TECHNICAL EVALUATION

AND

PRELIMINARY DETERMINATION

APPLICANT
INDUSTRIAL POWER GENERATING COMPANY, LLC
2250 Dabney Road
Richmond, Virginia 23230

FACILITY
South Dade Landfill
ARMS Facility ID No. 0250623

PROJECT
Facility Modification – Electrical Generating Station
Project No. 0250623-007-AC
Air Permit No. PSD-FL-408

COUNTY
Miami-Dade County, Florida

PERMITTING AUTHORITY

Florida Department of Environmental Protection
Division of Air Resource Management
Bureau of Air Regulation
New Source Review Section
2600 Blair Stone Road, MS #5505
Tallahassee, Florida 32399-2400
Telephone: 850-717-9000 Fax: 850-717-9097

April 20, 2011

1. GENERAL PROJECT INFORMATION

Facility Description and Location

Miami-Dade Solid Waste Management (MDSWM) operates a municipal solid waste landfill located at Black Point in southern Miami-Dade County. The 167 acre site is delineated by SW 97th Avenue on the west, 248th Street on the south, Coconut Palm Drive and Black Creek Canal on the northeast. This facility is located at 24000 SW 97th Avenue, Miami, Miami-Dade County, Florida.

Primary Responsible Official: Mr. German Hernandez, Manager, Environmental Affairs.

Latitude and Longitude are 25° 32' 39.22'' North and 80° 20' 30.21'' East respectively. UTM coordinates of the site are: Zone 17, 565.51 km East and 2825.11 km North.

Standard Industrial Classification Codes (SIC)

Major Group Number	49 Electric, Gas, and Sanitary Services
Industry Group Number	495 Sanitary Services
Industry Number	4953 Refuse Systems

Figure 1 – Regional Location

Figure 2 – Facility Location

The South Dade Landfill facility consists of five cells designated as Cells 1 to 5. Cells 1 and 2, located on the eastern half of the landfill are 60 acres and are currently closed; Cell 3, located on the center of the landfill is approximately 46 acres and is currently inactive and due for closure; and Cell 4 is approximately 48 acres and is currently active. The MDSWM plans to construct Cell 5, approximately 50 acres, as a landfill expansion in the near future.

The gas collection and control system was installed according to the requirements of 40 CFR Part 60, Subpart WWW, to control non-methane organic compound (NMOC). Methane-rich landfill gas (LFG) produced from the decomposition of the disposed waste materials at both active and capped cells is being collected by a gas recovery system. A gas collection and control system (GCCS) was installed as part of the formal closure of Cells 1 and 2. The GCCS comprise gas extraction wells, gas piping, and a thermal gas destruction unit. Since the solid waste at South Dade Landfill facility was placed above the natural ground surface, the system is intended to capture landfill gas which would escape through the cover soil and be transported into the air. The LFG collection system induces a slight negative pressure at the extraction wells, thus reducing the gas pressure gradient, which in turn will reduce the LFG escaping through the landfill surface and migrating off-site.

A blower station connected to the gas recovery system moves the collected LFG to a central location. LFG is directed to an enclosed flare where methane, NMOC and hazardous air pollutants (HAP) contained in the gas are destroyed at high temperatures. The following figures below show the set-up of the enclosed flare at the landfill.

Figure 3 - Flare Propane Tank

Figure 4 - Flare Knock-Out Drum Main Inlet Valve

Figure 5 - Flare Dual Blower

Figure 6 - Flare Flame Arrestor & Louvers

Figure 7 - Flare Control Panel

Landfill gas consists primarily of a blend of carbon dioxide and methane, roughly 50% of each. Methane contains useful energy, which can be recovered when fired in a combustion process. In order to reduce the amount of LFG wasted by flaring, all or part of the available LFG from the landfill will be supplied to the new electrical

generation plant proposed by Industrial Power Generating Company, LLC (INGENCO). The proposed 24 engines will be fueled with the methane-rich LFG generated by the South Dade Landfill. Although the proposed engines can fire 100% diesel or biodiesel fuel, it is not economically feasible to generate electricity with internal combustion engines due to the high cost of these fuels and the low efficiencies of the engines. The application indicates that LFG is the primary fuel and that diesel/biodiesel will only be fired for startup and combustion stability. Therefore, the project is reliant on LFG as the primary fuel.

