



Memorandum

Florida Department of Environmental Protection

TO: Michael G. Cooke, Division of Air Resources Management

THRU: Trina Vielhauer, Bureau of Air Regulation
Al Linero, New Source Review Section 

FROM: Jeff Koerner, New Source Review Section 

DATE: August 18, 2003

SUBJECT: Air Permit No. PSD-FL-277B
Original Project No. 0970073-001-AC
Palmetto Power LLC - Simple Cycle Gas Turbine Peaking Plant
Request for Permit Extension

The applicant, Palmetto Power LLC, previously received a PSD permit authorizing construction of a new simple cycle electrical generating power plant to be located in Osceola County approximately a half-mile east of State Road 532 and a quarter mile south of the Orange/Osceola County border. The Department approved a subsequent request for extension of the permit from July 1, 2002 to July 1, 2003. The applicant requests a second such extension to evaluate and resolve concerns over financial viability of the project related to merchant plants and the Florida Public Service Commission.

The application included information supporting the previous BACT determinations for CO, NOx, and PM/PM₁₀. My review indicates that the BACT standards for these pollutants remain valid given that the project is for the Siemens/Westinghouse Model 501 FD gas turbine, which will exclusively fire natural gas. Due to a lack of emissions data, the initial permit required Continuous Emissions Monitoring Systems (CEMS) on one gas turbine to record CO emissions for at least one year. The permittee could later request removal of the CEMS if emissions proved low. However, test data for several Model 501FD units show variable CO emissions at low loads. Therefore, the revised permit requires the permanent installation of CEMS for each gas turbine to provide reasonable assurance of continuous compliance with the CO standards.

As requested, the expiration date is extended to November 1, 2006 and authorization to commence construction is approved for another 18 months. The revised permit includes clarifications regarding CEMS requirements. It also provides notice of the "source obligation" requirement in Rule 62-212.400(2)(g), F.A.C., which could trigger future PSD review if specific requested limitations were later relaxed.

I recommend your approval and signature.

Attachments

P.E. CERTIFICATION STATEMENT

PERMITTEE

Palmetto Power LLC
1000 Louisiana Street, Suite 5800
Houston, TX 77002

Air Permit No. PSD-FL-277B
Extension of Permit
Osceola County, Florida

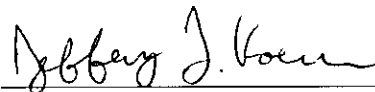
PROJECT DESCRIPTION

Palmetto Power LLC plans to install three new gas turbines designed to produce approximately 510 MW of electrical peaking power. The proposed new plant will be located in Osceola County approximately one half mile east of State Road 532 and a quarter mile south of the Orange/Osceola County border. Each gas turbine produces approximately 170 MW of electrical power while firing natural gas as the exclusive fuel and is permitted for up to 3750 hours per year. The proposed plant will be a PSD-major facility as defined in Rule 62-212.400, F.A.C. for Prevention of Significant Deterioration (PSD) of Air Quality. In addition, emissions of CO, NOx, and PM/PM10 exceed the PSD Significant Emissions Rates. Therefore, each of these pollutants is subject to PSD preconstruction review, which requires a determination of the Best Available Control Technology (BACT) and an Air Quality Analysis.

On June 5, 2000, the Department issued a Permit No. PSD-FL-277, which authorized construction of the new gas turbine peaking plant. On November 15, 2001, the Department extended the permit (Permit No. PSD-FL-277A) and the authority to commence construction on the new plant. Due a planned commercial restructuring of the project, the applicant requests a second extension of the air construction permit.

The Department's review reaffirms the BACT determinations made for the original project. Emissions of carbon monoxide and nitrogen oxide will be minimized by the lean premix combustion design of the gas turbine. Particulate matter emissions will be minimized by the exclusive firing of natural gas and efficient combustion at high temperatures. A CEMS was required to monitor CO emissions from each gas turbine due to concerns regarding low-load operation. The original ambient air quality analysis indicated that the project would not result in significant impacts from any of these pollutants and would not significantly contribute to or cause a violation of any state or federal ambient air quality standard. No additional modeling was required.

***I HEREBY CERTIFY** that the air pollution control engineering features described in the above referenced application and subject to the proposed permit conditions provide reasonable assurance of compliance with applicable provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 62-4 and 62-204 through 62-297. However, I have not evaluated and I do not certify aspects of the proposal outside of my area of expertise (including, but not limited to, the electrical, mechanical, structural, hydrological, geological, and meteorological features).*



Jeffery F. Koerner, P.E.
Registration Number: 49441

8-18-03

(Date)



Jeb Bush
Governor

Department of Environmental Protection

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

August 27, 2003

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Rick A. Bowen, Executive Vice President
Palmetto Power LLC
1000 Louisiana Street, Suite 5800
Houston, TX 77002

Re: Palmetto Power LLC – 510 MW Gas Turbine Peaking Power Plant
Extension of Air Construction Permit
Air Permit No. PSD-FL-277B
Original Project No. 0970073-001-AC

Dear Mr. Bowen:

The applicant, Palmetto Power LLC, applied on July 1, 2003 to the Department for an extension of Permit No. PSD-FL-277B to construct a new 510 MW gas turbine electrical generation peaking power plant. The proposed new plant will be located in Osceola County approximately a half-mile east of State Road 532 and a quarter mile south of the Orange/Osceola County border. An extension of time is requested to commence and complete construction on the project. The applicant believes that the original emissions standards for CO, NOx, and PM/PM₁₀ remain consistent with recent determinations of the Best Available Control Technology (BACT) for simple cycle gas turbine projects.

The Department's review reaffirms the initial BACT determinations; however, the revised permit requires the installation of Continuous Emissions Monitoring Systems (CEMS) for CO emissions to provide reasonable assurance of continuous compliance at low-load conditions. The revised permit extends the expiration date to November 1, 2006 and requires construction to commence within 18 months of this final action. The authority to commence construction becomes invalid after February 25, 2005.

A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative proceeding (hearing) under Sections 120.569 and 120.57 of the Florida Statutes (F.S.). The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida, 32399-3000. Petitions filed by the permit applicant or any of the parties listed below must be filed within fourteen (14) days of receipt of this notice of intent. Petitions filed by any persons other than those entitled to written notice under section 120.60(3), F.S., must be filed within fourteen (14) days of publication of the public notice or within fourteen (14) days of receipt of this notice of intent, whichever occurs first. Under Section 120.60(3), F.S., however, any person who asked the Department for notice of agency action may file a petition within fourteen (14) days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205 of the Florida Administrative Code (F.A.C.)

A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner, the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise

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statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action; and (g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the agency to take with respect to the agency's proposed action.

A petition that does not dispute the material facts upon which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301, F.A.C.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

Mediation is not available in this proceeding.

In addition to the above, a person subject to regulation has a right to apply for a variance from or waiver of the requirements of particular rules, on certain conditions, under Section 120.542, F.S. The relief provided by this state statute applies only to state rules, not statutes, and not to any federal regulatory requirements. Applying for a variance or waiver does not substitute or extend the time for filing a petition for an administrative hearing or exercising any other right that a person may have in relation to the action proposed in this notice of intent.

The application for a variance or waiver is made by filing a petition with the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000. The petition must specify the following information: (a) The name, address, and telephone number of the petitioner; (b) The name, address, and telephone number of the attorney or qualified representative of the petitioner, if any; (c) Each rule or portion of a rule from which a variance or waiver is requested; (d) The citation to the statute underlying (implemented by) the rule identified in (c) above; (e) The type of action requested; (f) The specific facts that would justify a variance or waiver for the petitioner; (g) The reason why the variance or waiver would serve the purposes of the underlying statute (implemented by the rule); and (h) A statement whether the variance or waiver is permanent or temporary and, if temporary, a statement of the dates showing the duration of the variance or waiver requested.

The Department will grant a variance or waiver when the petition demonstrates both that the application of the rule would create a substantial hardship or violate principles of fairness, as each of those terms is defined in Section 120.542(2), F.S., and that the purpose of the underlying statute will be or has been achieved by other means by the petitioner.

Persons subject to regulation pursuant to any federally delegated or approved air program should be aware that Florida is specifically not authorized to issue variances or waivers from any requirements of any such federally delegated or approved program. The requirements of the program remain fully enforceable by the Administrator of the EPA and by any person under the Clean Air Act unless and until the Administrator separately approves any variance or waiver in accordance with the procedures of the federal program.

This permitting decision is final and effective on the date filed with the clerk of the Department unless a petition is filed in accordance with the above paragraphs or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition pursuant to Rule 62-110.106, F.A.C., and the petition conforms to the content requirements of Rules 28-106.201 and 28-106.301, F.A.C. Upon timely filing of a petition or a request for extension of time, this action will not be effective until further order of the Department.

Any party to this permitting decision (order) has the right to seek judicial review of it under Section 120.68, F.S., by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department of Environmental Protection in the Office of General Counsel, Mail Station #35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000, and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The notice must be filed within thirty (30) days after this order is filed with the clerk of the Department.

Executed in Tallahassee, Florida.



Michael G. Cooke, Director
Division of Air Resources Management

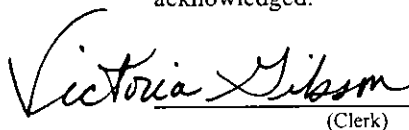
CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this order was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 8/28/03 to the person(s) listed:

Mr. Rick A. Bowen, Palmetto Power LLC*
Ms. Starla Lacy, Dynegy Inc.
Mr. Ken Kosky, Golder Associates
Mr. Len Kozlov, DEP - Central District Office
Mr. Jim Little, EPA Region 4
Mr. John Bunyak, NPS

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to §120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

 August 28, 2003
(Clerk) (Date)

**TECHNICAL EVALUATION
&
PRELIMINARY DETERMINATION**

PROJECT

Palmetto Power LLC
ARMS Facility ID No. 0970073
New Gas Turbine Peaking Plant
Emissions Units 001, 002, and 003
Extension of Permit No. PSD-FL-277B
Project No. 0970073-001-AC

COUNTY

Osceola County

APPLICANT

Palmetto Power LLC
1000 Louisiana Street, Suite 5800
Houston, TX 77002

Authorized Representative:

Mr. Rick A. Bowen, Executive Vice President

**PERMITTING
AUTHORITY**

Florida Department of Environmental Protection
Division of Air Resources Management
Bureau of Air Regulation
New Source Review Section
2600 Blair Stone Road, MS #5505
Tallahassee, FL 32399-2400



August 18, 2003

1. PROJECT DESCRIPTION

Palmetto Power LLC plans to install three new gas turbines designed to produce approximately 510 MW of electrical peaking power. The new power plant will be located in Osceola County approximately a half-mile east of State Road 532 and a quarter mile south of the Orange/Osceola County border. This is an area that is currently in attainment with, or designated as unclassifiable for, all air pollutants subject to a National Ambient Air Quality Standard (AAQS). The proposed plant will be a PSD-major facility as defined in Rule 62-212.400, F.A.C. for Prevention of Significant Deterioration (PSD) of Air Quality because potential emissions of carbon monoxide and nitrogen oxides each exceed 250 tons per year. In addition, emissions of carbon monoxide, nitrogen oxides, and particulate matter exceed the PSD Significant Emissions Rates established in Table 62-212.400-2, F.A.C. Therefore, each of these pollutants is subject to PSD preconstruction review, which requires a determination of the Best Available Control Technology (BACT) and an Air Quality Analysis.

On June 5, 2000, the Department issued a Permit No. PSD-FL-277 to construct the new gas turbine peaking plant. On November 15, 2001, the Department extended the permit (Permit No. PSD-FL-277A) as well as the authority to begin construction on the new plant. Due to the current power market conditions in Florida and planned commercial restructuring of this project, the applicant requests a second extension of the air construction permit. As part of the request, the applicant provided an updated BACT determination based on available control technologies and recent determinations in the United States.

2. EQUIPMENT DESCRIPTION

The applicant proposes to install three new Siemens/Westinghouse Model W501FD gas turbines with electrical generator sets. Each unit will produce approximately 170 MW of electrical power for up to 3750 hours per year while firing only natural gas. An evaporative cooling system may be installed to reduce the temperature of the compressor inlet air, which will provide additional power during warm weather. The combustion of natural gas will result in emissions of carbon monoxide (CO), nitrogen oxides (NO_x), particulate matter (PM/PM₁₀), sulfuric acid mist (SAM), sulfur dioxide (SO₂), and volatile organic compounds (VOC). The proposed gas turbines incorporate lean premix combustion technology to control CO, NO_x, and VOC emissions. The exclusive firing of natural gas minimizes emissions of PM/PM₁₀, SAM, and SO₂. At full load, exhaust gases from each combustion turbine will exit a 50 feet tall stack that is 19 feet in diameter at approximately 1100° F with a volumetric flow rate of 2,500,000 acfm.

3. PSD APPLICABILITY REVIEW

For projects subject to PSD preconstruction review, it is the Department's responsibility to determine the Best Available Control Technology (BACT) for each regulated pollutant emitted in excess of a PSD Significant Emission Rate. The BACT determination must be based on the maximum degree of emissions reduction that the Department determines is achievable through application of production processes and available methods, systems, and techniques for control of each such pollutant. The Department's determination is made on a case-by-case basis for each proposed project, taking into account energy, environmental and economic impacts. In addition to the information submitted by the applicant, the Department may rely upon other available information in making its BACT determination and shall also give consideration to:

- Any Environmental Protection Agency determination of BACT pursuant to Section 169 of the Clean Air Act, and any emission limitation contained in 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants).
- All scientific, engineering, and technical material and other information available to the Department.
- The emission limiting standards or BACT determination of any other state.
- The social and economic impact of the application of such technology.

