567,350	2,811,495	03123124
	0.112	567,350	2,811,495	04123124
	0.119	567,350	2,811,495	05123124
24-Hour, High	4.630	567,736	2,811,937	01111424
	3.564	567,693	2,812,159	02113024
	3.717	567,773	2,812,045	03032924
	4.103	567,773	2,812,045	04011524
	4.934	567,693	2,812,159	05021024
SO_2				
Annual	0.003	567,706	2,811,811	01123124
	0.003	567,444	2,811,505	02123124
	0.003	567,635	2,812,212	03123124
	0.003	567,716	2,811,903	04123124
	0.003	567,716	2,811,903	05123124
24-Hour, High	0.051	567,736	2,811,937	01111424
	0.039	567,693	2,812,159	02113024
	0.042	567,773	2,812,045	03032924
	0.047	567,773	2,812,045	04011524
	0.054	567,693	2,812,159	05021024
3-Hour, High	1.448	567,756	2,811,971	01052406
	0.896	567,776	2,812,004	02120103
	1.132	567,693	2,812,159	03041324
	1.090	567,756	2,811,971	04071506
	0.963	567,693	2,812,159	05021006
NO_x				
Annual	0.321	567,706	2,811,811	01123124
	0.287	567,397	2,811,500	02123124
	0.315	567,591	2,812,287	03123124
	0.292	567,716	2,811,903	04123124
	0.364	567,591	2,812,287	05123124
CO				
8-Hour, High	233.532	567,756	2,811,971	01052408
	191.084	567,773	2,812,045	02051408
	168.025	567,736	2,811,937	03101808
	197.689	567,773	2,812,045	04011508
	250.307	567,730	2,812,143	05021008
1-Hour, High	3912.533	567,693	2,812,159	01121724
	3898.360	567,656	2,812,175	02113019
	3907.537	567,656	2,812,175	03010905
	3678.321	567,693	2,812,159	04112704
	3900.815	567,656	2,812,175	05021005

Note: YYMMDDHH = Year, Month, Day, Hour Ending
UTM = Universal Transverse Mercator: Zone 17, NAD83 datum

[a] Based on the AERMOD model and surface and upper air meteorological data from Miami for 2001 to 2005.

TABLE 6-6
MAXIMUM PREDICTED PROJECT-ONLY CONCENTRATIONS COMPARED TO CLASS II SIGNIFICANT IMPACT LEVELS, TURKEY POINT UNITS 6 & 7

Pollutant / Averaging Time	Concentration[a] ($\mu g/m^3$)	Receptor Location UTM Coordinates (m) East	North	Time Period (YYMMDDHH)	EPA Significant Impact Level ($\mu g/m^3$)
PM_{10}					
Annual	0.119	567,350	2,811,495	05123124	1
24-Hour, High	4.934	567,693	2,812,159	05021024	5
SO_2					
Annual	0.003	567,706	2,811,811	01123124	1
24-Hour	0.054	567,693	2,812,159	05021024	5
3-Hour	1.448	567,756	2,811,971	01052406	25
NO_2[b]					
Annual	0.273	567,591	2,812,287	05123124	1
CO					
8-Hour	250.3	567,730	2,812,143	05021008	500
1-Hour	3912.5	567,693	2,812,159	01121724	2,000

Note: YYMMDDHH = Year, Month, Day, Hour Ending
UTM = Universal Transverse Mercator: Zone 17, NAD83 datum

[a] Based on the AERMOD model and surface and upper air meteorological data from Miami for 2001 to 2005.

[b] NO_x to NO_2 conversion factor of 75% applied based on recommendations in EPA's Guideline on Air Quality Models.

TABLE 6-7
MAXIMUM PREDICTED CONCENTRATIONS AT EVERGLADES NATIONAL PARK
FPL TURKEY POINT UNITS 6 & 7

Pollutant / Averaging Time	Concentration[a] ($\mu g/m^3$)	Receptor Location UTM Coordinates (m) East	Receptor Location UTM Coordinates (m) North	Time Period (YYMMDDHH)
PSD Pollutants				
PM_{10}				
Annual	0.0017	543,121	2,823,453	01123124
	0.0018	543,130	2,820,685	02123124
	0.0017	543,130	2,820,685	03123124
	0.0015	543,130	2,820,685	04123124
	0.0018	555,795	2,795,816	05123124
24-Hour, High	0.0549	545,727	2,795,778	01101924
	0.0538	543,103	2,828,990	02071224
	0.0773	555,818	2,790,280	03110824
	0.0716	553,278	2,795,806	04072224
	0.0833	540,634	2,815,140	05071324
Non-PSD Pollutants				
SO_2				
Annual	0.00002	555,795	2,795,816	01123124
	0.00002	555,795	2,795,816	02123124
	0.00002	553,278	2,795,806	03123124
	0.00002	555,807	2,793,048	04123124
	0.00002	555,795	2,795,816	05123124
24-Hour, High	0.0003	545,727	2,795,778	01101924
	0.0004	543,103	2,828,990	02071224
	0.0005	555,818	2,790,280	03110824
	0.0005	555,795	2,795,816	04060224
	0.0005	540,634	2,815,140	05071324
3-Hour, High	0.0139	555,841	2,784,743	01082903
	0.0136	548,244	2,795,787	02083124
	0.0146	553,278	2,795,806	03100824
	0.0185	555,795	2,795,816	04060206
	0.0126	543,112	2,826,221	05123024
NO_2[b]				
Annual	0.0018	555,795	2,795,816	01123124
	0.0017	555,795	2,795,816	02123124
	0.0019	553,278	2,795,806	03123124
	0.0019	555,807	2,793,048	04123124
	0.0023	555,795	2,795,816	05123124

Note: YYMMDDHH = Year, Month, Day, Hour Ending
UTM = Universal Transverse Mercator: Zone 17, NAD83 datum

[a] Based on the AERMOD model and surface and upper air meteorological data from Miami for 2001 to 2005.

[b] NO_x to NO_2 conversion factor of 75% applied based on recommendations in EPA's Guideline on Air Quality Models.

TABLE 6-8
POLLUTANT IMPACTS PREDICTED FOR THE PROJECT ONLY AT THE EVERGLADES NATIONAL PARK, COMPARED TO PSD CLASS I SIGNIFICANT IMPACT LEVELS

Pollutant / Averaging Time	Concentration[a] ($\mu g/m^3$)	Receptor Location UTM Coordinates (m) East	North	Time Period (YYMMDDHH)	EPA Class I Significat Impact Level ($\mu g/m^3$)
PSD Pollutants					
PM_{10}					
Annual	0.0018	555,795	2,795,816	05123124	0.2
24-Hour, High	0.0833	540,634	2,815,140	05071324	0.3
Non-PSD Pollutants					
SO_2					
Annual	0.00002	555,795	2,795,816	01123124	0.1
24-Hour, High	0.0005	540,634	2,815,140	05071324	0.2
3-Hour, High	0.01854	555,795	2,795,816	04060206	1.0
NO_2[b]					
Annual	0.0017	555,795	2,795,816	05123124	0.1

Note: YYMMDDHH = Year, Month, Day, Hour Ending
UTM = Universal Transverse Mercator: Zone 17, NAD83 datum

[a] Based on the AERMOD model and surface and upper air meteorological data from Miami for 2001 to 2005.

[b] NO_x to NO_2 conversion factor of 75% applied based on recommendations in EPA's Guidelines on Air Quality Models.

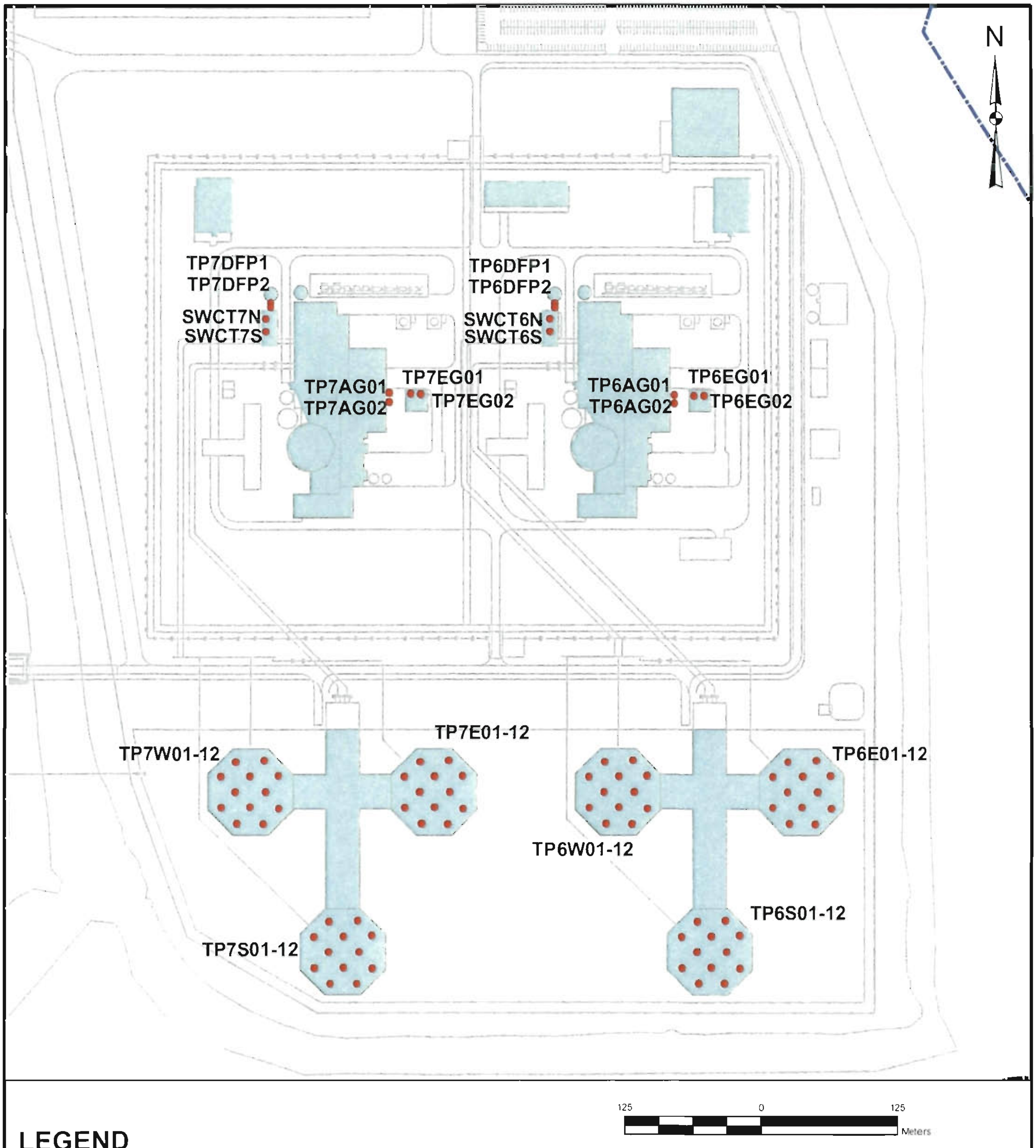
TABLE 6-9
MAXIMUM PREDICTED CO CONCENTRATIONS FOR TURKEY POINT 6 & 7 PROJECT ONLY, AAQS SCREENING ANALYSIS

Averaging Time	Concentration ($\mu g/m^3$) Total (C= A + B)	Project-Only[a] (A)	Background[b] (B)	Receptor Location UTM Coordinates (m) East	North	Time Period (YYMMDDHH)	Florida AAQS ($\mu g/m^3$)
1-Hour	8,719	3,913	4,806	567,693	2,812,159	01121724	40,000

Note: YYMMDDHH = Year, Month, Day, Hour Ending
UTM = Universal Transverse Mercator: Zone 17, NAD83 datum

[a] Based on the AERMOD model and surface and upper air meteorological data from Miami for 2001 to 2005.

[b] See Table 5-1, 4.2 ppm. Conversion from ppm to $\mu g/m^3$: 4.2 ppm x 28(MW) / 0.02447 = 4,805.9 $\mu g/m^3$.



LEGEND

- Source Locations
- Buildings Used in Downwash
- Restricted Property Boundary Receptors

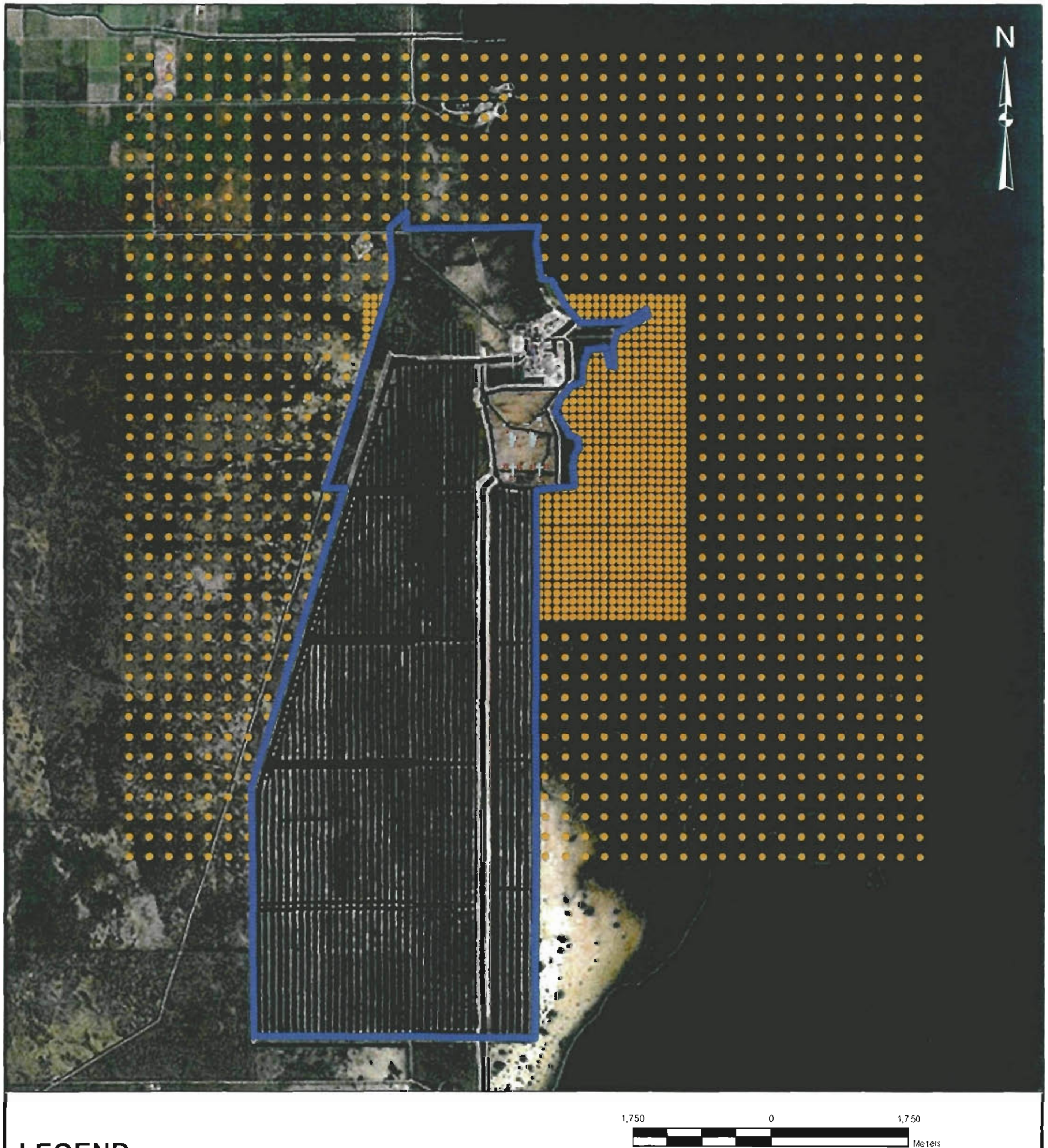
REFERENCES

PROJECT
TURKEY POINT UNITS 6 & 7 PROJECT

TITLE
Stacks, Structures, and Restricted Property Boundary Receptors Used in the Air Modeling Analysis

FPL

FILE No. 083875841002	FIGURE 6-1
REV. 0	
PLOT DATE 06/11/2009	



LEGEND

- Restricted Property Boundary Receptors
- Receptor Grid
- Buildings Used in Downwash

REFERENCES

PROJECT

TURKEY POINT UNITS 6 & 7
PROJECT

TITLE

Receptor Locations
Used in the Air Modeling Analysis

FPL

FILE No.	083875841003
REV.	0
PLOT DATE	06/11/2009

FIGURE
6-2

7.0 ADDITIONAL IMPACT ANALYSIS

This section presents the impacts that the proposed Project will have on associated growth; impacts to vegetation, soils, and visibility in the vicinity of Turkey Point Units 6 & 7; and impacts at the PSD Class I area of the ENP related to AQRVs. Specifically, this section addresses FDEP Rules 62-212.400(4)(e), (8)(a) and (b), and (9), F.A.C. These rules are:

> (4) Source Information. (e) The air quality impacts, and the nature and extent of any or all general commercial, residential, industrial, and other growth which has occurred since August 7, 1977, in the area the source or modification would affect.
>
> (8) Additional Impact Analyses. (a) The owner or operator shall provide an analysis of the impairment to visibility, soils and vegetation that would occur as a result of the source or modification and general commercial, residential, industrial and other growth associated with the source or modification. The owner or operator need not provide an analysis of the impact on vegetation having no significant commercial or recreational value.
>
> (b) The owner or operator shall provide an analysis of the air quality impact projected for the area as a result of general commercial, residential, industrial and other growth associated with the source or modification.
>
> (9) Sources Impacting Federal Class I Areas. Sources impacting Federal Class I areas are subject to the additional requirements provided in 40 CFR 52.21(p), adopted by reference in Rule 62-204.800, F.A.C.

7.1 Historical Growth and Impacts Due to Associated Growth

7.1.1 Introduction

The general trends in residential, commercial, industrial, and other growth that has occurred in Miami-Dade County since August 7, 1977 are presented in Subsections 7.1.2 through 7.1.4. Information is presented from a variety of available sources [i.e., Florida Statistical Abstract (UF/BEBR, 2007), FDEP, etc.] that characterize Miami-Dade County as a whole. Information on air emissions and quality obtained from FDEP and EPA is presented in Subsection 7.1.5.

The growth analysis in Subsection 7.1.6 considered the air quality impacts due to emissions resulting from the industrial, commercial, and residential growth associated with the proposed construction and operation of the Project. The information and analysis is consistent with the EPA Guidance related to this requirement in the *Draft New Source Review Workshop Manual* (EPA, 1990).

The Project is located in southeast Miami-Dade County on Florida's Atlantic coast. Miami-Dade County is adjacent to Monroe County to the south and west, Collier County to the northwest, and Broward to the north. Miami-Dade County is the second largest county in Florida, comprising a 2,430-square mile area. The County has 1,945 square miles of land area.

7.1.2 Residential Growth

7.1.2.1 Population and Household Trends

As an indicator of residential growth, the trends in the population and number of household units in Miami-Dade County since 1977 are shown in Figure 7-1. The County experienced a 59-percent increase in population for the years 1977 through 2006. During this period, there was an increase in population of about 902,500. Similarly, the number of households in the County increased since 1977 by about 314,400, or 59 percent.

7.1.3 Commercial Growth

7.1.3.1 Retail Trade and Wholesale Trade

As an indicator of commercial growth in Miami-Dade County, the trends in the number of commercial facilities and employees involved in retail and wholesale trade are presented in Figure 7-2. The retail trade sector comprises establishments engaged in retailing merchandise. The retailing process is the final step in the distribution of merchandise. Retailers are, therefore, organized to sell merchandise in small quantities to the general public. The wholesale trade sector comprises establishments engaged in wholesaling merchandise. This sector includes merchant wholesalers who buy and own the goods they sell; manufacturers' sales branches and offices that sell products manufactured domestically by their own company; and agents and brokers who collect a commission or fee for arranging the sale of merchandise owned by others.

Since 1977, retail trade in Miami-Dade County has increased by about 2,700 establishments and 12,300 employees or 33 and 11 percent, respectively. For the same period, wholesale trade has increased in the County by 5,100 establishments and 23,500 employees, or 134 and 54 percent, respectively.

7.1.3.2 Labor Force

The trend in the labor force in Miami-Dade County since 1977 is shown in Figure 7-3. The sectors employing the largest number of persons in Miami-Dade County have been in agriculture, services, and government. Between 1977 and 2006, approximately 537,700 persons were added to the available work force, for an increase of 87 percent.

7.1.3.3 Tourism

Another indicator of commercial growth in Miami-Dade County is the tourism industry. As an indicator of tourism growth in the County, the trend in the number of hotels and motels and the number of units at the hotels and motels are presented in Figure 7-4.

This industry comprises establishments primarily engaged in marketing and promoting communities and facilities to businesses and leisure travelers through a range of activities, such as assisting organizations in locating meeting and convention sites; providing travel information on area attractions, lodging accommodations, restaurants; providing maps; and organizing group tours of local historical, recreational, and cultural attractions.

Between 1978 and 2007, there was a decrease in the number of hotels of 48 percent and motels of 33 percent in the County.

7.1.3.4 Transportation

As an indicator of transportation growth, the trend in the number of VMT by motor vehicles on major roadways in Miami-Dade County is presented in Figure 7-5.

The County's main arteries are Interstate 95, the Florida Turnpike, U.S. Highway 1, and the Palmetto Expressway, which run north-south through the eastern section of the County. Major highways running east-west include the Airport and Dolphin Expressways and a portion of the Palmetto Expressway. Other major highways in the County are U.S. Highways 441, 98, and 27. The closest major roads to the plant area are U.S. Highway 1 and the Florida Turnpike.

Between 1977 and 2007, there was an increase of more than 24,900,000 VMT, or 80 percent, on major roadways in the County.

The workforce needed to operate the Project represents a small fraction of the labor force present in Miami-Dade County.

7.1.4 Industrial Growth

7.1.4.1 Manufacturing and Agricultural Industries

As an indicator of industrial growth, the trend in the number of employees in the manufacturing industry in Miami-Dade County since 1977 is shown in Figure 7-6. As shown, the manufacturing industry experienced a decrease of 45 percent in employment from 1977 through 2006.

The trend in the number of employees in the agricultural industry in Miami-Dade County since 1977 is also shown in Figure 7-6. As shown, the agricultural industry experienced an increase of 7,200 employees or 338 percent from 1977 through 2006.

7.1.4.2 Utilities

Existing power plants in Miami-Dade County include the following:

- FPL's Turkey Point Plant,
- FPL's Cutler Plant,
- City of Homestead Utility, and
- Miami-Dade Resource Recovery Facility.

Together, these power plants have an electrical generating capacity of over 3,700 MW.

As an indicator of electrical utility growth, the electrical nameplate generating capacity in Miami-Dade County since 1977 is shown in Figure 7-7. As shown, there has been an increase of 56 percent in electrical utility growth since 1977. In 2007, FPL's Turkey Point Unit 5 began operation. Unit 5 is an 1,150-MW natural gas fired combined cycle unit.

Growth Associated with the Operation of the Project

Since the PSD baseline date of August 7, 1977, the only major facility built within a 20-km radius of the Turkey Point Plant was the addition of Unit 5. There are a limited number of facilities located throughout the 20-km radius area surrounding the plant area. There has not been a significant amount of industrial and commercial growth in the vicinity of the Turkey Point Plant as evidenced by the rural nature of the area.

7.1.5 Air Quality Discussion

7.1.5.1 Air Emissions and Spatial Distribution of Major Facilities

The locations of major air pollutant facilities in Miami-Dade County are presented in Tables 6-3 and 6-4. Based on actual emissions reported for 1999 (latest year of available data) by EPA on its AIRSdata website, total emissions from stationary sources in the county are as follows:

- SO_2: 15,400 TPY
- PM_{10}: 1,980 TPY
- NO_x: 17,900 TPY
- CO: 5,240 TPY
- VOC: 3,950 TPY

7.1.5.2 Air Emissions from Mobile Sources

The trends in the air emissions of CO, VOC, and NO_x from mobile sources in Miami-Dade County are presented in Figure 7-8. Between 1977 and 2005, there were significant decreases in these emissions. The decreases in CO, VOC, and NO_x emissions were about 1,860, 200, and 81 tons per day, respectively, which represent decreases from 1977 emissions of 68, 71, and 40 percent, respectively.

7.1.5.3 Air Monitoring Data

Since 1977, Miami-Dade County has been classified as attainment or maintenance for all criteria pollutants. Air quality monitoring data have been collected in Miami-Dade County, primarily in the eastern portion of the county. For this evaluation, the air quality monitoring data collected at the monitoring station nearest to the Turkey Point Plant were used to assess air quality trends since 1977. Air quality monitoring data were based on the following monitoring stations:

- SO_2, CO, and O_3 concentrations – Miami,
- PM_{10} and $PM_{2.5}$ concentrations – Miami and Homestead, and
- NO_2 concentrations – Miami and Virginia Key.

Data collected from these stations are considered to be generally representative of air quality in Miami-Dade County. Because these monitoring stations are generally located in more industrialized areas than the Turkey Point Plant, the reported concentrations are likely to be somewhat higher than those experienced at the plant area.

These data indicate that the maximum air quality concentrations currently measured in the region comply with and are well below the applicable AAQS, except for $PM_{2.5}$ 24-hour average concentrations. These monitoring stations are located in areas where the highest concentrations of a measured pollutant are expected due to the combined effect of emissions from stationary and mobile sources, as well as the effects of meteorology. Therefore, the ambient concentrations in areas not monitored should have pollutant concentrations less than the monitored concentrations from these sites.

In addition, since 1988, PM in the form of PM_{10} has been collected at the air monitoring stations due to the promulgation of the PM_{10} AAQS. Prior to 1989, the AAQS for PM was in the form of TSP concentrations, and this form of PM was measured at the stations.

7.1.5.4 SO_2 Concentrations

The trends in the 3-hour, 24-hour, and annual average SO_2 concentrations measured in Miami-Dade County since 1977 are presented in Figures 7-9 through 7-11, respectively. As shown in these figures, measured SO_2 concentrations have been and continue to be well below the AAQS.

7.1.5.5 PM_{10}/TSP/$PM_{2.5}$ Concentrations

PM_{10}/TSP Concentrations

The trends in the 24-hour and annual average PM_{10} and TSP concentrations since 1981 are presented in Figures 7-12 and 7-13, respectively. TSP concentrations are presented through 1987 since the AAQS was based on TSP concentrations through that year. In 1988, the TSP AAQS was revoked and the PM standard was revised to PM_{10}.

As shown in these figures, measured PM_{10} concentrations have been below the AAQS since 1990. PM_{10} concentrations have been measured beginning in 1988. The PM_{10} concentrations have been and continue to be below the AAQS over the last decade.

$PM_{2.5}$ Concentrations

The trends in 24-hour and annual average $PM_{2.5}$ concentrations since 1999 are presented in Figures 7-14 and 7-15, respectively. As shown in the figures, measured $PM_{2.5}$ 24-hour average concentrations (98th percentile) were less than the AAQS standard. The annual average concentrations for $PM_{2.5}$ have been and continue to be below the AAQS standard.

7.1.5.6 NO_2 Concentrations

The trends in the annual average NO_2 concentrations measured at the nearest monitors to the plant area are presented in Figure 7-16. As shown in this figure, measured NO_2 concentrations have been well below the AAQS.

7.1.5.7 CO Concentrations

The trends in the one- and eight-hour average CO concentrations since 1981 are presented in Figures 7-17 and 7-18, respectively. As shown in these figures, measured CO concentrations have been well below the AAQS since mid-1980s.

7.1.5.8 Ozone Concentrations

The trends in the 1-hour average ozone concentrations since 1981 are presented in Figure 7-19. The 8-hour average ozone concentrations (99th percentile, three-year average) are presented in Figure 7-20. As shown in these figures, the measured ozone concentrations have been below the AAQS even in the more urbanized areas of Miami-Dade County. The EPA lowered the eight-hour average on March 27, 2008 from 0.08 to 0.075 ppm. The revised 8-hour standard is achieved when the three-year average of the annual 99th percentile is 0.075 ppm or less. The data shown in Figure 7-20 indicate that this revised standard would be achieved at the monitoring stations shown.

7.1.5.9 Air Quality Associated with the Operation of the Project

The air quality data measured in Miami-Dade County that are closest to the plant area indicate that the maximum air quality concentrations are well below and comply with the AAQS. Also, based on the trends presented of these maximum concentrations, the air quality has generally improved in the region since the baseline date of August 7, 1977. Because the maximum concentrations for the proposed Project are predicted to be well below the significant impact levels, air quality concentrations in the region are expected to remain below and comply with the AAQS when the Project becomes operational.

7.1.6 Impacts of Associated Growth

The Project is needed to meet projected electric demands for FPL's customers and provide fuel diversity in FPL's system. FPL has a statutory obligation to meet the projected increase in electric demand. The operation of the Turkey Point Units 6 & 7 is a direct result of the electric power demand and thus responds to growth that will occur in FPL's system.

Construction of Units 6 & 7 will occur over a ten-year period requiring an average of approximately 2,430 workers during that time. These construction personnel will commute to the plant area. Operation of Units 6 & 7 will require about 806 workers. The operational workforce will also include annual contracted maintenance workers to be hired for periodic routine services. The workforce needed to construct and operate the Project represents a small fraction of the population already present in Miami-Dade County. Therefore, while there would be an increase in vehicular traffic, the effect on air quality levels would be minimal.

There are also expected to be no air quality impacts due to associated commercial and industrial growth given the location of Units 6 & 7. The existing commercial and industrial infrastructure is adequate to provide any support services that the Project might require, and would not increase with the operation of Units 6 & 7. The Project will have little effect on the emissions increase in the area. The area to the west is expected to remain rural as FPL owns much of this land. The area to the east and south contains Biscayne Bay and Card Sound. The areas to the north have already been designated as areas for conservation and use for the Comprehensive Everglades Restoration Plan.

Since the PSD baseline date of August 7, 1977, there have been only a few major facilities built within a 20-km radius of the plant area. FPL's Turkey Point Unit 5 is an advanced combined-cycle unit firing natural gas with emission rate recently established as BACT. There are few nearby minor sources that have been constructed since August 7, 1977.

The air quality data measured in Miami-Dade County indicate that the maximum air quality concentrations are well below the AAQS. Based on the trends presented of these maximum concentrations, the air quality has generally improved in the region since the baseline date of August 7, 1977. As demonstrated in Section 6.0, the maximum air quality impacts resulting from Turkey Point Units 6 & 7 are predicted to be low and, for all air pollutants and averaging times, below the significant impact levels. As a result, the air quality concentrations in the region are expected to remain below the AAQS when Units 6 & 7 becomes operational.

7.2 Potential Air Quality Effect Levels on Soils, Vegetation, and Wildlife

7.2.1 Soils

The potential and hypothesized effects of atmospheric deposition on soils include:

- Increased soil acidification;
- Alteration in cation exchange;
- Loss of base cations; and
- Mobilization of trace metals.

The potential sensitivity of specific soils to atmospheric inputs is related to two factors. First, the physical ability of a soil to conduct water vertically through the soil profile is important in influencing the interaction with deposition. Second, the ability of the soil to resist chemical changes, as measured in terms of pH and soil cation exchange capacity (CEC), is important in determining how a soil responds to atmospheric inputs.

7.2.2 Vegetation

The concentrations of the pollutants, duration of exposure, and frequency of exposure influence the response of vegetation to atmospheric pollutants. The pattern of pollutant exposure expected from the facility is that of a few episodes of relatively high ground-level concentrations, which occur during certain meteorological conditions, interspersed with long periods of extremely low ground-level concentrations. If there are any effects of stack emissions on plants, they will be from the short-term, higher doses. A dose is the product of the concentration of the pollutant and duration of the exposure.