Because the proposed project will be located at an existing major stationary source, there is an issue as to whether the two operations constitute a single facility for purposes of PSD preconstruction review. Florida's definition of *facility* is, "All of the emissions units which are located on one or more contiguous or adjacent properties, and which are under the control of the same person (or persons under common control)." Florida's definition of *major stationary source* (PSD) includes the following, "For purposes of this definition, a stationary source is all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person or persons under common control, except the activities of any vessel; which emit or may emit a PSD pollutant. Pollutant-emitting activities shall be considered as part of the same industrial grouping if they belong to the same Major Group, or have the same first two-digit code, as described in the Standard Industrial Classification (SIC) Manual, 1972, as amended by the 1977 Supplement." These issues are summarized as follows:

- *Same Industrial Grouping*: The two-digit SIC code for the existing landfill is "49", which identifies the Major Group for Electric, Gas, and Sanitary Services. The two-digit SIC code for the proposed electric power plant is also "49".
- *Contiguous or Adjacent Properties*: The LFG-to-energy plant is contiguous to the landfill because it will be located on the same property and leased from the Miami-Dade Solid Waste Management.
- *Common Control*: Landfill gas will fuel the proposed engines to make the project economically viable. The LFG collection system acts as a support facility to the proposed electrical generation plant. But for the landfill operating a LFG collection system, the proposed electrical generation plant would be located elsewhere. Also, according to the contract, ownership of the engines will be transferred to the Miami-Dade Solid Waste Management after 20 years. Although the proposed engines can also fire diesel, it is the LFG which makes the project feasible. The applicant maintains that diesel is only necessary for startups and to maintain combustion stability for this specific type of engine. In addition, the permit will limit the number of engines that can startup simultaneously and fire 100% diesel because of the potential for adverse ambient air impacts. Therefore, the proposed electrical generation plant is ultimately controlled by the Miami-Dade Solid Waste Management.

The Department concludes that the proposed INGENCO electrical generation plant is a part of the existing South Dade Landfill facility. Therefore, upon completion of construction, the INGENCO air construction permit must be incorporated into the Title V air operation permit for the South Dade Landfill. The Title V air operation permit will have two different sections: one for the South Dade Landfill operations and one for the INGENCO electrical generation plant. The primary responsible official will be the Manager of Environmental Affairs of the Miami-Dade Solid Waste Management. A secondary responsible official will be identified from INGENCO for the electrical generation plant. The primary responsible official will be responsible for all applicable reporting and compliance certifications at the facility.

Facility Regulatory Categories

The facility is regulated according to the following categories.

- Title III: The existing facility is not a major source of hazardous air pollutants (HAP).
- Title V: The existing facility is a Title V major source of air pollution in accordance with Chapter 213, Florida Administrative Code (F.A.C.).

- PSD: The existing facility is a major stationary source in accordance with Rule 62-212.400, F.A.C for the Prevention of Significant Deterioration (PSD) of Air Quality and Rule 62-210.200(Definitions), F.A.C. This facility has the potential to emit 250 tons per year or more of a PSD pollutant.

Processing Schedule

June 2, 2009:	Department received the application for an air pollution construction permit.
July 1, 2009:	Department requested additional information.
July 2, 2009:	Department issued another request for additional information.
October 1, 2009:	Applicant submitted a response to the Department's request for additional information on July 1 and July 2, 2009.
October 21, 2009:	Department requested additional information.
November 23, 2009:	Applicant submitted a response to the Department's request for additional information on October 21, 2009.
December 8, 2009:	Department requested additional information.
December 9, 2009:	Applicant submitted a response to the Department's request for additional information on December 8, 2009. Application is complete.
March 3, 2010:	Department's Intent to Issue and Public Notice Package sent to the applicant.

The applicant did not publish the public notice of intent to issue the permit and did not obtain a final permit before the effective date (April 12, 2010) of EPA's final rule establishing a new 1-hour National Ambient Air Quality Standard (NAAQS) for nitrogen dioxide (NO_2). According to EPA, projects without final PSD air construction permits before this date must provide reasonable assurance of compliance with the new NO_2 NAAQS. This is demonstrated by conducting a comprehensive air quality modeling analysis. The applicant worked with the Department to show compliance with the new through multi-source modeling, but issues arose related to ambient impacts from other sources in the vicinity of the project. This is discussed in more detail in Section 5 of this Technical Evaluation and Preliminary Determination.