The EPA currently directs that BACT should be determined using the "top-down" approach. In this approach, available control technologies are ranked in order of control effectiveness for the emissions unit under review. The most stringent

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

control option is evaluated first and selected as BACT unless it is technically infeasible for the proposed project or rejected due to adverse energy, environmental or economic impacts. If the control option is eliminated, the next most stringent alternative is considered. This top-down approach continues until BACT is determined.

The Department will also consider the control or reduction of non-regulated air pollutants when determining the BACT limit for regulated pollutants, and will weigh control of non-regulated air pollutants favorably when considering control technologies for regulated pollutants. The Department will also favorably consider control technologies that utilize pollution prevention strategies. These approaches are consistent with EPA's consideration of environmental impacts and strategies regarding pollution prevention.

As discussed previously, a PSD permit to construct has been issued for the proposed project. For the original detailed project analysis, please see the Department's Technical Evaluation and Preliminary Determination issued concurrently with the initial Draft Permit. The following table summarizes the current potential annual emissions and PSD applicability for the project.

Table 3A. Review of PSD Applicability for Project

Pollutant	Project Potential Emissions ^a (Tons Per Year)	Significant Emissions Rate (Tons Per Year)	Significant?	Subject To BACT?
CO	383 ^b	100	Yes	Yes
NOx	624	40	Yes	Yes
PM/ PM ₁₀	46/46	25/15	Yes	Yes
SAM	5	7	No	No
SO ₂	33	40	No	No
VOC	21	40	No	No

a - Potential emissions are based on firing only natural gas for 3750 hours per year, evaporative cooling at 85%, and ambient conditions at 59°F and 60% relative humidity. Assumes all PM emitted is PM₁₀.

b - Potential CO emissions reflect revision of CO standard in Permit No. PSD-FL-277A.

As shown in the above table, the proposed combustion turbine project is subject to PSD review and a Best Available Control Technology (BACT) determination for CO, NOx, and PM/PM₁₀. The applicant did not begin construction within 18 months of the previous determination. Therefore, the BACT determination must be reevaluated. This report will focus solely on the BACT determinations required for this project.

4. BACT DETERMINATION REVIEW

Applicant's Recommendation

The applicant proposed the following standards as BACT for the project.

Table 4A. Applicant's Recommended Emissions Standards

Pollutant	Standard	Control Equipment/Technique
CO	15 ppmvd @ 15% O ₂	CO emissions will be minimized by the lean premix combustion design of the proposed gas turbine and the exclusive firing of natural gas. The applicant contends that the recommended standard is within the range of recent BACT determinations for similar simple cycle gas turbines. Although technically feasible, the applicant believes that oxidation catalysts are generally reserved for projects in non-attainment areas requiring a determination of the Lowest Achievable Emission Rate (LAER).

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

NOx	15 ppmvd @ 15% O ₂	NOx emissions will be minimized by the lean premix combustion design of the proposed gas turbine and the exclusive firing of natural gas. The applicant rejects selective non-catalytic reduction (SNCR), non-selective catalytic reduction (NSCR), and SCONOx™ as not technically feasible for the simple cycle project. "Hot" selective catalytic reduction is believed to be technically feasible, but not demonstrated. The applicant rejects hot SCR as being not cost effective (>\$10,000 per ton of NOx removed).
PM/PM ₁₀	Fuel Specification Opacity ≤5% (Work Practice Standard)	PM/PM ₁₀ emissions will be minimized by firing pipeline natural gas as the exclusive fuel. Add-on controls are not warranted due to the nearly complete combustion of natural gas at the high operating temperatures of the gas turbine. Maximum particulate matter emissions are expected to be at the levels usually represented as "controlled emissions" using electrostatic precipitators or baghouses (< 0.001 grains per dscf).

The applicant provided a summary of similar projects based on data collected from EPA's RACT/BACT/LAER Clearinghouse database and EPA Region 4's National Combustion Turbine Spreadsheet. The applicant believes that the previous BACT determinations remain valid when compared to other similar recent projects.

Available Information

In addition to Permit No. PSD-FL-277A and the information submitted by the applicant, the Department also relied on the following information:

- Siemens/Westinghouse technical product literature regarding lean premix combustion and emissions;
- Equipment cost quotes for a CO oxidation catalyst and selective catalytic NOx reduction for similar projects;
- EPA's RACT/BACT/LAER Clearinghouse database; and
- EPA Region 4's National Combustion Turbine Spreadsheet.

Appendix A of this report summarizes CO and NOx BACT determinations for about 60 simple cycle gas turbine projects made since 2000 that are similar to the Palmetto Power project. The information is based on EPA Region 4's National Combustion Turbine Spreadsheet and data in EPA's RACT/BACT/LAER Clearinghouse. It is not all inclusive because there is a disjoint in information between these two sources. An attempt was made to include only similar sized projects (~ 175 MW) with simple cycle operation for which the information appeared valid. The list should be representative of BACT determinations made since 2000 for similar gas turbine projects.

CO Review and BACT Determination

For projects with large frame gas turbines, the Department has previously determined that an oxidation catalyst is technically feasible and is the top control option. However, due to the very low CO emission rates for lean premix combustor designs on new gas turbines models, it is usually determined that this add-on control equipment is not cost effective for simple cycle projects with restricted hours of operation. For example, a similar project estimated a total capital investment of \$1.6 million for an oxidation catalyst and total annualized costs of \$691,000. For one of the proposed gas turbines, reducing the potential CO emissions from 128 to 13 tons per year (90% reduction) would result in a cost effectiveness of about \$6000 per ton of CO removed. However, it is very unlikely that the peaking units will ever approach the full 3750 hours per year and it is expected that the units will outperform the vendor's guaranteed emission rate. Each of these factors tends to drive the cost effectiveness even higher. At these levels, the Department has previously rejected an oxidation catalyst for simple cycle gas turbines as not being cost effective. Appendix A shows that other states have rejected oxidation catalysts for simple cycle gas turbines due to high costs with estimates ranging from about \$8000 to nearly \$32,000 per ton of CO removed.

Appendix A also shows CO BACT determinations for nearly 60 similar gas turbine projects. All but one project bases the BACT standard on "good combustion practices". The Interstate Power and Light project lists an oxidation catalyst as required add-on control equipment. However, note that the project also includes combined cycle operation and limits simple cycle operation to less than 400 hours per year. As noted above, this dramatically changes the cost effectiveness. Looking closer at this project, the CO limit in simple cycle mode (9 ppmvd) is almost twice the limit in combined cycle

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mode (5 ppmvd). Since the General Electric model can achieve the BACT limit without an oxidation catalyst, it is most likely that this project will be constructed in phases and the oxidation catalyst will only be necessary after converting to combined cycle mode. It is also possible that the General Electric gas turbine could meet the lower BACT standard *without* the oxidation catalyst.

The remaining projects in Appendix A list CO BACT standards ranging from about 7 to 25 ppmvd for simple cycle gas turbines firing natural gas. The majority of the projects are for the Model 7FA gas turbine, which General Electric will guarantee at 9 ppmvd. Siemens/Westinghouse was only recently able to guarantee a CO emission rate of 15 ppmvd for their similar Model 501FD gas turbine with gas-only combustors. The affect of the substantially different vendor guarantees is shown in the following two projects.

- *Alabama's South Eastern Energy Project:* This project lists two CO BACT standards: 9 ppmvd for the General Electric Model 7FA and 19 ppmvd for the Siemens Westinghouse Model 501F.
- *Florida's Granite Power Partners Project:* This project lists two CO BACT standards: 12 ppmvd for the General Electric Model 7FA and 16 ppmvd for the Siemens Westinghouse Model 501F.

About 40 projects list CO standards in the range of 7 to 14 ppmvd, 5 projects list CO standards at 15 ppmvd, and about 15 projects list CO standards in the range of 16 to 25 ppmvd. Of the six projects that specifically identify the Siemens/Westinghouse Model 501F gas turbine, only Texas's Mobile Oil project lists a CO standard below 15 ppmvd. This is a little confusing because there are eight other Texas projects with CO standards of 15 ppmvd or more, which include some General Electric Model 7FA units. It is likely that the Mobile Oil project will be a LAER determination, but this was not yet confirmed in EPA's RACT/BACT/LAER Clearinghouse.

Historically, manufacturers have been hesitant to guarantee low CO emissions simultaneously with low NO_x emissions. However, actual test information suggests that low emissions for both pollutants can be achieved once the unit reaches full lean premix combustion. The following tables show actual CO emissions based on recent performance tests for the Siemens/Westinghouse 501F gas turbine.

Table 4B. Siemens Westinghouse 501FD Performance Test Summary

Plant	Unit	State	Test Date	Load	CO (ppmvd at 15% oxygen)			
					Run 1	Run 2	Run 3	Avg.
Calpine - Decatur	1	AL	06/05/02	Base (100%)	0.35	0.34	0.17	0.29
Calpine - Decatur	2	AL	06/04/02	Base (100%)	0.26	0.43	0.43	0.37
Calpine - Decatur	1	AL	10/10/02	Base (100%)	1.73	1.07	1.87	1.56
Calpine - Decatur	2	AL	10/09/02	Base (100%)	1.31	1.37	1.48	1.39
AEC - McWilliams	1	AL	12/22/01	Base (100%)	2.06	2.31	2.47	2.28
AEC - McWilliams	2	AL	12/23/01	Base (100%)	2.47	1.99	1.95	2.14
Calpine - Ontelaunee	1	PA	08/13/02	Base (100%)	<0.41	<0.42	<0.42	<0.42
Calpine - Ontelaunee	2	PA	08/14/02	Base (100%)	<0.42	<0.42	<0.42	<0.42
AEC - McWilliams	1	AL	12/22/01	85%	2.75	2.86	2.74	2.78
AEC - McWilliams	2	AL	12/23/01	85%	2.26	2.48	2.67	2.47
AEC - McWilliams	1	AL	12/22/01	70%	16.81	17.08	17.33	17.1
AEC - McWilliams	2	AL	12/23/01	70%	12.59	12.73	13.45	12.9
Calpine - Decatur	1	AL	06/05/02	60%	1.27	0.81	0.54	0.87
Calpine - Decatur	2	AL	06/04/02	60%	13.04	8.04	6.55	9.21

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

The above table shows that under full load conditions, the Siemens/Westinghouse 501F gas turbine is capable of operating with CO emissions of less than 3 ppmvd @ 15% oxygen. However, it also shows that higher CO emissions are possible under low loads.

Although technically feasible, an oxidation catalyst is not considered cost effective for this simple cycle gas turbine project. Therefore, the BACT determination will rely on the combustor design, the exclusive firing of natural gas, restricted operation, and good combustion practices. Based on the available information for the Siemens/Westinghouse 501F gas turbine, the Department reaffirms the following CO standard as BACT for this project.

$$\text{CO} \leq 15.0 \text{ ppmvd @ 15\% O}_2$$

The above standard represents the maximum degree of reduction using lean premix combustors based on the specific manufacturer, available emissions data, and requested operating conditions. This standard is within the range of recent BACT determination for similar project issued over the last three years. The original permit required installation of a Continuous Emissions Monitoring System (CEMS) to record CO emissions for at least one unit. Based on the available emissions data for low loads, the Department will require a CEMS for each gas turbine to monitor CO emissions, which will provide reasonable assurance of continuous compliance with the BACT standard under all load conditions.

In addition to the vendor's guaranteed emission rate, the Department also notes that this BACT determination is based on the following project restrictions in accordance with Rule 62-212.400(2)(g), F.A.C.

- Each combustion turbine shall operate only in simple cycle mode.
- Each combustion turbine shall operate no more than 3750 hours during any consecutive 12 months.
- Each combustion turbine shall be installed with combustors capable of firing only natural gas.
- Except for up to two hours in any 24-hour period, each combustion turbine shall operate at least 70% of base load.

A relaxation of any of these restrictions will result in a full PSD application and a new determination of BACT as if the project has never been constructed.

The Department recently issued a Draft Permit for the Hines Energy Power Block 3, a combined cycle gas turbine unit. The project is based on the Siemens/Westinghouse 501FD gas turbine and the preliminary CO BACT standard is 10 ppmvd @ 15% oxygen. Although an oxidation catalyst is not initially required, the design must allow space for the future addition of this equipment should the unit fail to achieve the BACT standard. The Department notes that the peaking operation of a gas turbine results in a wide range of load conditions, which can generate higher CO emissions. Frequent startups and shutdowns mean more operation at lower loads. In addition, when peaking power is needed, it is typical for base-loaded units to be operating at full capacity and peaking units to make up the difference, which is likely to be less than full load. Therefore, the Department makes a distinction between the two plants and believes the separate determinations are justified.

NOx Review and BACT Determination

For peaking projects with large frame gas turbines, the Department has previously determined that "hot" selective catalytic reduction (SCR) is technically feasible and is the top control option. However, due to the very low NOx emission rates for lean premix combustor designs on new gas turbines models, it is usually determined that such add-on control equipment is not cost effective for simple cycle projects with restricted hours of operation. The applicant presented information based on a similar project estimating a total capital investment of more than \$11 million for a high-temperature catalyst system and total annualized costs of \$1.9 million. For one of the proposed gas turbines, reducing the potential NOx emissions from 208 to 55 tons per year (~ 74% reduction) would result in a cost effectiveness of more than \$12,000 per ton of NOx removed. Also, it is very unlikely that the peaking units will ever approach the full 3750 hours per year and it is expected that the units will outperform the vendor's guaranteed emission rate. Each of these factors tends to drive the cost effectiveness even higher. At these levels, the Department has previously rejected SCR for simple cycle gas turbines as not being cost effective. Appendix A shows that other states have rejected this technology for simple cycle gas turbines also due to high costs with estimates ranging from about \$13,000 to \$22,000 per ton of NOx removed. The applicant notes that, although technically feasible, "hot" SCR has not yet been successfully demonstrated on a large frame simple cycle gas turbines.