In general, the effects of air pollutants on vegetation occur primarily from SO_2, NO_2, O_3, and PM. Effects from minor air contaminants, such as fluoride, chlorine, hydrogen chloride, ethylene, ammonia, hydrogen sulfide, CO, and pesticides, have also been reported in the literature. The effects of air pollutants are dependent both on the concentration of the contaminant and the duration of the exposure. The term "injury," as opposed to damage, is commonly used to describe all plant responses to air contaminants and will be used in the context of this analysis. Air contaminants are thought to interact primarily with plant foliage, which is considered to be the major pathway of exposure.

Injury to vegetation from exposure to various levels of air contaminants can be termed acute, physiological, or chronic. Acute injury occurs as a result of a short-term exposure to a high-contaminant concentration and is typically manifested by visible injury symptoms ranging from chlorosis (discoloration) to necrosis (dead areas). Physiological or latent injury occurs as the result of a long-term exposure to contaminant concentrations below those which result in acute injury symptoms. Chronic injury results from repeated exposure to low concentrations over extended periods of time, often without any visible symptoms, but with some effect on the overall growth and productivity of the plant. In this assessment, 100 percent of the particular air pollutant in the ambient air was assumed to interact with the vegetation, which is a very conservative approach.

7.2.2.1 Sulfur Dioxide and Sulfuric Acid Mist

Sulfur is an essential plant nutrient usually taken up as sulfate ions by the roots from the soil solution. When SO_2 in the atmosphere enters the foliage through pores in the leaves, it reacts with water in the leaf interior to form sulfite ions. Sulfite ions are highly toxic. They interact with enzymes, compete with normal metabolites, and interfere with a variety of cellular functions (Horsman and Wellburn, 1976). However, within the leaf, sulfite is oxidized to sulfate ions, which can then be used by the plant as a nutrient. Small amounts of sulfite may be oxidized before they prove harmful.

Observed SO_2 effect levels for several plant species and plant sensitivity groupings are presented in Tables 7-1 and 7-2, respectively. SO_2 gas at elevated levels has long been known to cause injury to plants. Acute SO_2 injury usually develops within a few hours or days of exposure, and symptoms include marginal, flecked, and/or intercostal necrotic areas that appear water-soaked and dullish green initially. This injury generally occurs to younger leaves. Chronic injury is usually evident by signs of chlorosis, bronzing, premature senescence, reduced growth, and possible tissue necrosis (EPA, 1982). Background levels of SO_2 range from 2.5 to 25 $\mu g/m^3$.

Many studies have been conducted to determine the effects of high-concentration, short-term SO_2 exposure on natural community vegetation. Sensitive plants include ragweed, legumes, blackberry, southern pine, and red and black oak. These species are injured by exposure to 3-hour SO_2 concentrations of 790 to 1,570 $\mu g/m^3$. Intermediate plants include locust and sweetgum. These species are injured by exposure to 3-hour SO_2 concentrations of 1,570 to 2,100 $\mu g/m^3$. Resistant species (injured at concentrations above 2,100 $\mu g/m^3$ for 3 hours) include white oak and dogwood (EPA, 1982).

A study of native Floridian species (Woltz and Howe, 1981) demonstrated that cypress, slash pine, live oak, and mangrove exposed to 1,300 $\mu g/m^3$ SO_2 for 8 hours were not visibly damaged. This finding supports the levels cited by other researchers on the effects of SO_2 on vegetation.

A corroborative study (McLaughlin and Lee, 1974) demonstrated that approximately 20 percent of a cross-section of plants ranging from sensitive to tolerant were visibly injured at 3-hour SO_2 concentrations of 920 μg/m^3. Jack pine seedlings exposed to SO_2 concentrations of 470 to 520 μg/m^3 for 24 hours demonstrated inhibition of foliar lipid synthesis; however, this inhibition was reversible (Malhotra and Kahn, 1978). Black oak exposed to 1,310 μg/m^3 SO_2 for 24 hours a day for 1 week demonstrated a 48-percent reduction in photosynthesis (Carlson, 1979).

SO_2 is considered to be the primary factor causing the death of lichens in most urban and industrial areas. The first indications of damage from SO_2 include the inhibition of nitrogen fixation, increased electrolyte leakage, and decreased photosynthesis and respiration followed by discoloration and death of the algal component of the lichen (Fields, 1988). Sensitive species are damaged or killed by annual average levels of SO_2 ranging from 8 to 30 μg/m^3, and very few lichens can tolerate levels exceeding 125 μg/m^3 (Johnson, 1979; DeWit, 1976; Hawsworth and Rose, 1970; LeBlanc et al., 1972). In another study, two lichen species exhibited signs of SO_2 damage in the form of decreased biomass gain and photosynthetic rate as well as membrane leakage when exposed to concentrations of 200 to 400 μg/m^3 for 6 hours/week for 10 weeks (Hart et al., 1988).

Acidic precipitation is formed from SO_2 emissions during the burning of fossil fuels. This pollutant is oxidized to sulfur trioxide in the atmosphere and dissolves in rain to form sulfuric acid mist (SAM), which falls as acidic precipitation (Ravera, 1989). Although concentration data are not available, SAM has been reported to yield necrotic spotting on the upper surfaces of leaves (Middleton et al., 1950).

7.2.2.2 Nitrogen Dioxide

NO_2 can injure plant tissue with symptoms usually appearing as irregular white to brown collapsed lesions between the leaf veins and near the margins. Conversely, non-injurious levels of NO_2 can be absorbed by plants, enzymatically transformed into ammonia, and incorporated into plant constituents such as amino acids (Matsumaru et al., 1979).

For plants that have been determined to be more sensitive to NO_2 exposure than others, acute exposure (1, 4, and 8 hours) caused 5 percent predicted foliar injury at concentrations ranging from 3,800 to 15,000 μg/m^3 (Heck and Tingey, 1979). Chronic exposure of selected plants (some considered NO_2 sensitive) to NO_2 concentrations of 2,000 to 4,000 μg/m^3 for 213 to 1,900 hours caused reductions in yield of up to 37 percent and some chlorosis (Zahn, 1975). Short-term exposure to NO_x at concentrations of 564 μg/m^3 caused adverse effects in lichen species (Holopainen and Karenlampi, 1984).

7.2.2.3 Particulate Matter

Although information pertaining to the effects of PM on plants is scarce, baseline concentrations are available (Mandoli and Dubey, 1988). Ten species of native Indian plants were exposed to levels of PM that ranged from 210 to 366 μg/m^3 for an 8-hour averaging period. Damage in the form of a higher leaf area/dry weight ratio was observed at varying degrees for most plants tested. Concentrations of PM lower than 163 μg/m^3 did not appear to be injurious to the tested plants.

7.2.2.4 Carbon Monoxide

Information pertaining to the effects of CO on plants is scarce. The main effect of high concentrations of CO is the inhibition of cytochrome *c* oxidase, the terminal oxidase in the mitochondrial electron transfer chain. Inhibition of cytochrome *c* oxidase depletes the supply of adenosine triphosphate (ATP), the principal donor of free energy required for cell functions. However, this inhibition only occurs at extremely high concentrations of CO. Pollok et al. (1989) reported that exposure to a $CO:O_2$ ratio of 25 (equivalent to an ambient CO concentration of 6.85×10^6 μg/m^3) resulted in stomatal closure in the leaves of the sunflower (*Helianthus annuus*). Naik et al. (1992) reported cytochrome *c* oxidase inhibition in corn, sorghum, millet, and Guinea grass at $CO:O_2$ ratios of 2.5 (equivalent to an ambient CO concentration of 6.85×10^5 μg/m^3). These plants were considered the species most sensitive to CO-induced inhibition of cytochrome *c* oxidase.

7.2.2.5 Ozone

Ozone can cause various damage to broad-leaved plants including: tissue collapse, interveinal necrosis and markings on the upper surface leaves know as stippling (pigmented yellow, light tan, red brown, dark brown, red, or purple), flecking (silver or bleached straw white), mottling, chlorosis or bronzing, and bleaching. O_3 can also stunt plant growth and bud formation. On certain plants such as citrus, grape, and tobacco, it is common for leaves to wither and drop early.

7.2.3 Wildlife

A wide range of physiological and ecological effects to fauna has been reported for gaseous and particulate pollutants (Newman, 1981; Newman and Schreiber, 1988). The most severe of these effects have been observed at concentrations above the secondary AAQS. Physiological and behavioral effects have been observed in experimental animals at or below these standards. For impacts on wildlife, the lowest threshold values of SO_2, NO_x, and particulates that are reported to cause physiological changes are shown in Table 7-3.

7.2.4 Impact Analysis Methodology

A screening approach was used that compared the Project's maximum predicted ambient concentration of air pollutants of concern in the vicinity of the plant area and the ENP PSD Class I Area with effect threshold limits for both vegetation and wildlife as reported in the scientific literature. A literature search was conducted to determine the effects of air contaminants on plant species as well as those species reported to occur in the vicinity of the plant area and in the PSD Class I area. It is recognized that effect threshold information is not available for all species found in these areas, although studies have been performed on a few of the common species and on other species known to be sensitive indicators of effects. Species of lichens, which are symbiotic organisms comprised of green or blue-green algae and fungi, have been used worldwide as air pollution monitors because relatively low levels of sulfur-, nitrogen-, and fluorine-containing pollutants adversely affect many species, altering lichen community composition, growth rates, reproduction, physiology, and morphological appearance (Blett et al., 2003).

7.3 Impacts on Soils, Vegetation, Wildlife, and Visibility in the Project's Vicinity

7.3.1 Impacts on Vegetation and Soils

Vegetative communities in the vicinity of the plant area are red mangrove (*Rhizophora mangle*), tidal dwarf red mangrove, buttonwood (*Conocarpus erectus*), white mangrove (*Laguncularia racemosa*), and black mangrove (*Avicennia germinans*). The red mangroves that are found in the tidal flats are characteristic of the dwarf mangrove community, reduced in size due to higher salinities and reduced tidal flushing. Additional vegetative species observed within the mangrove community include occasional Brazilian pepper (*Schinus terebinthfolius*), Australian pine (*Casuarina equisetifolia*), tree seaside oxeye (*Borrichia arborescens*), grey nicker (*Caesalpinia bonduc*), groundsel tree (*Baccharis halimifolia*), and cordgrass (*Spartina* sp.).

Soils in the area are primarily histosols, which are peat soils with high amounts of organic matter. The agricultural lands west of the plant area are part of the Everglades Agricultural Area, which is noted for its "muck", i.e., rich, black soil that is very fertile.

According to the modeling results presented in Section 6.0, the maximum air quality impacts due to the Project are predicted to be well below the AAQS and PSD Increments. The AAQS were established to protect both public health and welfare. Public welfare is protected by the secondary AAQS, which Florida has adopted. Secondary standards set limits to protect public welfare, including protection against visibility impairment, damage to animals, crops, vegetation, and buildings (EPA, 2007).

Since the Project's impacts on the local air quality are predicted to be less than the AAQS, less than the Significant Impact Levels, and much less than the effect levels on soils and vegetation, impacts on soils, vegetation, and wildlife in the Project's vicinity are expected to be negligible. With regard to ozone concentrations, the Project's VOC and NO_x emissions represent an insignificant increase in VOC and NO_x emissions for Miami-Dade County (see Section 6.11).

7.3.2 Impacts on Wildlife

The major air quality risk to wildlife in the United States is from continuous exposure to pollutants above the National AAQS. This occurs in non-attainment areas, e.g., Los Angeles Basin. Risks to wildlife also may occur for wildlife living in the vicinity of an emission source that experiences frequent upsets or episodic conditions resulting from malfunctioning equipment, unique meteorological conditions, or startup operations (Newman and Schreiber, 1988). Under these conditions, chronic effects (e.g., particulate contamination) and acute effects (e.g., injury to health) have been observed (Newman, 1981).

Although air pollution impacts to wildlife have been reported in the literature, many of the incidents involved acute exposures to pollutants, usually caused by unusual or highly concentrated releases or unique weather conditions. It is highly unlikely that emissions from the Project will cause adverse effects to wildlife due to the Project's extremely low impacts, well below the AAQS. Coupled with the mobility of wildlife, the potential for exposure of wildlife to the Project's impacts is extremely unlikely.

7.3.3 Impacts on Visibility

No visibility impairment in the vicinity of the Project is expected due to the types and quantities of emissions proposed for the Project. The opacity of the diesel engines will be 20 percent or less under normal operation.

7.4 Impacts to PSD Class I Areas

7.4.1 Identification of AQRVs

An AQRV analysis was conducted to assess the potential risk to AQRVs at the ENP due to the proposed emissions from the Project. The ENP is the closest Class I area to the Turkey Point plant area, and is located about 20 km from the plant area.

The AQRVs include visibility, freshwater and coastal wetlands, dominant plant communities, unique and rare plant communities, soils and associated periphyton, and the wildlife dependent on these communities for habitat. Rare, endemic, threatened, and endangered species of the ENP and bioindicators of air pollution (e.g., lichens) are also evaluated.

The deposition of sulfur and nitrogen in the ENP is an AQRV. Because the Project emissions of SO_2 and NO_x are less than the EPA significant emission rates, the deposition of total sulfur and nitrogen is not considered to be significant and was not evaluated.

The CAA Amendments of 1977 provide for implementation of guidelines to prevent visibility impairment in Class I areas. The guidelines are intended to protect the aesthetic quality of these pristine areas from reduction in visual range and atmospheric discoloration due to various pollutants. Visibility can take the form of plume blight for nearby areas (i.e., distances within 50 km) or regional haze for long distances (i.e., distances beyond 50 km).

Sources of air pollution can cause visible plumes if emissions of PM_{10} and NO_x are sufficiently large. A plume will be visible if its constituents scatter or absorb sufficient light so that the plume is brighter or darker than its viewing background (e.g., the sky or a terrain feature, such as a mountain). PSD Class I areas, such as national parks and wilderness areas, are afforded special visibility protection designed to prevent plume visual impacts to observers within a Class I area.

Visibility is an AQRV for the ENP. Because the nearest distance of the Turkey Point Units 6 & 7 Project to the ENP is within 50 km, the change in visibility is analyzed as plume blight. However, the ENP also extends beyond 50 km from the Turkey Point Plant. As a result, the change in visibility for the Project is also analyzed as regional haze in the part of the ENP that is beyond 50 km.

Currently, there are several air quality modeling approaches recommended by the Interagency Workgroup on Air Quality Models (IWAQM) to perform these analyses. The IWAQM consists of

EPA and Federal Land Managers (FLMs) of Class I areas who are responsible for ensuring that AQRVs are not adversely impacted by new and existing sources. These recommendations have been summarized in guidelines required by the 1977 CAA Amendments and are contained in two documents:

- *IWAQM, Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts* (EPA, 1998), referred to as the IWAQM Phase 2 report; and
- *Federal Land Managers' Air Quality Related Values Workgroup (FLAG), Phase I Report*, USFS, NPS, USFWS (December, 2000), referred to as the FLAG document.

The methods and assumptions recommended in these documents were used to assess visibility impairment due to the Project.

7.4.2 Impacts to Soils, Vegetation, and Wildlife

The maximum predicted atmospheric concentrations of PM_{10} due to the increase in emissions resulting from the proposed Project are presented in Table 7-4. As shown, the predicted increase in impacts is very low.

As discussed in Section 6.0, PSD Review is not applicable to SO_2 or NO_x. However, a supplemental air quality analysis was performed for SO_2 and NO_2 to determine impacts in the ENP. The maximum impacts are less than the PSD Class I significant impact levels.

The soils of the ENP are generally classified as histosols or entisols. Histosols (peat soils) are organic and have extremely high buffering capacities based on their CEC, base saturation, and bulk density. Therefore, they would be relatively insensitive to atmospheric inputs. The entisols are shallow sandy soils overlying limestone, such as the soils found in the pinelands. The direct connection of these soils with subsurface limestone tends to neutralize any acidic inputs. Moreover, the groundwater table is highly buffered due to the interaction with subsurface limestone formations, which results in high alkalinity (as $CaCO_3$).

The relatively low sensitivity of the soils to acid inputs coupled with the extremely low ground-level concentrations of contaminants projected for the ENP from the Project emissions precludes any significant impact on soils.

While the deposition of sulfur and nitrogen is an AQRV for the ENP, the emissions of SO_2 and NO_x are below the PSD significant emission rates.

The maximum 8-hour PM_{10} concentration due to the Project is predicted to be 0.189 $\mu g/m^3$ at the ENP PSD Class I area. This concentration is approximately 0.1 to 0.2 percent of the values that are known to affect plant foliage. As a result, no significant effects to vegetative AQRVs are expected from the Project's emissions.

In summary, the phytotoxic effects on the ENP from the proposed Project's emissions are expected to be minimal. It is important to note that the substances were evaluated with the assumption that 100 percent was available for plant uptake. This is rarely the case in a natural ecosystem.

No significant effects on wildlife AQRVs from PM_{10} are expected. These results are considered indications of the risk of other air pollutant emissions predicted from the Project, which is also considered to be negligible.

7.4.3 Impacts on Visibility

7.4.3.1 Visibility Analysis for Everglades National Park Areas within 50 km of the plant area

Methodology – The analysis to determine the potential adverse plume visibility effects in the ENP was based on recommendations in the FLAG document using the screening approach suggested in the Workbook for Plume Visual Impact Screening and Analysis (EPA, 1992). EPA has computerized this approach in a program called the VISCREEN model. The VISCREEN model is currently recommended for use by the EPA to assess visual plume impacts in regulatory applications. The VISCREEN model can be used to calculate potential plume impact of specific pollutant emissions for specific transport and meteorological dispersion conditions. The model can be applied in two successive levels of screening (i.e., referred to as Levels 1 and 2) without the need for extensive source, meteorological, or pollutant input. If the screening calculations demonstrate that during "worst-case" meteorological conditions a plume is imperceptible or, if perceptible, is not likely to be considered objectionable ("adverse" or "significant" in the language of the EPA PSD and visibility regulations), further analysis of plume visual impact would not be required as part of the air quality review of the source. However, if the screening analyses demonstrate that the criteria are exceeded, plume visual impacts cannot be ruled out, and more detailed analyses to ascertain the magnitude, frequency, location, and timing of plume visual impacts would be required.

The Level 1 screening analysis is designed to provide a conservative estimate of plume visual impacts (i.e., impacts that would be larger than those calculated with more realistic input and modeling assumptions). This analysis assumes worst-case meteorological conditions of stable stability (Pasquill-Gifford stability Class F) and a one meter per second (m/s) wind speed persisting for 12 hours in one direction towards a PSD Class I area. The input required for the Level 1 analysis is limited to the following parameters:

- Emission rates of PM_{10} and NO_x;
- Distance between the emission source and (a) the observer; (b) the closest Class I area boundary; and (c) the most distant Class I area boundary;
- Background visual range appropriate for the region in which the Class I area is located; and
- If available, emission rates of NO_2, soot, and primary sulfate (SO_4).

Visibility impacts are then determined for two parameters:

- Contrast of a plume against a viewing background such as the sky or a terrain feature, and
- Perceptibility of a plume on the basis of the color difference between the plume and the viewing background (Delta E).

Results are provided by the model for several scenarios based on the background view, the viewing angle, visibility improvement due to plumes located both inside and outside the Class I area, and the sun angle. The critical values for contrast and Delta E are 0.05 and 2.00, respectively. If these levels are not exceeded by the proposed source, the source is considered to pass the Level 1 visibility analysis, and the source will not have a significant impact on the Class I area.

Results of Level 1 Analysis – The input parameters and results of the Level 1 analysis for the Project are presented in Figure 7-21. As shown, the Project will emit PM_{10}, NO_x, and primary SO_4 (as sulfuric acid mist). The maximum short-term average emission rates used in the analysis, which are presented in Section 2.0, are based on all generators and engines operating at least 4 hours on a given day simultaneously. Because these machines will actually operate only 4 hours per month, this assumption is extremely conservative. Primary NO_2 and soot are not emitted in significant quantities by the generators and engines. Therefore, these emissions were set to zero.

The terrain between the Turkey Point plant area and the ENP PSD Class I area, and within the Class I area, can be considered as generally flat. With no terrain feature that can be used as a viewing background, the visibility impacts were determined using the sky as the only viewing background. It should also be noted that these critical visual impacts are estimated for locations inside of the Class I area. Since no integral vistas have been identified for the NP, this evaluation did not evaluate vistas located outside the Class I area.

From the FLAG report, the background visual range for the ENP was assumed to be 177.8 km. Other parameters input to the model were based upon default values given in the Workbook and incorporated into the computer model.

As shown in Figure 7-21, the Project's emissions are calculated to exceed the Level 1 visibility screening criteria at the Class I area. Because results from the Level 1 screening analysis exceed the visibility criteria, a Level 2 screening analysis was performed. The only difference in input between the Level 1 and Level 2 analyses is the meteorology assumed for plume transport and dispersion.

Results of Level 2 Analysis – The Level 2 screening analysis is designed to account for more realistic occurrences of meteorological conditions that would transport the plumes of the proposed units towards the Class I area. In this analysis, an assessment of the frequency of the wind direction, wind speed, and atmospheric stability classes is made to determine the frequency of conditions that are most likely to cause a potentially adverse plume visual impact. If the Level 1 default parameters are selected for addressing visual plume impacts, the VISCREEN model assigns an appropriate estimate of particle size and density for the emitted and background atmosphere particulate and worst-case plume dispersion conditions. For this analysis, the particle size and density for the emission sources were not changed.

The first step in the analysis is to construct a table that shows worst-case dispersion conditions ranked in order of decreasing severity and the frequency of occurrence of these conditions associated with the wind direction that could transport emissions toward the Class I area. Dispersion conditions are ranked by evaluating the product of the horizontal dispersion parameter (called sigma y) times the vertical dispersion parameter (called sigma z) times the wind speed. Sigma y and sigma z account for the amount of plume spreading or dispersion that will occur as a plume travels away from a source for a given stability class. The dispersion conditions are then ranked in ascending order of the value of the dispersion product term (i.e., sigma y times sigma z times the wind speed).

For the Level 2 analysis, it is assumed that steady-state plume conditions are unlikely to persist for more than 12 hours. Thus, if a transit time of more than 12 hours is required to transport a plume parcel from the emission source to a Class I area for a given dispersion condition, it is assumed that the plume material is more dispersed than a standard Gaussian plume model would predict. This enhanced dilution would result from daytime convective mixing and wind direction and speed changes.

To obtain the worst-case meteorological conditions, it is necessary to determine the dispersion conditions (i.e., a given wind speed and stability class associated with the wind direction that would transport emissions toward the Class I area) that have a dispersion product term with a cumulative probability of 1 percent. Thus, the dispersion condition is selected to address potential plume visual impacts such that the sum of all frequencies of occurrence worse than this condition totals 1 percent (i.e., about 4 days per year). The 1-percentile meteorology is assumed to be worst-case plume visual impacts when the probability of worst-case meteorology conditions is coupled with the probability of other factors being ideal for maximizing plume visual impacts. Dispersion conditions associated with transport times of more than 12 hours are not considered in this cumulative frequency.

For this study, the surface meteorological data from the NWS station at MIA from 2001 to 2005 were used to generate a frequency distribution of wind direction, wind speed, and stability occurrences based on the standardized Stability Array (STAR) program used for many air dispersion model applications. The STAR program generates frequencies using 16 wind direction classes with each class covering a 22.5-degree sector, 6 wind speed classes, and 6 stability classes. It should be noted that these data were used to address air quality impacts from the Project as presented in Section 6.0.

The PSD Class I area of the ENP is located to the south-southwest through northwest of the Turkey Point plant area, with the closest distance of 19.7 km to the southwest. Therefore, the frequencies associated with winds that would blow from the Project to the Class I area were included in the analysis (i.e., north-northeast through southeast) and assumed a minimum distance of 20 km for each direction. The highest frequency from the northwest was used in the cumulative frequency to determine the worst-case meteorology.

As an additional conservative approach used in the method recommended by the Workbook, the frequencies were classified into four 6-hour periods: 1 a.m. to 7 a.m.; 7 a.m. to 1 p.m.; 1 p.m. to 7 p.m.; and 7 p.m. to 1 a.m. In effect, the criteria of 1 percent are applied to each 6-hour period, allowing only one day to exceed the criteria per period (instead of using the frequencies for an entire day summed over the year). However, since the approach is based on viewing the plume during the day when the sun is either in front or back of the observer, the frequencies are presented only for the 6-hour periods during the daytime from 7 a.m. to 1 p.m. and 1 p.m. to 7 p.m.

This analysis is presented in Table 7-5, which shows the dispersion product term, transport time to the nearest part of the Class I area (i.e., distance of 19.7 km), and the frequency associated with each wind direction. As indicated in Table 7-5, all of the meteorological conditions considered in the analysis could be transported to the Class I area in less than 12 hours. As a result, these conditions were all included in determining the worst-case meteorology using the cumulative probability of one percent.

During the daytime period, the weather condition for the northeast and east-northeast wind directions produced a cumulative frequency of 1 percent or more (slightly stable stability and wind speed of 2.0 m/s). This weather condition was used to assess the potential visual plume impacts from the Project at the closest distance of 20 km to the southwest.

The results of the visual plume impact analysis using the Level 2 meteorological condition for the Project are shown in Figure 7-22. As shown, the Project's values of Delta E and contrast are predicted to be less than the screening criteria of 2.00 and 0.05, respectively.

Therefore, given that the Project's generators and engines have a very low probability of operating simultaneously for 4 hours per day, the pollutant emissions from the Project are considered highly unlikely to cause adverse visibility impairment in the form of plume blight at the ENP.

7.4.3.2 Visibility Analysis for Everglades National Park Areas Beyond 50 km from the plant area

Methodology – Based on the FLAG document, current regional haze guidelines characterize a change in visibility by the change in the light-extinction coefficient (b_{ext}). The b_{ext} is the attenuation of light per unit distance due to the scattering and absorption by gases and particles in the atmosphere. A change in the extinction coefficient produces a perceived visual change. An index that simply quantifies the percent change in visibility due to the operation of a source is calculated as:

$$\Delta\% = (b_{exts} / b_{extb}) \times 100$$

where: b_{exts} is the extinction coefficient calculated for the source, and

b_{extb} is the background extinction coefficient.

The purpose of the visibility analysis is to calculate the extinction at each receptor for each day (24-hour period) of the year due to the proposed Project. The criteria to determine if the Project's impacts are potentially significant are based on a change in extinction of 5 percent or greater for any day of the year.

Processing of visibility impairment for this study was performed with the CALPUFF model and the CALPUFF post-processing program CALPOST. The analysis was conducted in accordance with the most recent guidance from the FLAG report (December 2000). The CALPUFF postprocessor model CALPOST is used to calculate the combined visibility effects from the different pollutants that are emitted from the Project. Daily background extinction coefficients are calculated on a hour-by-hour basis using hourly relative humidity data from CALMET and hygroscopic and non-hygroscopic extinction components specified in the FLAG document. For the Class I area evaluated, the hygroscopic and non-hygroscopic components are 0.9 and 8.5 inverse megameters (Mm^{-1}). CALPOST then predicts the percent extinction change for each day of the year.

Results – The results of the refined regional haze analysis are presented in Table 7-6. The results indicate that the proposed Project's maximum predicted impact on visibility at the ENP is 5.38 percent for Method 2 and 2.12 percent for Method 6, assuming that the generators and engines operate 4 hours per day. As mentioned earlier, this assumption is extremely conservative and it is considered highly unlikely that the proposed project will have adverse impact on the existing regional haze in the ENP.

TABLE 7-1
SO_2 EFFECTS LEVELS FOR VARIOUS PLANT SPECIES

Plant Species	Observed Effect Level (µg/m^3)	Exposure (Time)	Reference
Sensitive to tolerant	920 (20 percent displayed visible injury)	3 hours	McLaughlin and Lee, 1974
Lichens	200-400	6 hr/wk for 10 weeks	Hart *et al.*, 1988
Cypress, slash pine, live oak, mangrove	1,300	8 hours	Woltz and Howe, 1981
Jack pine seedlings	470-520	24 hours	Malhotra and Kahn, 1978
Black oak	1,310	Continuously for 1 week	Carlson, 1979

TABLE 7-2
SENSITIVITY GROUPINGS OF VEGETATION BASED ON VISIBLE INJURY AT DIFFERENT SO_2 EXPOSURES[a]

Sensitivity Grouping	SO_2 Concentration		Plants
	1-Hour	3-Hour	
Sensitive	1,310 - 2,620 μg/m³ (0.5 - 1.0 ppm)	790 - 1,570 μg/m³ (0.3 - 0.6 ppm)	Ragweeds Legumes Blackberry Southern pines Red and black oaks White ash Sumacs
Intermediate	2,620 - 5,240 μg/m³ (1.0 - 2.0 ppm)	1,570 - 2,100 μg/m³ (0.6 - 0.8 ppm)	Maples Locust Sweetgum Cherry Elms Tuliptree Many crop and garden species
Resistant	>5,240 μg/m³ (>2.0 ppm)	>2,100 μg/m³ (>0.8 ppm)	White oaks Potato Upland cotton Corn Dogwood Peach

[a] Based on observations over a 20-year period of visible injury occurring on over 120 species growing in the vicinities of coal-fired power plants in the southeastern United States.

Source: EPA, 1982a.

TABLE 7-3
EXAMPLES OF REPORTED EFFECTS OF AIR POLLUTANTS AT CONCENTRATIONS BELOW NATIONAL SECONDARY AMBIENT AIR QUALITY STANDARDS

Pollutant	Reported Effect	Concentration ($\mu g/m^3$)	Exposure
Sulfur Dioxide[a]	Respiratory stress in guinea pigs	427 to 854	1 hour
	Respiratory stress in rats	267	7 hours/day; 5 day/week for 10 weeks
	Decreased abundance in deer mice	13 to 157	continually for 5 months
Nitrogen Dioxide[b,c]	Respiratory stress in mice	1,917	3 hours
	Respiratory stress in guinea pigs	96 to 958	8 hours/day for 122 days
Particulates[a]	Respiratory stress, reduced respiratory disease defenses	120 PbO_3	continually for 2 months
	Decreased respiratory disease defenses in rats, same with hamsters	100 $NiCl_2$	2 hours

Sources:
[a] Newman and Schreiber, 1988.
[b] Gardner and Graham, 1976.
[c] Trzeciak et al., 1977.

TABLE 7-4
MAXIMUM PM_{10} CONCENTRATIONS PREDICTED AT THE EVERGLADES NP PSD CLASS I AREA, TURKEY POINT UNITS 6 & 7

Averaging Time	Concentration ($\mu g/m^3$)
Annual	0.0018
24-Hour	0.083
8-Hour	0.189
3-Hour	1.750
1-Hour	3.554

[a] Based on the AERMOD model and surface and upper air meteorological data from Miami for 2001 to 2005.