Project Description

The proposed project will consist of 24 Detroit Diesel Series 60 dual-fuel engines or equivalent coupled to electrical generators. The electrical generation plant will consist of:

- LFG treatment equipment (landfill gas dewatering, filtration and compression equipment and processes).
- 24 internal combustion engine / electrical generator sets, which will produce a total of 8 megawatts (MW, nominal) of electricity under base load operating conditions and will be interconnected to the Florida Power and Light distribution network through a nearby power line.
- Ancillary equipment to support the electric generation plant (e.g., fuel tanks, lube oil tanks, a small boiler and small cooling towers).

Landfill Gas Treatment System

Landfill gas consists primarily of methane (CH_4), carbon dioxide (CO_2) and nitrogen (N_2), with varying smaller amounts of oxygen (O_2), HAPs, NMOC and sulfur compounds. The size of the energy plant and the number of engines operating at any given time will depend on the available heat input (methane fraction) provided by the landfill or the amount of diesel fuel fired. The engines will start up by firing only diesel or biodiesel, but will operate in the dual-fuel mode firing LFG (up to approximately 98%) with diesel or biodiesel (approximately 2%).

The LFG will be treated by compression, dewatering and filtration through a 1-micron filter. The gas will be compressed from 5 to 15 pounds per square inch gauge (psig), filtered through a 1-micron coalescing filter and

dewatered in a gas cooler. The gas cooler will be a fin-fan cooler designed to decrease the gas temperature from 265° F to 150° F at ambient temperature of 95°F. The compressed, filtered and dewatered LFG is directed to the engines for combustion. Components of the specified LFG treatment system will not be equipped with atmospheric vents. Therefore, all of the LFG received by INGENCO will be directed to the engines for use as a fuel. The facility will be equipped so that the LFG is automatically diverted to the existing flare system when the LFG is not being combusted by the engines.

Specifications for Engine/Generator Sets

The applicant proposes to install 24 identical Detroit Diesel Series 60 (or equivalent) dual-fuel fired compression ignition reciprocating internal combustion engines. The engines will be located near the existing GCCS and connected from the existing line to a blower/compressor that will be used to draw methane-rich LFG from the GCCS to the proposed electric generation plant. The LFG will be processed by the LFG treatment system prior to combustion in the engines. Each engine:

- Will be 6-cylinder engine with a total displacement of 12.7 liters.
- Will have a maximum rating of 550 brake horsepower (bhp).
- Will produce a maximum of 469 bhp when coupled to a 350 kilowatts (kW) generator (nominal rating).
- Will have a heat rate of 9,500 Btu /kW in a single-fuel mode and 10,500 Btu/kW in a dual-fuel mode.

The engines will be arranged in four groups of six engines: group A, B, C and D. Each group of engines will share a common stack.

The engines/generator sets will be interconnected to the Florida Power and Light distribution network through a nearby power line for the generation of up to a total of 8 MW of electricity. The engines will start up by firing only diesel or biodiesel, but will operate in the dual-fuel mode firing LFG fraction up to approximately 98% with diesel or biodiesel (approximately 2%). The engines are capable of operating 24 hours per day, 365 days per year; however, the operating hours and output will be dependent on the ability of the distribution grid to accept electricity, as well as the supply of LFG. This specific type of compression ignition engine requires the firing of a small amount of diesel or biodiesel to maintain combustion stability. The engines will operate at a LFG fraction of 90% or more.

Ancillary Equipment

The following ancillary equipment will be installed to support the electrical generation plant:

- A 30,000 gallon diesel tank to supply the engines.
- A 1,000 gallon lube oil tank.
- A 1,000 gallon used lube oil tank.
- An unregulated 0.156 MMBtu/hour boiler and 275 gallon diesel tank (if necessary) for heating in a building.
- Three small, unregulated cooling towers to provide non-contact cooling for other engine requirements such as fuel cooling and charge-air cooling in the engine turbo after-coolers. The evaporative cooling towers will not use any treatment chemicals. The maximum particulate matter (PM) emissions from the cooling towers are estimated to be 0.8 tons per year (TPY) making these towers de minimis emissions sources.