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

Appendix A shows NO_x BACT determinations for nearly 60 similar simple cycle gas turbines firing natural gas. All of these projects base the NO_x BACT standard on lean premix combustion technology. NO_x standards range from 9 to 25 ppmvd for gas firing. About 90% of the projects identify the Model 7FA gas turbine, for which General Electric guarantees a NO_x emissions rate of 9 ppmvd @ 15% oxygen. Currently, Siemens/Westinghouse offers a guaranteed NO_x emissions rate of 15 ppmvd @ 15% oxygen for the Model 501F gas turbine. During full lean premix combustion, the Model 501FD never fully shuts off the diffusion flame combustor, which generates higher NO_x emissions.

Although SCR has been determined to be cost effective for combined cycle gas turbines, these projects have much higher annual capacity factors and can use the less expensive conventional catalysts due to the lower operating temperatures encountered after the heat recovery steam generator. The Department believes that "hot" SCR with a high-temperature catalyst is technically feasible for large frame simple cycle gas turbines. However, based on estimated cost of more than \$10,000 per ton of NO_x removed, the Department also rejects "hot" SCR as not being cost effective for the simple cycle gas turbine project. Therefore, the Department reaffirms the following NO_x standard as BACT for this project.

NO_x ≤ 15.0 ppmvd @ 15% O₂

The above NO_x standard also considers the fact that this project is based on the exclusive firing of natural gas. This is important for two reasons. First, the Department does not believe that Siemens/Westinghouse offers a guarantee of this low NO_x emission rate for a dual-fuel burner system. Second, most other similar projects request oil as a restricted alternate fuel. Unfortunately, the lean premix combustor designs do not yet extend to oil firing. NO_x emissions during oil firing are reduced by either water or steam injection, which results in controlled NO_x emissions of about 42 ppmvd @ 15% oxygen for most units. This is roughly 3-4 times higher than NO_x emissions when firing gas depending on the specific model. Therefore, even projects with restricted oil firing typically result in higher overall NO_x emissions than gas-only projects.

The same project restrictions identified under the CO review also apply to the review of NO_x emissions. Continuous compliance will be demonstrated by a Continuous Emissions Monitoring System (CEMS). The Subpart GG New Source Performance Standard (NSPS) for NO_x emissions from new gas turbines is 112.5 ppmvd @ 15% oxygen based on a heat rate of 9100 Btu/kWh for the Model 501F gas turbine, the lower heating value of natural gas, and inlet compressor conditions of 59° F and 60% relative humidity. The BACT determination is clearly more stringent than this standard.

PM/PM₁₀ Review and BACT Determination

The applicant identified several available control technologies for particulate matter removal including centrifugal collectors, electrostatic precipitators, fabric filters, and wet scrubbers. Pipeline natural gas typically contains less than 1 grain of sulfur per 100 standard cubic feet. Siemens/Westinghouse estimates particulate matter emissions of no more than 8.6 pounds per hour from the Model 501FD combustion turbine when fired exclusively with natural gas. Based on the design flow rate, this equates to approximately 0.001 grains per dry standard cubic feet of exhaust gas, which is similar to concentrations expected *after* control by a high efficiency fabric filter for other combustion processes. At this level, additional add-on control equipment would be cost prohibitive. Therefore, the Department establishes the following work practice standards as BACT for particulate matter.

Fuel Specification: Each gas turbine shall be fired exclusively with pipeline natural gas containing no more than 1 grain of sulfur per 100 SCF (monthly average).

Opacity: Visible emissions shall not exceed 5% opacity.

Information from EPA's RACT/BACT/LAER Clearinghouse supports the above standards as BACT for particulate matter from simple cycle gas turbines. Compliance with the fuel specifications shall be demonstrated by keeping records of the sulfur content of the natural gas delivered via the pipeline. Compliance with the opacity standard shall be demonstrated by conducting initial and annual performance tests in accordance with EPA Method 9.

5. AIR QUALITY ANALYSIS

From the original Technical Evaluation and Preliminary Determination, "The applicant's initial PM₁₀, CO, and NO_x air

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

quality impact analyses for this project predicted no significant impacts; therefore, further applicable AAQS and PSD increment impact analyses for these pollutants were not required." The applicant's request and the proposed permit revisions would not result in any changes to the modeled emissions. The project continues to show no significant impacts. No further modeling analysis was required.

6. CONCLUSION

The Department makes a preliminary determination that the proposed project will comply with all applicable state and federal air pollution regulations. This determination is based on the technical review of the complete application, reasonable assurances provided by the applicant, a reevaluation of the determination of Best Available Control Technology (BACT), and the conditions specified in the Draft Permit. Jeff Koerner is the permitting engineer responsible for reviewing the application, reaffirming the BACT determinations, and drafting the permit conditions.

**Appendix A - Recent BACT Determinations for
Similar Simple Cycle Gas Turbine Projects**

State	Facility	# of New MW	Application Date	Final Permit Issued	# of CTs	Turbine Model	Fuel	Mode	Hours	NOx Limit	Control Method	Avg. Time	CO Limit	Control Method	Avg. Time	Comments
AL	Calhoun Power Company	680	08/30/2000	01/01/2001	4	GE 7FA (175 MW)	NG/FO	SC	SC-4,000 FO-1,000	9 ppmvd, gas 42 ppmvd, FO	Gas-DLN FO-WI	1-hr	- 20 ppmvd, gas - 35 ppmvd, FO	GCP		
AL	South Eastern Energy Corp.	1,500	01/18/2000	01/01/2001	6	GE 7FA or SW 501F (175 MW)	NG	CC/SC	8,760	9 ppmvd, GE 25 ppmvd, S/W	CC-SCR SC-DLN		9ppmvd, GE 19 ppmvd, S/W	GCP		
AL	Tenaska Alabama III Partners	510	08/28/2000	01/01/2001	3	GE 7FA (175 MW)	NG/FO	SC	SC-3,066 FO-720	15 ppmvd, gas 42 ppmvd, FO	Gas-DLN FO-WI		15 ppmvd	GCP		
CO	Front Range Power Project/Ray Nixon Sta., Fountain, CO	480	5/1/2000	11/01/2000	2	GE 7FA (175MW)	NG	CC/SC	8,760	9 ppmvd	DLN		25 ppmvd	GCP	1-hr	Revising application to net out of PSD for NOx using reductions at coal-fired unit
CO	Public Service Co. of Colo./Ft. St. Vrain Unit 4 (242 MW)	240	1/1/2000	06/19/2000	1	GE 7FA (175MW)	NG	CC/SC	8,760	9 ppmvd	SC-DLN CC-SCR	24-hr	9 ppmvd 20 ppmvd, DB+CC	GCP	1-hr	
FL	Belle Glade Energy Center	600	04/03/2001	01/28/2002	3	GE 7FA (175 MW)	NG	SC	SC-5,000	9 ppmvd	SC-DLN	24-hr	8 ppmvd	GCP	3-hr	
FL	Broward Energy Center	775	04/03/2001	05/15/2002	4	GE 7FA (175 MW)	NG	SC	SC-5,000	9 ppmvd	SC-DLN	24-hr	8 ppmvd	GCP	3-hr	
FL	Deerfield Beach Energy Center	510	01/26/2001	Draft Permit	3	GE 7FA (175 MW)	NG/FO	SC	SC-3,500 FO-1000	9 ppmvd, gas 42 ppmvd, FO	Gas-DLN FO-WI	24-hr	9 ppmvd, gas 20 ppmvd, FO	GCP		
FL	Florida Power & Light - Martin Power Plant	340	02/23/2000	07/01/2000	2	GE 7FA (175 MW)	NG/FO	SC	SC-3,390 FO-500	9 ppmvd, gas 42 ppmvd, FO	Gas-DLN FO-WI		9 ppmvd, gas 20 ppmvd, FO	GCP		
FL	FPL Manatee	1,150	03/04/2002	04/15/2003	4	GE 7FA (175 MW)	NG	CC/SC	CC-8,760 SC-1,000	9 ppmvd	CC-SCR SC-DLN	24-hr	10 ppmvd, gas	GCP	24-hr	
FL	FPL Martin	1,150	02/05/2002	04/16/2003	4	GE 7FA (175 MW)	NG/FO	CC/SC	CC-8,760 SC-5,000 FO-500	9 ppmvd, gas 42 ppmvd, FO	CC-SCR SC-DLN FO-WI	24-hr	10 ppmvd, gas 15 ppmvd, FO	GCP	24-hr	
FL	Granite Power Partners	540	01/19/2000	08/01/2000	3	GE 7FA or SW 501F (175 MW)	NG/FO	SC	SC-3,000 FO-500	10.5 ppmvd, gas 15 ppmvd, S/W gas only 42 ppmvd, FO	DLN		12 ppmvd, GE 16 ppmvd, S/W gas only 20 ppmvd, FO	GCP		FO-500 hr
FL	IPS Avon Park - Shady Hills	510	10/28/1999	01/01/2000	3	GE 7FA (175 MW)	NG/FO	SC	SC-3,390 FO-1,000	9 ppmvd, gas 42 ppmvd, FO	Gas-DLN FO-WI		12 ppmvd, gas 20 ppmvd, FO	GCP		
FL	IPS Avon Park Corp. - DeSoto Power Project	510	02/11/2000	06/01/2000	3	GE 7FA (175 MW)	NG/FO	SC	SC-3,390 FO-1,000	9 ppmvd, gas 42 ppmvd, FO	Gas-DLN FO-WI		12 ppmvd, gas 20 ppmvd, FO	GCP		
FL	Manatee Energy Center	600	04/03/2001	01/17/2002	3	GE 7FA (175 MW)	NG	CC/SC	CC-8,760 SC-5,000	9 ppmvd	CC-SCR SC-DLN	24-hr	8 ppmvd	GCP	3-hr	
FL	Midway Development Center	510	11/17/2000	02/01/2001	3	GE 7FA (175 MW)	NG/FO	SC	SC-3,500 FO-1,500	12 ppmvd, gas 42 ppmvd, FO	Gas-DLN FO-WI		9 ppmvd, gas 20 ppmvd, FO	GCP		Hot SCR - \$20,700/ton NOx; CatOx- \$31,800/ton CO
FL	Palmetto Power	540	10/25/1999	06/01/2000	3	SW 501F (175 MW)	NG	SC	SC-3750	15 ppmvd (Gas Only)	DLN		15 ppmvd	GCP		
FL	Peace River Station	510	06/14/2000	12/01/2000	3	GE 7FA (175 MW)	NG/FO	SC	SC-3,390 FO-720	10 ppmvd, gas 42 ppmvd, FO	Gas-DLN FO-WI	3-hr	8.2 ppmvd, gas 14.2 ppmvd, FO	GCP	3-hr	
FL	Pompano Beach Energy Center, LLC	510	10/24/2000	Draft Permit	3	GE 7FA (175 MW)	NG/FO	SC	SC-3,500 FO-1,500	12 ppmvd, gas 42 ppmvd, FO	Gas-DLN FO-WI		9 ppmvd, gas 20 ppmvd, FO	GCP		Hot SCR - \$20,400/ton NOx; CatOx- \$31,800/ton CO
FL	South Pond Energy Park	600	11/21/2000	Draft Permit	3	GE 7FA (175 MW)	NG/FO	CC/SC	CC-8,760 SC-3,390 FO-720	9 ppmvd 36 ppmvd, FO	CC-SCR SC-DLN FO-WI	3-hr	9 ppmvd, gas 20 ppmvd, FO	GCP	3-hr	