TABLE 7-5
PLUME VISUAL IMPACT ANALYSIS - SCREENING LEVEL 2 - IDENTIFICATION OF WORSE-CASE METEOROLOGICAL CONDITIONS

Dispersion Conditions						Transport	Frequency of Occurrence (percent) of Dispersion Conditions [c]			
Stability		Wind Speed	Dispersion Parameter		Sigma Y x Sigma Z x Wind Speed	Time to Class I Area	7 a.m. to 1 p.m.		1 p.m. to 7 p.m.	
Category	Name	(m/s)	Horizontal (sigma Y (m))	Vertical (sigma Z (m))	(m^3/s)	(hours) [a]	f [b]	cf [b]	f [b]	cf [b]
NNE Wind Direction Sector										
F	Moderately Stable	1	493.4	60.0	29,585	5.5	0.00	0.00	0.00	0.00
F	Moderately Stable	2	493.4	60.0	59,169	2.7	0.04	0.04	0.35	0.35
E	Slightly Stable	1	741.0	108.6	80,476	5.5	0.00	0.04	0.00	0.35
F	Moderately Stable	3	493.4	60.0	88,754	1.8	0.00	0.04	0.25	0.59
E	Slightly Stable	2	741.0	108.6	160,951	2.7	0.01	0.05	0.20	0.79
D	Neutral	1	989.7	197.7	195,700	5.5	0.00	0.05	0.00	0.79
E	Slightly Stable	3	741.0	108.6	241,427	1.8	0.00	0.05	0.24	1.03
E	Slightly Stable	4	741.0	108.6	321,902	1.4	0.01	0.05	0.19	1.22
D	Neutral	2	989.7	197.7	391,399	2.7	0.10	0.16	0.07	1.30
E	Slightly Stable	5	741.0	108.6	402,378	1.1	0.00	0.16	0.10	1.40
D	Neutral	3	989.7	197.7	587,099	1.8	0.17	0.33	0.16	1.55
D	Neutral	4	989.7	197.7	782,798	1.4	0.15	0.47	0.41	1.96
D	Neutral	5	989.7	197.7	978,498	1.1	0.12	0.59	0.27	2.24
NE Wind Direction Sector										
F	Moderately Stable	1	493.4	60.0	29,585	5.5	0.00	0.00	0.00	0.00
F	Moderately Stable	2	493.4	60.0	59,169	2.7	0.03	0.03	0.27	0.27
E	Slightly Stable	1	741.0	108.6	80,476	5.5	0.00	0.03	0.00	0.27
F	Moderately Stable	3	493.4	60.0	88,754	1.8	0.01	0.04	0.46	0.73
E	Slightly Stable	2	741.0	108.6	160,951	2.7	0.01	0.05	0.10	0.83
D	Neutral	1	989.7	197.7	195,700	5.5	0.00	0.05	0.00	0.83
E	Slightly Stable	3	741.0	108.6	241,427	1.8	0.03	0.07	0.41	1.24
E	Slightly Stable	4	741.0	108.6	321,902	1.4	0.00	0.07	0.55	1.79
D	Neutral	2	989.7	197.7	391,399	2.7	0.09	0.16	0.07	1.86
E	Slightly Stable	5	741.0	108.6	402,378	1.1	0.00	0.16	0.43	2.29
D	Neutral	3	989.7	197.7	587,099	1.8	0.18	0.35	0.31	2.60
D	Neutral	4	989.7	197.7	782,798	1.4	0.29	0.64	0.86	3.46
D	Neutral	5	989.7	197.7	978,498	1.1	0.40	1.04	1.01	4.47
ENE Wind Direction Sector										
F	Moderately Stable	1	493.4	60.0	29,585	5.5	0.00	0.00	0.00	0.00
F	Moderately Stable	2	493.4	60.0	59,169	2.7	0.00	0.00	0.05	0.05
E	Slightly Stable	1	741.0	108.6	80,476	5.5	0.00	0.00	0.00	0.05
F	Moderately Stable	3	493.4	60.0	88,754	1.8	0.00	0.00	0.20	0.26
E	Slightly Stable	2	741.0	108.6	160,951	2.7	0.00	0.00	0.02	0.27
D	Neutral	1	989.7	197.7	195,700	5.5	0.00	0.00	0.00	0.27
E	Slightly Stable	3	741.0	108.6	241,427	1.8	0.01	0.01	0.20	0.47
E	Slightly Stable	4	741.0	108.6	321,902	1.4	0.01	0.02	0.56	1.03
D	Neutral	2	989.7	197.7	391,399	2.7	0.05	0.07	0.07	1.10
E	Slightly Stable	5	741.0	108.6	402,378	1.1	0.00	0.07	0.48	1.59
D	Neutral	3	989.7	197.7	587,099	1.8	0.15	0.22	0.25	1.83
D	Neutral	4	989.7	197.7	782,798	1.4	0.35	0.57	0.60	2.44
D	Neutral	5	989.7	197.7	978,498	1.1	0.84	1.41	1.26	3.70
E Wind Direction Sector										
F	Moderately Stable	1	493.4	60.0	29,585	5.5	0.00	0.00	0.00	0.00
F	Moderately Stable	2	493.4	60.0	59,169	2.7	0.03	0.03	0.10	0.10
E	Slightly Stable	1	741.0	108.6	80,476	5.5	0.00	0.03	0.00	0.10
F	Moderately Stable	3	493.4	60.0	88,754	1.8	0.01	0.04	0.33	0.43
E	Slightly Stable	2	741.0	108.6	160,951	2.7	0.01	0.05	0.07	0.50
D	Neutral	1	989.7	197.7	195,700	5.5	0.00	0.05	0.00	0.50
E	Slightly Stable	3	741.0	108.6	241,427	1.8	0.02	0.06	0.47	0.97
E	Slightly Stable	4	741.0	108.6	321,902	1.4	0.01	0.07	0.72	1.69
D	Neutral	2	989.7	197.7	391,399	2.7	0.05	0.13	0.06	1.75
E	Slightly Stable	5	741.0	108.6	402,378	1.1	0.03	0.16	1.16	2.91
D	Neutral	3	989.7	197.7	587,099	1.8	0.31	0.47	0.26	3.18
D	Neutral	4	989.7	197.7	782,798	1.4	0.66	1.12	1.29	4.46
D	Neutral	5	989.7	197.7	978,498	1.1	1.07	2.19	2.14	6.60
ESE Wind Direction Sector										
F	Moderately Stable	1	493.4	60.0	29,585	5.5	0.00	0.00	0.00	0.00
F	Moderately Stable	2	493.4	60.0	59,169	2.7	0.01	0.01	0.34	0.34
E	Slightly Stable	1	741.0	108.6	80,476	5.5	0.00	0.01	0.00	0.34
F	Moderately Stable	3	493.4	60.0	88,754	1.8	0.03	0.04	0.47	0.80
E	Slightly Stable	2	741.0	108.6	160,951	2.7	0.00	0.04	0.10	0.90
D	Neutral	1	989.7	197.7	195,700	5.5	0.00	0.04	0.00	0.90
E	Slightly Stable	3	741.0	108.6	241,427	1.8	0.01	0.05	0.59	1.50
E	Slightly Stable	4	741.0	108.6	321,902	1.4	0.00	0.05	0.62	2.12
D	Neutral	2	989.7	197.7	391,399	2.7	0.11	0.16	0.15	2.26
E	Slightly Stable	5	741.0	108.6	402,378	1.1	0.02	0.17	0.39	2.66
D	Neutral	3	989.7	197.7	587,099	1.8	0.37	0.55	0.40	3.06
D	Neutral	4	989.7	197.7	782,798	1.4	0.57	1.11	1.27	4.33
D	Neutral	5	989.7	197.7	978,498	1.1	1.26	2.37	1.49	5.81
SE Wind Direction Sector										
F	Moderately Stable	1	493.4	60.0	29,585	5.5	0.00	0.00	0.00	0.00
F	Moderately Stable	2	493.4	60.0	59,169	2.7	0.01	0.01	0.36	0.36
E	Slightly Stable	1	741.0	108.6	80,476	5.5	0.00	0.01	0.00	0.36
F	Moderately Stable	3	493.4	60.0	88,754	1.8	0.01	0.02	0.58	0.93
E	Slightly Stable	2	741.0	108.6	160,951	2.7	0.00	0.02	0.11	$\boxed{1.04}$
D	Neutral	1	989.7	197.7	195,700	5.5	0.00	0.02	0.00	1.04
E	Slightly Stable	3	741.0	108.6	241,427	1.8	0.01	0.03	0.50	1.54
E	Slightly Stable	4	741.0	108.6	321,902	1.4	0.01	0.04	0.47	2.02
D	Neutral	2	989.7	197.7	391,399	2.7	0.10	0.14	0.09	2.11
E	Slightly Stable	5	741.0	108.6	402,378	1.1	0.01	0.15	0.11	2.22
D	Neutral	3	989.7	197.7	587,099	1.8	0.26	0.41	0.50	2.72
D	Neutral	4	989.7	197.7	782,798	1.4	0.55	0.96	0.99	3.71
D	Neutral	5	989.7	197.7	978,498	1.1	1.03	1.99	0.98	4.69

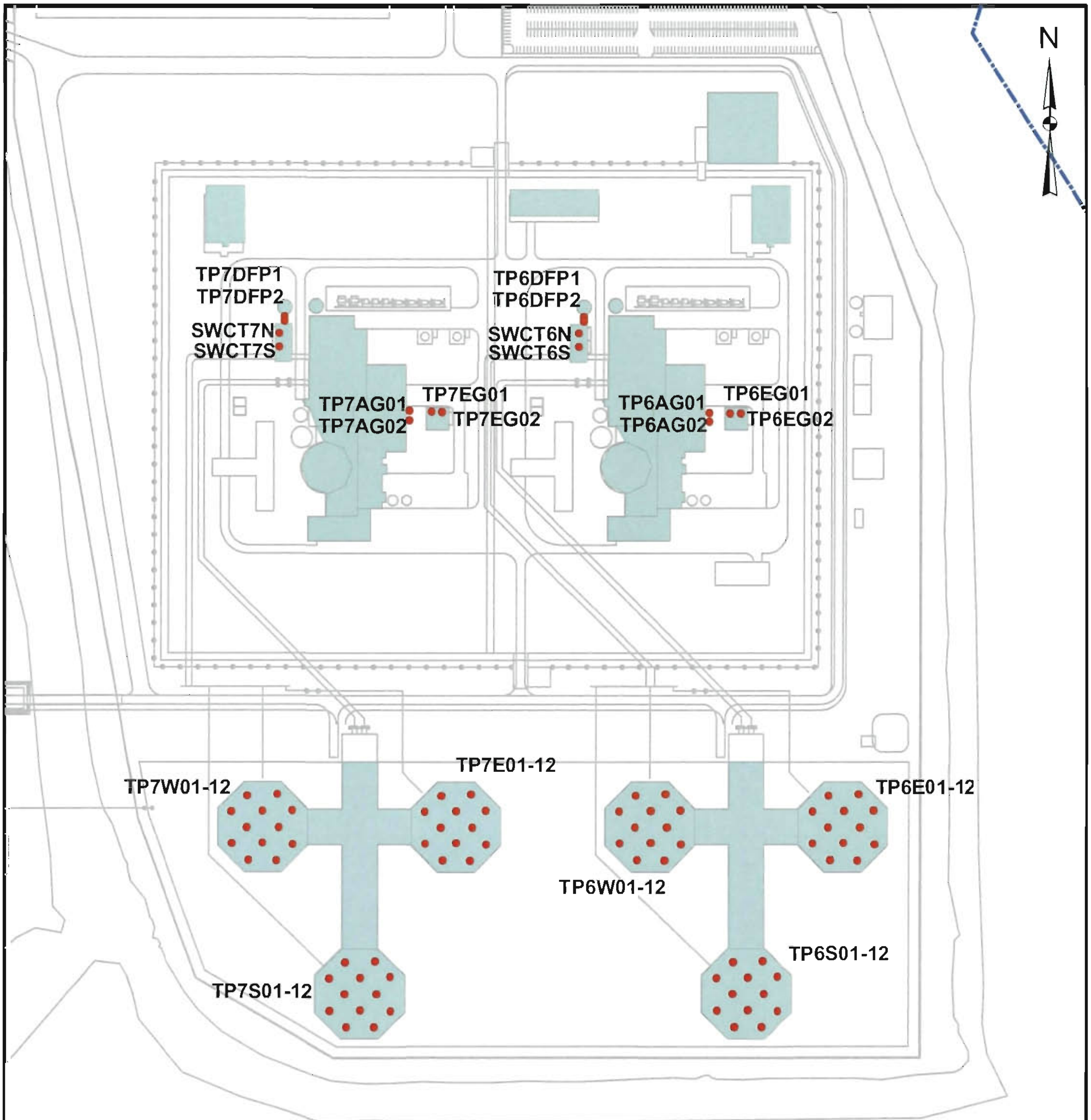
Note: Value inside box represents critical meteorological stability and wind speed condition for modeling.

TABLE 7-6
MAXIMUM 24-HOUR VISIBILITY IMPAIRMENT PREDICTED FOR THE PROPOSED PROJECT AT EVERGLADES NATIONAL PARK PSD CLASS I AREA

Background Extinction Calculations	Visibility Impairment (%) [a]			Visibility Impairment Criteria (%)
	2001	2002	2003	
Method 2 with RHMAX = 95 Percent	4.40	5.38[b]	3.84	5.0
Method 6 with monthly F(RH) factors	1.5	2.12	1.67	5.0

[a] Concentrations are highest predicted using CALPUFF V5.8 with CALMET V5.8 4-km Florida Domains, 2001 to 2003. Background extinctions calculated using FLAG Document (December 2000) and stated method.

[b] Two days greater than 5%: 5.02 and 5.38%. Based on 4 hours of generator and engine operation.



125 0 125 Meters

LEGEND

- Source Locations
- Buildings Used in Downwash
- Restricted Property Boundary Receptors

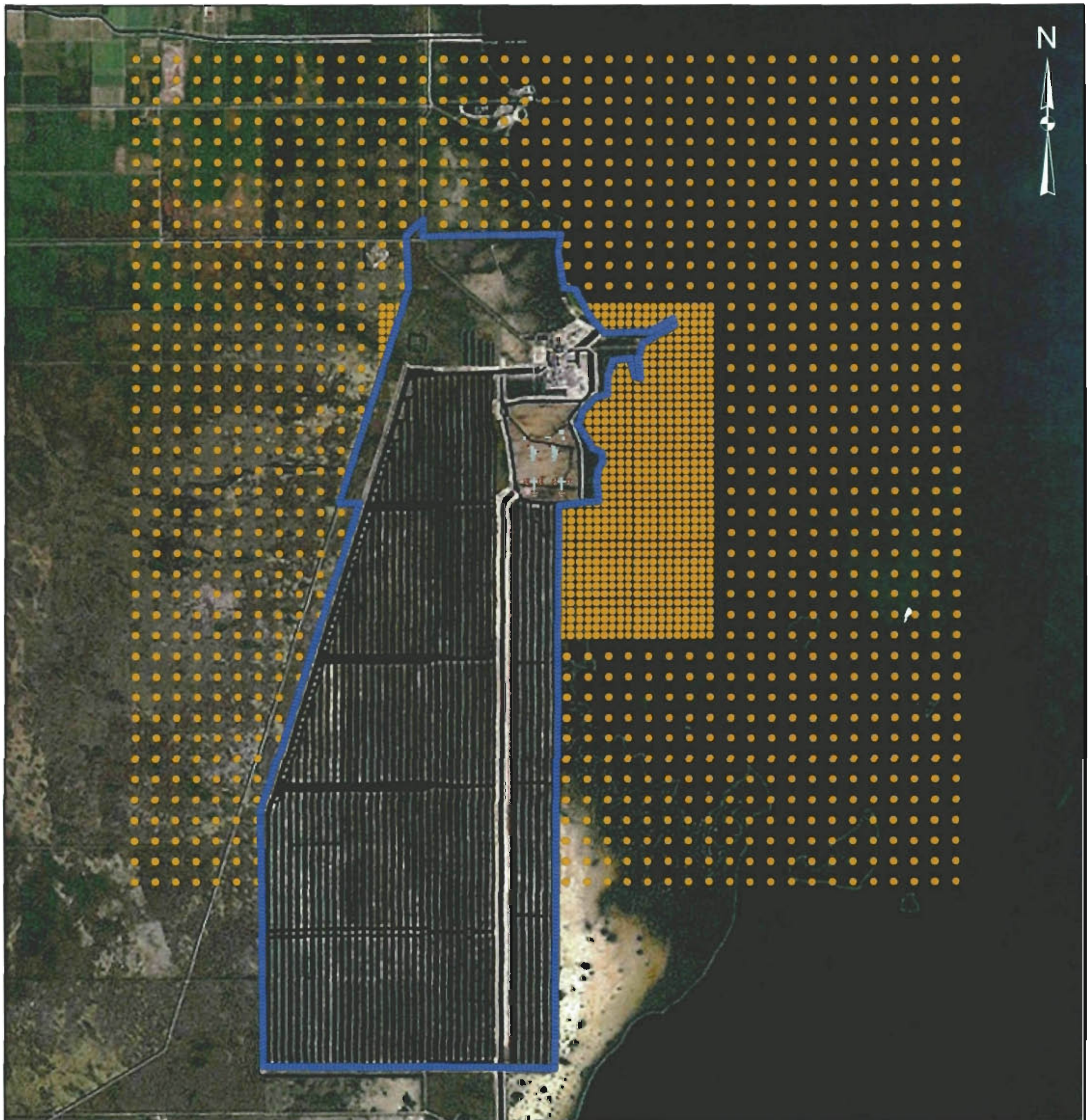
REFERENCES

PROJECT	TURKEY POINT UNITS 6 & 7 PROJECT
TITLE	Stacks, Structures, and Restricted Property Boundary Receptors Used in the Air Modeling Analysis

FPL

FILE No. 083875841002
REV. 0
PLOT DATE 06/11/2009

FIGURE 6-1



LEGEND

- Restricted Property Boundary Receptors
- Receptor Grid
- Buildings Used in Downwash

REFERENCES

PROJECT	TURKEY POINT UNITS 6 & 7 PROJECT
TITLE	Receptor Locations Used in the Air Modeling Analysis
FILE No.	083875841003
REV.	0
PLOT DATE	06/11/2009
FIGURE	6-2

FPL

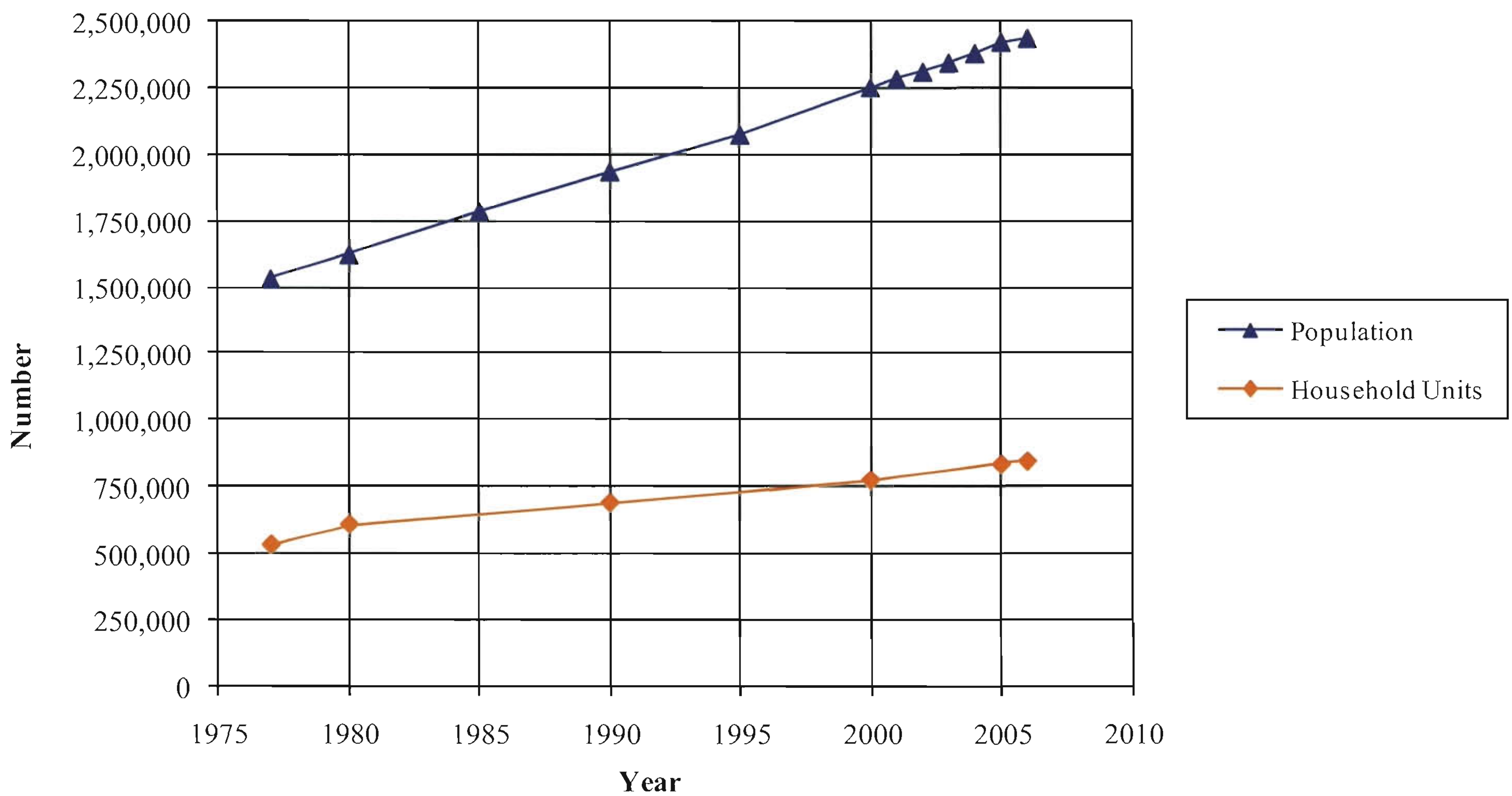


Figure 7-1
Population and Household Unit Trends in Miami-Dade County
Figure 7-1.docx

Source: UF/BEBR 1992, 1998, 2001, 2006, 2007.

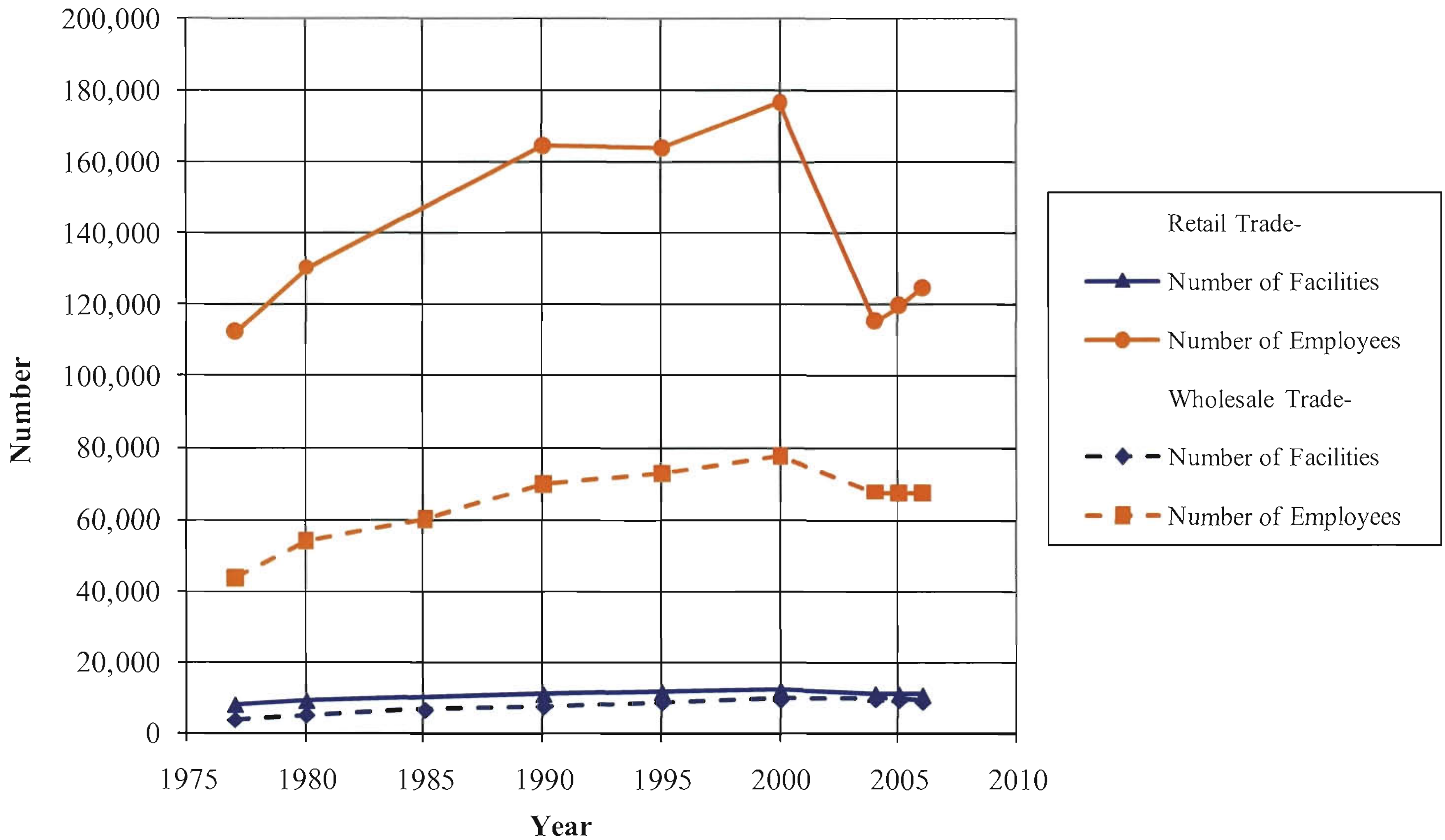


Figure 7-2
Retail and Wholesale Trade Trends in Miami-Dade County
Figure 7-2.docx

Source: UF/BEBR 1992, 1998, 2001, 2006, 2007.

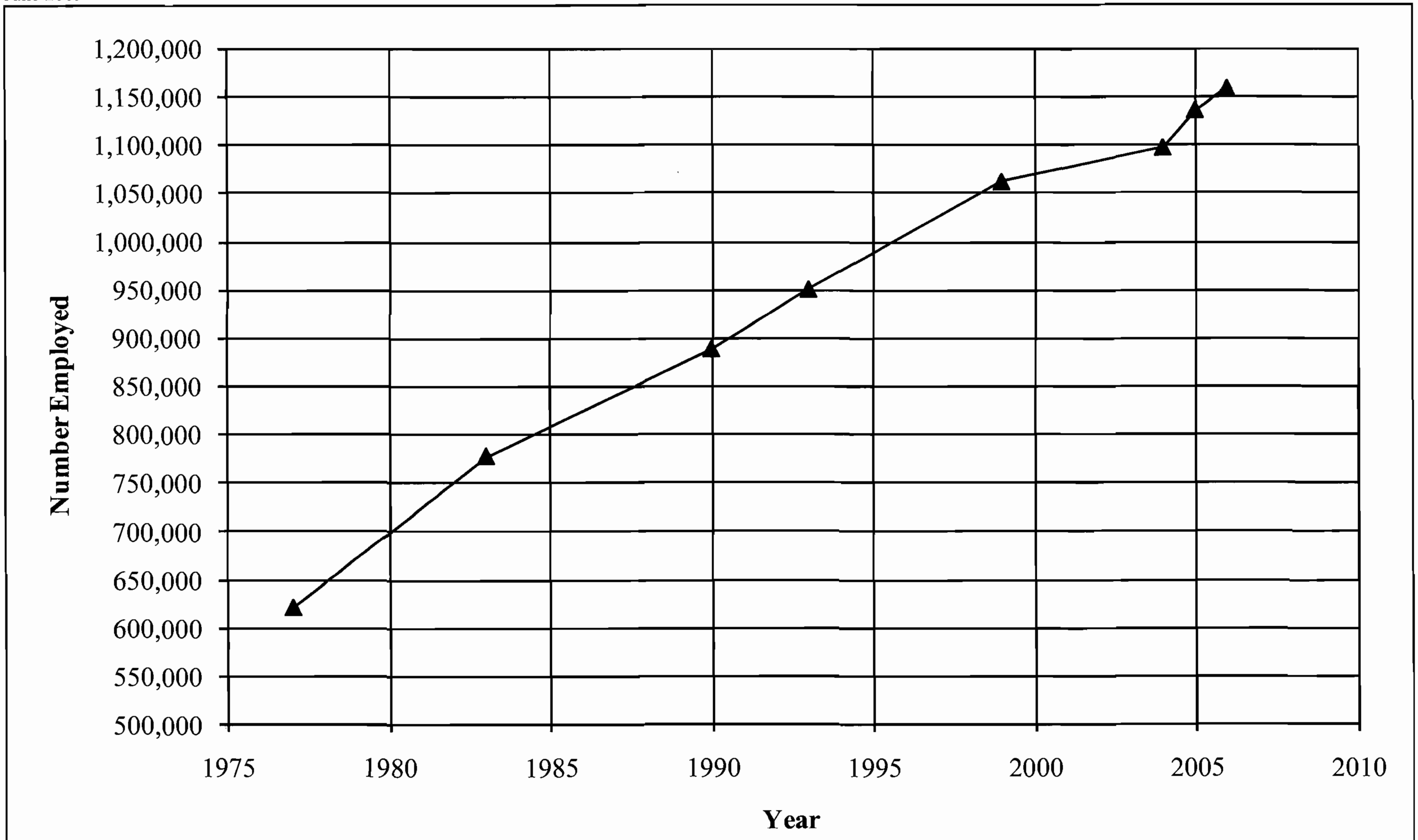


Figure 7-3
Labor Force Trend in Miami-Dade County
Figure 7-3.docx

Source: UF/BEBR 1992, 1998, 2001, 2006, 2007.

FPL.

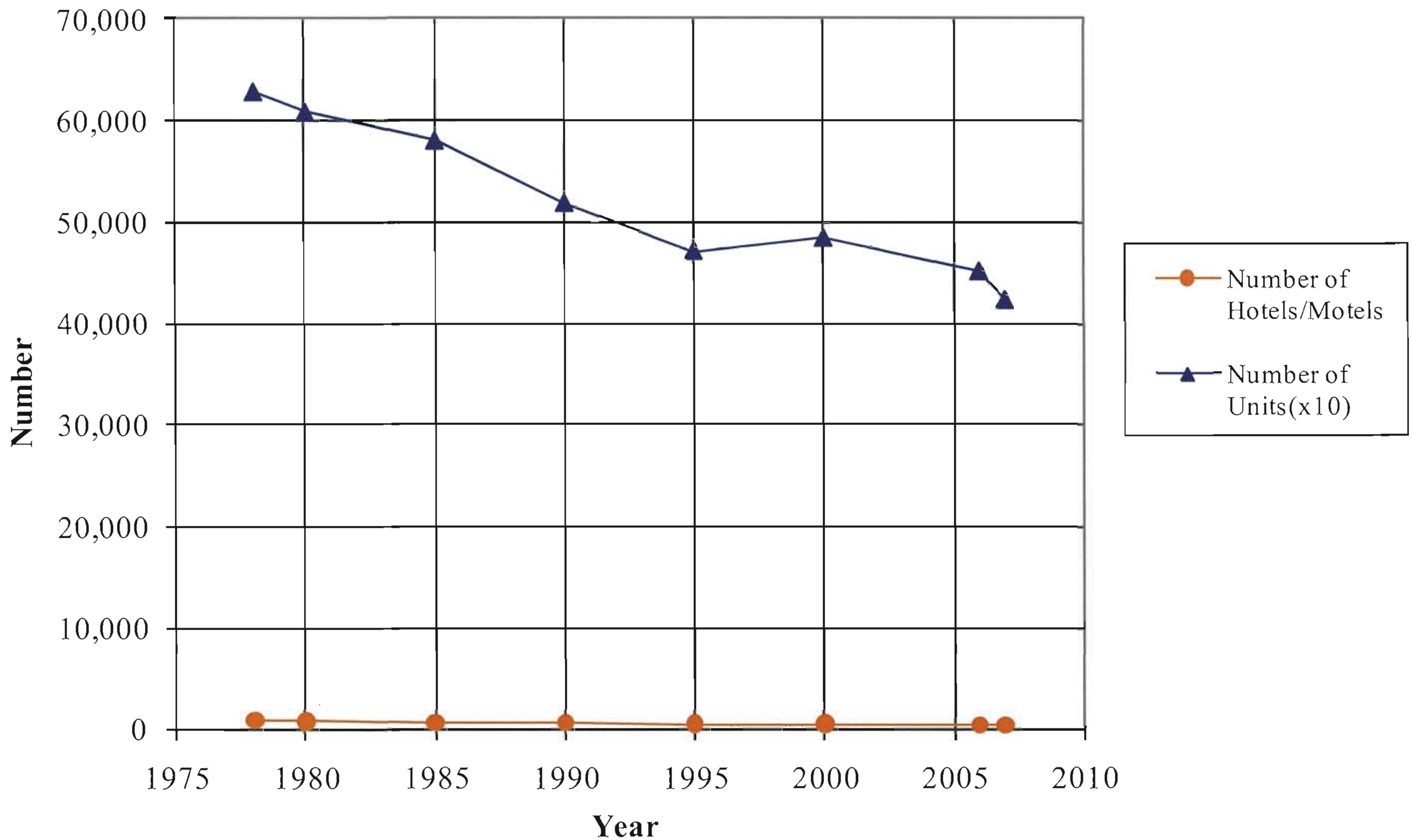


Figure 7-4
Hotel and Motel Trend in Miami-Dade County
Figure 7-4.docx

Source: UF/BEBR 1992, 1998, 2001, 2006, 2007.