2. APPLICABLE REGULATIONS

State Regulations

This project is subject to the applicable environmental laws specified in Section 403 of the Florida Statutes (F.S.). The Florida Statutes authorize the Department of Environmental Protection to establish rules and regulations regarding air quality as part of the Florida Administrative Code (F.A.C.). This project is subject to the applicable

rules and regulations defined in the following Chapters of the F.A.C.: 62-4 (Permitting Requirements); 62-204 (Ambient Air Quality Requirements, PSD Increments, and Federal Regulations Adopted by Reference); 62-210 (Permits Required, Public Notice, Reports, Stack Height Policy, Circumvention, Excess Emissions, and Forms); 62-212 (Preconstruction Review, PSD Review and BACT, and Non-attainment Area Review and LAER); 62-213 (Title V Air Operation Permits for Major Sources of Air Pollution); 62-296 (Emission Limiting Standards); and 62-297 (Test Methods and Procedures, Continuous Monitoring Specifications, and Alternate Sampling Procedures). PSD applicability and the preconstruction review requirements of Rule 62-212.400, F.A.C. are discussed in Section 2 of this report. Additional details of the other state regulations are provided in Section 3 of this report.

Federal Regulations

The Environmental Protection Agency (EPA) establishes air quality regulations in Title 40 of the Code of Federal Regulations (CFR). Part 60 identifies New Source Performance Standards (NSPS) for a variety of industrial activities. Part 61 specifies National Emissions Standards for Hazardous Air Pollutant (NESHAP) based on specific pollutants. Part 63 specifies NESHAP provisions based on the Maximum Achievable Control Technology (MACT) for given source categories. Federal regulations are adopted in Rule 62-204.800, F.A.C. Additional details of the applicable federal regulations are provided in Section 3 of this report.

In accordance with Title V air operation Permit No. 0250623-006-AV, the existing South Dade Landfill is currently subject to the following federal provisions: 40 CFR Part 63, NESHAP Subparts A (General Provisions) and Subpart AAAA (Municipal Solid Waste Landfills); and Part 60, NSPS Subparts A (General Provisions) and WWW (Municipal Solid Waste Landfills). The following federal standards are discussed in terms of the proposed engines.

New Source Performance Standards (NSPS)

<u>NSPS Subpart IIII</u>: 40 CFR 60.4219 defines compression ignition as relating to a type of stationary internal combustion engine that is not a spark ignition engine. While spark ignition means relating to a gasoline, natural gas, or liquefied petroleum gas fueled engine or any other type of engine with a spark plug (or other sparking device) and with operating characteristics significantly similar to the theoretical Otto combustion cycle. Spark ignition engines usually use a throttle to regulate intake air flow to control power during normal operation. Dual-fuel engines in which a liquid fuel (typically diesel fuel) is used for compression ignition (CI) and gaseous fuel (typically natural gas) is used as the primary fuel at an annual average ratio of less than 2 parts diesel fuel to 100 parts total fuel on an energy equivalent basis are spark ignition engines. The proposed engines fire 100% diesel fuel during start-up and from 2 to 10% diesel fuel during normal operation. From this information the engines could be subject to NSPS Subpart IIII.

The application indicates that each of the proposed engines was manufactured prior to April 1, 2006, which is the applicability deadline for NSPS Subpart IIII. This will establish the engines as predating the NSPS Subpart IIII provisions in 40 CFR 60 if the engines have not been modified or reconstructed. The application indicates that the engines proposed for this project were manufactured between 1996 and 1998 and have not been modified or reconstructed with respect to the permit application. Therefore, the engines are not subject to the NSPS provisions as long as the owner operates and maintain the engines according to the manufacturer's written instructions or procedures over the entire life of the engines to maintain this status. The permittee shall provide documentation that the proposed engines have not been modified nor reconstructed and information from the vendor indicating that the engines were designed as stationary engines to fire landfill gas. The permittee shall obtain a modification of this permit to install another model/type of engine.