**Appendix A - Recent BACT Determinations for
Similar Simple Cycle Gas Turbine Projects**

State	Facility	# of New MW	Application Date	Final Permit Issued	# of CTs	Turbine Model	Fuel	Mode	Hours	NOx Limit	Control Method	Avg. Time	CO Limit	Control Method	Avg. Time	Comments
GA	Effingham Power Co.	525	12/27/2000	12/27/2001	2	GE 7FA (175 MW)	NG	CC/SC	8,760	12 ppmvd	CC-SCR SC-DLN		9 ppmvd	GCP		
GA	MEA of Georgia - W. R. Clayton	500	08/07/2001	Draft Permit	3	GE 7FA (175 MW)	NG/FO	SC	SC-8,760 FO-1,500	12 ppmvd, gas 42 ppmvd, FO	Gas-DLN FO-WI	24-hr	13.1 ppmvd, gas 32.4 ppmvd, FO	GCP	24-hr	Hot SCR - \$14,100/ton NOx; CatOx - \$15,000/ton CO
GA	Peace Valley Generation Co., LLC	1,550	02/20/2001	Under Review	6	"F" Class (175 MW)	NG	CC/SC	CC-8,760 SC-2,500	9 ppmvd	CC-SCR SC-DLN		10.6 ppmvd	GCP		
IA	Interstate Power and Light	568	Public Review	Public Review	2	GE 7FA (175 MW)	NG/FO	CC/SC	CC-8760 SC-400 FO-200/50	9 ppmvd 42 ppmvd, FO	CC-SCR SC-DLN FO-WI	3-hour	9 ppmvd, gas 20 ppmvd, FO 5 ppmvd, CC	Ox. Cat.	3-hr	Ox. Cat. required only for CC operation?
IN	(Acadia Bay) Allegheny Energy Supply Company, LLC	630	03/22/2001	12/07/2001	2	S/W 501 (175MW)	NG	CC/SC	8,760	25 ppmvd	CC-SCR SC-DLN	CC- 3 hr SC-24 hr	25-100 ppmvd	GCP	24 hr	CO depends on temp.
IN	Southern Energy, Inc. (Mirant Sugar Creek, LLC)	1,008	04/24/2000	05/09/2001	4	GE 7FA (175 MW)	NG	CC/SC	8,760	9 ppmvd (>=50% load)	DLN, GCP	3-hr	9 ppmvd (>=50% load)	GCP	24-hr	
KY	Louisville Gas & Electric - Trimble	960	05/01/2001	06/26/2001	6	GE 7FA (175 MW)	NG	SC	SC-8760	9/12 ppmvd	DLN	1-hr Annual	9 ppmvd	GCP	3-hr	
KY	Summer Shade Development Co.	680	01/14/2002	Under Review	4	GE 7FA (175 MW)	NG	SC	SC-4000	9 ppmvd	DLN		9 ppmvd	GCP		
KY	Westlake Energy Corp.	520	06/13/2001	Draft Permit	2	"F" Class (175 MW)	NG	SC	SC-8760	4.5 ppm	SCR		17.2 ppmvd	GCP		Hot SCR? Not in R/B/L/C
MA	Sithe West Medway	540		Final	3	GE 7FA (175 MW)	NG	SC	SC-2500	9 ppmvd	DLN	1-hr	9 ppmvd	GCP	1-hr	
MD	ODEC Rock Springs - Cecil Co., MD	1,020	08/06/1999	10/30/2000	6	GE 7FA (175 MW)	NG	SC		9 ppmvd	Dry LNB		9 ppmvd	GCP		
NC	Carolina Power & Light, Richmond Co. (2nd revision - new configuration)	2,040	05/14/2001	Under Review	9	GE 7FA (175 MW)	NG/FO	CC/SC	CC-8,760 SC-/2,000 FO-1,000	9 ppmvd 42 ppmvd, FO	CC-SCR SC-DLN FO-WI	24-hr	9 ppmvd, gas 20 ppmvd, FO	GCP		
NC	Entergy Power - Rowan Generating Facility	930	01/29/2001	01/25/2002	6	GE 7FA (175 MW)	NG/FO	SC	SC-4,400 FO-1,000	10.5 ppmvd, gas 42 ppmvd, FO	Gas-DLN FO-WI	24-hr	9 ppmvd, gas 20 ppmvd, FO	GCP		Hot SCR - \$13,049/ton NOx; CatOx - \$8,204/ton CO
NC	Fayetteville Generation	500	04/03/2000	01/10/2002	2	GE 7FA (175 MW)	NG/FO	CC/SC	8,760; 1000 FO	9 ppmvd 42 ppmvd, FO	CC-SCR SC-DLN FO-WI		9 ppmvd, gas 20-41 ppmvd, FO	GCP		CO for FO depends on Load
NE	Omaha Public Power, Cass County Station	346	09/06/2000	11/15/2001	2	GE 7FA or SW 501F (175 MW)	NG	SC	SC-2,500	20 ppmvd	DLN		15 ppmvd	GCP		
NJ	Sithe Energy (GPU) - Reliant Energy	520	Pending	Under Review	3	"F" Class (175 MW)	NG	SC	SC-8760	9 ppmvd	DLN	1 hour	9 ppmvd	GCP	1-hr	
OH	DP&L Tait Generating	?	?	-	?	?		SC		9 ppmvd	DLN		?	GCP		
OH	Rolling Hills Generating	1,045	?	-	5	(209 MW)		SC		15 ppmvd	DLN		?	GCP		
PA	Armstrong	660	08/17/2000	12/07/2000	4	GE 7FA (175 MW)	NG/FO	SC	SC-4450 FO-770	9 ppmvd, gas 42 ppmvd, FO	Gas-DLN FO-WI	1 hour	20 ppmvd, gas 25 ppmvd, FO	GCP	1-hr	
SC	Broad River Energy (SkyGen)	342	07/13/2000	12/01/2000	2	GE 7FA (175 MW)	NG	SC	SC-3000	9 ppmvd	DLN		9 ppmvd	GCP		
SC	Broad River Energy Center (f/k/a Cherokee Falls)	340	03/01/2002	Draft Permit	2	GE 7FA (175 MW)	NG/FO	SC	SC-3000	9 ppmvd, gas 42 ppmvd, FO	Gas-DLN FO-WI		9 ppmvd, gas 20 ppmvd, FO	GCP		Hot SCR - \$22,800/ton NOx; CatOx - \$10,500/ton CO
SC	GenPower Anderson - revision	340	03/01/2002	Under Review	2	GE 7FA (175 MW)	NG	SC	SC-2928	9 ppmvd	DLN		9 ppmvd	GCP		
SC	Greenville Generating	930	05/04/2001	Draft Permit	6	GE 7FA (175 MW)	NG/FO	SC	SC-3,400 FO-1,000	9 ppmvd, gas 42 ppmvd, FO	Gas-DLN FO-WI		9 ppmvd, gas 36 ppmvd, FO	GCP		Hot SCR - \$13,909/ton NOx; CatOx - \$8,204/ton CO
SC	Santee Cooper, Rainey Generating Station	870	06/14/1999	04/01/2000	4	GE 7FA (175 MW)	NG/FO	CC/SC	CC-8,760 FO-1,000	9 ppmvd, gas 42 ppmvd, FO	Gas-DLN FO-WI		9 ppmvd, gas 20 ppmvd, FO	GCP		

**Appendix A - Recent BACT Determinations for
Similar Simple Cycle Gas Turbine Projects**

State	Facility	# of New MW	Application Date	Final Permit Issued	# of CTs	Turbine Model	Fuel	Mode	Hours	NOx Limit	Control Method	Avg. Time	CO Limit	Control Method	Avg. Time	Comments
TN	Southern Power Co.	1,940	12/05/2001	Under Review	8	GE 7FA (175 MW)	NG/FO	CC/SC	CC-8760 FO-1,000	9 ppmvd 42 ppmvd, FO	CC-SCR SC-DLN FO-WI		- 20 ppmvd, gas - 40 ppmvd, FO	GCP		
TX	AES Aurora	1,000	04/22/1999	02/07/2000	4	GE 7FA or SW 501F (175 MW)	NG	SC		9 ppmvd	DLN		25 ppmvd	GCP		
TX	Archer Power Partners LP	1,000	04/05/1999	01/13/2000	4	GE 7FA (175 MW)	NG	SC		9 ppmvd	DLN		9 ppmvd	GCP		
TX	Coastal Power Company	550	07/28/1999	03/22/2000	2	GE 7FA (175 MW)	NG	SC		9 ppmvd	DLN		20 ppmvd	GCP		
TX	Cobisa-Forney, LP	1,774	07/29/1999	03/06/2000	6	GE 7FA (175 MW)	NG	SC		9 ppmvd	DLN		15 ppmvd	GCP		
TX	Corpus Christi Cogeneration LP	708	05/28/1999	02/04/2000	3	GE 7FA (175 MW)	NG	SC		9 ppmvd	DLN		15 ppmvd	GCP		
TX	Duke Energy Bell LP	520	06/14/1999	02/04/2000	2	GE 7FA (175 MW)	NG	SC		9 ppmvd	DLN		20 ppmvd	GCP		
TX	Duke Ennergy Kaufman	440	05/27/1999	01/27/2000	2	GE 7FA (175 MW)	NG	SC		9 ppmvd	DLN		20 ppmvd	GCP		
TX	Duke Power - Jack, LP	520	08/25/1999	03/14/2000	2	GE 7FA (175 MW)	NG	SC		9 ppmvd	DLN		20 ppmvd	GCP		
TX	Freestone Power Project LP	1,070	04/30/1999	03/28/2000	4	GE 7FA (175 MW)	NG	SC		9 ppmvd	DLN		20 ppmvd	GCP		
TX	Gateway Power Project, LP	800	07/06/1999	03/20/2000	3	GE 7FA (175 MW)	NG	SC		9 ppmvd	DLN		7.4 ppmvd	GCP		
TX	Mobil Oil	740	02/11/1999	03/14/2000	3	SW 501 (175 MW)	NG	SC		9 ppmvd	DLN		10 ppmvd, gas 25 ppmvd, FO	GCP		
TX	SEI - Texas, LLC	650	02/11/1999	03/21/2000	2	GE 7FA (175 MW)	NG	SC		9 ppmvd	DLN		9 ppmvd	GCP		
VA	CHICKAHOMINY POWER	675		01/10/2003	4	S/W 501 (175MW)	NG	SC		15 ppmvd	LNB		25 ppmvd	GCP		R/B/L/C lists: NOx < 1.5 ppmvd CO < 2 ppmvd Looks like error ...
VA	LADYSMITH	800		07/02/2000	5	GE 7FA (175 MW)	NG/FO	SC		9 ppmvd	LNB/WI		9ppmvd	GCP		
VA	White Oak Power	680		08/29/2002	4	GE 7FA (175 MW)	NG	SC		9 ppmvd	LNB		8 ppmvd	GCP		
WV	Pleasants	335		Final	2	GE 7FA (175 MW)	NG/FO	SC	SC-3708	9 ppmvd	Gas-DLN FO-WI		32 ppmvd	GCP		

Abbreviations:

GE = General Electric
S/W = Seimens Westinghouse

SC = Simple Cycle
CC = Combined Cycle
FO = Fuel Oil

DLN = Dry-Low NOx
WI = Water Injection
SCR = Selective Catalytic Reduction

Ox. Cat = Oxidation Catalyst
GCP = Good Combustion Practices

This list was compiled from EPA Region 4's National Combustion Turbine Spreadsheet. It is representative of projects similar to Palmetto Power LLC's: 175 MW gas turbine fired with natural gas in simple cycle mode. Excluded were projects for smaller gas turbines, oil-only projects, combined cycle only projects, projects with clear errors in data, new projects still under review, and projects with data different than that in EPA's RACT/BACT/LAER Clearinghouse. Note that some projects included both combined cycle and simple cycle units or units were allowed both types of operation.



Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
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David B. Struhs
Secretary

PERMITTEE:

Palmetto Power LLC
1000 Louisiana Street, Suite 5800
Houston, TX 77002

Authorized Representative:

Mr. Rick A. Bowen, Executive Vice President

Project No. 0970073-001-AC PSD Permit No. PSD-FL-277B Facility ID No. 0970073 SIC No. 4911 Expires: November 1, 2006
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PROJECT AND LOCATION

This permit is issued pursuant to the requirements for the Prevention of Significant Deterioration of Air Quality (PSD Permit). The proposed project authorizes the installation of three 170 MW simple cycle gas turbines with electrical generator sets fired solely with natural gas. The new electric power generating plant will provide approximately 510 MW of electrical power. The original PSD permit was issued June 2, 2000 and later extended on November 13, 2001. This second revision extends the expiration date and period of construction.

The project will be located in Osceola County approximately a half-mile east of State Road 532 and a quarter mile south of the Orange/Osceola County border. The UTM coordinates are Zone 17, 508.3 km E, 3135.2 km N and the map coordinates are Latitude 28° 20' 40", Longitude 80° 54' 52".

STATEMENT OF BASIS

This air pollution construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.) and 40 CFR 52.21. The permittee is authorized to install the proposed equipment in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department.

APPENDICES

The following Appendices are attached as part of this permit.

- Appendix A. Terminology
- Appendix BD. Summary of Final BACT Determinations
- Appendix GC. Construction Permit General Conditions
- Appendix GG. NSPS Subpart GG Requirements for Gas Turbines
- Appendix XS. CEMS Excess Emissions and Performance Report

Michael G. Cooke, Director
Division of Air Resources Management

Effective Date: August 28, 2003

"More Protection, Less Process"

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SECTION I. FACILITY INFORMATION

FACILITY DESCRIPTION

Completion of this project will result in a new electric power generating plant capable of providing approximately 510 MW of electrical power.

NEW EMISSIONS UNITS

The proposed project will result in the following new emissions units.

ARMS ID No.	COMMON EMISSION UNIT DESCRIPTION
001	Each unit consists of a 170 MW gas turbine with electrical generator set. Lean premix combustion technology controls emissions of CO, NOx, and VOC. The exclusive firing of natural gas minimizes emissions of PM and SO ₂ .
002	
003	

REGULATORY CLASSIFICATION

Title III: The new facility will not be a major source of hazardous air pollutants (HAP).

Title IV: The gas turbines are subject to the acid rain provisions of the Clean Air Act.

Title V: The new facility will be a Title V major source of air pollution pursuant to Chapter 62-213, F.A.C.

PSD: The new facility will be a PSD major source of air pollution pursuant to Rule 62-212.400, F.A.C.

NSPS: The gas turbines are subject to the New Source Performance Standards in Subpart GG of 40 CFR 60.

RELEVANT DOCUMENTS

- Request to extend Permit No. PSD-FL-277B received on July 1, 2003; all information to make it complete.
- Extension of Permit No. PSD-FL-277A issued on November 13, 2001.
- Original Permit No. PSD-FL-277 issued on June 2, 2000.

EXTENSION

On July 1, 2003, the permittee requested an extension of the PSD air permit to construct the new facility. The Department reaffirmed the previous determinations of the Best Available Control Technology for carbon monoxide, nitrogen oxides, and particulate matter. Based on the available information for the Siemens/Westinghouse Model 501 FD, the Department is also requiring the installation of CEMS to monitor CO emissions from each gas turbine. The permit is amended to extend the expiration date, extend the authority to commence construction, and for the CEMS requirements.