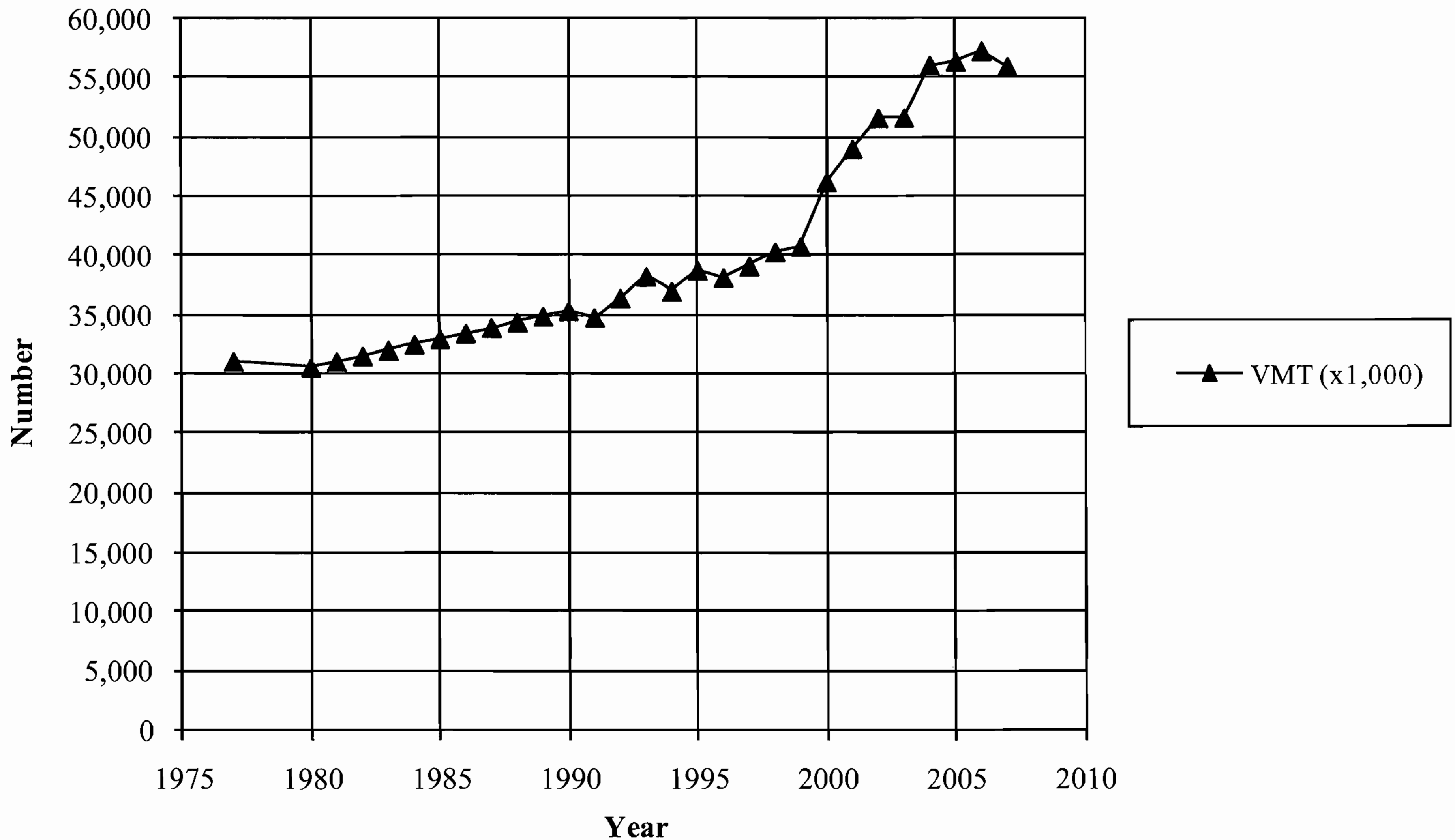


Figure 7-5
Vehicle Miles Traveled (VMT) Estimates for Motor Vehicles for Miami-Dade County
Figure 7-5.docx

Source: FDOT Public Road Miles Travelled Reports (1990-2007) and 1984 Centerline Miles.

FPL.

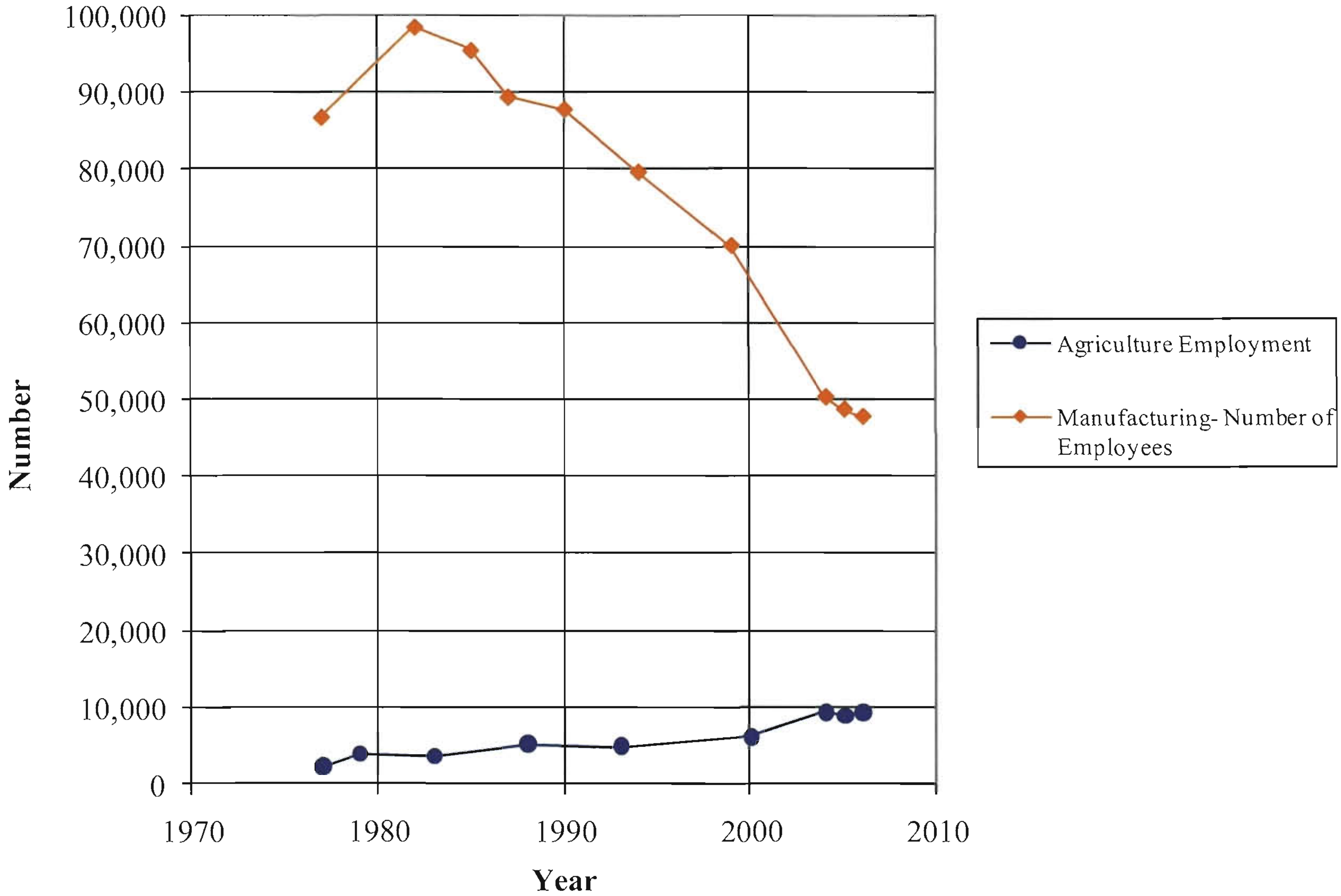


Figure 7-6
Manufacturing and Agriculture Trends in Miami-Dade County
Figure 7-6.docx

Source: UF/BEBR 1992, 1998, 2001, 2006, 2007.

FPL.

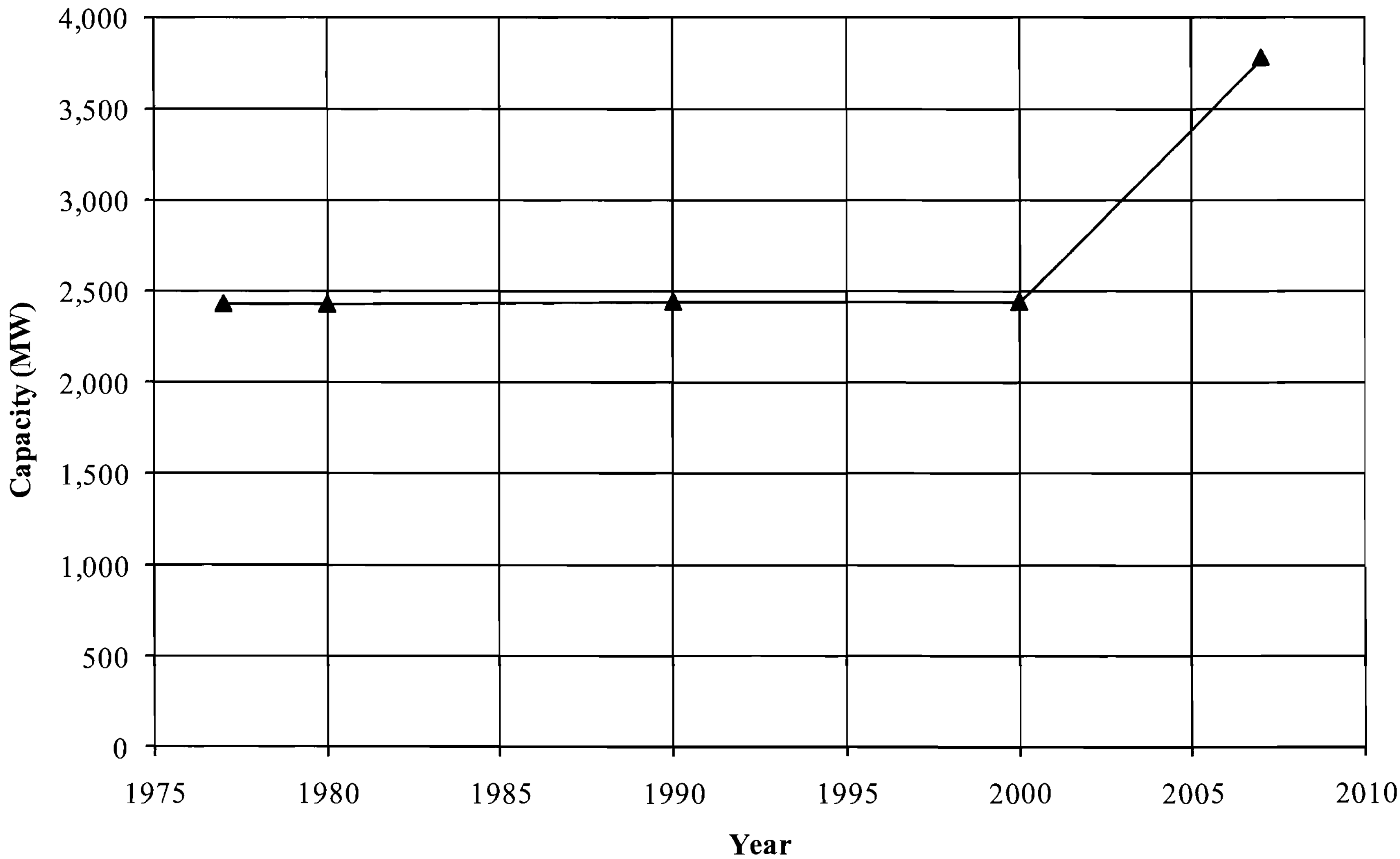


Figure 7-7
Electrical Power Generation Capacity in Miami-Dade County
Figure 7-7.docx

Source: FDEP, {year}.

FPL.

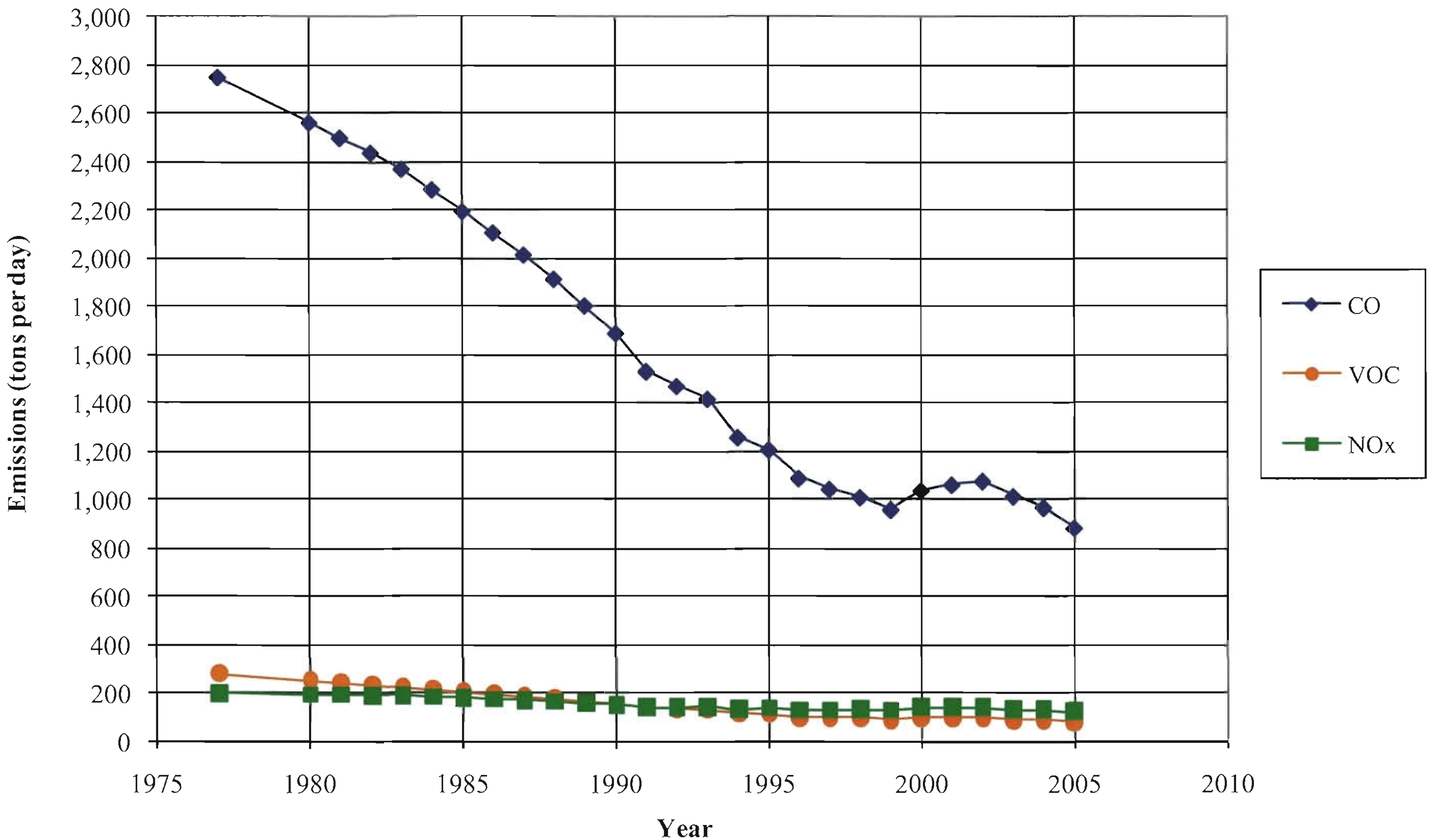


Figure 7-8
Mobile Source Emissions (Tons per Day) of CO, VOC, and NO_x in Miami-Dade County
Figure 7-8.docx

Source: MOBILE6 output 1997-2005.

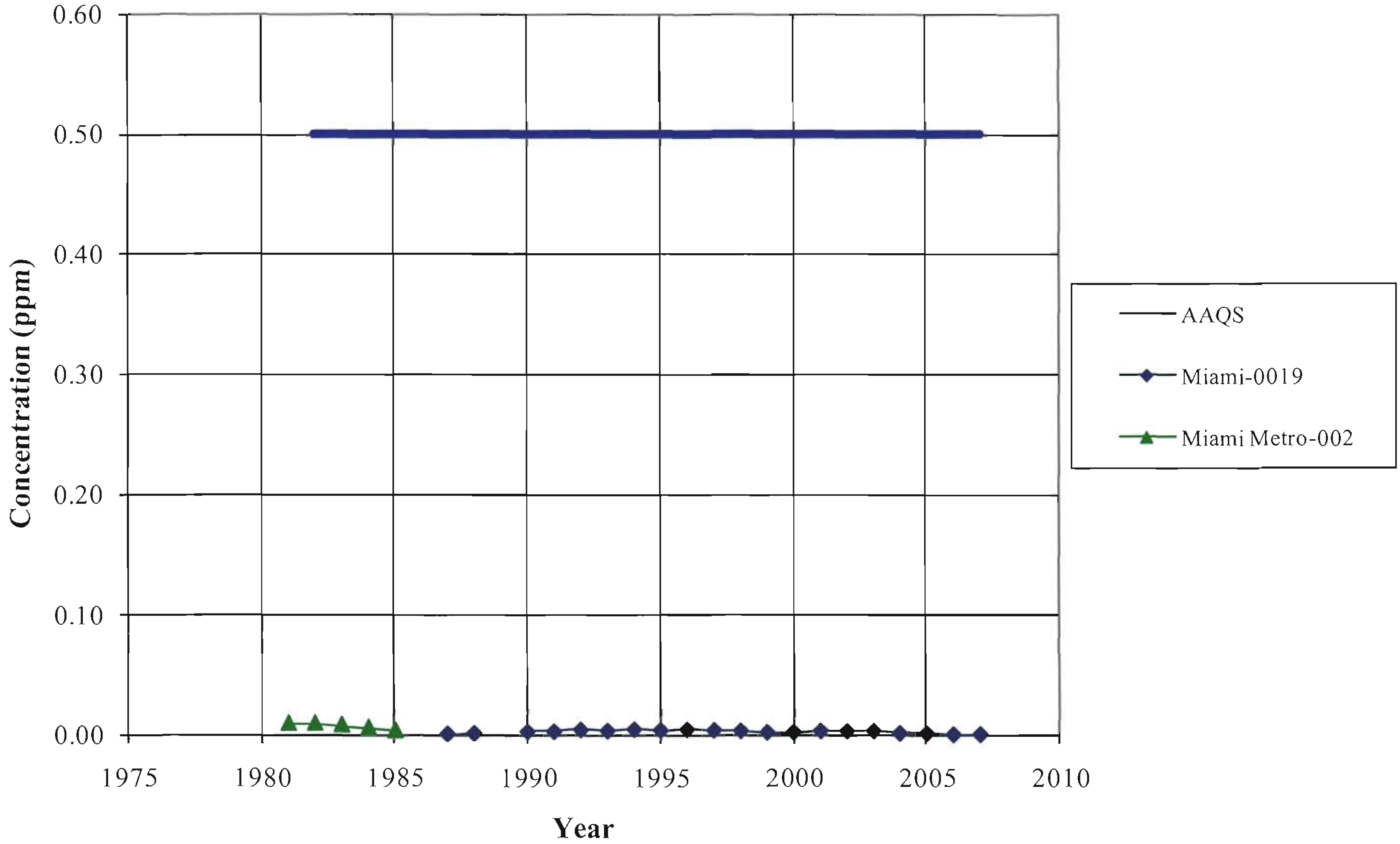


Figure 7-9
Measured 3-Hour Average SO_2 Concentrations (2nd Highest Values) 1981-2002
Miami-Dade County
Figure 7-9.docx
Source: FDEP Quick Look Reports 1984-2007.

FPL.

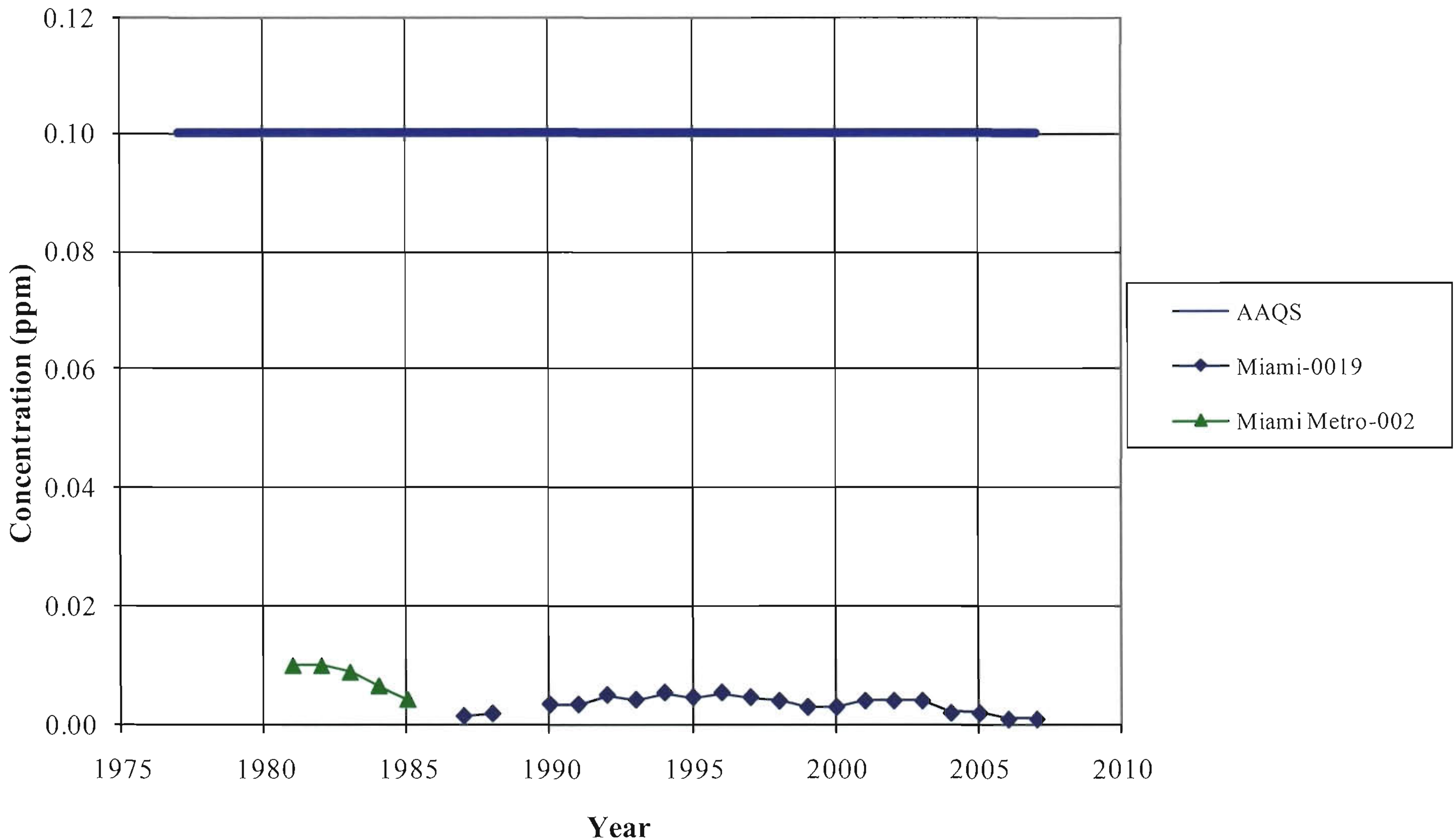


Figure 7-10
Measured 24-Hour Average SO_2 Concentrations (2nd Highest Values) 1981-2002
Miami-Dade County
Figure 7-10.docx
Source: FDEP Quick Look Reports 1984-2007.

FPL.

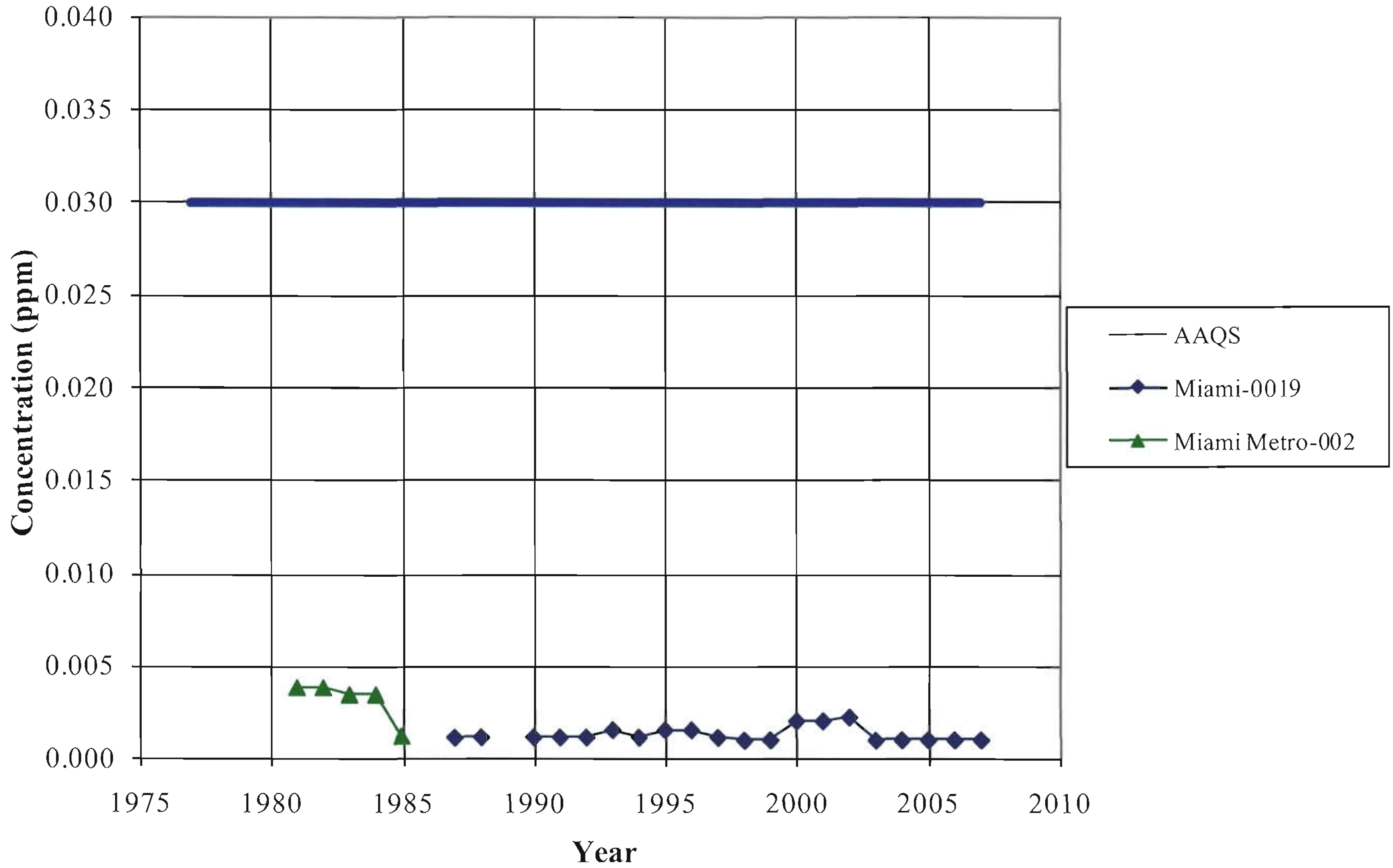


Figure 7-11
Measured Annual Average SO_2 Concentrations 1981-2002 - Miami-Dade County
Figure 7-11.docx

Source: FDEP Quick Look Reports 1984-2007.

FPL.

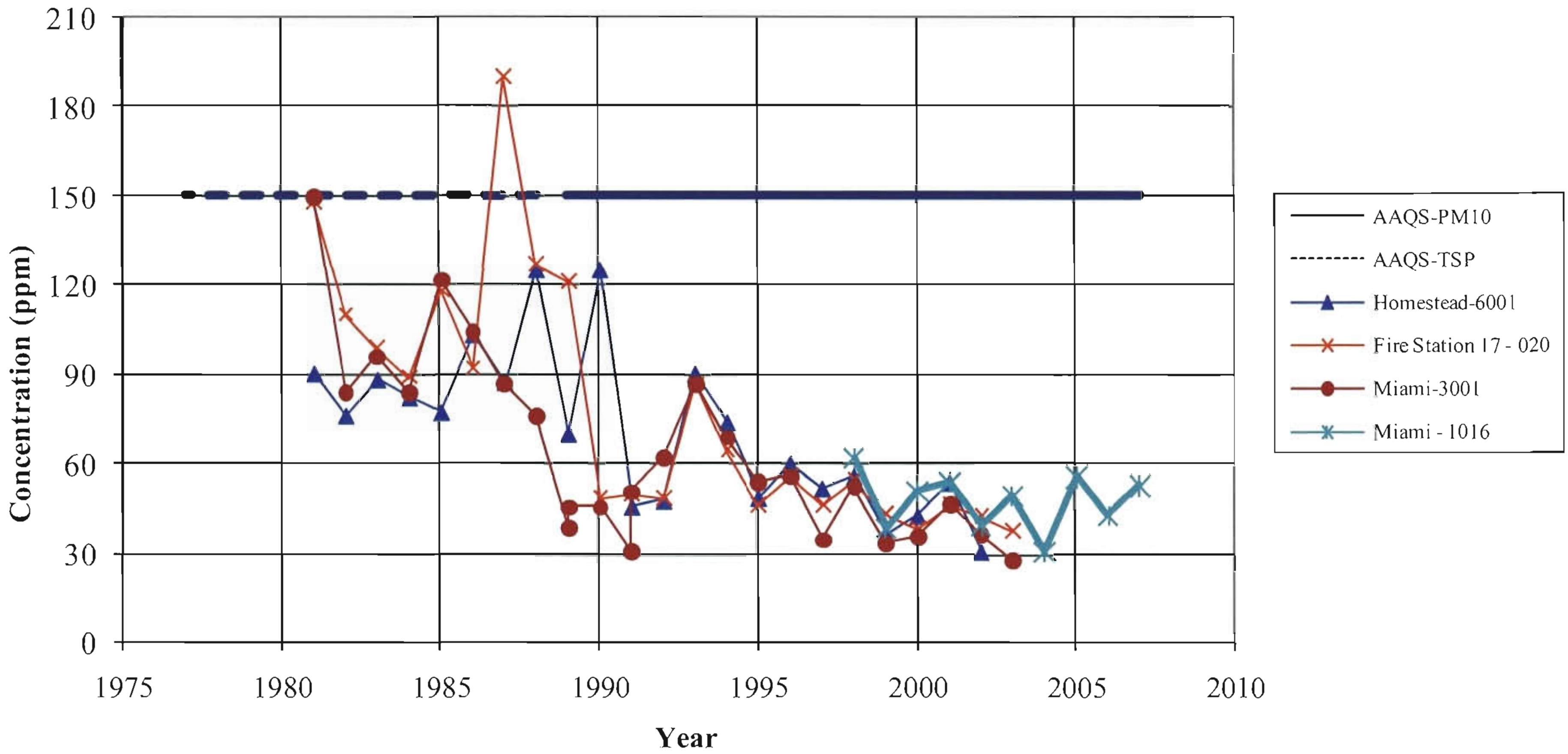


Figure 7-12
Measured 24-Hour Average PM_{10} (1988 to 2002) and TSP (1981 to 1987) Concentrations
(2nd Highest Values) - Miami-Dade County
Figure 7-12.docx
Source: FDEP Quick Look Reports 1984-2007.