National Emissions Standard for Hazardous Pollutants (NESHAP)

<u>HAP Source Status</u>: Emissions of hazardous air pollutants may be produced during the combustion of LFG, diesel and biodiesel in the engines. Some HAP compounds are directly present in the LFG generated by the South Dade Landfill facility and will be directly emitted due to incomplete combustion. Chlorinated compounds

present in the LFG have the potential to form hydrogen chloride (HCl), a regulated HAP, when combusted. Site-specific HAP content analyses have not been performed on the LFG generated by the South Dade Landfill facility. Therefore, data developed by EPA in Section 2.4 of the AP-42 Emissions Factor document were used to estimate the total potential HAP content of the LFG to be used as engine fuel.

Table 2.4-3 of AP-42 identifies organic compound control efficiencies for engines firing LFG as 93% for halogenated HAP species and 86.1% for non-halogenated HAP species. These control efficiencies were considered in determining potential HAP emissions. The contribution of HCl to the potential HAP emissions from the engines was estimated based on a conversion of the individual chlorinated compound measurements presented in the AP-42 default list of LFG HAP constituents to HCl as a result of high temperature combustion. This methodology indicates that potential annual HAP emissions will be less than the major source threshold for any single HAP of 10 TPY and for the combination of all HAP of 25 TPY. However, potential annual HCl emissions are estimated to be 8.1 TPY under base load conditions. Therefore, the Department will require LFG sampling and analysis to demonstrate that HCl emissions from the project are not major.

Subpart ZZZZ, 40 CFR Part 63: This subpart establishes operating limitations for HAP emissions from stationary reciprocating internal combustion engines located at major and area sources of HAP. Each proposed engine will produce a maximum of 469 bhp to meet the generator capacity of 350 kW. However, each engine is rated at a maximum capacity of 550 bhp. For Subpart ZZZZ applicability, the maximum rated capacity is used to determine applicability. The Detroit Diesel Series 60 engines for the proposed project are compression ignition engines were manufactured from 1996-1998. Pursuant to Subpart ZZZZ (40 CFR 63.6590), the proposed engines are defined as "existing engines" and are subject to the applicable requirements, which primarily include:

40 CFR 66.6603, Table 2d. Owner or operator shall:

a. Change oil and filter every 1,440 hours of operation or annually, whichever comes first;

b. During periods of startup minimize the engine's time spent at idle and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply; and

c. Maintain recordkeeping requirements found in 40 CFR 63.6655, continuous compliance in 40 CFR 63.6605 and 40 CFR 63.6640 and monitoring, installation, collection, operation and maintenance requirements in 40 CFR 63.6625(e), (h), and (j).

d. In accordance with 40 CFR 63.6625(b), the owner or operator shall during periods of startup minimize the engine's time spent at idle and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, after which time the non-startup emission limitations apply.

3. PSD APPLICABILITY

General PSD Applicability

The Department regulates major stationary sources in accordance with Florida's PSD program pursuant to Rule 62-212.400, F.A.C. PSD preconstruction review is required in areas that are currently in attainment with the state and federal Ambient Air Quality Standards (AAQS) or areas designated as "unclassifiable" for these regulated pollutants. As defined in Rule 62-210.200, F.A.C., a facility is considered a "major stationary source" if it emits or has the potential to emit 5 tons per year of lead, 250 tons per year or more of any PSD pollutant, or 100 tons per year or more of any PSD pollutant and the facility belongs to one of the 28 listed PSD major facility categories. PSD pollutants include: carbon monoxide (CO); nitrogen oxides (NO_X); sulfur dioxide (SO_2); particulate matter (PM); particulate matter with a mean particle diameter of 10 microns or less (PM_{10}); volatile organic compounds (VOC); lead (Pb); Fluorides (F); sulfuric acid mist (SAM); hydrogen sulfide (H_2S); total reduced sulfur (TRS), including H_2S; reduced sulfur compounds, including H_2S; municipal waste combustor organics measured as total tetra- through octa-chlorinated dibenzo-p-dioxins and dibenzofurans; municipal waste combustor metals measured as particulate matter; municipal waste combustor acid gases measured as SO_2 and hydrogen chloride (HCl); municipal solid waste landfills emissions measured as nonmethane organic compounds

(NMOC); and mercury (Hg).