SECTION II. ADMINISTRATIVE REQUIREMENTS

GENERAL AND ADMINISTRATIVE REQUIREMENTS

1. Permitting Authority: All documents related to applications for permits to construct, operate or modify an emissions unit should be submitted to the Bureau of Air Regulation (BAR), Florida Department of Environmental Protection (DEP), at 2600 Blair Stone Road, MS#5505, Tallahassee, Florida 32399-2400 and phone number 850/488-0114.
2. Compliance Authority: All documents related compliance activities such as reports, tests, and notifications should be submitted to the Air Resources Section of the Central District Office, Florida Department of Environmental Protection, 3319 Maguire Boulevard, Suite 232, Orlando, Florida 32803-3767. The phone number is 407/894-7555 and the fax number is 407/897-5963.
3. Terminology: The terms used in this permit have specific meanings as defined in the applicable chapters of the Florida Administrative Code. *Appendix A* lists frequently used abbreviations and explains the format used to cite rules and regulations in this permit.
4. General Conditions: The owner and operator are subject to, and shall operate under, the attached General Conditions listed in *Appendix GC* of this permit. General Conditions are binding and enforceable pursuant to Chapter 403 of the Florida Statutes. [Rule 62-4.160, F.A.C.]
5. Applicable Regulations, Forms and Application Procedures: Unless otherwise indicated in this permit, the construction and operation of the subject emissions units shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of: Chapter 403 of the Florida Statutes (F.S.); Chapters 62-4, 62-204, 62-210, 62-212, 62-213, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.); and the Title 40, Parts 52, 60, 72, 73, and 75 of the Code of Federal Regulations (CFR), adopted by reference in Rule 62-204.800, F.A.C. The permittee shall use the applicable forms listed in Rule 62-210.900, F.A.C. and follow the application procedures in Chapter 62-4, F.A.C. Issuance of this permit does not relieve the facility permittee from compliance with any applicable federal, state, or local permitting or regulations. [Rules 62-204.800, 62-210.300 and 62-210.900, F.A.C.]
6. PSD Expiration: Approval to construct shall become invalid if construction is not commenced within 18 months after the effective date of this permit (Page 1), or if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time. The Department may extend the 18-month period upon a satisfactory showing that an extension is justified. {Permitting Note: The 18-month period to commence construction has been extended twice. Failure to begin construction may require the submittal of a new PSD permit application.} [40 CFR 52.21(r)(2)]
7. Permit Expiration: For good cause, the permittee may request that this PSD air construction permit be extended. Such a request shall be submitted to the Department's Bureau of Air Regulation at least sixty (60) days prior to the expiration of this permit. [Rules 62-4.070(4), 62-4.080, and 62-210.300(1), F.A.C.]
8. BACT Determination: In conjunction with extension of the 18-month period to commence or continue construction, phasing of the project, or an extension of the permit expiration date, the permittee may be required to demonstrate the adequacy of any previous determination of Best Available Control Technology (BACT) for the source. [Rule 62-212.400(6)(b), F.A.C. and 40 CFR 52.166(j)(4)]
9. New or Additional Conditions: For good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.]
10. Modifications: No emissions unit or facility subject to this permit shall be constructed or modified without obtaining an air construction permit from the Department. Such permit shall be obtained prior to beginning construction or modification. [Rules 62-210.300(1) and 62-212.300(1)(a), F.A.C.]

SECTION II. ADMINISTRATIVE REQUIREMENTS

11. Source Obligation: This project is subject to Rule 62-212.400(2)(g), F.A.C., which states, "If a previously permitted facility or modification becomes a facility or modification which would be subject to the preconstruction review requirements of this rule if it were a proposed new facility or modification solely by virtue of a relaxation in any federally enforceable limitation on the capacity of the facility or modification to emit a pollutant (such as a restriction on hours of operation), which limitation was established after August 7, 1980, then at the time of such relaxation the preconstruction review requirements of this rule shall apply to the facility or modification as though construction had not yet commenced on it." This includes, but is not limited to, increases in maximum heat input rates, hours of operation, pollutant emission rates, or a request for combined cycle operation. [Rule 62-212.400(2)(g), F.A.C.]
12. Application for Title IV Permit: At least 24 months before the date on which the new unit begins serving an electrical generator greater than 25 MW, the permittee shall submit an application for a Title IV Acid Rain Permit to the Region 4 Office of the U.S. Environmental Protection Agency in Atlanta, Georgia and a copy to the Department's Bureau of Air Regulation in Tallahassee. [40 CFR 72]
13. Application for Title V Permit: This permit authorizes construction of the permitted emissions units and initial operation to determine compliance with Department rules. A Title V operation permit is required for regular operation of the permitted emissions unit. The permittee shall apply for a Title V operation permit at least 90 days prior to expiration of this permit, but no later than 180 days after commencing operation. To apply for a Title V operation permit, the applicant shall submit the appropriate application form, compliance test results, and such additional information as the Department may require by law. The application shall be submitted to the appropriate Permitting Authority with copies to the Compliance Authority. [Rules 62-4.030, 62-4.050, 62-4.220, and Chapter 62-213, F.A.C.]

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS

This section of the permit addresses the following new emissions units.

EU ID No.	COMMON EMISSION UNIT DESCRIPTION
001	Each unit consists of a 170 MW Siemens/Westinghouse Model W501FD gas turbine with electrical generator set. Lean premix combustion technology controls CO, NO _x , and VOC emissions. The exclusive firing of natural gas minimizes PM/PM ₁₀ , SAM, and SO ₂ emissions. Exhaust gases exit a 50 foot tall stack that is 19 feet in diameter at approximately 1100°F with a volumetric flow rate of 2,522,120 acfm. During warm weather conditions, an evaporative cooling system may be used to reduce the compressor inlet air for additional power production.
002	
003	

APPLICABLE STANDARDS AND REGULATIONS

1. **BACT Determinations:** The emissions units addressed in this section are subject to Best Available Control Technology (BACT) determinations for carbon monoxide (CO), nitrogen oxides (NO_x), and particulate matter (PM/PM₁₀). [Rule 62-212.400(BACT), F.A.C.]
2. **NSPS Requirements:** Each gas turbine shall comply with all applicable requirements of 40 CFR 60, adopted by reference in Rule 62-204.800(7)(b), F.A.C.

(a) **Subpart A, General Provisions**, including:

- 40 CFR 60.7, Notification and Record Keeping
- 40 CFR 60.8, Performance Tests
- 40 CFR 60.11, Compliance with Standards and Maintenance Requirements
- 40 CFR 60.12, Circumvention
- 40 CFR 60.13, Monitoring Requirements
- 40 CFR 60.19, General Notification and Reporting Requirements

(b) **Subpart GG, Standards of Performance for Stationary Gas Turbines**, identified in *Appendix GG* of this permit. These provisions include a requirement to correct test data to ISO conditions; however, such correction is not used for compliance determinations with the BACT standards.

PERFORMANCE RESTRICTIONS

3. **Gas Turbines:** The permittee is authorized to install, tune, operate and maintain three new gas turbines with electrical generator sets (Siemens/Westinghouse Model 501FD or equivalent). Each unit is designed to produce a maximum 196.2 MW of electrical power. [Applicant Request; Design]
4. **Permitted Capacity:** The maximum heat input to each gas turbine when firing natural gas is 1981 MMBtu per hour based on the following: 100% base load (196.2 MW); a higher heating value (HHV) of 23,299 BTU/lb_m for natural gas; a compressor inlet air temperature of 32° F; and a compressor inlet air relative humidity of 50%. The permittee shall provide manufacturer's performance curves (or equations) that correct for site conditions to the Permitting and Compliance Authorities within 45 days of completing the initial compliance testing. Heat input rates will vary depending upon ambient conditions and the gas turbine characteristics. Compliance shall be determined by data compiled from the automated gas turbine control system. This data may be adjusted for the appropriate site conditions in accordance with the performance curves and/or equations on file with the Department. Operation below 70% of base load shall not exceed two (2) hours during any 24-hour period. [Design, Rule 62-210.200(PTE), F.A.C.]
5. **Simple Cycle, Intermittent Operation Only:** Each gas turbine shall operate only in simple cycle mode not to exceed the permitted hours of operation allowed by this permit. This restriction is based on the permittee's request, which formed the basis of the CO and NO_x BACT determinations and resulted in the emission

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS

standards specified in this permit. Specifically, the CO and NOx BACT determinations eliminated several control alternatives based on technical considerations due to the elevated temperature of the exhaust gas as well as higher cost effectiveness due to the requested intermittent operation of 3750 hours per year. For any request to convert these units to combined cycle operation by installing/connecting to heat recovery steam generators or increasing the allowable hours of operation, the permittee shall submit a full PSD permit application complete with a new proposal of the best available control technology as if the units had never been built. [Rules 62-212.400(2)(g) and 62-212.400(6)(b), F.A.C.]

6. Allowable Fuels: Each gas turbine shall only be fired with pipeline natural gas containing no more than 1 grain of sulfur per 100 dry standard cubic feet of gas (monthly average). It is noted that this limitation is much more stringent than the sulfur dioxide limitation in 40 CFR 60, NSPS Subpart GG and assures compliance with regulations 40 CFR 60.333 and 60.334 of this Subpart. The permittee shall demonstrate compliance with the fuel sulfur limit by keeping the records specified in this permit. [Applicant Request, Rule 62-210.200, F.A.C. (Definition - PTE)]
7. Hours of Operation: Each gas turbine shall operate no more than 3750 hours during any consecutive 12-month period. For each gas turbine, the permittee shall install, calibrate, operate and maintain a monitoring system to measure and accumulate the amount of natural gas fired and the hours of operation. [Applicant Request; Rule 62-212.400(BACT), F.A.C.; Rule 62-210.200, F.A.C. (Definitions - PTE)]
8. Operating Procedures: The Best Available Control Technology (BACT) determinations established by this permit rely on "good operating practices" to minimize emissions. Therefore, all operators and supervisors shall be properly trained to operate and maintain the gas turbines and pollution control systems in accordance with the guidelines and procedures established by the manufacturer. The training shall include good operating practices as well as methods of minimizing excess emissions. [Applicant Request; Rule 62-4.070(3); Rule 62-212.400(BACT), F.A.C.]
9. Plant Operation - Problems: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, the permittee shall notify the Compliance Authority as soon as possible, but at least within one working day, excluding weekends and holidays. The notification shall include: pertinent information as to the cause of the problem; steps being taken to correct the problem and prevent future recurrence; and, where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with the conditions of this permit or the regulations. [Rule 62-4.130, F.A.C.]

EMISSIONS CONTROLS

10. Unconfined Particulate Emissions: During the construction period, unconfined particulate matter emissions shall be minimized by dust suppressing techniques such as covering, confining, or applying water or chemicals to the affected areas, as necessary. [Rule 62-296.320(4)(c), F.A.C.]
11. Automated Control System: In accordance with the manufacturer's recommendations, the permittee shall install, calibrate, tune, operate, and maintain an ECONOPAC™ automated gas turbine control system (or equivalent) for each unit. Each system shall be designed and operated to monitor and control the gas turbine combustion process and operating parameters including, but not limited to: fuel distribution and staging, turbine speed, load conditions, combustion temperatures, heat input, and fully automated startup, shutdown, and cool-down. [Design; Rule 62-4.070(3); Rule 62-212.400(BACT), F.A.C.]
12. DLN Combustion Technology: To control NOx emissions, each gas turbine shall include a dry low-NOx (DLN) combustion system designed for firing natural gas only. The DLN system shall be tuned, operated and maintained in accordance with the manufacturer's recommendations. [Design and Rule 62-212.400(BACT), F.A.C.]

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS

13. **Tuning:** Prior to the initial emissions performance tests for each gas turbine, the lean premix combustion system and automated gas turbine control system shall be tuned to optimize the reduction of CO, NOx, and VOC emissions. Thereafter, each system shall be maintained and tuned in accordance with the manufacturer's recommendations to minimize these pollutant emissions. [Design, Rules 62-4.070 and 62-212.400(BACT), F.A.C.]
14. **Circumvention:** The permittee shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. [Rule 62-210.650, F.A.C.]
15. **Future Controls:** If for any reason additional controls are necessary to comply with the BACT standards specified in this permit, the permittee shall submit a full PSD permit application to modify this permit. The application shall propose Best Available Control Technology for gas turbines as if the project had never been constructed. [Rule 62-212.400(2)(g), F.A.C.]

EMISSIONS STANDARDS

16. **Summary:** The following table summarizes the emissions standards specified in this permit.

EU-001, 002, and 003: Siemens/Westinghouse Model 501 FD Gas Turbines		
BACT Standards		
Pollutant	Control Method ^a	Emission Standard ^b
CO	LPM with Gas Firing	≤ 15.0 ppmvd @ 15% oxygen, and ≤ 68.0 pounds per hour
NOx	LPM with Gas Firing	≤ 15.0 ppmvd @ 15% oxygen, and ≤ 111.0 pounds per hour
PM/PM10	Fuel Specification	Visible emissions ≤ 5% opacity Natural gas only (≤ 1 grain per 100 scf) {Maximum PM/PM10 emissions are estimated to be 8.6 lb/hour.}
PSD Synthetic Minor Standards		
SAM/SO2	Fuel Specification	≤ 1 grain per 100 SCF of natural gas (monthly average)
VOC	LPM with Gas Firing	≤ 1.5 ppmvd @ 15% oxygen, as methane, and ≤ 3.7 pounds per hour, as methane

^a "LPM" means lean premix combustion technology.

^b The mass emission limits (pounds per hour) were based on 100% base load (196.2 MW), a heat input of 1981 MMBtu per hour (HHV) from firing natural gas, a higher heating value (HHV) for natural gas of 23,299 Btu/lbm, an ambient temperature of 32° F, a relative humidity of 50%, and no evaporative cooling.

17. **Carbon Monoxide (CO):** CO emissions from each gas turbine shall not exceed 68.0 pounds per hour and 15.0 ppmvd corrected to 15% oxygen based on a 3-run test average. In addition, CO emissions shall not exceed 15.0 ppmvd corrected to 15% oxygen based on a 3-hour block average for data collected from the required CO continuous emissions monitor. The permittee shall demonstrate compliance with these standards by conducting performance tests and emissions monitoring in accordance with EPA Method 10 and the requirements of this permit. [Rule 62-212.400(BACT), F.A.C.]
18. **Nitrogen Oxides (NOx):** NOx emissions from each gas turbine shall not exceed 111.0 pounds per hour and 15.0 ppmvd corrected to 15% oxygen based on a 3-run test average. In addition, NOx emissions shall not exceed 15.0 ppmvd corrected to 15% oxygen based on a 3-hour block average for data collected from the NOx continuous emissions monitor. NOx emissions are defined as oxides of nitrogen measured as NO2. The permittee shall demonstrate compliance by conducting performance tests and continuous emissions

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS

monitoring in accordance with EPA Methods 7E and 20 and the requirements of this permit. [Rule 62-212.400(BACT), F.A.C.]