FPL.

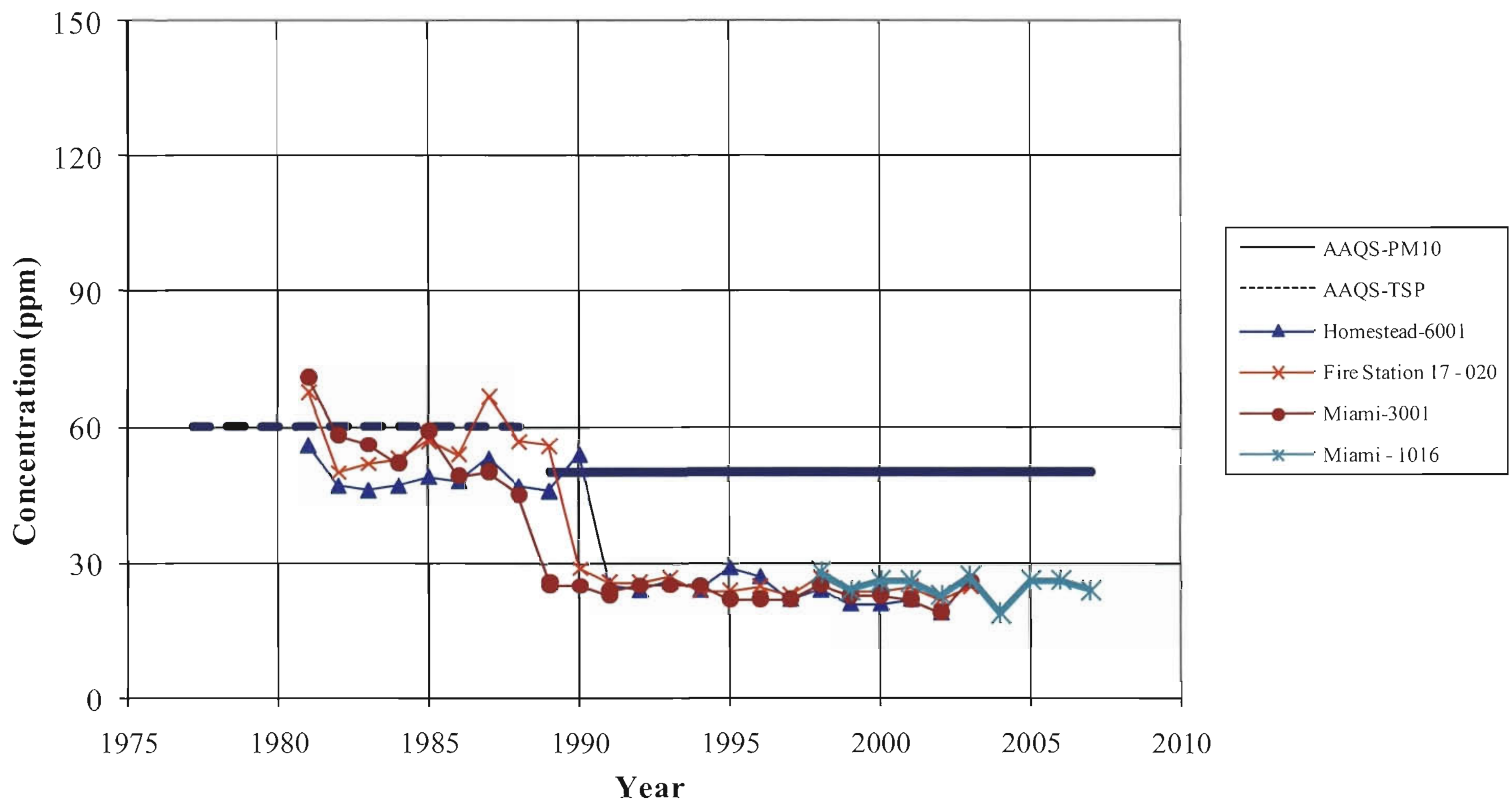


Figure 7-13
Measured Annual Average PM_{10} (1988 to 2002) and TSP (1981 to 1987) Concentrations
Miami-Dade County
Figure 7-13.docx
Source: FDEP Quick Look Reports 1984-2007.

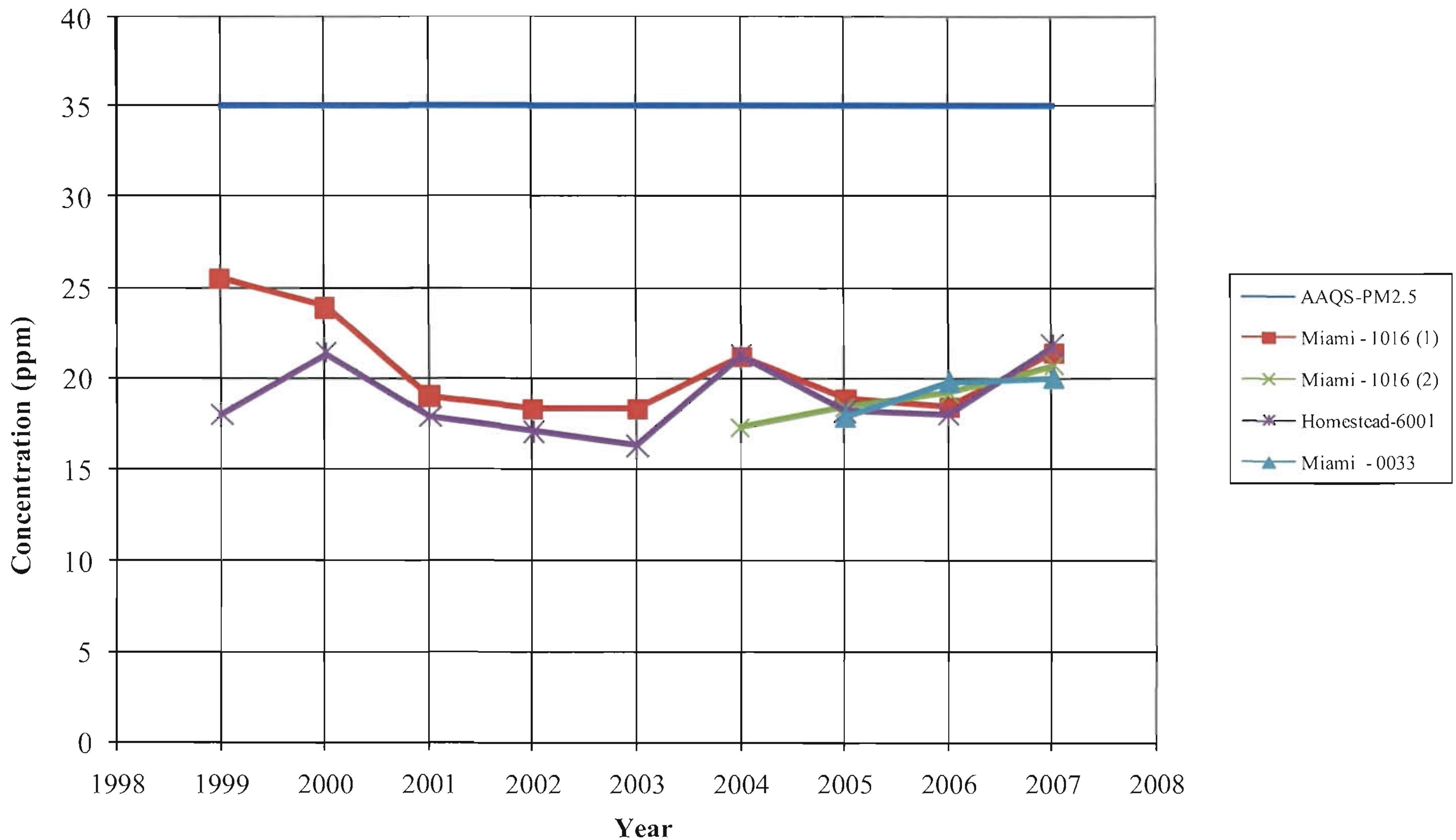


Figure 7-14
Measured 24-Hour Average $PM_{2.5}$ Concentrations 1999-2007 (98th Percentile Values)
Miami-Dade County
Figure 7-14.docx
Source: FDEP Quick Look Reports 1984-2007.

FPL.

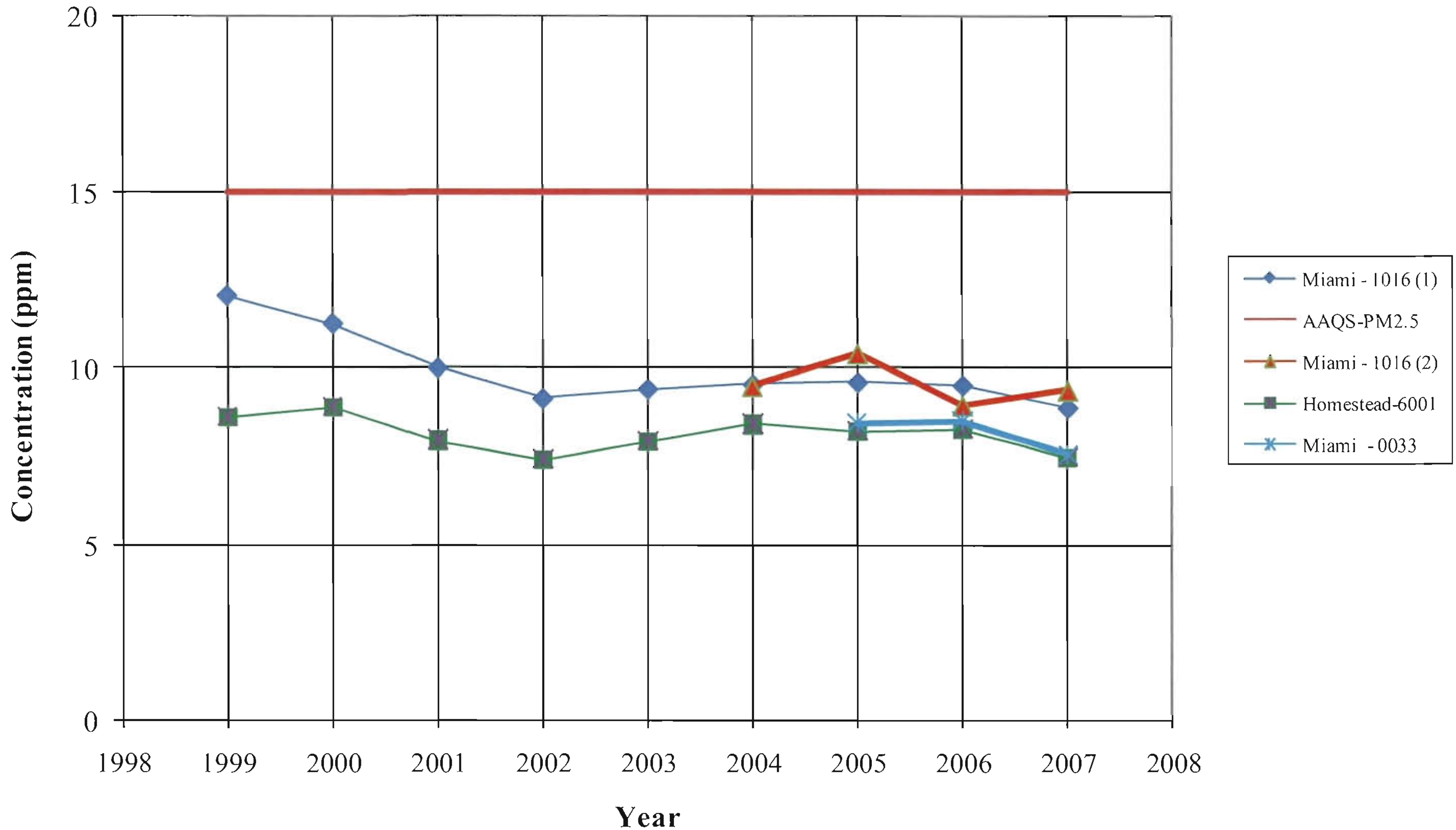


Figure 7-15
Measured Annual Average $PM_{2.5}$ Concentrations 1999-2007 - Miami-Dade County
Figure 7-15.docx

Source: FDEP Quick Look Reports 1984-2007.

FPL

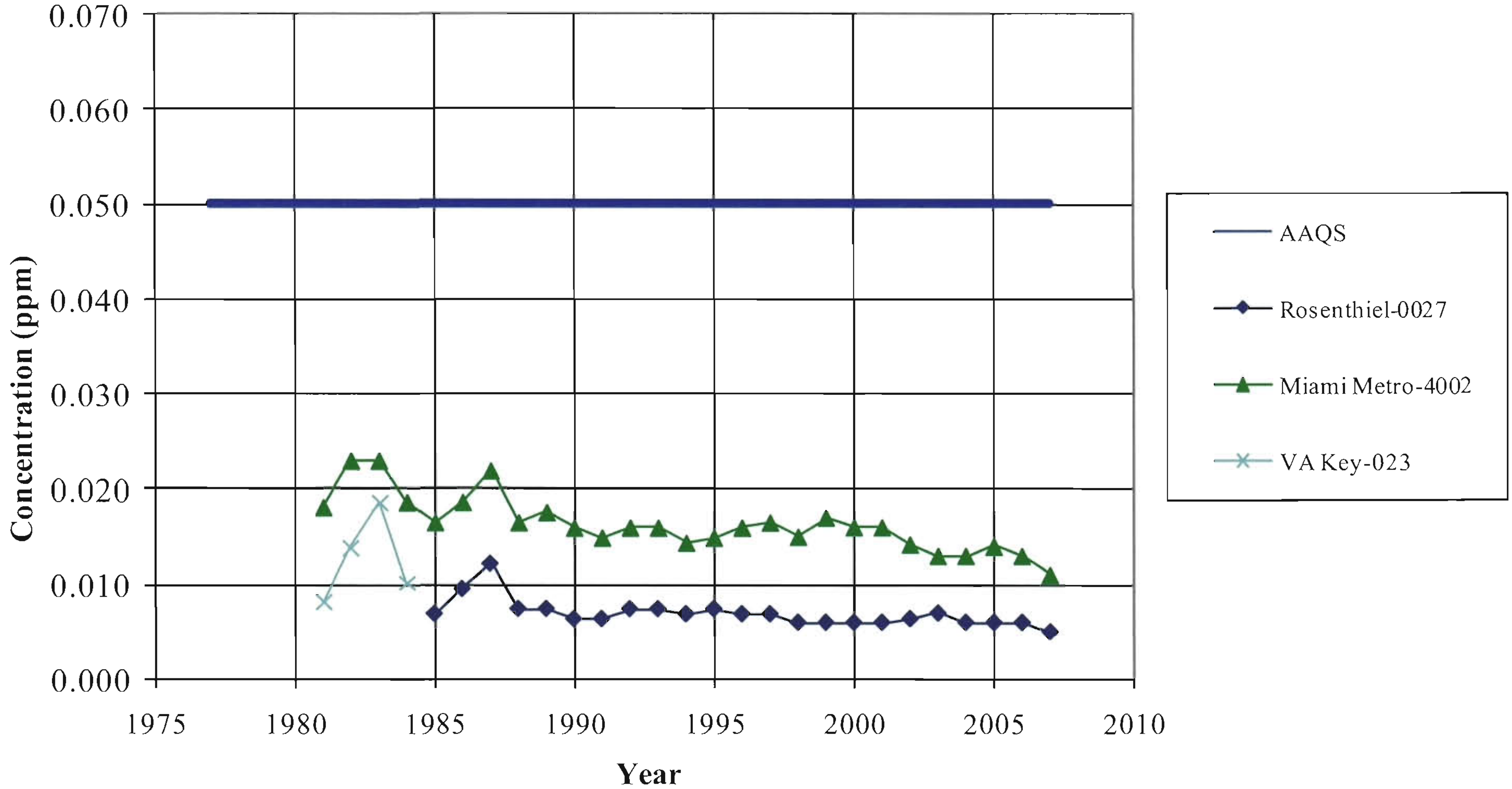


Figure 7-16
Measured Annual Average NO_2 Concentrations 1981-2007 - Miami-Dade County
Figure 7-16.docx

Source: FDEP Quick Look Reports 1984-2007.

FPL

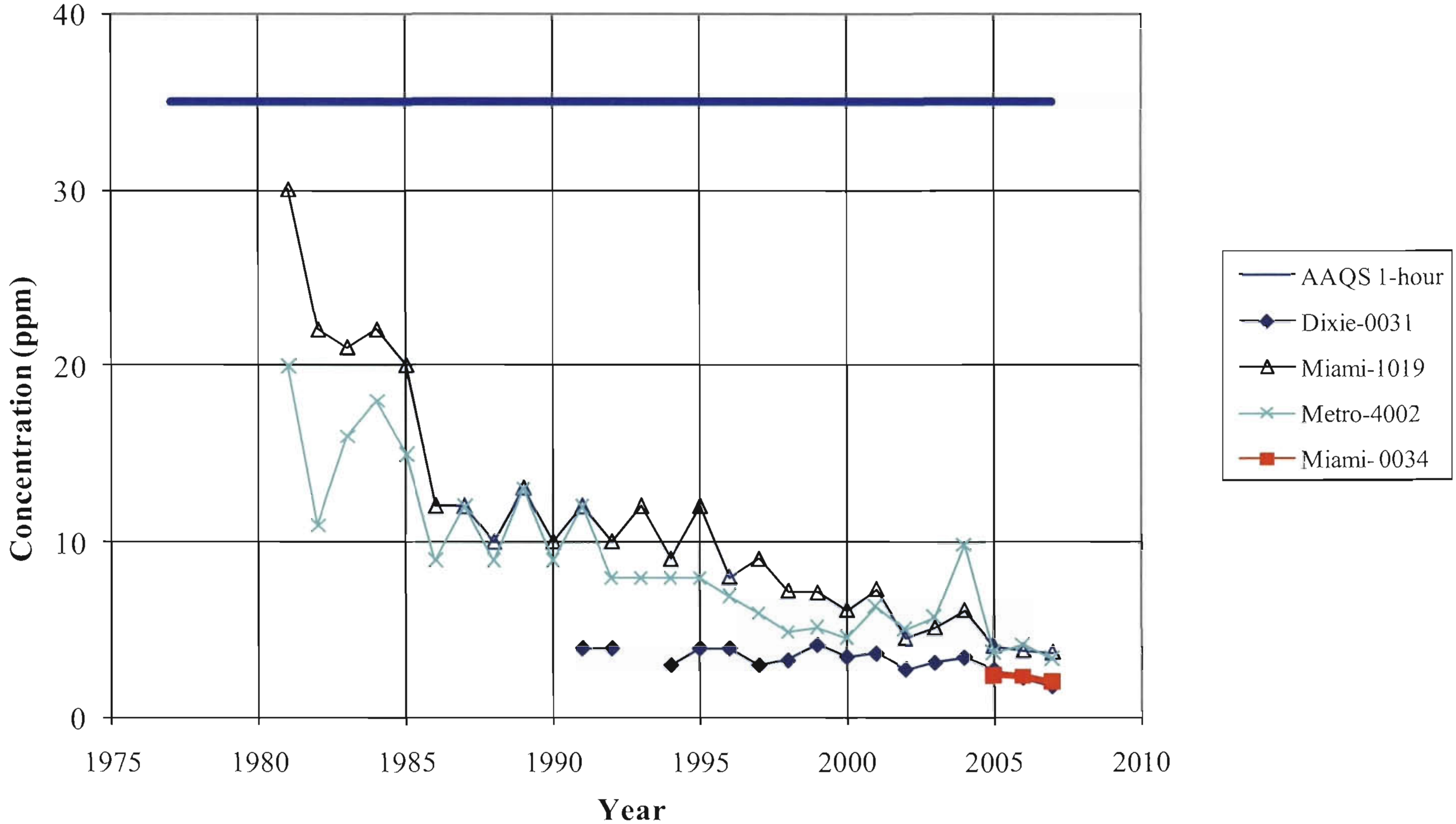


Figure 7-17
Measured 1-Hour Average CO Concentrations (2nd Highest Values) 1981-2007
Miami-Dade County
Figure 7-17.docx
Source: FDEP Quick Look Reports 1984-2007.

FPL

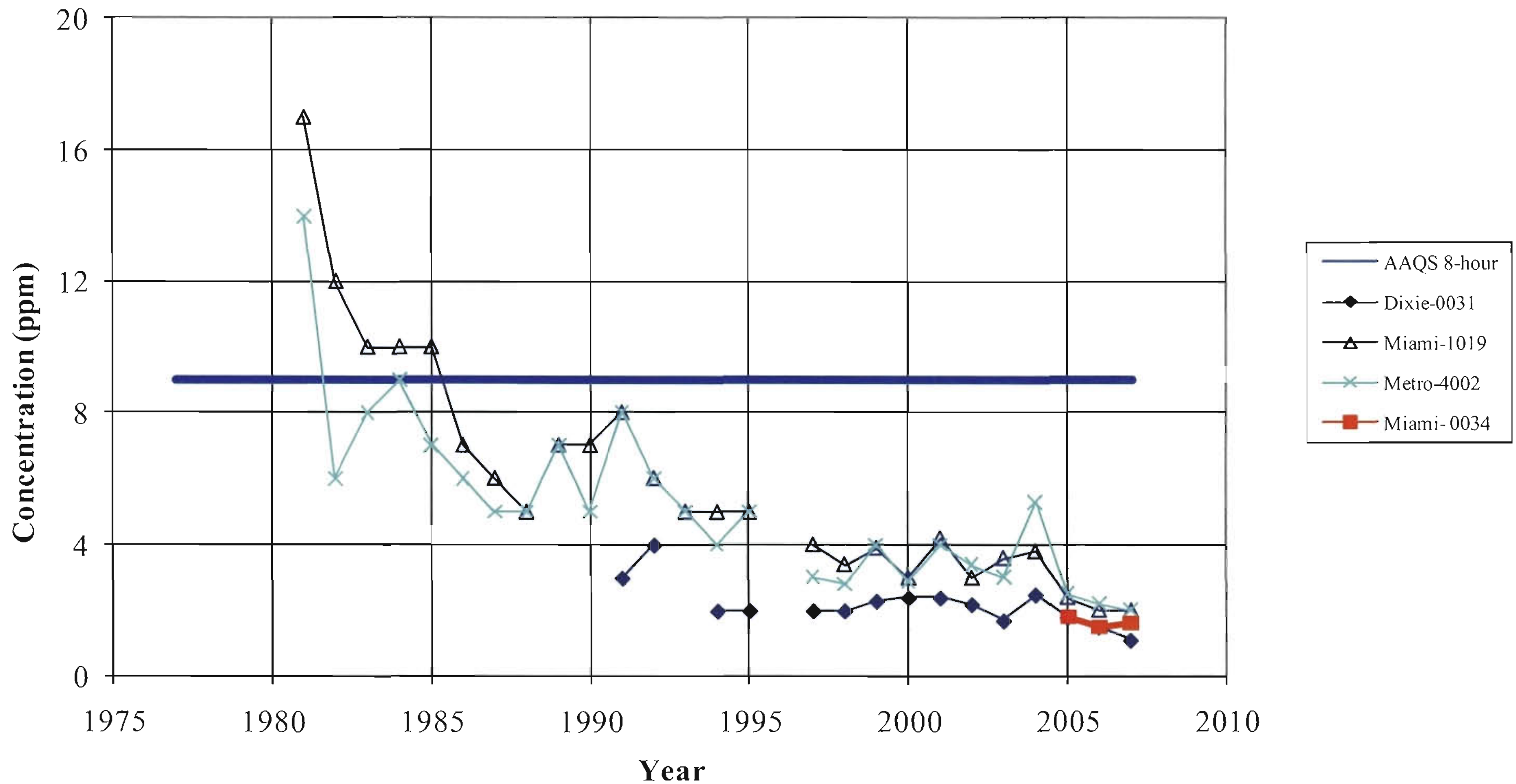


Figure 7-18
Measured 8-Hour Average CO Concentrations (2nd Highest Values) 1981-2007
Miami-Dade County
Figure 7-18.docx
Source: FDEP Quick Look Reports 1984-2007.

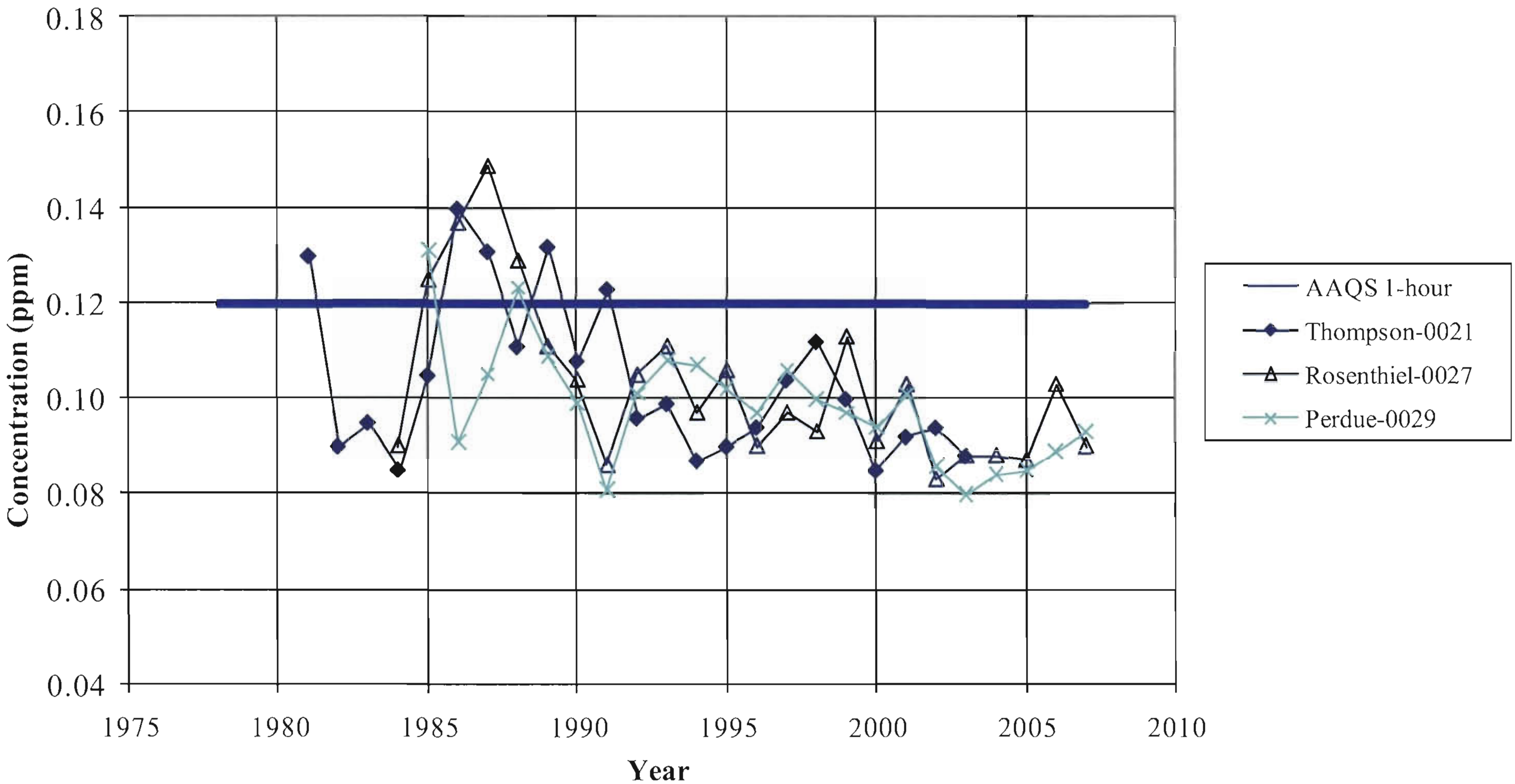


Figure 7-19
Measured 1-Hour Average O_3 Concentrations (2nd Highest Values) 1981-2007
Miami-Dade County
Figure 7-19.docx
Source: FDEP Quick Look Reports 1984-2007.

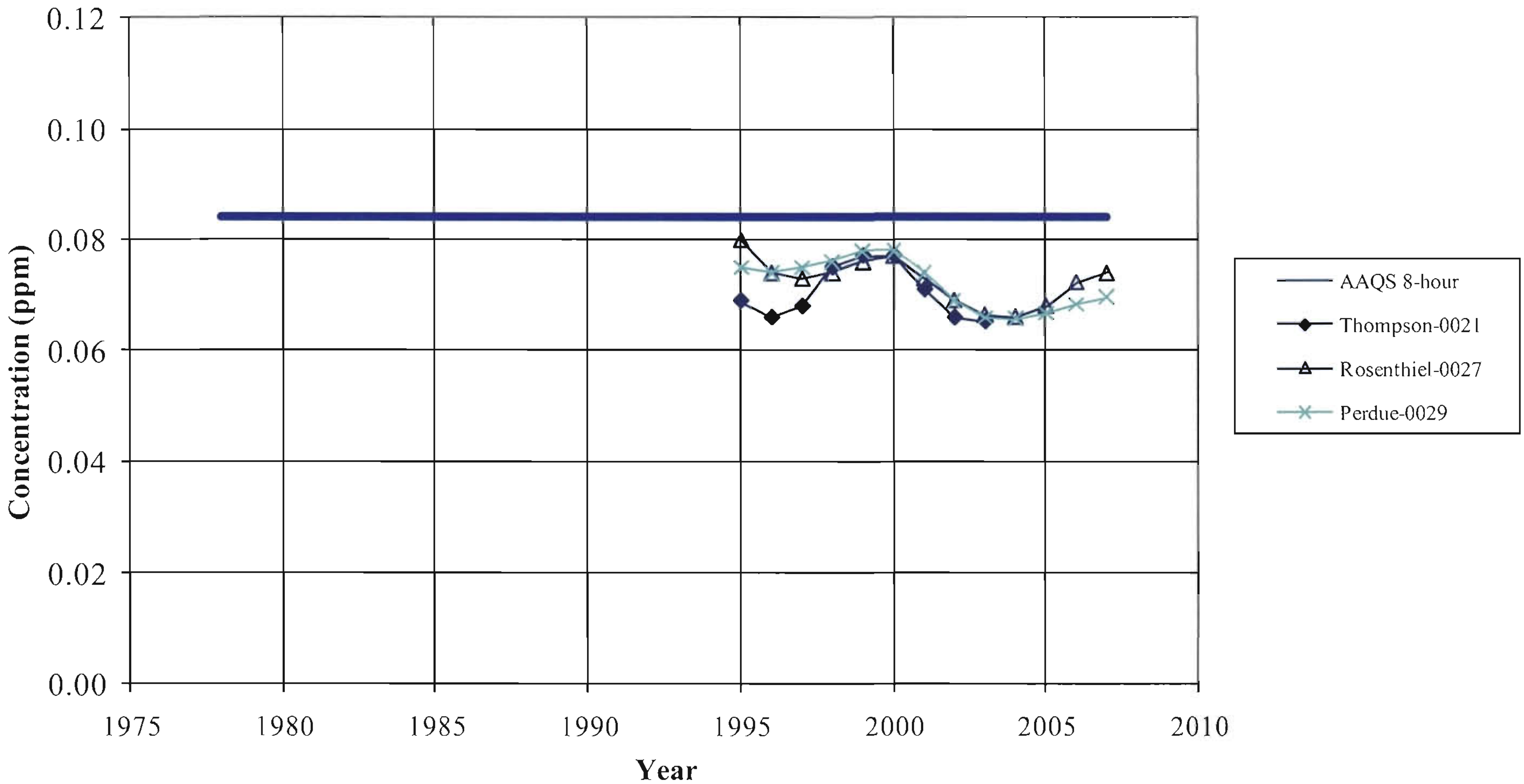


Figure 7-20
Measured 8-Hour Average O_3 Concentrations (3-Year Average; 99^{th} Percentile) 1995-2007
Miami-Dade County
Figure 7-20.docx
Source: FDEP Quick Look Reports 1984-2007.