19. Particulate Matter (PM/PM₁₀), Sulfuric Acid Mist (SAM) and Sulfur Dioxides (SO₂)

(a) **Fuel Specifications.** Emissions of PM/PM₁₀, SAM, and SO₂ shall be limited by the exclusive use of pipeline natural gas containing no more than 1 grain of sulfur per 100 standard cubic feet (monthly average) and good combustion techniques as specified in this permit. The permittee shall demonstrate compliance with the fuel sulfur limit by maintaining the records specified by this permit. The fuel specification is a work practice standard established as a BACT limit for PM/PM₁₀ emissions [Rule 62-212.400(BACT), F.A.C.] and as a synthetic minor limit for SAM/SO₂ emissions [Rule 62-4.070(3), F.A.C.].

(b) **VE Standard.** Visible emissions from each gas turbine shall not exceed 5% opacity, based on a 6-minute average. This work practice standard is established as a BACT limit for PM/PM₁₀ emissions. The permittee shall demonstrate compliance with this standard by conducting tests in accordance with EPA Method 9 and the performance testing requirements of this permit. [Rule 62-212.400(BACT), F.A.C.]

20. Volatile Organic Compounds (VOC): VOC emissions shall not exceed 3.7 pounds per hour and 1.5 ppmvd corrected to 15% oxygen based on a 3-run test average. The VOC emissions shall be measured and reported in terms of methane. The permittee shall demonstrate compliance with these standards by conducting tests in accordance with EPA Methods 25 and/or 25A and the performance testing requirements of this permit. Optional testing in accordance with EPA Method 18 may be conducted to account for the actual methane fraction of the measured VOC emissions. [Application; Design; Rule 62-4.070(3), F.A.C.]

EXCESS EMISSIONS

21. Excess Emissions Prohibited: Excess emissions caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction, shall be prohibited. These emissions shall be included in the calculation of the 3-hour averages to demonstrate compliance with the continuous CO and NO_x emissions standards. [Rule 62-210.700(4), F.A.C.]

22. Excess Emissions Allowed: Providing the permittee adheres to best operational practices to minimize the amount and duration of excess emissions, the following conditions shall apply:

(a) During startup and shutdown, visible emissions excluding water vapor shall not exceed 20% opacity. [Design; Rule 62-210.700(1) and (5), F.A.C.]

(b) During all startups, shutdowns, and malfunctions, the continuous emissions monitoring systems (CEMS) shall monitor and record emissions. However, up to 2 hours of monitoring data during any 24-hour period may be excluded from continuous compliance demonstrations as a result of startups, shutdowns, and documented malfunctions. In case of malfunctions, the permittee shall notify the Compliance Authorities within one working day. A full written report on the malfunctions shall be submitted in a quarterly report. [Design; Rules 62-210.700(1), (5), and 62-4.130, F.A.C.]

EMISSIONS PERFORMANCE TESTING

23. Sampling Facilities: The permittee shall design the gas turbine stack to accommodate adequate testing and sampling locations in order to determine compliance with the applicable emission limits specified by this permit. Permanent stack sampling facilities shall be installed in accordance with Rule 62-297.310(6), F.A.C. [Rules 62-4.070 and 62-204.800, F.A.C., and 40 CFR 60.40a(b)]

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS

24. Performance Test Methods: Compliance tests shall be performed in accordance with the following reference methods as described in 40 CFR 60, Appendix A, and adopted by reference in Chapter 62-204.800, F.A.C.
- (a) EPA Method 7E - Determination of Nitrogen Oxide Emissions from Stationary Sources;
 - (b) EPA Method 9 - Visual Determination of the Opacity of Emissions from Stationary Sources;
 - (c) EPA Method 10 - Determination of Carbon Monoxide Emissions from Stationary Sources;
 - (d) EPA Method 20 - Determination of Oxides of Nitrogen Oxide, Sulfur Dioxide and Diluent Emissions from Stationary Gas Turbines; and
 - (e) EPA Method 25 or 25A - Determination of Volatile Organic Concentrations. (EPA Method 18 may be conducted to account for the non-regulated methane portion of the VOC emissions.)
- No other test methods may be used for compliance testing without prior written approval from the Department. [Rule 62-297.401, F.A.C.]
25. Test Notification: The permittee shall notify the Compliance Authority in writing at least 30 days prior to initial NSPS performance tests and at least 15 days prior to any other required tests. [40 CFR 60.7; 40 CFR 60.8; and Rule 62-297.310(7)(a)9, F.A.C.]
26. Initial Tests Required: Initial compliance with the allowable emission standards specified in this permit shall be determined within 60 days after achieving the maximum production rate, but not later than 180 days after initial operation of the emissions units. Initial tests for emissions from each gas turbine shall be conducted for CO, NO_x, VOC, and visible emissions. Initial NO_x performance tests shall be conducted in accordance with the requirements of NSPS Subpart GG including testing at four separate load conditions (see Appendix GG). NO_x emissions data shall also be converted into units of the NSPS emissions standard. Initial CO performance tests shall be conducted concurrently with all NO_x performance tests required at the four load conditions. [Rule 62-297.310(7)(a)1, F.A.C.]
27. Annual Performance Tests: To demonstrate compliance with the opacity standard specified in this permit, the permittee shall conduct annual performance tests for visible emissions from each gas turbine. Tests required on an annual basis shall be conducted at least once during each federal fiscal year (October 1st to September 30th). Continuous compliance with the CO and NO_x standards of this permit shall be demonstrated by data collected from the required CEMS. [Rule 62-297.310(7)(a)4, F.A.C.]
28. Tests Prior to Permit Renewal: Prior to renewing the air operation permit, the permittee shall conduct performance tests for VOC and visible emissions from each gas turbine. These tests shall be conducted within the 12-month period prior to renewing the air operation permit. For pollutants required to be tested annually, the permittee may submit the most recent annual compliance test to satisfy the requirements of this provision. Continuous compliance with the CO and NO_x standards of this permit shall be demonstrated by data collected from the required CEMS. [Rule 62-297.310(7)(a)3, F.A.C.]
29. Tests After Substantial Modifications: The Department may require any performance tests for initial startup to be repeated after any substantial modification and appropriate shakedown period of air pollution control equipment including the replacement of lean premix combustors. Shakedown periods shall not exceed 100 days after re-starting the gas turbine. [Rule 62-297.310(7)(b), F.A.C.]
30. Gas Turbine Testing Capacity: Initial performance tests shall be conducted in accordance with 40 CFR 60.8 and 40 CFR 60.335 for pollutants subject to a New Source Performance Standard (NSPS) in Subpart GG for stationary gas turbines. Other required performance tests for compliance with standards specified in this permit shall be conducted with the gas turbine operating at permitted capacity. Permitted capacity is defined as 90-100 percent of the maximum heat input rate allowed by the permit, corrected for the average ambient air temperature during the test (with 100 percent represented by a curve depicting heat input vs.

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS

ambient temperature). If it is impracticable to test at permitted capacity, the source may be tested at less than permitted capacity. However, subsequent operation is limited by adjusting the entire heat input vs. ambient temperature curve downward by an increment equal to the difference between the maximum permitted heat input (corrected for inlet temperature) and 110 percent of the value reached during the test until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purposes of additional compliance testing to regain the permitted capacity. Emissions performance tests shall meet all applicable requirements of Chapters 62-204 and 62-297, F.A.C. [Rule 62-297.310(2), F.A.C.]

31. **Calculation of Emission Rate:** For each emissions performance test, the indicated emission rate or concentration shall be the arithmetic average of the emission rate or concentration determined by each of the three separate test runs unless otherwise specified in a particular test method or applicable rule. [Rule 62-297.310(3), F.A.C.]

32. **Applicable Test Procedures**

(a) **Required Sampling Time.**

1. Unless otherwise specified in the applicable rule, the required sampling time for each test run shall be no less than one hour and no greater than four hours, and the sampling time at each sampling point shall be of equal intervals of at least two minutes. [Rule 62-297.310(4)(a)1, F.A.C.]
2. The minimum observation period for a visible emissions compliance test shall be sixty (60) minutes. The observation period shall include the period during which the highest opacity can reasonably be expected to occur. [Rule 62-297.310(4)(a)2, F.A.C.]

- (b) **Minimum Sample Volume.** Unless otherwise specified in the applicable rule or test method, the minimum sample volume per run shall be 25 dry standard cubic feet. [Rule 62-297.310(4)(b), F.A.C.]

- (c) **Calibration of Sampling Equipment.** Calibration of the sampling train equipment shall be conducted in accordance with the schedule shown in Table 297.310-1, F.A.C. [Rule 62-297.310(4)(d), F.A.C.]

33. **Determination of Process Variables**

- (a) **Required Equipment.** The owner or operator of an emissions unit for which compliance tests are required shall install, operate, and maintain equipment or instruments necessary to determine process variables, such as process weight input or heat input, when such data are needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards. [Rule 62-297.310(5)(a), F.A.C.]

- (b) **Accuracy of Equipment.** Equipment or instruments used to directly or indirectly determine process variables, including devices such as belt scales, weight hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value. [Rule 62-297.310(5)(b), F.A.C.]

34. **Special Compliance Tests:** When the Department, after investigation, has good reason (such as complaints, increased visible emissions or questionable maintenance of control equipment) to believe that any applicable emission standard contained in a Department rule or in a permit issued pursuant to those rules is being violated, it shall require the owner or operator of the emissions unit to conduct compliance tests which identify the nature and quantity of pollutant emissions from the emissions unit and to provide a report on the results of said tests to the Department. [Rule 62-297.310(7)(b), F.A.C.]

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS

CONTINUOUS MONITORING REQUIREMENTS

35. CO and NOx CEMS: The permittee shall install, calibrate, maintain, and operate continuous emission monitoring systems (CEMS) on each gas turbine exhaust to measure and record CO and NOx emissions in a manner sufficient to demonstrate continuous compliance with the CEMS emission standards of this section. Emissions shall be monitored and recorded at all times including startup, operation, shutdown, and malfunction except for continuous monitoring system breakdowns, repairs, calibration checks, and zero and span adjustments.
- (a) *CO Monitors*. Each CO monitor shall be installed, certified, operated and maintained in accordance with Performance Specification 4 or 4A specified in Appendix B of 40 CFR 60. Quality assurance procedures shall conform to the requirements of Appendix F in 40 CFR 60 and the Data Assessment Report of Section 7 shall be made each calendar quarter, and reported quarterly to the Compliance Authority. The RATA tests required for the CO monitor shall be performed using EPA Method 10 in Appendix A of 40 CFR 60 and shall be based on a continuous sampling train. The CO monitor span values shall be set appropriately considering the allowable methods of operation and corresponding emission standards.
 - (b) *NOx Monitors*. Each NOx monitor shall be installed, certified, operated, and maintained in accordance with the requirements of 40 CFR 75. Record keeping and reporting shall be conducted pursuant to Subparts F and G in 40 CFR 75. The RATA tests required for the NOx monitor shall be performed using EPA Method 20 or 7E in Appendix A of 40 CFR 60. In addition to the requirements of Appendix A of 40 CFR 75, the NOx monitor span values shall be set appropriately considering the allowable methods of operation and corresponding emission standards. In addition to the provision of the Acid Rain program, the NOx CEMS shall be used to determine compliance with the BACT standards specified in this permit.
 - (c) *Diluent Monitors*. The oxygen (O₂) or carbon dioxide (CO₂) content of the flue gas shall be monitored at the location where CO and NOx are monitored to correct the measured emissions rates to 15% oxygen. If a CO₂ monitor is installed, the oxygen content of the flue gas shall be calculated using F-factors that are appropriate for the fuel fired. Each diluent monitor shall comply with the performance and quality assurance requirements of 40 CFR 75.
 - (d) *1-Hour Block Averages*. Each CEMS shall be designed and operated to sample, analyze, and record data evenly spaced over an hour. Hourly average values shall begin at the top of each hour. Each hourly average value shall be computed using at least one data point in each fifteen-minute quadrant of an hour, where the unit combusted fuel during that quadrant of an hour. Notwithstanding this requirement, an hourly value shall be computed from at least two data points separated by a minimum of 15 minutes (where the unit operates for more than one quadrant of an hour). If less than two such data points are available, the hourly average value is not valid. The permittee shall use all valid measurements or data points collected during an hour to calculate the hourly average values. Missing (or excluded) data shall not be substituted. Each 1-hour average shall be expressed in terms of "ppmvd corrected to 15% oxygen". Upon request by the Department, the CEMS emission rates shall be corrected to ISO conditions to demonstrate compliance with the applicable standards of 40 CFR 60.332.
 - (e) *3-hour Block Averages*: Each CEMS shall be used to demonstrate compliance with the emission standards as specified in this permit. The 3-hour block average shall be the arithmetic average of three consecutive hourly average emission rate values. For purposes of determining compliance with the CEMS emission standards of this permit, missing (or excluded) data shall not be substituted. Instead, the 3-hour block average shall be determined using the remaining hourly data in the 3-hour block. Each 3-hour average shall be expressed in terms of "ppmvd corrected to 15% oxygen". Unless prohibited by 62-210.700, F.A.C., the 3-hour block averages shall not include periods of start up, shutdown, or

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS

documented malfunction in accordance with other requirements specified in this permit. See Condition No.22.

- (f) *Data Reporting:* When a monitoring system reports emissions in excess of the standards allowed by this permit, the permittee shall notify the Compliance Authority within one (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. The Department may request a written report summarizing the excess emissions incident. The permittee shall also report excess emissions in a quarterly report as required by this permit.
- (g) *Monitor Availability.* Monitor availability for each CEMS shall be 95% or greater in any calendar quarter. The quarterly permit excess emissions report shall be used to demonstrate monitor availability. In the event 95% availability is not achieved, the permittee shall provide the Department with a report identifying the problems in achieving 95% availability and a plan of corrective actions that will be taken to achieve 95% availability. The permittee shall implement the reported corrective actions within the next calendar quarter. Failure to take corrective actions or continued failure to achieve the minimum monitor availability shall be violations of this permit, except as otherwise authorized by the Department's Compliance Authority.

{Permitting Note: Compliance with these requirements ensure compliance with other applicable CEMS requirements such as: NSPS Subpart GG; Rule 62-297.520, F.A.C.; 40 CFR 60.7(a)(5); 40 CFR 60.13; 40 CFR Part 51, Appendix P; 40 CFR 60, Appendix B - Performance Specifications; and 40 CFR 60, Appendix F - Quality Assurance Procedures.} [Rules 62-4.070(3) and 62-212.400(BACT), F.A.C.]

COMPLIANCE DEMONSTRATIONS

- 36. Records Retention: All measurements, records, and other data required by this permit shall be documented in a permanent, legible format and retained for at least five (5) years following the date on which such measurements, records, or data are recorded. Records shall be made available to the Department upon request. [Rules 62-4.160(14) and 62-213.440(1)(b)2, F.A.C.]
- 37. Fuel Records: The permittee shall demonstrate compliance with the fuel sulfur limit for natural gas specified in this permit by maintaining records of the sulfur content of the natural gas being supplied for each month of operation. Methods for determining the sulfur content of the natural gas shall be ASTM methods D4084-82, D3246-81 or equivalent methods. These methods shall be used to determine the sulfur content of the natural gas fired as specified in the Alternate Monitoring Plan. The analysis may be performed by the permittee, a service contractor retained by the permittee, the fuel vendor, or any other qualified agency pursuant to 40 CFR 60.335(e). However, the permittee is responsible for ensuring that the procedures in 40 CFR 60.335 or 40 CFR 75 are used to determine the fuel sulfur content for compliance with the 40 CFR 60.333 SO₂ standard. [Rules 62-4.070(3) and 62-4.160(15), F.A.C.]
- 38. Alternate Monitoring Plan: The following alternate monitoring may be used to demonstrate compliance.
 - (a) When requested by the Department, the CEMS emission rates for NO_x on this unit shall be corrected to ISO conditions to demonstrate compliance with the NO_x standard established in 40 CFR 60.332.
 - (b) Data collected from the NO_x CEMS shall be used to report excess emissions in accordance with 40 CFR 60.334(c)(1) of NSPS, Subpart GG.
 - (c) A *custom fuel monitoring schedule* pursuant to 40 CFR 75 Appendix D for natural gas may be used in lieu of the daily sampling requirements of 40 CFR 60.334 (b)(2) provided the following conditions are met.
 - (1) Each gas turbine shall fire only pipeline natural gas. No other fuels are permitted.

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS

- (2) The permittee shall apply for an Acid Rain permit within the deadlines specified in 40 CFR 72.30.
- (3) The permittee shall submit a monitoring plan, certified by the Authorized Representative, that commits to using a primary fuel of pipeline-supplied natural gas containing no more than 1 grain of sulfur per 100 standard cubic feet of natural gas (monthly average) pursuant to 40 CFR 75.11(d)(2).
- (4) Each unit shall be monitored for SO₂ emissions using methods consistent with the requirements of 40 CFR 75 and certified by the U.S. EPA.

This custom fuel-monitoring schedule is only valid with the use of pipeline natural gas as the exclusive fuel. Changing to a higher sulfur fuel or adding an alternate fuel would require a modification of this permit with SO₂ emissions accounted for as required pursuant to 40 CFR 75.11(d).

[40 CFR 60, Subpart GG and Applicant Request]

39. Monthly Operations Summary: By the fifth calendar day of each month, the permittee shall record the hours of operation and the million cubic feet of natural gas fired for each gas turbine. The information shall be recorded in a written or electronic log and shall summarize the previous month of operation and the previous 12 months of operation. Information recorded and stored as an electronic file shall be available for inspection and/or printing within at least one day of a request from the Compliance Authority. [Rule 62-4.160(15), F.A.C.]

REPORTS

40. Emissions Performance Test Reports: A report indicating the results of any required emissions performance test shall be submitted to the Compliance Authority no later than 45 days after completion of the last test run. The test report shall provide sufficient detail on the tested emission unit and the procedures used to allow the Department to determine if the test was properly conducted and if the test results were properly computed. At a minimum, the test report shall provide the applicable information listed in Rule 62-297.310(8)(c), F.A.C. [Rule 62-297.310(8), F.A.C.].
41. Quarterly Excess Emissions Reports: If excess CO, NO_x or visible emissions occur due to malfunction, the permittee shall notify the Compliance Authority within (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. In addition, the Department may request a written summary report of the incident. Within thirty (30) days following each calendar quarter, the permittee shall submit a quarterly report to the Compliance Authority indicating any periods of excess emissions (including startup, shutdown and malfunction) and monitor availability. One report shall be filed for emissions in excess of the standards specified in this permit and a separate report shall be filed for emissions in excess of the NSPS Subpart GG standards. The quarterly reports shall follow the general format provided in Appendix XS of this permit. [Rules 62-4.130, 62-204.800, 62-210.700(6), F.A.C., and 40 CFR 60.7]
42. Annual Operating Report: The permittee shall submit an annual report that summarizes the actual operating rates and emissions from this facility. Annual operating reports shall be submitted to the Compliance Authority by March 1st of each year. [Rule 62-210.370(2), F.A.C.]

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APPENDIX A. TERMINOLOGY

ABBREVIATIONS AND ACRONYMS

°F	- Degrees Fahrenheit
DEP	- State of Florida, Department of Environmental Protection
DARM	- Division of Air Resource Management
EPA	- United States Environmental Protection Agency
F.A.C.	- Florida Administrative Code
F.S.	- Florida Statute
SOA	- Specific Operating Agreement
UTM	- Universal Transverse Mercator
GT	- Gas Turbine
HRSG	- Heat Recovery Steam Generator
DLN	- Dry Low-NOx Combustion Technology
SCR	- Selective Catalytic Reduction
OC	- Oxidation Catalyst Technology for CO Control

RULE CITATIONS

The following examples illustrate the methods used in this permit to abbreviate and cite the references of rules, regulations, permit numbers, and identification numbers.

Florida Administrative Code (F.A.C.) Rules:

Example: [Rule 62-213.205, F.A.C.]

Where: 62 - identifies the specific Title of the F.A.C.
62-213 - identifies the specific Chapter of the F.A.C.
62-213.205 - identifies the specific Rule of the F.A.C.

Facility Identification (ID) Number:

Example: Facility ID No. 099-0001

Where: 099 - 3 digit number that identifies the specific county location
0221 - 4 digit number that identifies the specific facility

New Permit Numbers:

Example: Permit No. 099-2222-001-AC or 099-2222-001-AV

Where: AC - identifies the permit as an Air Construction Permit
AV - identifies the permit as a Title V Major Source Air Operation Permit
099 - 3 digit number that the specific county location
2222 - 4 digit number that identifies the specific facility
001 - 3 digit sequential number identifies the specific permit project

Old Permit Numbers:

Example: Permit No. AC50-123456 or AO50-123456

Where: AC - identifies the permit as an Air Construction Permit
AO - identifies the permit as an Air Operation Permit
123456 - 6 digit sequential number that identifies the specific permit project

SECTION IV.

APPENDIX BD. SUMMARY OF FINAL BACT DETERMINATIONS

The following table summarizes the emissions standards for the gas turbines. The standards for carbon monoxide, nitrogen oxides, and particulate matter were determined by the Department to represent the Best Available Control Technology (BACT).

EU-001, 002, and 003: Siemens/Westinghouse Model 501 FD Gas Turbines		
<i>BACT Standards</i>		
Pollutants	Controls ^f	Emission Standards
CO ^a	LPM with Gas Firing	≤ 15.0 ppmvd @ 15% oxygen, and ≤ 68.0 pounds per hour
NOx ^b	LPM with Gas Firing,	≤ 15.0 ppmvd @ 15% oxygen, and ≤ 111.0 pounds per hour
PM/PM ₁₀ ^c	LPM with Gas Firing Fuel Specifications	Visible emissions ≤ 5% opacity Natural gas only (≤ 1 grain per 100 scf, monthly average) {Maximum PM emissions estimated at < 0.001 grains per dscf}
<i>PSD Synthetic Minor Standards</i>		
Pollutant	Controls ^f	Emission Standard
SAM/SO ₂ ^d	Fuel Specification	≤ 1 grain per 100 SCF of natural gas
VOC ^e	LPM with Gas Firing	≤ 1.5 ppmvd @ 15% oxygen, as methane, and ≤ 3.7 pounds per hour, as methane

- a. Initial compliance with the CO standard shall be determined by conducting tests in accordance with EPA Method 10. Continuous compliance shall be demonstrated with data collected from the certified continuous emissions monitoring system (CEMS) for each gas turbine (3-hour average).
- b. Initial compliance with the NOx standard shall be determined by conducting tests in accordance with EPA Method 7E or 20. Continuous compliance shall be demonstrated with data collected from the certified continuous emissions monitoring system (CEMS) for each gas turbine (3-hour average).
- c. Compliance with the visible emissions standard shall be determined by conducting initial and annual tests in accordance with EPA Method 9. This shall serve as a work practice standard for particulate matter emissions.
- d. The fuel specification shall serve as a work practice standard that effectively limits potential emissions of SAM and SO₂. Compliance with the fuel sulfur content of natural gas shall be determined by ASTM Methods D 1072-80, D 3031-81, D 4084-82, or D 3246-81.
- e. Initial compliance with the VOC standard shall be determined conducting initial tests in accordance with EPA Methods 25 or 25A. EPA Method 18 may be conducted to account for the non-regulated methane portion of the VOC emissions. Compliance shall also be demonstrated prior to renewal of the operation permit by conducting such tests.
- f. "LPM" means lean premix combustion technology.

The above BACT standards and the PSD synthetic minor standards are established in accordance with Rule 62-212.400, F.A.C. The initial BACT standards were reevaluated in November of 2001 and determined to be consistent with current BACT standards for large simple cycle gas turbines. These standards were again reaffirmed in August of 2003 when the permit was extended for the second time. Please see the file for original Air Permit No. PSD-FL-277 issued on June 2, 2000 for the complete project review and BACT rationale.

SECTION IV.

APPENDIX GC. CONSTRUCTION PERMIT GENERAL CONDITIONS

- G.1 The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.
- G.2 This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings or exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.
- G.3 As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey and vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.
- G.4 This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.
- G.5 This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.
- G.6 The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.
- G.7 The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:
- (a) Have access to and copy and records that must be kept under the conditions of the permit;
 - (b) Inspect the facility, equipment, practices, or operations regulated or required under this permit, and,
 - (c) Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

- G.8 If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:
- (a) A description of and cause of non-compliance; and
 - (b) The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

- G.9 In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

SECTION IV.

APPENDIX GC. CONSTRUCTION PERMIT GENERAL CONDITIONS

- G.10 The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.
- G.11 This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.
- G.12 This permit or a copy thereof shall be kept at the work site of the permitted activity.
- G.13 This permit also constitutes:
- (a) Determination of Best Available Control Technology (X);
 - (b) Determination of Prevention of Significant Deterioration (X); and
 - (c) Compliance with New Source Performance Standards (X).
- G.14 The permittee shall comply with the following:
- (a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.
 - (b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application or this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.
 - (c) Records of monitoring information shall include:
 - 1. The date, exact place, and time of sampling or measurements;
 - 2. The person responsible for performing the sampling or measurements;
 - 3. The dates analyses were performed;
 - 4. The person responsible for performing the analyses;
 - 5. The analytical techniques or methods used; and
 - 6. The results of such analyses.
- G.15 When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

SECTION IV.

APPENDIX GG. NSPS SUBPART GG REQUIREMENTS FOR GAS TURBINES

Each gas turbine (Emissions Units 001, 002, and 003) shall comply with all applicable requirements of 40 CFR 60, Subparts A and GG adopted by reference in Rule 62-204.800(7)(b), F.A.C. Inapplicable provisions have been deleted in the following conditions, but the numbering of the original rules has been preserved for ease of reference. The term "Administrator" when used in 40 CFR 60 shall mean the Department's Secretary or the Secretary's designee. Department notes and requirements related to the Subpart GG requirements are shown immediately following the section to which they refer. The rule basis for the Department requirements specified below is Rule 62-4.070(3), F.A.C.

This section applies to the gas turbines.

40 CFR 60, SUBPART A. NSPS GENERAL PROVISIONS

- 40 CFR 60.7, Notification and Record Keeping
- 40 CFR 60.8, Performance Tests
- 40 CFR 60.11, Compliance with Standards and Maintenance Requirements
- 40 CFR 60.12, Circumvention
- 40 CFR 60.13, Monitoring Requirements
- 40 CFR 60.19, General Notification and Reporting Requirements

For copies of these requirements, please contact the Department's New Source Review Section.

40 CFR 60, SUBPART GG. STATIONARY GAS TURBINES

40 CFR 60.330 Applicability and designation of affected facility.

- (a) The provisions of this subpart are applicable to all stationary gas turbines with a heat input at peak load equal to or greater than 10 million BTU per hour, based on the lower heating value of the fuel fired.