Figure 7-21
Level I VISCREEN Analysis
Visual Effects Screening Analysis for
Source: TURKEY PT UNITS 6&7
Class I Area: EVERGLADES NP

*** Level-1 Screening ***

Input Emissions for

Particulates	8.47	LB /HR
NOx (as NO2)	62.95	LB /HR
Primary NO2	.00	LB /HR
Soot	.00	LB /HR
Primary SO4	.00	LB /HR

**** Default Particle Characteristics Assumed

Transport Scenario Specifications:

Background Ozone:	.04 ppm
Background Visual Range:	177.80 km
Source-Observer Distance:	19.70 km
Min. Source-Class I Distance:	19.70 km
Max. Source-Class I Distance:	125.00 km
Plume-Source-Observer Angle:	11.25 degrees
Stability: 6	
Wind Speed: 1.00 m/s	

R E S U L T S

Asterisks (*) indicate plume impacts that exceed screening criteria

Maximum Visual Impacts INSIDE Class I Area
Screening Criteria ARE Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	155.	35.0	14.	2.00	3.665*	.05	.019
SKY	140.	155.	35.0	14.	2.00	2.221*	.05	-.032
TERRAIN	10.	84.	19.7	84.	2.00	3.322*	.05	.018
TERRAIN	140.	84.	19.7	84.	2.00	.336	.05	.002

Maximum Visual Impacts OUTSIDE Class I Area
Screening Criteria ARE Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	1.	1.0	168.	2.00	10.165*	.05	.177*
SKY	140.	1.	1.0	168.	2.00	3.260*	.05	-.096*
TERRAIN	10.	1.	1.0	168.	2.00	20.760*	.05	.197*
TERRAIN	140.	1.	1.0	168.	2.00	3.226*	.05	.058*

Figure 7-22
Level 2 VISCREEN Analysis - Daytime Hours
Visual Effects Screening Analysis for
Source: TURKEY PT UNITS 6&7
Class I Area: EVERGLADES NP

*** User-selected Screening Scenario Results ***

Input Emissions for

Particulates	8.47	LB /HR
NOx (as NO2)	62.95	LB /HR
Primary NO2	.00	LB /HR
Soot	.00	LB /HR
Primary SO4	.00	LB /HR

**** Default Particle Characteristics Assumed

Transport Scenario Specifications:

Background Ozone:	.04 ppm
Background Visual Range:	177.80 km
Source-Observer Distance:	19.70 km
Min. Source-Class I Distance:	19.70 km
Max. Source-Class I Distance:	125.00 km
Plume-Source-Observer Angle:	11.25 degrees
Stability: 5	
Wind Speed: 2.00 m/s	

R E S U L T S

Asterisks (*) indicate plume impacts that exceed screening criteria

Maximum Visual Impacts INSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	155.	35.0	14.	2.00	1.017	.05	.005
SKY	140.	155.	35.0	14.	2.00	.623	.05	-.009
TERRAIN	10.	84.	19.7	84.	2.00	.964	.05	.005
TERRAIN	140.	84.	19.7	84.	2.00	.093	.05	.001

Maximum Visual Impacts OUTSIDE Class I Area
Screening Criteria ARE Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	1.	1.0	168.	2.00	4.286*	.05	.052*
SKY	140.	1.	1.0	168.	2.00	2.018*	.05	-.042
TERRAIN	10.	1.	1.0	168.	2.00	8.530*	.05	.078*
TERRAIN	140.	1.	1.0	168.	2.00	1.678	.05	.022

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APPENDIX A

EXPECTED PERFORMANCE AND EMISSION INFORMATION

EMISSION TABLES

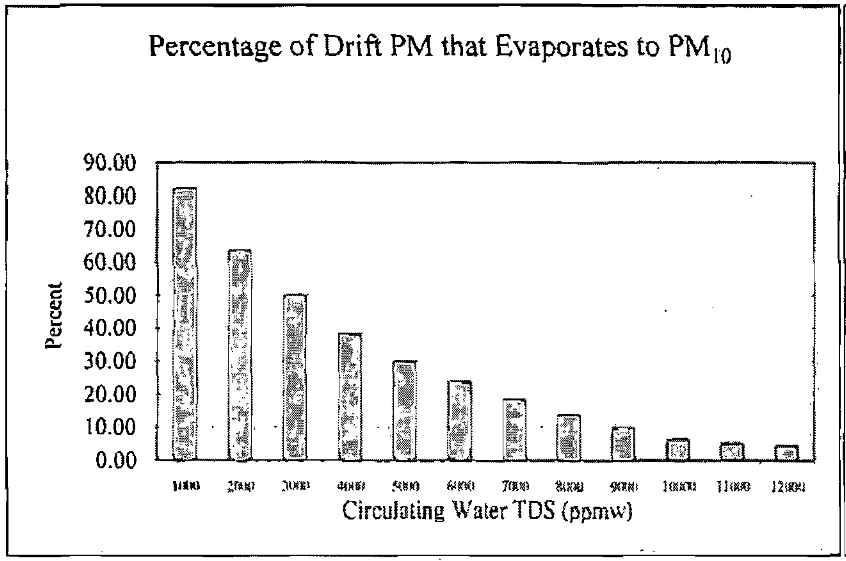
PM AND PM_{10} EMISSION RATE CALCULATIONS FOR COOLING TOWER

TABLE A-1
TURKEY POINT 6 & 7 CIRCULATING WATER COOLING TOWERS
VARIATION OF COOLING TOWER PM AND PM_{10} EMISSION RATES WITH TOTAL DISSOLVED SOLIDS (TDS) CONTENT

TDS (ppmw)	PM Emission Rate (lb/hr)	Percent of Emissions $\leq PM_{10}$ %	PM_{10} Emissions (lb/hr)
1000	1.579	82.04	1.295
2000	3.158	63.50	2.005
3000	4.736	50.00	2.368
4000	6.315	38.33	2.421
5000	7.894	29.97	2.366
6000	9.473	23.59	2.235
7000	11.051	18.20	2.011
8000	12.630	13.57	1.714
9000	14.209	9.65	1.371
10000	15.788	6.28	0.991
11000	17.366	5.11	0.887
12000	18.945	4.46	0.845
30000	47.363	0.76	0.360
65000	107.664	0.29	0.312

Tower Circulation Rate (GPM)	Drift Rate %
631,000	0.0005

Calculated PM_{10} % $\leq PM_{10}$ %
82.04
63.50
50.00
38.33
29.97
23.59
18.20
13.57
9.65
6.28
5.11
4.46
0.76
0.29



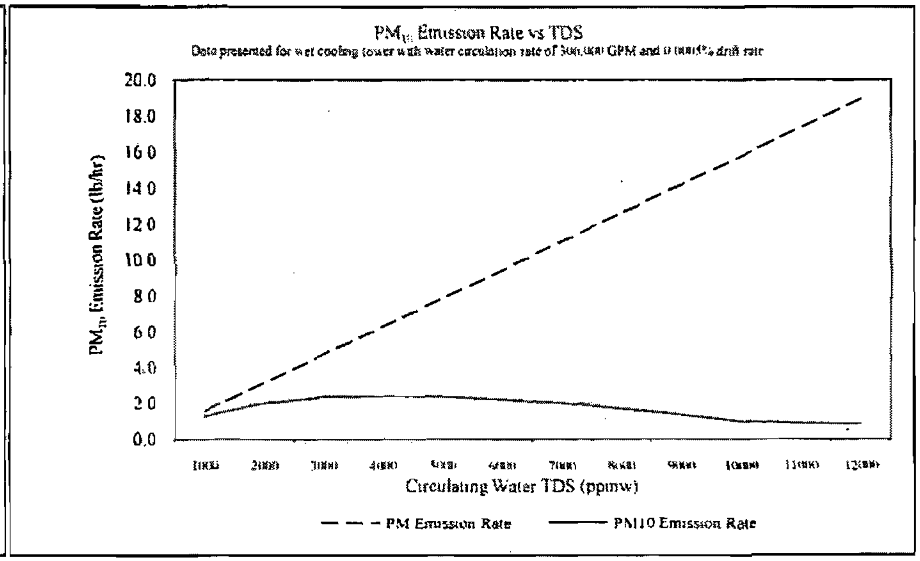


TABLE A-2
RESULTANT SOLID PARTICULATE SIZE DISTRIBUTION (TDS = 4,000 PPMW)

EPRI Droplet Diameter (μm)	Droplet Volume (μm³)	Droplet Mass (μg)	Particulate Mass (Solids) (μg)	Solid Particulate Volume (μm³)	Solid Particulate Diameter (μm)	EPRI % Mass Smaller
10	523.6	5.24E-04	2.09E-06	0.95	1.221	0.000
20	4188.8	4.19E-03	1.68E-05	7.62	2.441	0.196
30	14137.2	1.41E-02	5.65E-05	25.70	3.662	0.226
40	33510.3	3.35E-02	1.34E-04	60.93	4.882	0.514
50	65449.8	6.54E-02	2.62E-04	119.00	6.103	1.816
60	113097.3	1.13E-01	4.52E-04	205.63	7.323	5.702
70	179594.4	1.80E-01	7.18E-04	326.54	8.544	21.348
90	381703.5	3.82E-01	1.53E-03	694.01	10.985	49.812
110	696910.0	6.97E-01	2.79E-03	1267.11	13.426	70.509
130	1150346.5	1.15E+00	4.60E-03	2091.54	15.867	82.023
150	1767145.9	1.77E+00	7.07E-03	3212.99	18.308	88.012
180	3053628.1	3.05E+00	1.22E-02	5552.05	21.969	91.032
210	4849048.3	4.85E+00	1.94E-02	8816.45	25.631	92.468
240	7238229.5	7.24E+00	2.90E-02	13160.42	29.293	94.091
270	10305994.7	1.03E+01	4.12E-02	18738.17	32.954	94.689
300	14137166.9	1.41E+01	5.65E-02	25703.94	36.616	96.288
350	22449297.5	2.24E+01	8.98E-02	40816.90	42.718	97.011
400	33510321.6	3.35E+01	1.34E-01	60927.86	48.821	98.340
450	47712938.4	4.77E+01	1.91E-01	86750.80	54.924	99.071
500	65449846.9	6.54E+01	2.62E-01	118999.72	61.026	99.071
600	113097335.5	1.13E+02	4.52E-01	205631.52	73.231	100.000

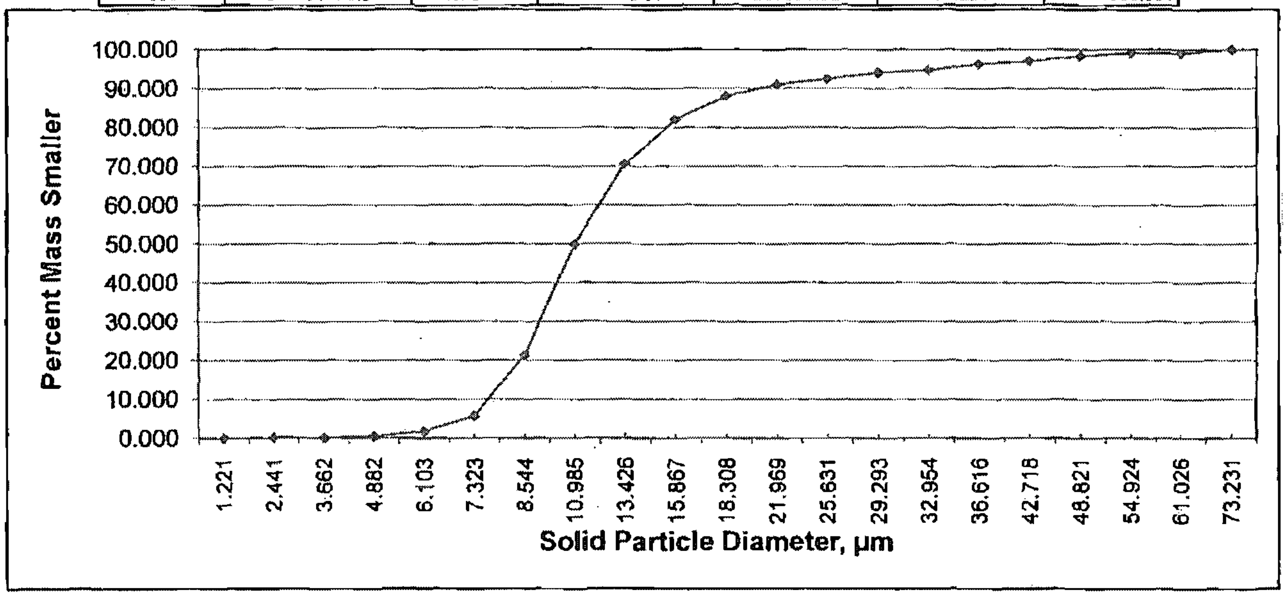
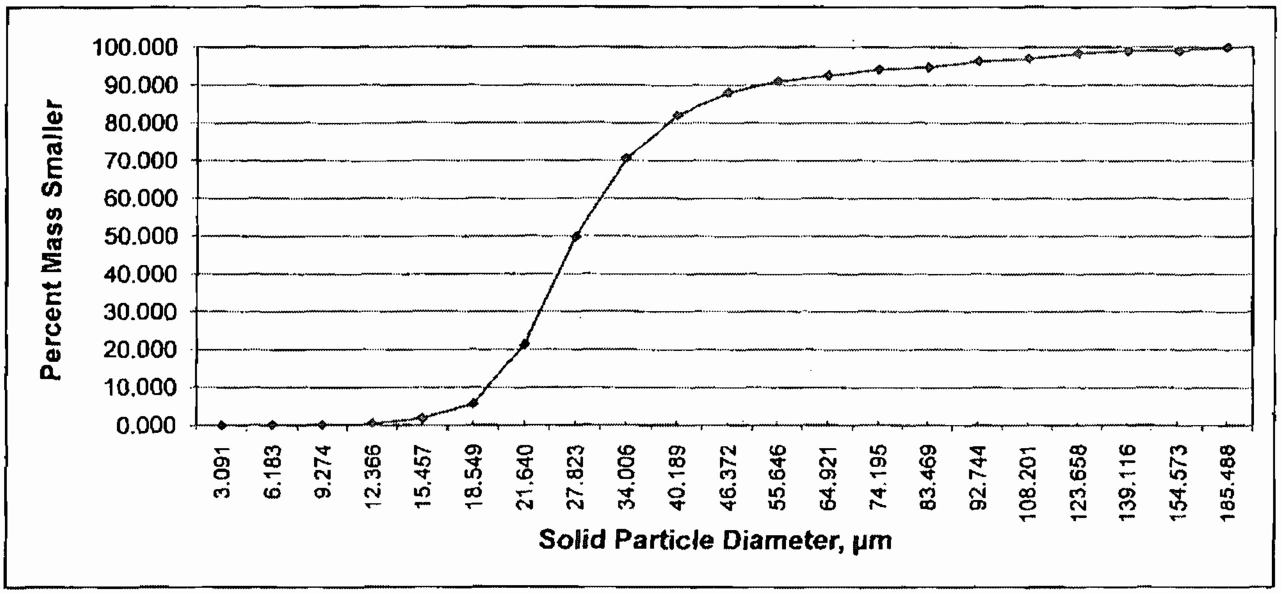


TABLE A-3
RESULTANT SOLID PARTICULATE SIZE DISTRIBUTION (TDS = 65,000 PPMW)

EPRI Droplet Diameter (µm)	Droplet Volume (µm³)	Droplet Mass (µg)	Particulate Mass (Solids) (µg)	Solid Particulate Volume (µm³)	Solid Particulate Diameter (µm)	EPRI % Mass Smaller
10	523.6	5.24E-04	3.40E-05	15.47	3.091	0.000
20	4188.8	4 19E-03	2.72E-04	123.76	6.183	0.196
30	14137.2	1 41E-02	9.19E-04	417 69	9 274	0.226
40	33510.3	3.35E-02	2.18E-03	990.08	12.366	0 514
50	65449.8	6.54E-02	4.25E-03	1933 75	15 457	1 816
60	113097.3	1.13E-01	7.35E-03	3341.51	18.549	5.702
70	179594.4	1.80E-01	1 17E-02	5306.20	21.640	21.348
90	381703 5	3 82E-01	2.48E-02	11277.60	27 823	49.812
110	696910.0	6.97E-01	4.53E-02	20590 52	34 006	70.509
130	1150346.5	1.15E+00	7.48E-02	33987 51	40.189	82.023
150	1767145.9	1 77E+00	1.15E-01	52211.13	46.372	88.012
180	3053628.1	3.05E+00	1.98E-01	90220.83	55 646	91.032
210	4849048.3	4.85E+00	3 15E-01	143267.33	64.921	92.468
240	7238229.5	7.24E+00	4 70E-01	213856.78	74.195	94.091
270	10305994.7	1.03E+01	6.70E-01	304495.30	83.469	94 689
300	14137166.9	1.41E+01	9.19E-01	417689.02	92 744	96.288
350	22449297.5	2.24E+01	1.46E+00	663274.70	108.201	97.011
400	33510321 6	3 35E+01	2.18E+00	990077.68	123.658	98.340
450	47712938.4	4.77E+01	3.10E+00	1409700.45	139.116	99.071
500	65449846.9	6.54E+01	4.25E+00	1933745.48	154.573	99.071
600	113097335.5	1.13E+02	7.35E+00	3341512.19	185 488	100 000



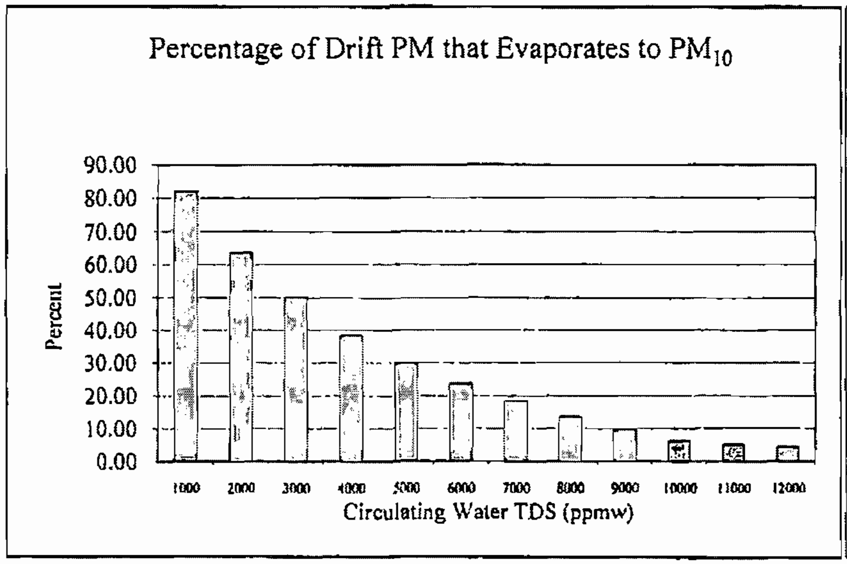
CALCULATION OF PM/PM_{10} EMISSIONS
FOR SERVICE WATER SYSTEM COOLING TOWERS

TABLE A-4
TURKEY POINT 6 & 7 SERVICE COOLING TOWERS
VARIATION OF COOLING TOWER PM AND PM_{10} EMISSION RATES WITH TOTAL DISSOLVED SOLIDS (TDS) CONTENT

TDS (ppmw)	PM Emission Rate (lb/hr)	Percent of Emissions $\leq PM_{10}$ %	PM_{10} Emissions (lb/hr)
1000	0.053	82.04	0.043
2000	0.105	63.50	0.067
3000	0.158	50.00	0.079
4000	0.210	38.33	0.081
5000	0.263	29.97	0.079
6000	0.315	23.59	0.074
7000	0.368	18.20	0.067
8000	0.420	13.57	0.057
9000	0.473	9.65	0.046
10000	0.525	6.28	0.033
11000	0.578	5.11	0.030
12000	0.631	4.46	0.028
30000	1.576	0.76	0.012
50000	2.627	0.38	0.010

Tower Circulation Rate (GPM)	Drift Rate %
21,000	0.0005

Calculated PM_{10} % $\leq PM_{10}$ %
82.04
63.50
50.00
38.33
29.97
23.59
18.20
13.57
9.65
6.28
5.11
4.46
0.76
0.38



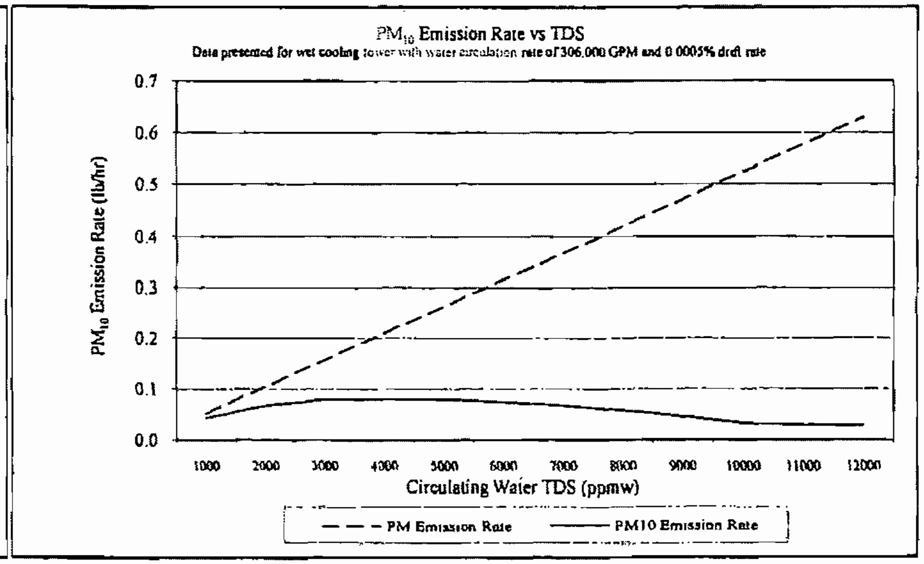
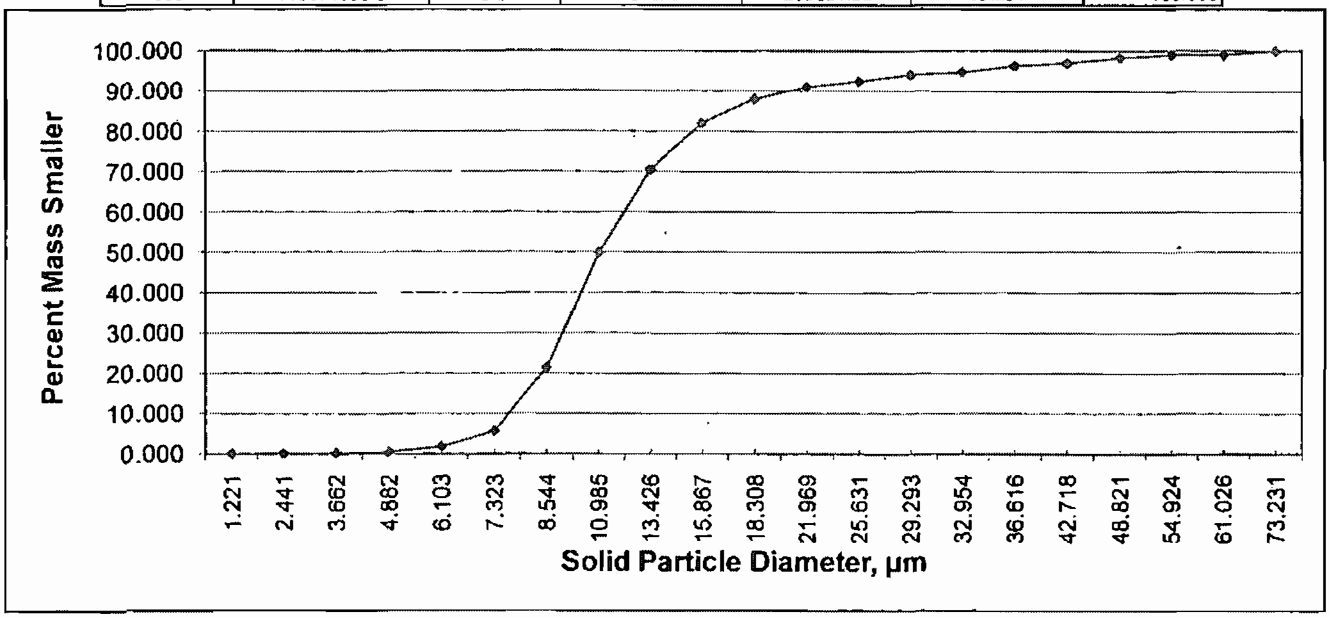


TABLE A-5
RESULTANT SOLID PARTICULATE SIZE DISTRIBUTION (TDS = 4,000 PPMW)

EPRI Droplet Diameter (μm)	Droplet Volume (μm³)	Droplet Mass (μg)	Particulate Mass (Solids) (μg)	Solid Particulate Volume (μm³)	Solid Particulate Diameter (μm)	EPRI % Mass Smaller
10	523.6	5.24E-04	2.09E-06	0.95	1.221	0.000
20	4188.8	4.19E-03	1.68E-05	7.62	2.441	0.196
30	14137.2	1.41E-02	5.65E-05	25.70	3.662	0.226
40	33510.3	3.35E-02	1.34E-04	60.93	4 882	0.514
50	65449.8	6.54E-02	2.62E-04	119.00	6.103	1.816
60	113097 3	1.13E-01	4.52E-04	205.63	7.323	5 702
70	179594 4	1 80E-01	7.18E-04	326.54	8.544	21.348
90	381703 5	3.82E-01	1.53E-03	694.01	10.985	49.812
110	696910.0	6.97E-01	2.79E-03	1267 11	13.426	70.509
130	1150346.5	1.15E+00	4.60E-03	2091 54	15.867	82.023
150	1767145.9	1.77E+00	7.07E-03	3212.99	18 308	88.012
180	3053628 1	3.05E+00	1.22E-02	5552.05	21.969	91.032
210	4849048.3	4.85E+00	1.94E-02	8816.45	25.631	92.468
240	7238229.5	7.24E+00	2.90E-02	13160.42	29.293	94.091
270	10305994.7	1.03E+01	4.12E-02	18738 17	32.954	94.689
300	14137166.9	1.41E+01	5.65E-02	25703.94	36.616	96.288
350	22449297.5	2.24E+01	8.98E-02	40816.90	42.718	97.011
400	33510321.6	3 35E+01	1.34E-01	60927 86	48.821	98.340
450	47712938.4	4 77E+01	1.91E-01	86750.80	54.924	99.071
500	65449846.9	6.54E+01	2.62E-01	118999 72	61.026	99.071
600	113097335 5	1.13E+02	4.52E-01	205631.52	73.231	100.000



ARTICLE:

CALCULATING REALISTIC PM_{10} EMISSIONS FROM COOLING TOWERS

Calculating Realistic PM_{10} Emissions from Cooling Towers

Abstract No. 216   Session No. AM-1b

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ABSTRACT

Particulate matter less than 10 micrometers in diameter (PM_{10}) emissions from wet cooling towers may be calculated using the methodology presented in EPA's AP-42[1], which assumes that all total dissolved solids (TDS) emitted in "drift" particles (liquid water entrained in the air stream and carried out of the tower through the induced draft fan stack.) are PM_{10}. However, for wet cooling towers with medium to high TDS levels, this method is overly conservative, and predicts significantly higher PM_{10} emissions than would actually occur, even for towers equipped with very high efficiency drift eliminators (e.g., 0.0006% drift rate). Such over-prediction may result in unrealistically high PM_{10} modeled concentrations and/or the need to purchase expensive Emission Reduction Credits (ERCs) in PM_{10} non-attainment areas. Since these towers have fairly low emission points (10 to 15 m above ground), over-predicting PM_{10} emission rates can easily result in exceeding federal Prevention of Significant Deterioration (PSD) significance levels at a project's fenceline. This paper presents a method for computing realistic PM_{10} emissions from cooling towers with medium to high TDS levels.

INTRODUCTION

Cooling towers are heat exchangers that are used to dissipate large heat loads to the atmosphere. Wet, or evaporative, cooling towers rely on the latent heat of water evaporation to exchange heat between the process and the air passing through the cooling tower. The cooling water may be an integral part of the process or may provide cooling via heat exchangers, for example, steam condensers. Wet cooling towers provide direct contact between the cooling water and air passing through the tower, and as part of normal operation, a very small amount of the circulating water may be entrained in the air stream and be carried out of the tower as "drift" droplets. Because the drift droplets contain the same chemical impurities as the water circulating through the tower, the particulate matter constituent of the drift droplets may be classified as an emission. The magnitude of the drift loss is influenced by the number and size of droplets produced within the tower, which are determined by the tower fill design, tower design, the air and water patterns, and design of the drift eliminators.

AP-42 METHOD OF CALCULATING DRIFT PARTICULATE

EPA's AP-42[1] provides available particulate emission factors for wet cooling towers, however, these values only have an emission factor rating of "E" (the lowest level of confidence acceptable). They are also rather high, compared to typical present-day manufacturers' guaranteed drift rates, which are on the order of 0.0006%. (Drift emissions are typically expressed as a percentage of the cooling tower water circulation rate). AP-42 states that "a *conservatively high* PM_{10} emission factor can be obtained by (a) multiplying the total liquid drift factor by the TDS fraction in the circulating water, and (b) assuming that once the water evaporates, all remaining solid particles are within the PM_{10} range." (Italics per EPA).

If TDS data for the cooling tower are not available, a source-specific TDS content can be estimated by obtaining the TDS for the make-up water and multiplying it by the cooling tower cycles of concentration. [The cycles of concentration is the ratio of a measured parameter for the cooling tower water (such as conductivity, calcium, chlorides, or phosphate) to that parameter for the make-up water.]

Using AP-42 guidance, the total particulate emissions (PM) (after the pure water has evaporated) can be expressed as:

$$\text{PM} = \text{Water Circulation Rate x Drift Rate x TDS} \qquad [1]$$

For example, for a typical power plant wet cooling tower with a water circulation rate of 146,000 gallons per minute (gpm), drift rate of 0.0006%, and TDS of 7,700 parts per million by weight (ppmw):

$$\text{PM} = 146{,}000 \text{ gpm x } 8.34 \text{ lb water/gal x } 0.0006/100 \text{ x } 7{,}700 \text{ lb solids}/10^6 \text{ lb water x } 60 \text{ min/hr} = \underline{3.38 \text{ lb/hr}}$$

On an annual basis, this is equivalent to almost 15 tons per year (tpy). Even for a state-of-the-art drift eliminator system, this is not a small number, especially if assumed to all be equal to PM_{10}, a regulated criteria pollutant. However, as the following analysis demonstrates, only a very small fraction is actually PM_{10}.

COMPUTING THE PM_{10} FRACTION

Based on a representative drift droplet size distribution and TDS in the water, the amount of solid mass in each drop size can be calculated. That is, for a given initial droplet size, assuming that the mass of dissolved solids condenses to a spherical particle after all the water evaporates, and assuming the density of the TDS is equivalent to a representative salt (e.g., sodium chloride), the diameter of the final solid particle can be calculated. Thus, using the drift droplet size distribution, the percentage of drift mass containing particles small enough to produce PM_{10} can be calculated. This method is conservative as the final particle is assumed to be perfectly spherical; hence as small a particle as can exist.

The droplet size distribution of the drift emitted from the tower is critical to performing the analysis. Brentwood Industries, a drift eliminator manufacturer, was contacted and agreed to provide drift eliminator test data from a test conducted by Environmental Systems Corporation (ESC) at the Electric Power Research Institute (EPRI) test facility in Houston, Texas in 1988 (Aull[2], 1999). The data consist of water droplet size distributions for a drift eliminator that achieved a tested drift rate of 0.0003 percent. As we are using a 0.0006 percent drift rate, it is reasonable to expect that the 0.0003 percent drift rate would produce smaller droplets, therefore, this size distribution data can be assumed to be <u>conservative</u> for predicting the fraction of PM_{10} in the total cooling tower PM emissions.