40 CFR 60.331 Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act and in subpart A of this part.

- (a) Stationary gas turbine means any simple cycle gas turbine, regenerative cycle gas turbine or any gas turbine portion of a combined cycle steam/electric generating system that is not self propelled. It may, however, be mounted on a vehicle for portability.
- (b) Simple cycle gas turbine means any stationary gas turbine which does not recover heat from the gas turbine exhaust gases to preheat the inlet combustion air to the gas turbine, or which does not recover heat from the gas turbine exhaust gases to heat water or generate steam.
- (d) Combined cycle gas turbine means any stationary gas turbine which recovers heat from the gas turbine exhaust gases to heat water or generate steam.
- (f) Ice fog means an atmospheric suspension of highly reflective ice crystals.
- (g) ISO standard day conditions means 288 degrees Kelvin, 60 percent relative humidity and 101.3 kilopascals pressure.
- (h) Efficiency means the gas turbine manufacturer's rated heat rate at peak load in terms of heat input per unit of power output based on the lower heating value of the fuel.
- (i) Peak load means 100 percent of the manufacturer's design capacity of the gas turbine at ISO standard day conditions.
- (j) Base load means the load level at which a gas turbine is normally operated.
- (p) Gas turbine model means a group of gas turbines having the same nominal air flow, combustor inlet pressure, combustor inlet temperature, firing temperature, turbine inlet temperature and turbine inlet pressure.
- (q) Electric utility stationary gas turbine means any stationary gas turbine constructed for the purpose of supplying more than one-third of its potential electric output capacity to any utility power distribution system for sale.

SECTION IV.

APPENDIX GG. NSPS SUBPART GG REQUIREMENTS FOR GAS TURBINES

60.332 Standard for nitrogen oxides.

- (a) On and after the date of the performance test required by Sec. 60.8 is completed, every owner or operator subject to the provisions of this subpart as specified in paragraphs (b) of this section shall comply with one of the following, except as provided in paragraphs (e) of this section.

- (1) No owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any stationary gas turbine, any gases which contain nitrogen oxides in excess of:

$$\text{STD} = (0.0075) \frac{(14.4)}{Y} + F$$

Where:

STD = allowable NOx emissions (percent by volume at 15 percent oxygen and on a dry basis).

Y = manufacturer's rated heat rate at manufacturer's rated load (kilojoules per watt hour) or, actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the facility. The value of Y shall not exceed 14.4 kilojoules per watt hour.

F = NO emission allowance for fuel-bound nitrogen as defined in the following table:

- (3) F shall be defined according to the nitrogen content of the fuel as follows:

(Percent By Weight)	"F" (NOx Percent By Volume)
N < 0.015	0
0.015 < N < 0.1	0.04(N)
0.1 < N < 0.25	0.004 + 0.0067(N - 0.1)
N > 0.25	0.005

Where, N = the nitrogen content of the fuel (percent by weight).

{Permitting Note: For the Westinghouse gas turbine, the "Y" value when firing natural gas is approximately "9.5", which results in an NSPS standard of 112.5 ppmvd at 15% oxygen. The emissions standards in Section III of this permit are much more stringent than this requirement.}

- (b) Electric utility stationary gas turbines with a heat input at peak load greater than 100 million Btu per hour based on the lower heating value of the fuel fired shall comply with the provisions of paragraph (a)(1) of this section.
- (f) Stationary gas turbines using water or steam injection for control of NOx emissions are exempt from paragraph (a) when ice fog is deemed a traffic hazard by the owner or operator of the gas turbine.

40 CFR 60.333 Standard for sulfur dioxide.

On and after the date on which the performance test required to be conducted by Sec. 60.8 is completed, every owner or operator subject to the provision of this subpart shall comply with one or the other of the following conditions:

- (b). No owner or operator subject to the provisions of this subpart shall burn in any stationary gas turbine any fuel which contains sulfur in excess of 0.8 percent by weight.

40 CFR 60.334 Monitoring of operations.

- (a) The owner or operator of any stationary gas turbine subject to the provisions of this subpart and using water injection to control NOx emissions shall install and operate a continuous monitoring system to monitor and record the fuel consumption and the ratio of water to fuel being fired in the turbine. This system shall be accurate to within +/- 5.0 percent and shall be approved by the Administrator.
- (b) The owner or operator of any stationary gas turbine subject to the provisions of this subpart shall monitor sulfur content and nitrogen content of the fuel being fired in the turbine. The frequency of determination of these values shall be as follows:

SECTION IV.

APPENDIX GG. NSPS SUBPART GG REQUIREMENTS FOR GAS TURBINES

- (1) If the turbine is supplied its fuel from a bulk storage tank, the values shall be determined on each occasion that fuel is transferred to the storage tank from any other source.
- (2) If the turbine is supplied its fuel without intermediate bulk storage the values shall be determined and recorded daily. Owners, operators or fuel vendors may develop custom schedules for determination of the values based on the design and operation of the affected facility and the characteristics of the fuel supply. These custom schedules shall be substantiated with data and must be approved by the Administrator before they can be used to comply with paragraph (b) of this section.

Department Requirement: The requirement to monitor the nitrogen content of pipeline quality natural gas fired is waived because natural gas is the exclusive fuel and contains negligible amounts of nitrogen. For purposes of complying with the sulfur content monitoring requirements of this rule, the permittee shall comply with the custom fuel monitoring schedule specified in the Section III of the permit.

{Permitting Note: This is consistent with guidance from EPA Region 4 on custom fuel monitoring.}

- (c) For the purpose of reports required under Sec. 60.7(c), periods of excess emissions that shall be reported are defined as follows:

- (1) Nitrogen oxides. Any one-hour period during which the average water-to-fuel ratio, as measured by the continuous monitoring system, falls below the water-to-fuel ratio determined to demonstrate compliance with Sec. 60.332 by the performance test required in Sec. 60.8 or any period during which the fuel-bound nitrogen of the fuel is greater than the maximum nitrogen content allowed by the fuel-bound nitrogen allowance used during the performance test required in Sec. 60.8. Each report shall include the average water-to-fuel ratio, average fuel consumption, ambient conditions, gas turbine load, and nitrogen content of the fuel during the period of excess emissions, and the graphs or figures developed under Sec. 60.335(a).
- (2) Sulfur dioxide. Any daily period during which the sulfur content of the fuel being fired in the gas turbine exceeds 0.8 percent.

Department Requirement: The permit only requires compliance with the permit fuel sulfur specification because the gas turbine fires only pipeline natural gas.

40 CFR 60.335 Test methods and procedures.

- (a) To compute the nitrogen oxides emissions, the owner or operator shall use analytical methods and procedures that are accurate to within 5 percent and are approved by the Administrator to determine the nitrogen content of the fuel being fired.
- (b) In conducting the performance tests required in Sec. 60.8, the owner or operator shall use as reference methods and procedures the test methods in appendix A of this part or other methods and procedures as specified in this section, except as provided for in Sec. 60.8(b). Acceptable alternative methods and procedures are given in paragraph (f) of this section.
- (c) The owner or operator shall determine compliance with the nitrogen oxides and sulfur dioxide standards in Secs. 60.332 and 60.333(a) as follows:

- (1) The nitrogen oxides emission rate (NOx) shall be computed for each run using the following equation:

$$\text{NOx} = (\text{NOx}_o) (\text{Pr}/\text{Po})^{0.5} (e^{19(\text{Ho} - 0.00633)}) (288^\circ \text{K} / \text{Ta})^{1.53}$$

Where

NOx = emission rate of NOx at 15 percent oxygen and ISO standard ambient conditions, volume percent

NOxo = observed NOx concentration, ppm by volume

Pr = reference combustor inlet absolute pressure at 101.3 kilopascals ambient pressure, mm Hg

Po = observed combustor inlet absolute pressure at test, mm Hg

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APPENDIX GG. NSPS SUBPART GG REQUIREMENTS FOR GAS TURBINES

Ho = observed humidity of ambient air, g H₂O/g air

E = transcendental constant, 2.718

Ta = ambient temperature, degrees Kelvin

Department Requirement: NO_x emissions shall be corrected to ISO ambient atmospheric conditions for each required emissions performance test and compared to the NO_x standard specified in 40 CFR 60.332.

- (2) The monitoring device of Sec. 60.334(a) shall be used to determine the fuel consumption and the water-to-fuel ratio necessary to comply with Sec. 60.332 at 30, 50, 75, and 100 percent of peak load or at four points in the normal operating range of the gas turbine, including the minimum point in the range and peak load. All loads shall be corrected to ISO conditions using the appropriate equations supplied by the manufacturer.

Department Requirement: The initial NO_x performance tests at four evenly spaced points between the minimum normal operating load and 100% of peak load is waived because each gas turbine is required to demonstrate compliance via CEMS.

{Permitting Note: This is consistent with EPA Region 4 guidance.}

- (3) Method 20 shall be used to determine the nitrogen oxides, sulfur dioxide, and oxygen concentrations. The span values shall be 300 ppm of nitrogen oxide and 21 percent oxygen. The NO_x emissions shall be determined at each of the load conditions specified in paragraph (c)(2) of this section.

Department Requirement: The span value shall be no greater than 45 ppmvd of nitrogen oxides due to the low NO_x emission levels from the gas turbine.

- (d) The owner or operator shall determine compliance with the sulfur content standard in Sec. 60.333(b) as follows: ASTM D 2880-71 shall be used to determine the sulfur content of liquid fuels and ASTM D 1072-80, D 3031-81, D 4084-82, or D 3246-81 shall be used for the sulfur content of gaseous fuels (incorporated by reference--see Sec. 60.17). The applicable ranges of some ASTM methods mentioned above are not adequate to measure the levels of sulfur in some fuel gases. Dilution of samples before analysis (with verification of the dilution ratio) may be used, subject to the approval of the Administrator.

Department Requirement: The natural gas shall be sampled and analyzed for the sulfur content as determined by ASTM methods D4084-82, D3246-81 or more recent versions.

- (e) To meet the requirements of Sec. 60.334(b), the owner or operator shall use the methods specified in paragraphs (a) and (d) of this section to determine the nitrogen and sulfur contents of the fuel being burned. The analysis may be performed by the owner or operator, a service contractor retained by the owner or operator, the fuel vendor, or any other qualified agency.

{Permitting Note: The fuel analysis requirements of the permit meet or exceed the requirements of this rule and will ensure compliance.}

SECTION IV.

**APPENDIX XS. CEMS EXCESS EMISSIONS AND PERFORMANCE REPORT
QUARTERLY REPORT**

Company: _____

Address: _____

Process Unit Description: Gas Turbine Exhaust, Emissions Unit No. _____

Reporting Period: From _____ to _____

Pollutant (Check One): _____ CO _____ NOx

Emission Limitation and Units: _____

Monitor Manufacturer and Model No.: _____

Date of Latest CEMS Certification or Audit: _____

Total Source Operating Time in Reporting Period (Hours): _____

Emission data summary ^a		CMS performance summary ^a	
1. Duration of Excess Emissions In Reporting Period Due To:		1. CMS downtime in reporting period due to:	
a. Startup/Shutdown		a. Monitor Equipment Malfunctions	
b. Control Equipment Problems		b. Non-Monitor Equipment Malfunctions	
c. Process Problems		c. Quality Assurance Calibration	
d. Other Known Causes		d. Other Known Causes	
e. Unknown Causes		e. Unknown Causes	
2. Total Duration of Excess Emissions		2. Total CMS Downtime	
3. $\frac{[\text{Total Duration of Excess Emissions}]}{[\text{Total Source Operating Time}]} \times (100\%)$ ^b		3. $\frac{[\text{Total CMS Downtime}]}{[\text{Total source operating time}]} \times (100\%)$	

^a For gases, record all times in hours.

^b For reporting excess emissions in accordance with the NSPS requirements: If the total duration of excess emissions is 1 percent or greater of the total operating time or the total CMS downtime is 5 percent or greater of the total operating time, both the summary report form and the excess emission report described in 40 CFR 60.7(c) shall be submitted.

Note: On a separate page, describe any changes since last quarter in CMS, process or controls.

I certify that the information contained in this report is true, accurate, and complete.

Name

Title

Signature

Date

{Note: This form is based on the format provided in the General Provisions of 40 CFR 60.7, Subpart A. Separate reports are required for the permit standards and the NSPS standards. The format may be revised as necessary as long as the report contains the information required by the permit and the NSPS requirements.}

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. Rick A. Bowen
Executive Vice President
Palmetto Power LLC
1000 Louisiana Street, Suite 5800
Houston, TX 77002

2.

7001 0320 0001 3692 5375

PS Form 3811, July 1999

Domestic Return Receipt

102595-99-M-1789

COMPLETE THIS SECTION ON DELIVERY

A. Received by (Please Print Clearly)

B. Date of Delivery

C. Signature

X

☐ Agent☐ Addressee

D. Is delivery address different from item 1?

☐ Yes

If YES, enter delivery address below:

☐ No

3. Service Type

☒ Certified Mail☐ Express Mail☐ Registered☐ Return Receipt for Merchandise☐ Insured Mail☐ C.O.D.

4. Restricted Delivery? (Extra Fee)

☐ Yes**U.S. Postal Service****CERTIFIED MAIL RECEIPT**

(Domestic Mail Only; No Insurance Coverage Provided)

7001 0320 0001 3692 5375

Postage

\$

Certified Fee

Return Receipt Fee
(Endorsement Required)Restricted Delivery Fee
(Endorsement Required)

Total Postage & Fees

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Rick A. Bowen

Street, Apt. No.,

or P.O. Box No. 1000 Louisiana St., Ste. 5800

City, State, ZIP+4

Houston, TX 77002

PS Form 3800, January 2001

See Reverse for Instructions