In calculating PM_{10} emissions the following assumptions were made:

- Each water droplet was assumed to evaporate shortly after being emitted into ambient air, into a single, solid, spherical particle.
- Drift water droplets have a density (ρ_w) of water; 1.0 g/cm^3 or $1.0*10^{-6}\ \mu g/\mu m^3$.
- The solid particles were assumed to have the same density (ρ_{TDS}) as sodium chloride, (i.e., 2.2 g/cm^3).

Using the formula for the volume of a sphere, $V = 4\pi r^3/3$, and the density of pure water, $\rho_w = 1.0$ g/cm^3, the following equations can be used to derive the solid particulate diameter, D_p, as a function of the TDS, the density of the solids, and the initial drift droplet diameter, D_d :

$$\text{Volume of drift droplet} = (4/3)\pi(D_d/2)^3 \qquad [2]$$

$$\text{Mass of solids in drift droplet} = (TDS)(\rho_w)(\text{Volume of drift droplet}) \qquad [3]$$

substituting,

$$\text{Mass of solids in drift} = (TDS)(\rho_w)(4/3)\pi(D_d/2)^3 \qquad [4]$$

Assuming the solids remain and coalesce after the water evaporates, the mass of solids can also be expressed as:

$$\text{Mass of solids} = (\rho_{TDS})\ (\text{solid particle volume}) = (\rho_{TDS})(4/3)\pi(D_p/2)^3 \qquad [5]$$

Equations [4] and [5] are equivalent:

$$(\rho_{TDS})(4/3)\pi(D_p/2)^3 = (TDS)(\rho_w)(4/3)\pi(D_d/2)^3 \qquad [6]$$

Solving for D_p:

$$D_p = D_d\ [(TDS)(\rho_w/\rho_{TDS})]^{1/3} \qquad [7]$$

Where,

TDS is in units of ppmw
D_p = diameter of solid particle, micrometers (μm)
D_d = diameter of drift droplet, μm

Using formulas [2] – [7] and the particle size distribution test data, Table 1 can be constructed for drift from a wet cooling tower having the same characteristics as our example; 7,700 ppmw TDS and a 0.0006% drift rate. The first and last columns of this table are the particle size distribution derived from test results provided by Brentwood Industries. Using straight-line interpolation for a solid particle size 10 μm in diameter, we conclude that approximately <u>14.9 percent</u> of the mass emissions are equal to or smaller than PM_{10}. The balance of the solid particulate are particulate greater than 10 μm. Hence, PM_{10} emissions from this tower would be equal to PM emissions x 0.149, or 3.38 lb/hr x 0.149 = 0.50 lb/hr. The process is repeated in Table 2, with all parameters equal except that the TDS is 11,000 ppmw. The result is that approximately 5.11 percent are smaller at 11,000 ppm. Thus, while total PM emissions are larger by virtue of a higher TDS, overall PM_{10} emissions are actually lower, because more of the solid particles are larger than 10 μm.

Table 1. Resultant Solid Particulate Size Distribution (TDS = 7700 ppmw)

EPRI Droplet Diameter (μm)	Droplet Volume (μm^3) [2][1]	Droplet Mass (μg) [3]	Particle Mass (Solids) (μg) [4]	Solid Particle Volume (μm^3)	Solid Particle Diameter (μm) [7]	EPRI % Mass Smaller
10	524	5.24E-04	4.03E-06	1.83	1.518	0.000
20	4189	4.19E-03	3.23E-05	14.66	3.037	0.196
30	14137	1.41E-02	1.09E-04	49.48	4.555	0.226
40	33510	3.35E-02	2.58E-04	117.29	6.073	0.514
50	65450	6.54E-02	5.04E-04	229.07	7.591	1.816
60	113097	1.13E-01	8.71E-04	395.84	9.110	5.702
70	179594	1.80E-01	1.38E-03	628.58	10.628	21.348
90	381704	3.82E-01	2.94E-03	1335.96	13.665	49.812
110	696910	6.97E-01	5.37E-03	2439.18	16.701	70.509
130	1150347	1.15E+00	8.86E-03	4026.21	19.738	82.023
150	1767146	1.77E+00	1.36E-02	6185.01	22.774	88.012
180	3053628	3.05E+00	2.35E-02	10687.70	27.329	91.032
210	4849048	4.85E+00	3.73E-02	16971.67	31.884	92.468
240	7238229	7.24E+00	5.57E-02	25333.80	36.439	94.091
270	10305995	1.03E+01	7.94E-02	36070.98	40.994	94.689
300	14137167	1.41E+01	1.09E-01	49480.08	45.549	96.288
350	22449298	2.24E+01	1.73E-01	78572.54	53.140	97.011
400	33510322	3.35E+01	2.58E-01	117286.13	60.732	98.340
450	47712938	4.77E+01	3.67E-01	166995.28	68.323	99.071
500	65449847	6.54E+01	5.04E-01	229074.46	75.915	99.071
600	113097336	1.13E+02	8.71E-01	395840.67	91.098	100.000

[1] Bracketed numbers refer to equation number in text.

The percentage of PM_{10}/PM was calculated for cooling tower TDS values from 1000 to 12000 ppmw and the results are plotted in Figure 1. Using these data, Figure 2 presents predicted PM_{10} emission rates for the 146,000 gpm example tower. As shown in this figure, the PM emission rate increases in a straight line as TDS increases, however, the PM_{10} emission rate increases to a maximum at around a TDS of 4000 ppmw, and then begins to decline. The reason is that at higher TDS, the drift droplets contain more solids and therefore, upon evaporation, result in larger solid particles for any given initial droplet size.

CONCLUSION

The emission factors and methodology given in EPA's AP-42[1] Chapter 13.4 *Wet Cooling Towers*, do not account for the droplet size distribution of the drift exiting the tower. This is a critical factor, as more than 85% of the mass of particulate in the drift from most cooling towers will result in solid particles larger than PM_{10} once the water has evaporated. Particles larger than PM_{10} are no longer a regulated air pollutant, because their impact on human health has been shown to be insignificant. Using reasonable, conservative assumptions and a realistic drift droplet size distribution, a method is now available for calculating realistic PM_{10} emission rates from wet mechanical draft cooling towers equipped with modern, high-efficiency drift eliminators and operating at medium to high levels of TDS in the circulating water.

Table 2. Resultant Solid Particulate Size Distribution (TDS = 11000 ppmw)

EPRI Droplet Diameter (μm)	Droplet Volume (μm^3) [2][1]	Droplet Mass (μg) [3]	Particle Mass (Solids) (μg) [4]	Solid Particle Volume (μm^3)	Solid Particle Diameter (μm) [7]	EPRI % Mass Smaller
10	524	5.24E-04	5.76E-06	2.62	1.710	0.000
20	4189	4.19E-03	4.61E-05	20.94	3.420	0.196
30	14137	1.41E-02	1.56E-04	70.69	5.130	0.226
40	33510	3.35E-02	3.69E-04	167.55	6.840	0.514
50	65450	6.54E-02	7.20E-04	327.25	8.550	1.816
60	113097	1.13E-01	1.24E-03	565.49	10.260	5.702
70	179594	1.80E-01	1.98E-03	897.97	11.970	21.348
90	381704	3.82E-01	4.20E-03	1908.52	15.390	49.812
110	696910	6.97E-01	7.67E-03	3484.55	18.810	70.509
130	1150347	1.15E+00	1.27E-02	5751.73	22.230	82.023
150	1767146	1.77E+00	1.94E-02	8835.73	25.650	88.012
180	3053628	3.05E+00	3.36E-02	15268.14	30.780	91.032
210	4849048	4.85E+00	5.33E-02	24245.24	35.909	92.468
240	7238229	7.24E+00	7.96E-02	36191.15	41.039	94.091
270	10305995	1.03E+01	1.13E-01	51529.97	46.169	94.689
300	14137167	1.41E+01	1.56E-01	70685.83	51.299	96.288
350	22449298	2.24E+01	2.47E-01	112246.49	59.849	97.011
400	33510322	3.35E+01	3.69E-01	167551.61	68.399	98.340
450	47712938	4.77E+01	5.25E-01	238564.69	76.949	99.071
500	65449847	6.54E+01	7.20E-01	327249.23	85.499	99.071
600	113097336	1.13E+02	1.24E+00	565486.68	102.599	100.000

Figure 1: Percentage of Drift PM that Evaporates to PM10

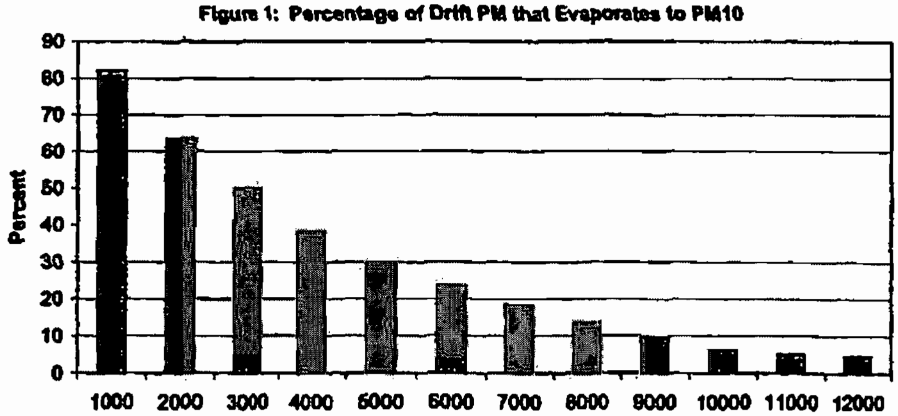
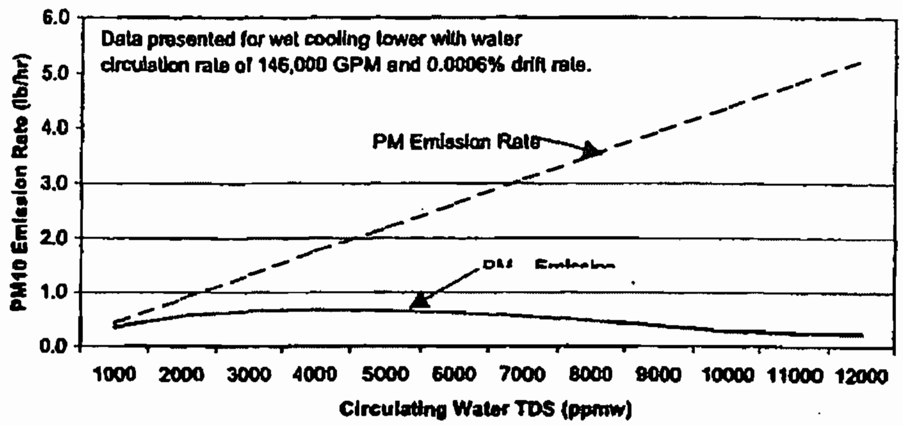


Figure 2: PM_{10} Emission Rate vs. TDS



REFERENCES

1. EPA, 1995. Compilation of Air pollutant Emission Factors, AP-42 Fifth edition, Volume I: *Stationary Point and Area Sources*, Chapter 13.4 Wet Cooling Towers, http://www.epa.gov/ttn/chief/ap42/, United States Environmental Protection Agency, Office of Air Quality Planning and Standards, January.

2. Aull, 1999. Memorandum from R. Aull, Brentwood Industries to J. Reisman, Greystone, December 7, 1999.

KEY WORDS

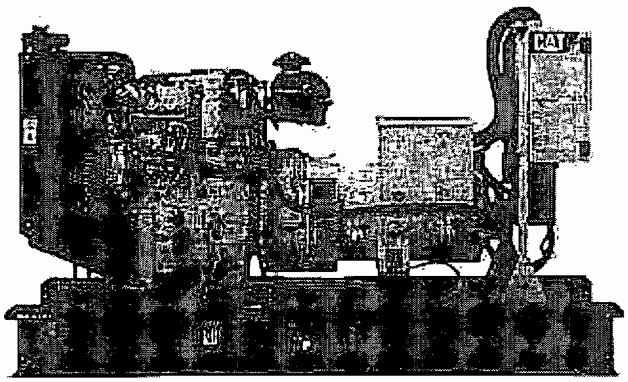
Drift
Drift eliminators
Cooling tower
PM_{10} emissions
TDS

BASIS FOR STANDBY GENERATOR

DIESEL ENGINE PERFORMANCE

DIESEL GENERATOR SET

CATERPILLAR®



STANDBY 40-60 kW
PRIME 36-54.6 kW
60 Hz

Model	Standby kW (kVA)	Prime kW (kVA)
D40-4	40 (50)	36 (45)
D40-4S	40 (40)	36 (36)
D50-4	50 (62.5)	45 (56.3)
D50-4S	50 (50)	45 (45)
D60-4	60 (75)	54.6 (68.2)

All models are Tier II EPA Approved, Emissions certified.

FEATURES

GENERATOR SET
- Complete system designed and built at ISO 9001 certified facilities
- Factory tested to design specifications at full load conditions

ENGINE
- Governor, mechanical
- Electrical system, 12 VDC
- Cartridge type filters
- Battery rack and cables
- Coolant and lube drains piped to edge of base

GENERATOR
- Insulation system, class H
- Drip proof generator air intake (NEMA 2, IP23)
- Electrical design in accordance with BS5000 Part 99, IEC60034-1, EN61000-6, NEMA MG-1.33

CONTROL SYSTEM
- EMCP 3.1 digital control panel
- Vibration isolated NEMA 1 enclosure with lockable hinged door
- DC and AC wiring harnesses

MOUNTING ARRANGEMENT
- Heavy-duty fabricated steel base with lifting points
- Anti-vibration pads to ensure vibration isolation
- Complete OSHA guarding
- Stub-up pipe ready for connection to silencer pipework
- Flexible fuel lines terminated at skid base with NPT connections

COOLING SYSTEM
- Radiator and cooling fan complete with protective guards
- Standard ambient temperatures up to 50° C (122° F)

CIRCUIT BREAKER
- UL/CSA listed
- 3-pole with solid neutral
- NEMA 1 steel enclosure, vibration isolated
- Electrical stub-up area directly below circuit breaker

AUTOMATIC VOLTAGE REGULATOR
- Voltage within ± 0.5% 3-phase and ± 1.0% single phase at steady state from no load to full load
- Provides fast recovery from transient load changes

EQUIPMENT FINISH
- All electroplated hardware
- Anticorrosive paint protection
- High gloss polyurethane paint for durability and scuff resistance

QUALITY STANDARDS
- BS4999, BS5000, BS5514, IEC60034, EN61000-6, NEMA MG-1.33, NFPA 110 (with optional equipment)

DOCUMENTATION
- Operation and maintenance manuals provided
- Wiring diagrams included

WARRANTY
- All equipment carries full manufacturer's warranty

CATERPILLAR®

OPTIONAL EQUIPMENT*

ENCLOSURE
- B Series weather protective enclosure (includes internal silencer system)
  – Panel viewing window
  – External emergency stop push button
- Sound attenuated enclosure (includes internal silencer system)
- Super sound attenuated enclosure (includes internal silencer system)

SILENCER SYSTEM – OPEN UNIT
- Level 1 silencer
- Level 2 silencer
- Level 3 silencer
- Mounting kit
- Through-wall installation kits

ENGINE
- Electronic governor
- Battery heater
- Lube oil drain pump
- Lube oil sump heater

CIRCUIT BREAKER
- Auxiliary voltfree contacts
- Shunt trip (100 + amp breakers)

MOUNTING ACCESSORIES
- Seismic (zone 4) vibration isolators

GENERATOR
- Anti-condensation heater
- AREP excitation system (D40-4, D50-4, D60-4)
- Generator upgrade 1 size (D40-4, D50-4, D60-4)
- Permanent magnet generator

CONTROL SYSTEM
- No control system
- EMCP 3.2 digital control panel

FUEL SYSTEM
- Single-walled steel fuel tank
- UL listed closed top-diked skid-mounted fuel tank base (24-hour capacity) with fuel alarm (low level/leak detected)
- Critical high fuel alarm
- Low fuel level alarm and shutdown

REMOTE ANNUNCIATORS
- Remote annunciator panel (supplied loose)

COOLING SYSTEM
- Coolant heater
- Low coolant temperature alarm
- Low coolant level shutdown
- Radiator transition flange

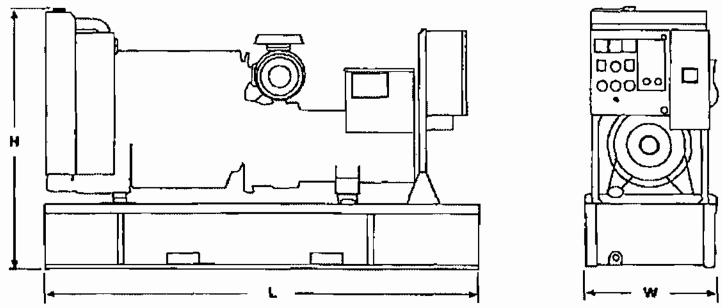
MISCELLANEOUS ACCESSORIES
- Toolkit
- Additional operator's manual pack
- Special enclosure color
- UL listing
- CSA certification
- French or Spanish language labels

EXTENDED SERVICE CONTRACTS
- Extended service coverage available

TESTING
- Factory witness test (restricted to 6 hours – full load, 1.0 pf)

* Some options may not be available on all models. Not all options are listed.

GENERATOR SET DIMENSIONS AND WEIGHTS



Model	Length mm (in)	Width mm (in)	Height mm (in)	Weight kg (lb)*
D40-4	2149 (84.6)	752 (29.6)	1366 (53.8)	870 (1914)
D40-4S	2149 (84.6)	752 (29.6)	1366 (53.8)	870 (1914)
D50-4	2149 (84.6)	752 (29.6)	1366 (53.8)	905 (1991)
D50-4S	2149 (84.6)	752 (29.6)	1366 (53.8)	885 (1947)
D60-4	2149 (84.6)	752 (29.6)	1366 (53.8)	955 (2101)

NOTE: General configuration not to be used for installation. See specific dimensional drawings for detail. Dimensions and weights shown are for the open skid configuration.

*Includes oil and coolant

SPECIFICATIONS

GENERATOR

Voltage regulation	± 0.5% 3PH and ± 1% single PH at steady state from no load to full load
Frequency	± 0.8% for constant load, no load to full load
Waveform distortion	THD < 4%, at no load
Radio interference	Compliance with EN61000-6
Telephone interference	TIF < 50, THF < 2%
Overspeed limit	2250 rpm
Insulation	Class H
Temperature rise	Within Class H limits
Available voltages	1-phase – 120/240, 115/230, 110/220 3-phase – 277/480, 120/240, 127/220, 120/208
Deration	Consult factory for available outputs
Ratings	At 30° C (86° F), 152.4 m (500 ft), 60% humidity, 1.0 pf (1-phase), 0.8 pf (3-phase)

ENGINE

Manufacturer	Caterpillar
Type	4-cycle
Aspiration	Natural/turbo
Stroke – mm (in)	127 (5.0)
Piston speed – m/sec (ft/sec)	7.62 (25.0)
Engine speed – rpm	1800
Air cleaner type	Dry, replaceable paper element type with restriction indicator

D40-4, D40-4S – C4.4

Cylinder configuration	In-line 4
Displacement – L (cu in)	4.4 (269)
Bore – mm (in)	105 (4.13)
Compression ratio	19.3:1
Governor	
Type	Mechanical and electrical
Class	G2 and G3
Max power at rated rpm – kW (hp)	
Standby	54.2 (72.6)
Prime	48.5 (64.8)
BMEP – kPa (psi)	
Standby	819 (118.8)
Prime	746 (108.2)
Regenerative power – kW (hp)	10.7 (14.3)

D50-4, D50-4S, D60-4 – C4.4

Cylinder configuration	In-line 4
Displacement – L (cu in)	4.4 (269)
Bore – mm (in)	105 (4.13)
Compression ratio	18.2:1
Governor	
Type	Mechanical and electrical
Class	G2 and G3
Max power at rated rpm – kW (hp)	
Standby	70.5 (94.5)
Prime	63.5 (85.1)
BMEP – kPa (psi)	
Standby	1070 (155)
Prime	960 (139.2)
Regenerative power – kW (hp)	13.7 (18.3)

CONTROL PANEL

- Heavy duty sheet steel enclosure with lockable hinged door
- Vibration isolated from generating set
- LCD display
- AC metering
- DC metering
- Fail to start shutdown
- Low oil pressure shutdown
- High engine temperature
- Low/high battery voltage
- Underspeed/overspeed
- Loss of engine speed detection
- 2 spare fault channels
- 20 event fault log
- 2 LED status indicators
- Lockdown emergency stop push button

RATING DEFINITIONS AND CONDITIONS

Standby – Applicable for supplying continuous electrical power (at variable load) in the event of a utility power failure. No overload is permitted on these ratings. The generator is peak rated (as defined in ISO8528-3).

Prime – Applicable for supplying continuous electrical power (at variable load) in lieu of commercially purchased power. There is no limitation to the annual hours of operation and the generator set can supply 10 percent overload power for 1 hour in 12 hours.

D40-4 (3-Phase)

Materials and specifications are subject to change without notice.

Generator Set Technical Data – 1800 rpm/60 Hz			Standby		Prime	
Power Rating	kW	kVA	40	50	36	45
Lubricating System						
Type: full pressure						
Oil filter: spin-on, full flow						
Oil cooler: watercooled						
Oil type required: API CF-4						
Total oil capacity	L	U.S. gal	7.0	1.85	7.0	1.85
Oil pan	L	U.S. gal	5.5	1.45	5.5	1.45
Fuel System						
Generator set fuel consumption						
100% load	L/hr	gal/hr	11.6	3.1	10.5	2.8
75% load	L/hr	gal/hr	8.9	2.3	8.1	2.1
50% load	L/hr	gal/hr	6.3	1.7	5.8	1.5
Engine Electrical System						
Voltage/ground: 12/negative						
Battery charging generator ampere rating	amps		45		45	
Cooling System						
Water pump type: centrifugal						
Radiator system capacity incl. engine	L	U.S. gal	12.8	3.37	12.8	3.37
Maximum coolant static head	m H_2O	ft H_2O	10.2	33.5	10.2	33.5
Coolant flow rate	L/hr	U.S. gal/hr	11 640	3,075	11 640	3,075
Minimum temperature to engine	°C	°F	70	158	70	158
Temperature rise across engine	°C	°F	6	10.8	6	10.8
Heat rejected to coolant at rated power	kW	Btu/min	28.3	1,610	25.6	1,456
Total heat radiated to room at rated power	kW	Btu/min	13.8	785	13.8	785
Radiator fan load	kW	hp	1.0	1.34	1.0	1.34
Air Requirements						
Combustion air flow	m³/min	cfm	3.59	127	3.60	127
Maximum air cleaner restriction	kPa	in H_2O	6.6	26.5	6.6	26.5
Radiator cooling air (zero restriction)	m³/min	cfm	121	4,280	121	4,280
Generator cooling air	m³/min	cfm	19.2	678	19.2	678
Allowable air flow restriction (after radiator)	kPa	in H_2O	0.12	0.5	0.12	0.5
Cooling airflow (@ rated speed)						
Rate with restriction	m³/min	cfm	97.8	3,453	97.8	3,453
Exhaust System						
Maximum allowable backpressure	kPa	in Hg	15	4.43	15	4.43
Exhaust flow at rated kW	m³/min	cfm	9.58	338	8.80	311
Exhaust temperature at rated kW –						
Dry exhaust	°C	°F	629	1,164	560	1,040
Generator Set Noise Rating* (without attenuation) at 1 m (3 ft)	dB(A)		93.5		93.3	

Generator Technical Data		277/480V	127/220V 120/208V	120/240V	347/600V
Motor Starting Capability: (30% voltage dip)	(kVA)				
	Self excited	98	84	76	98
	AREP excited	128	110	100	128
	PMG	128	110	100	128
Full Load Efficiencies:	Standby	88.9	88.4	87.8	88.9
	Prime	89.2	88.8	88.5	89.2
Reactances (per unit):	X_d	2.65	3.16	3.53	2.65
	X'_d	0.12	0.14	0.16	0.12
Reactances	X''_d	0.059	0.070	0.078	0.059
shown are	X_q	1.59	1.89	2.12	1.59
applicable to the	X''_q	0.073	0.087	0.098	0.073
standby rating.	X_2	0.066	0.078	0.087	0.066
	X_0	0.004	0.005	0.006	0.004
Time Constants:		t'_d 50 ms	t''_d 5 ms	t'_{do} 1131 ms	t_a 8 ms

* dB(A) levels are for guidance only

CATERPILLAR®

D40-4S (1-Phase)

Materials and specifications are subject to change without notice.

Generator Set Technical Data – 1800 rpm/60 Hz			Standby		Prime	
Power Rating	kW	kVA	40	40	36	36
Lubricating System						
Type: full pressure						
Oil filter: spin-on, full flow						
Oil cooler: watercooled						
Oil type required: API CF-4						
Total oil capacity	L	U.S. gal	7.0	1.85	7.0	1.85
Oil pan	L	U.S. gal	5.5	1.45	5.5	1.45
Fuel System						
Generator set fuel consumption						
100% load	L/hr	gal/hr	12.0	3.2	10.9	2.9
75% load	L/hr	gal/hr	9.3	2.5	8.5	2.2
50% load	L/hr	gal/hr	6.6	1.8	6.1	1.6
Engine Electrical System						
Voltage/ground: 12/negative						
Battery charging generator ampere rating	amps		45		45	
Cooling System						
Water pump type: centrifugal						
Radiator system capacity incl. engine	L	U.S. gal	12.8	3.37	12.8	3.37
Maximum coolant static head	m H_2O	ft H_2O	10.2	33.5	10.2	33.5
Coolant flow rate	L/hr	U.S. gal/hr	11 640	3,075	11 640	3,075
Minimum temperature to engine	°C	°F	70	158	70	158
Temperature rise across engine	°C	°F	6	10.8	6	10.8
Heat rejected to coolant at rated power	kW	Btu/min	29.8	1,695	27.1	1,541
Total heat radiated to room at rated power	kW	Btu/min	15.5	882	15.6	887
Radiator fan load	kW	hp	1.0	1.34	1.0	1.34
Air Requirements						
Combustion air flow	m³/min	cfm	3.58	126	3.59	127
Maximum air cleaner restriction	kPa	in H_2O	6.6	26.5	6.6	26.5
Radiator cooling air (zero restriction)	m³/min	cfm	121	4,280	121	4,280
Generator cooling air	m³/min	cfm	19.2	678	19.2	678
Allowable air flow restriction (after radiator)	kPa	in H_2O	0.12	0.5	0.12	0.5
Cooling airflow (@ rated speed)						
Rate with restriction	m³/min	cfm	97.8	3,453	97.8	3,453
Exhaust System						
Maximum allowable backpressure	kPa	in Hg	15	4.43	15	4.43
Exhaust flow at rated kW	m³/min	cfm	9.58	338	8.80	311
Exhaust temperature at rated kW –						
Dry exhaust	°C	°F	629	1,164	560	1,040
Generator Set Noise Rating* (without attenuation) at 1 m (3 ft)	dB(A)		93.5		93.3	

Generator Technical Data		120/240V	115/230V	110/220V
Motor Starting Capability: (kVA) (30% voltage dip)	Self excited	70	65	60
	PMG	70	65	60
Full Load Efficiencies:	Standby	84.6	83.7	82.7
	Prime	84.6	83.7	82.7
Reactances (per unit):	X_d	2.35	2.56	2.79
Reactances shown are applicable to the standby rating.	X'_d	0.22	0.24	0.26
	X''_d	0.111	0.121	0.132
	X_q	1.41	1.53	1.68
	X''_q	0.140	0.152	0.166

Time Constants:	t'_d	t''_d	t'_{do}	t_a
	80 ms	7 ms	1131 ms	12 ms

* dB(A) levels are for guidance only

CATERPILLAR®

D50-4 (3-Phase)

Materials and specifications are subject to change without notice.

Generator Set Technical Data – 1800 rpm/60 Hz			Standby		Prime	
Power Rating	kW	kVA	50	62.5	45	56.3
Lubricating System						
Type: full pressure						
Oil filter: spin-on, full flow						
Oil cooler: watercooled						
Oil type required: API CF-4						
Total oil capacity	L	U.S. gal	7.0	1.85	7.0	1.85
Oil pan	L	U.S. gal	5.5	1.45	5.5	1.45
Fuel System						
Generator set fuel consumption						
100% load	L/hr	gal/hr	16.0	4.2	14.1	3.7
75% load	L/hr	gal/hr	11.7	3.1	10.8	2.9
50% load	L/hr	gal/hr	9.3	2.4	9.0	2.4
Engine Electrical System						
Voltage/ground: 12/negative						
Battery charging generator ampere rating	amps		45		45	
Cooling System						
Water pump type: centrifugal						
Radiator system capacity incl. engine	L	U.S. gal	13.1	8.22	13.1	8.22
Maximum coolant static head	m H_2O	ft H_2O	10.2	33.5	10.2	33.5
Coolant flow rate	L/hr	U.S. gal/hr	11 640	3,075	11 640	3,075
Minimum temperature to engine	°C	°F	70	158	70	158
Temperature rise across engine	°C	°F	6	10.8	6	10.8
Heat rejected to coolant at rated power	kW	Btu/min	47.7	2,713	42.3	2,406
Total heat radiated to room at rated power	kW	Btu/min	19.8	1,126	16.6	944
Radiator fan load	kW	hp	2.8	3.75	2.8	3.75
Air Requirements						
Combustion air flow	m³/min	cfm	5.29	187	5.26	186
Maximum air cleaner restriction	kPa	in H_2O	8.0	32.1	8.0	32.1
Radiator cooling air (zero restriction)	m³/min	cfm	143	5,042	143	5,042
Generator cooling air	m³/min	cfm	19.2	678	19.2	678
Allowable air flow restriction (after radiator)	kPa	in H_2O	0.12	0.5	0.12	0.5
Cooling airflow (@ rated speed)						
Rate with restriction	m³/min	cfm	134	4,724	134	4,724
Exhaust System						
Maximum allowable backpressure	kPa	in Hg	15	4.43	15	4.43
Exhaust flow at rated kW	m³/min	cfm	13.8	487.1	13.1	462.4
Exhaust temperature at rated kW –						
Dry exhaust	°C	°F	594	1,108	544	1,015
Generator Set Noise Rating*						
(without attenuation) at 1 m (3 ft)	dB(A)		91.7		91.8	

Generator Technical Data		277/480V	127/220V 120/208V	120/240V	347/600V
Motor Starting Capability: (30% voltage dip)	(kVA)				
	Self excited	115	99	90	115
	AREP excited	150	130	118	150
	PMG	150	130	118	150
Full Load Efficiencies:	Standby	88.9	88.5	87.9	88.9
	Prime	89.3	88.8	88.4	89.3
Reactances (per unit):	X_d	2.86	3.41	3.81	2.86
	X'_d	0.12	0.14	0.16	0.12
Reactances shown are applicable to the standby rating.	X''_d	0.061	0.073	0.081	0.061
	X_q	1.72	2.04	2.29	1.72
	X''_q	0.076	0.090	0.101	0.076
	X_2	0.068	0.081	0.091	0.068
	X_0	0.005	0.006	0.007	0.005
Time Constants:		t'_d 50 ms	t''_d 5 ms	t'_{do} 1171 ms	t_a 8 ms

* dB(A) levels are for guidance only

CATERPILLAR®

D50-4S (1-Phase)

Materials and specifications are subject to change without notice.

Generator Set Technical Data – 1800 rpm/60 Hz			Standby		Prime	
Power Rating	kW	kVA	50	50	45	45
Lubricating System						
Type: full pressure						
Oil filter: spin-on, full flow						
Oil cooler: watercooled						
Oil type required: API CF-4						
Total oil capacity	L	U.S. gal	7.0	1.85	7.0	1.85
Oil pan	L	U.S. gal	5.5	1.45	5.5	1.45
Fuel System						
Generator set fuel consumption						
100% load	L/hr	gal/hr	16.9	4.5	14.7	3.9
75% load	L/hr	gal/hr	12.3	3.3	11.3	3.0
50% load	L/hr	gal/hr	9.5	2.5	9.2	2.4
Engine Electrical System						
Voltage/ground: 12/negative						
Battery charging generator ampere rating	amps		45		45	
Cooling System						
Water pump type: centrifugal						
Radiator system capacity incl. engine	L	U.S. gal	13.1	8.22	13.1	8.22
Maximum coolant static head	m H_2O	ft H_2O	10.2	33.5	10.2	33.5
Coolant flow rate	L/hr	U.S. gal/hr	11 640	3,075	11 640	3,075
Minimum temperature to engine	°C	°F	70	158	70	158
Temperature rise across engine	°C	°F	6	10.8	6	10.8
Heat rejected to coolant at rated power	kW	Btu/min	51.8	2,946	45.4	2,582
Total heat radiated to room at rated power	kW	Btu/min	25.0	1,422	20.8	1,183
Radiator fan load	kW	hp	2.8	3.75	2.8	3.75
Air Requirements						
Combustion air flow	m³/min	cfm	5.32	188	5.28	186
Maximum air cleaner restriction	kPa	in H_2O	8.0	32.1	8.0	32.1
Radiator cooling air (zero restriction)	m³/min	cfm	143	5,042	143	5,042
Generator cooling air	m³/min	cfm	19.2	678	19.2	678
Allowable air flow restriction (after radiator)	kPa	in H_2O	0.12	0.5	0.12	0.5
Cooling airflow (@ rated speed)						
Rate with restriction	m³/min	cfm	134	4,724	134	4,724
Exhaust System						
Maximum allowable backpressure	kPa	in Hg	15	4.43	15	4.43
Exhaust flow at rated kW	m³/min	cfm	13.8	487.1	13.1	462.4
Exhaust temperature at rated kW –						
Dry exhaust	°C	°F	594	1,108	544	1,015
Generator Set Noise Rating*						
(without attenuation) at 1 m (3 ft)	dB(A)		91.7		91.8	

Generator Technical Data		120/240V	115/230V	110/220V
Motor Starting Capability: (kVA)				
(30% voltage dip)	Self excited	70	65	60
	PMG	70	65	60
Full Load Efficiencies:	Standby	83.7	82.7	81.6
	Prime	84.6	83.7	82.7
Reactances (per unit):	X_d	2.93	3.19	3.49
Reactances shown	X'_d	0.28	0.30	0.33
are applicable to	X''_d	0.139	0.151	0.165
the standby rating.	X_q	1.76	1.92	2.10
	X''_q	0.174	0.190	0.208

	t'_d	t''_d	t'_{do}	t_a
Time Constants:	80 ms	7 ms	1131 ms	12 ms

* dB(A) levels are for guidance only

CATERPILLAR®

D60-4 (3-Phase)

Materials and specifications are subject to change without notice.

Generator Set Technical Data – 1800 rpm/60 Hz			Standby		Prime	
Power Rating	kW	kVA	60	75	54.6	68.2
Lubricating System						
Type: full pressure						
Oil filter: spin-on, full flow						
Oil cooler: watercooled						
Oil type required: API CF-4						
Total oil capacity	L	U.S. gal	7.0	1.85	7.0	1.85
Oil pan	L	U.S. gal	5.5	1.45	5.5	1.45
Fuel System						
Generator set fuel consumption						
100% load	L/hr	gal/hr	19.7	5.2	17.2	4.5
75% load	L/hr	gal/hr	13.7	3.6	12.4	3.3
50% load	L/hr	gal/hr	10.0	2.6	9.6	2.5
Engine Electrical System						
Voltage/ground: 12/negative						
Battery charging generator ampere rating	amps		45		45	
Cooling System						
Water pump type: centrifugal						
Radiator system capacity incl. engine	L	U.S. gal	13.1	3.22	13.1	3.22
Maximum coolant static head	m H_2O	ft H_2O	10.2	33.5	10.2	33.5
Coolant flow rate	L/hr	U.S. gal/hr	11 640	3,075	11 640	3,075
Minimum temperature to engine	°C	°F	70	158	70	158
Temperature rise across engine	°C	°F	6	10.8	6	10.8
Heat rejected to coolant at rated power	kW	Btu/min	57.0	3,242	51.1	2,907
Total heat radiated to room at rated power	kW	Btu/min	23.5	1,337	20.3	1,155
Radiator fan load	kW	hp	2.8	3.75	2.8	3.75
Air Requirements						
Combustion air flow	m³/min	cfm	5.35	189	5.31	187
Maximum air cleaner restriction	kPa	in H_2O	8.0	32.1	8.0	32.1
Radiator cooling air (zero restriction)	m³/min	cfm	143	5,042	143	5,042
Generator cooling air	m³/min	cfm	19.2	678	19.2	678
Allowable air flow restriction (after radiator)	kPa	in H_2O	0.12	0.5	0.12	0.5
Cooling airflow (@ rated speed)						
Rate with restriction	m³/min	cfm	134	4,724	134	4,724
Exhaust System						
Maximum allowable backpressure	kPa	in Hg	15	4.43	15	4.43
Exhaust flow at rated kW	m³/min	cfm	13.8	487.1	13.1	462.4
Exhaust temperature at rated kW –						
Dry exhaust	°C	°F	594	1,108	544	1,015
Generator Set Noise Rating* (without attenuation) at 1 m (3 ft)	dB(A)		91.5		91.6	

Generator Technical Data		277/480V	127/220V 120/208V	120/240V	347/600V
Motor Starting Capability:	(kVA)				
(30% voltage dip)	Self excited	163	140	127	163
	AREP excited	212	184	167	212
	PMG	212	184	167	212
Full Load Efficiencies:	Standby	90.8	90.3	89.7	90.8
	Prime	91.0	90.5	90.1	91.0
Reactances (per unit):	X_d	2.76	3.28	3.67	2.76
	X'_d	0.10	0.12	0.14	0.10
Reactances shown are applicable to the standby rating.	X''_d	0.051	0.061	0.068	0.051
	X_q	1.66	1.97	2.20	1.66
	X''_q	0.063	0.075	0.084	0.063
	X_2	0.057	0.068	0.076	0.057
	X_0	0.005	0.006	0.006	0.005
Time Constants:		t'_d 50 ms	t''_d 5 ms	t'_{do} 1354 ms	t_a 8 ms

* dB(A) levels are for guidance only

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BASIS FOR ANCILLARY GENERATOR
DIESEL ENGINE PERFORMANCE

DIESEL GENERATOR SET

CATERPILLAR®

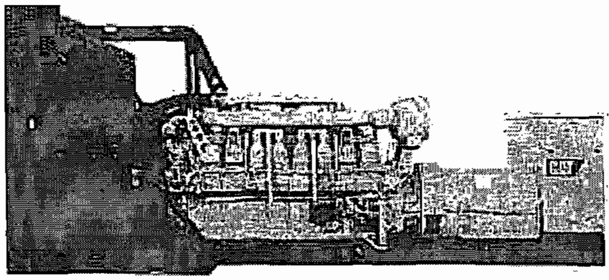


Image shown may not reflect actual package.

CONTINUOUS

2050 ekW 2562 kVA

60 Hz 1800 rpm 480 Volts

Caterpillar is leading the power generation marketplace with Power Solutions engineered to deliver unmatched flexibility, expandability, reliability, and cost-effectiveness.

FEATURES

FUEL/EMISSIONS STRATEGY
- EPA Tier 2

DESIGN CRITERIA
- The generator set accepts 100% rated load in one step per NFPA 110 and meets ISO 8528-5 transient response.

UL 2200

UL 2200 listed packages available. Certain restrictions may apply. Consult with your Caterpillar Dealer.

FULL RANGE OF ATTACHMENTS
- Wide range of bolt-on system expansion attachments, factory designed and tested

SINGLE-SOURCE SUPPLIER
- Fully prototype tested with certified torsional vibration analysis available

WORLDWIDE PRODUCT SUPPORT
- Caterpillar® dealers provide extensive post sale support including maintenance and repair agreements
- Caterpillar dealers have over 1,600 dealer branch stores operating in 200 countries
- The Cat® S•O•S℠ program cost effectively detects internal engine component condition, even the presence of unwanted fluids and combustion by-products

CAT 3516C-HD TA DIESEL ENGINE
- Reliable, rugged, durable design
- Field-proven in thousands of applications worldwide
- Four-stroke-cycle diesel engine combines consistent performance and excellent fuel economy with minimum weight

CAT SR5 GENERATOR
- Matched to the performance and output characteristics of Caterpillar engines
- UL 1446 Recognized
- Class H insulation system

CAT EMCP 3 SERIES CONTROL PANELS
- Simple user friendly interface and navigation
- Scalable system to meet a wide range of customer needs
- Integrated Control System and Communications Gateway

CONTINUOUS 2050 ekW 2562 kVA

60 Hz 1800 rpm 480 Volts

CATERPILLAR®

FACTORY INSTALLED STANDARD & OPTIONAL EQUIPMENT

System	Standard	Optional
Air Inlet	• Single element canister type air cleaner • Service indicator	• Dual element & heavy duty air cleaners (with pre-cleaners) • Air inlet adapters & shutoff
Cooling	• Radiator with guard (43°C) • Coolant drain line with valve • Fan and belt guards • Caterpillar Extended Life Coolant • Low coolant level & high temperature alarm or shutdown	• Radiator duct flange • Jacket water heater
Exhaust	• Dry exhaust manifold • Flanged faced outlets	• Mufflers and Silencers • Stainless steel exhaust flex fittings • Elbows, flanges, expanders & Y adapters
Fuel	• Secondary fuel filters • Fuel priming pump • Flexible fuel lines • Fuel cooler* *Not included with packages without radiators	• Water separator • Duplex fuel filter
Generator SR5	• Class H insulation • Class H temperature (125°C prime/150°C standby)	• Oversize & premium generators • Anti-condensation space heater • Bearing temperature detector • Stator temperature detector
Power Termination	• Bus bar (NEMA and IEC meachanicallug holes) -right side standard • Top and bottom cable entry	• Circuit breakers, UL listed, 3 pole with shunt trip, 80% or 100% rated, choice of trip units, manual or electrically operated (low voltage only) • Circuit breakers, IEC compliant, 3 or 4 pole with shunt trip (low voltage only), choice of trip units, manual or electrically operated • Shroud cover for bottom cable entry • Power terminations can be located on the left and/or rear as an option. Also, multiple circuit breakers can be ordered (up to 3).
Governor	• ADEM™ 3	• Load share module
Control Panels	• User Interface panel (UIP) - rear mount (standard) • EMCP3.1 Genset Controller • Speed adjust (on panel) • AC&DC customer wiring area (right side) • CAT digital voltage regulator (CDVR) with KVAR/PF control, 3-phase sensing • Emergency Stop Pushbutton	• EMCP 3.3 • Option for right or left mount UIP • Local & remote annunciator modules • Load share module • Discrete I/O module • Generator temperature monitoring & protection • Voltage Adjust (on panel)
Lube	• Lubricating oil and filter • Oil drain line with valves • Fumes disposal • Gear type lube oil pump	• Oil level regulator • Deep sump oil pan • Electric & air prelube pumps • Manual prelube with sump pump • Duplex oil filter
Mounting	• Structual steel tube • Anti-vibration mounts (shipped loose)	• Isolator removal
Starting/Charging	• 24 volt starting motor(s) • Batteries with rack and cables • Battery disconnect switch	• Battery chargers (10&20AMP) •45 amp charging alternator • Oversize batteries • Ether starting aid • Heavy duty starting motors • Barring device (manual) • Air starting motor with control & silencer
General	• Right-hand service • Paint - Caterpillar Yellow except rails and radiators are gloss black • SAE standard rotation • Flywheel and flywheel housing - SAE No. 00	• CSA certification • EU Certificate of Conformance
Note	Standard and optional equipment may vary for UL 2200 Listed Packages. UL 2200 Listed packages may have oversized generators with a different temperature rise and motor starting characteristics.	

CONTINUOUS 2050 ekW 2562 kVA

60 Hz 1800 rpm 480 Volts

SPECIFICATIONS

CAT GENERATOR

Frame....................1842
Excitation....................Permanent Magnet
Pitch....................0.6667
Number of poles....................4
Number of bearings....................2
Number of leads....................6
Insulation.................... UL 1446 Recognized Class H with tropicalization and antiabrasion
IP Rating....................Drip Proof IP22
Alignment....................Closed Coupled
Overspeed capability.................... 125%
Wave form.................... 2%
Paralleling kit/Droop transformer....................Standard
Voltage regulator.3 Phase sensing with selectible volts/Hz
Voltage regulation ....Less than +/- 1/2% (steady state)
Less than +/- 1/2% (w/3% speed change)
Telephone influence factor....................Less than 50
Harmonic distortion....................Less than 5%

CAT DIESEL ENGINE

3516C-HD ATAAC, V-16,4 stroke, water-cooled
Bore....................170.00 mm (6.69 in)
Stroke....................215.00 mm (8.46 in)
Displacement....................78.08 L (4764.73 in³)
Compression Ratio.................... 14.7:1
Aspiration....................TA
Fuel System.................... Electronic unit injection
Governor Type:....................ADEM3

CAT EMCP3 CONTROL PANELS

EMCP 3.1 (standard)
EMCP 3.2 & 3.3 (Optional)
24 Volt DC control
Generator insturments designed to meet UL/CSA/CE
Integral generator terminal box
Single location for customer connection
MODBUS isolated data link (RS0485 half-duplex) supports serial communication at data rate up to 33.6 kbaud
Auto start/stop control
True RMS metering, 3-phase
• Digital indication for:
-RPM
-Operating hours
-Oil pressure
-Coolant temperature
- System DC volts
--L-L volts, L-N volts, phase amps, Hz
-Ekw, kVA, kVAR, kW-hr, %kW, PF
• Shutdowns with indicating lights for:
-Low oil pressure
-High coolant temperature
- Low coolant level
- Overspeed
-Overspeed
-Emergency stop
- Failure to start (over crank)
• Programmable protective relay functions:
- Under and over voltage
- Under and over frequency
- Reverse power
- Overcurrent (phase & total)
-

CONTINUOUS 2050 ekW 2562 kVA

60 Hz 1800 rpm 480 Volts

CATERPILLAR

TECHNICAL DATA

Open Generator Set - - 1800 rpm/60 Hz/480 Volts	DM8268	
EPA Tier 2		
Generator Set Package Performance		
Genset Power rating @ 0.8 pf	2562.5 kVA	
Genset Power rating with fan	2050 ekW	
Coolant to aftercooler		
Coolant to aftercooler temp max	50 ° C	122 ° F
Fuel Consumption		
100% load with fan	548.0 L/hr	144.8 Gal/hr
75% load with fan	434.5 L/hr	114.8 Gal/hr
50% load with fan	317.0 L/hr	83.7 Gal/hr
Cooling System[1]		
Air flow restriction (system)	0.12 kPa	0.48 in. water
Air flow (max @ rated speed for radiator arrangement)	2800 m^3/min	98881 cfm
Engine Coolant capacity with radiator/exp. tank	504.0 L	133.1 gal
Engine coolant capacity	233.0 L	61.6 gal
Radiator coolant capacity	271.0 L	71.6 gal
Inlet Air		
Combustion air inlet flow rate	177.5 m^3/min	6268.4 cfm
Exhaust System		
Exhaust stack gas temperature	467.7 ° C	873.9 ° F
Exhaust gas flow rate	465.2 m^3/min	16428.4 cfm
Exhaust flange size (internal diameter)	203.2 mm	8.0 in
Exhaust system backpressure (maximum allowable)	6.7 kPa	26.9 in. water
Heat Rejection		
Heat rejection to coolant (total)	739 kW	42027 Btu/min
Heat rejection to exhaust (total)	2075 kW	118005 Btu/min
Heat rejection to aftercooler	600 kW	34122 Btu/min
Heat rejection to atmosphere from engine	147 kW	8360 Btu/min
Heat rejection to atmosphere from generator	87.6 kW	4981.8 Btu/min
Alternator[2]		
Motor starting capability @ 30% voltage dip	6559 skVA	
Frame	1842	
Temperature Rise	105 ° C	189 ° F
Lube System		
Sump refill with filter	401.3 L	106.0 gal
Emissions (Nominal)[3]		
NOx g/hp-hr	4.4 g/hp-hr	
CO g/hp-hr	.27 g/hp-hr	
HC g/hp-hr	.12 g/hp-hr	
PM g/hp-hr	.028 g/hp-hr	

[1] For ambient and altitude capabilities consult your Caterpillar dealer. Air flow restriction (system) is added to existing restriction from factory.

[2] UL 2200 Listed packages may have oversized generators with a different temperature rise and motor starting characteristics. Generator temperature rise is based on a 40 degree C ambient per NEMA MG1-32.

[3] Emissions data measurement procedures are consistent with those described in EPA CFR 40 Part 89, Subpart D & E and ISO8178-1 for measuring HC, CO, PM, NOx. Data shown is based on steady state operating conditions of 77°F, 28.42 in HG and number 2 diesel fuel with 35° API and LHV of 18,390 btu/lb. The nominal emissions data shown is subject to instrumentation, measurement, facility and engine to engine variations. Emissions data is based on 100% load and thus cannot be used to compare to EPA regulations which use values based on a weighted cycle.

RATING DEFINITIONS AND CONDITIONS

Meets or Exceeds International Specifications: AS1359, CSA, IEC60034, ISO 3046, ISO 8528, NEMA MG 1-33, UL508A, 98/37/EC

Continuous - Output available with non-varying load for an unlimited time. Average power output is 70-100% of the continuous power rating. Typical peak demand is 100% of continuous rated ekW for 100% of operating hours. Continuous power in accordance with ISO 3046. Continuous ambients shown indicate ambient temperature at 100% load which results in a coolant top tank temperature below the alarm temperature.

Ratings are based on SAE J1349 standard conditions. These ratings also apply at ISO 3046 standard conditions.

Fuel rates are based on fuel oil of 35° API [16° C (60° F)] gravity having an LHV of 42 780 kJ/kg (18,390 Btu/lb) when used at 29° C (85° F) and weighing 838.9 g/liter (7.001 lbs/U.S. gal.). Additional ratings may be available for specific customer requirements, contact your Caterpillar representative for details. For information regarding Low Sulfur fuel and Biodiesel capability, please consult your Caterpillar dealer.

CONTINUOUS 2050 ekW 2562 kVA

60 Hz 1800 rpm 480 Volts

DIMENSIONS

Package Dimensions		
Length	7073.1 mm	278.47 in
Width	2569.2 mm	101.15 in
Height	3003.5 mm	118.25 in
Weight	18 441 kg	40,655 lb

NOTE: For reference only - do not use for installation design. Please contact your local dealer for exact weight and dimensions. (General Dimension Drawing #2924201).

Performance No.: DM8268

ature Code: 516DE5L

Gen. Arr. Number: 2523944

Source: U.S. Sourced

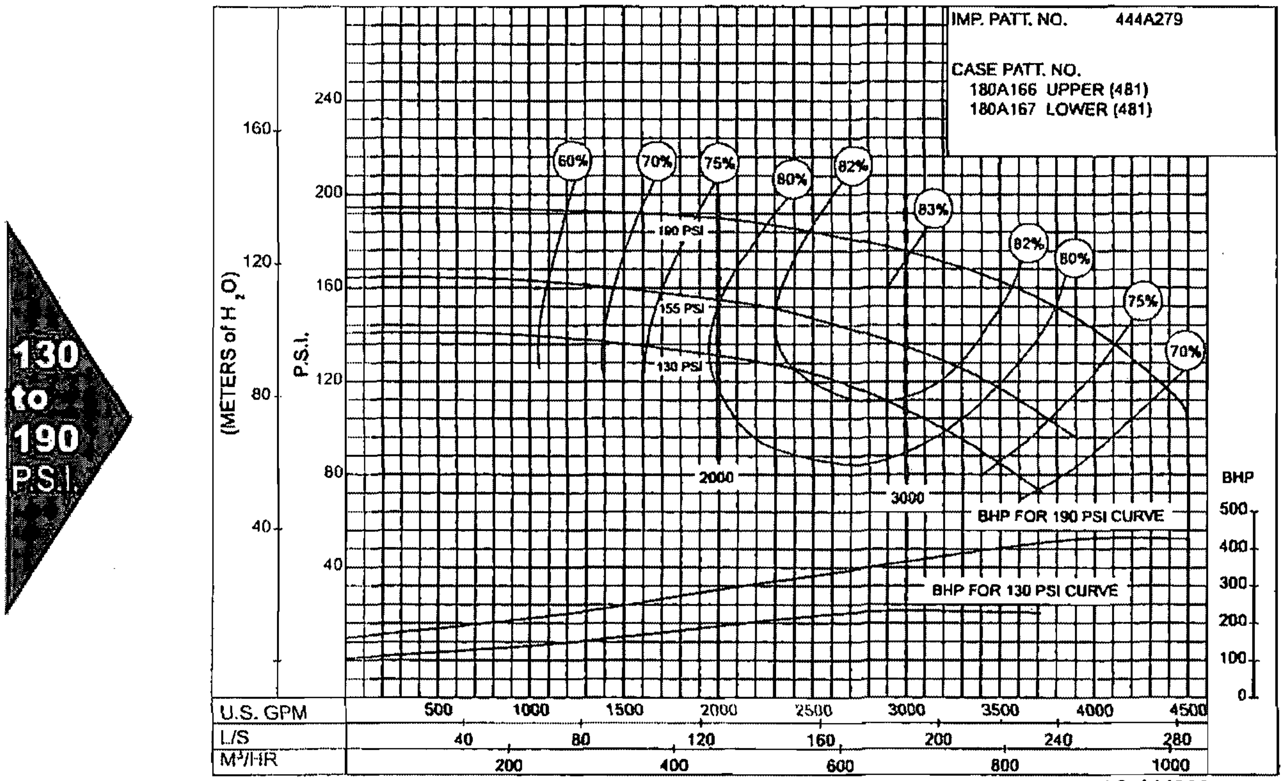
March 04 2008 11953962

BASIS FOR DIESEL FIRE PUMP ENGINE SIZE AND PERFORMANCE

2000 G.P.M. 913 SERIES

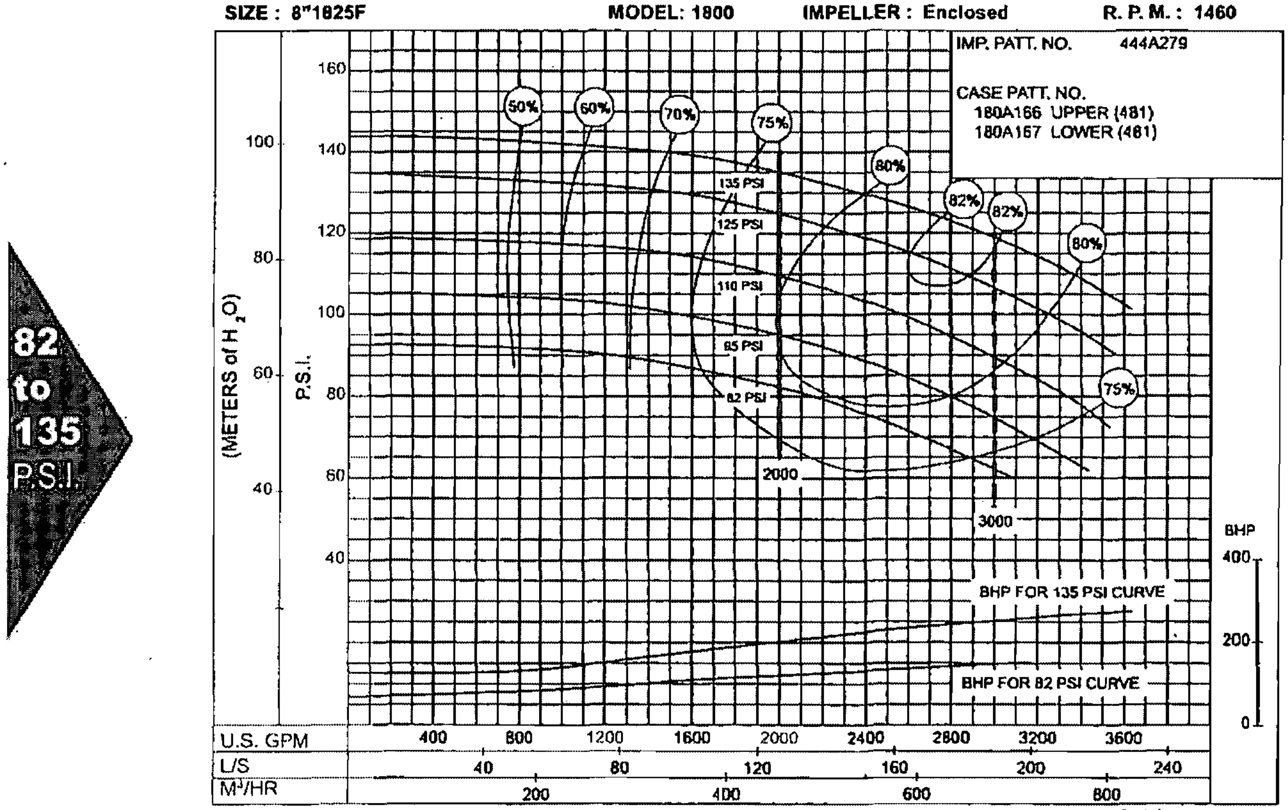
DIESEL ENGINE DRIVE

SIZE : 8"1825F **MODEL: 1800** **IMPELLER : Enclosed** **R. P. M. : 1750**



PC-144930

SIZE : 8"1825F **MODEL: 1800** **IMPELLER : Enclosed** **R. P. M. : 1460**



PC-147587

FAIRBANKS FIRE PUMPS

DIESEL ENGINE DATA

CATERPILLER MODEL 3406B-DIT PHASE 0

NUMBERS OF CYLINDERS	VOLTAGE AND POLARITY	DISPLACEMENT CU. IN. (L)	UNIT WEIGHT LBS.	EXHAUST CONNECTION	RAW WATER INLET SIZE	MAXIMUM RAW WATER P.S.I. PRESSURE	STANDARD WATER JACKET HEATER SIZE VOLTS/WATT
I-6	24V NEG. GROUND	893 (14.6)	2960	6" NPT	2" NPT	75	120/240 VOLT 3000 WATT

R.P.M.	RATED HORSE-POWER SEE NOTE 1	FUEL CONSUMPTION GAL/HOUR	COMBUSTION AIR REQ'D C.F.M.	EXHAUST FLOW RATE C.F.M.	EXHAUST TEMP. °F	MAXIMUM ALLOWABLE EXHAUST BACK PRESSURE IN. H_2O.	RADIATED HEAT BTU/MIN	MINIMUM RAW WATER FLOW GPM @ °90F
1460	247*	12.4	458	1098	840	27.0	1299	35 GPM
1750	292	14.8	578	1367	828	27.0	1366	35 GPM
2100	330	17.2	750	1704	774	27.0	1401	35 GPM

This rating is not listed or approved by ULI or FM, but is available and meets the same standards as listed and approved ratings

CATERPILLAR MODEL 3406B-DIT PHASE 1

NUMBERS OF CYLINDERS	VOLTAGE AND POLARITY	DISPLACEMENT CU. IN. (L)	UNIT WEIGHT LBS.	EXHAUST CONNECTION	RAW WATER INLET SIZE	MAXIMUM RAW WATER P.S.I. PRESSURE	STANDARD WATER JACKET HEATER SIZE VOLTS/WATT
I-6	24V NEG. GROUND	893 (14.6)	2960	6" SPL CAT FLANGE	2" NPT	75	120/240 VOLT 3000 WATT

R.P.M.	RATED HORSE-POWER SEE NOTE 1	FUEL CONSUMPTION GAL/HOUR	COMBUSTION AIR REQ'D C.F.M.	EXHAUST FLOW RATE C.F.M.	EXHAUST TEMP. °F	MAXIMUM ALLOWABLE EXHAUST BACK PRESSURE IN. H_2O.	RADIATED HEAT BTU/MIN	MINIMUM RAW WATER FLOW GPM @ °90F
1460	325	16.1	625	1801	1078	34.0	1820	25 GPM
1750	370	18.3	823	2218	988	34.0	1820	29 GPM
2100	375	18.6	1006	2440	847	34.0	1820	31 GPM
2300	350	17.8	1084	2458	766	34.0	1820	30 GPM

NOTES:

1. **If UL and FM horsepower ratings differ, the lesser of the two ratings is shown.**

EPA TANKS 4.0.9 OUTPUT

FOR DIESEL FUEL TANK EMISSIONS

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	FPL-TP Stby Diesel 60K
City:	Miami
State:	Florida
Company:	
Type of Tank:	Vertical Fixed Roof Tank
Description:	

Tank Dimensions

Shell Height (ft):		34.44
Diameter (ft):		17.22
Liquid Height (ft) :		33.46
Avg. Liquid Height (ft):		33.46
Volume (gallons):		60,000.00
Turnovers:		0.46
Net Throughput(gal/yr):		27,802.00
Is Tank Heated (y/n):	N	

Paint Characteristics

Shell Color/Shade:	Gray/Light
Shell Condition	Good
Roof Color/Shade:	Gray/Light
Roof Condition:	Good

Roof Characteristics

Type:	Dome	
Height (ft)		0.00
Radius (ft) (Dome Roof)		17.22

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Miami, Florida (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

FPL-TP Stby Diesel 60K - Vertical Fixed Roof Tank
Miami, Florida

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	83.70	75.41	92.00	78.13	0.0135	0.0106	0.0172	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

FPL-TP Stby Diesel 60K - Vertical Fixed Roof Tank
Miami, Florida

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	1.16	3.17	4.33

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	FPL- TP Diesel Day Tank 1.3K
City:	Miami
State:	Florida
Company:	
Type of Tank:	Horizontal Tank
Description:	

Tank Dimensions

Shell Length (ft):		9.60
Diameter (ft):		4.80
Volume (gallons):		1,300.00
Turnovers:		21.39
Net Throughput(gal/yr):		27,802.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	

Paint Characteristics

Shell Color/Shade:	Gray/Light
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Miami, Florida (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

FPL- TP Diesel Day Tank 1.3K - Horizontal Tank
Miami, Florida

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	83.70	75.41	92.00	78.13	0.0135	0.0108	0.0172	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

FPL- TP Diesel Day Tank 1.3K - Horizontal Tank
Miami, Florida

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	1.16	0.70	1.86

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	FPL - TP Ancillary Diesel Tank .65K
City:	Miami
State:	Florida
Company:	
Type of Tank:	Horizontal Tank
Description:	

Tank Dimensions

Shell Length (ft):		7.62
Diameter (ft):		3.81
Volume (gallons):		650.00
Turnovers:		0.43
Net Throughput(gal/yr):		278.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	

Paint Characteristics

Shell Color/Shade:	Gray/Light
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

Meterological Data used in Emissions Calculations: Miami, Florida (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

FPL - TP Ancillary Diesel Tank .65K - Horizontal Tank
Miami, Florida

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	83.70	75.41	92.00	78.13	0.0135	0.0106	0.0172	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

FPL - TP Ancillary Diesel Tank .65K - Horizontal Tank
Miami, Florida

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	0.01	0.35	0.36

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	FPL - TP Fire Pump Diesel Tank .24K
City:	Miami
State:	Florida
Company:	
Type of Tank:	Horizontal Tank
Description:	

Tank Dimensions

Shell Length (ft):		5.47
Diameter (ft):		3.00
Volume (gallons):		220.00
Turnovers:		7.50
Net Throughput(gal/yr):		1,650.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	

Paint Characteristics

Shell Color/Shade:	Gray/Light
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Miami, Florida (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

FPL - TP Fire Pump Diesel Tank .24K - Horizontal Tank
Miami, Florida

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	83.70	75.41	92.00	78.13	0.0135	0.0106	0.0172	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

FPL - TP Fire Pump Diesel Tank .24K - Horizontal Tank
Miami, Florida

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	0.07	0.16	0.22