For major stationary sources, PSD applicability is based on emissions thresholds known as the "significant emission rates" as defined in Rule 62-210.200, F.A.C. Emissions of PSD pollutants from the project exceeding these rates are considered "significant" and the Best Available Control Technology (BACT) must be employed to minimize emissions of each PSD pollutant. Although a facility may be "major" for only one PSD pollutant, a project must include BACT controls for any PSD pollutant that exceeds the corresponding significant emission rate. Rule 62-210.200, F.A.C. defines "BACT" as:

> *An emission limitation, including a visible emissions standard, based on the maximum degree of reduction of each pollutant emitted which the Department, on a case by case basis, taking into account:*
>
> *1. Energy, environmental and economic impacts, and other costs;*
>
> *2. All scientific, engineering, and technical material and other information available to the Department; and*
>
> *3. The emission limiting standards or BACT determinations of Florida and any other state;*
>
> *determines is achievable through application of production processes and available methods, systems and techniques (including fuel cleaning or treatment or innovative fuel combustion techniques) for control of each such pollutant.*
>
> *If the Department determines that technological or economic limitations on the application of measurement methodology to a particular part of an emissions unit or facility would make the imposition of an emission standard infeasible, a design, equipment, work practice, operational standard or combination thereof, may be prescribed instead to satisfy the requirement for the application of BACT. Such standard shall, to the degree possible, set forth the emissions reductions achievable by implementation of such design, equipment, work practice or operation.*
>
> *Each BACT determination shall include applicable test methods or shall provide for determining compliance with the standard(s) by means which achieve equivalent results.*
>
> *In no event shall application of best available control technology result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR Parts 60, 61, and 63.*

The EPA currently directs that BACT should be determined using the "top-down" approach. The first step in this approach is to determine, for the emission unit in question, the most stringent control available for a similar or identical emission unit or emission unit category. If it is shown that this level of control is technically or economically unfeasible for the emission unit in question, then the next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, energy, environmental or economic issues.

In addition, applicants must provide an Air Quality Analysis that evaluates the predicted air quality impacts resulting from the project for each PSD pollutant.

PSD Applicability for the Project

The project is located in Miami-Dade County, which is in an area that is currently in attainment with the state and federal AAQS or otherwise designated as unclassifiable. The existing South Dade Landfill facility is a major stationary source and the project is subject to a PSD applicability review. The following table identifies the estimated potential emissions increases from the project based on the initial application.

Pollutant	Potential Emissions (TPY)		PSD Significant Emissions Rates (TPY)	Subject To PSD Review?
	Per Engine	All Engines		
PM	1.2	29.0	25	Yes
PM_{10}	1.2	29.0	15	Yes
$PM_{2.5}$	1.2	29.0	10	Yes
SO_2	1.7	39.9	40	No
NOx	10.6	254	40	Yes
CO	13.8	331	100	Yes
VOC	1.6	38.6	40	No

Note: Based on the applicant's estimate of worst-case operation. As shown above, the project is subject to PSD preconstruction review for CO, NOx and PM/PM_{10}/particulate matter with a mean particle diameter of 2.5 microns or less ($PM_{2.5}$).

4. BACT ANALYSIS AND PRELIMINARY DETERMINATIONS FOR CO, NOx AND PM/PM_{10}

PSD Pollutants

For this project, emissions of CO, NOx and PM/PM_{10} are significant and require a BACT determination. The air pollutant emissions from this facility for which a BACT determination is required can be grouped into categories based upon the control equipment and techniques that are available to control emissions from these emission units. Using this approach, the emissions can be classified as indicated below:

- PM/PM_{10}: Controlled generally by wet scrubbing or filtration.
- CO and NO_X (Combustion Products): Generally controlled by efficient combustion of clean fuels, but catalytic technologies are available for reducing these emissions.

Grouping the pollutants in this manner facilitates the BACT analysis because it enables the pollutant control equipment and the corresponding energy, economic, and environmental impacts to be examined on a common basis.

Identifying Add-On Emission Controls for Combustion Products

For combustion sources, the following add-on control technologies are generally available and the primary options for consideration:

- *Non-Selective Catalytic Reduction (NSCR)*: NSCR uses a platinum/rhodium catalyst to reduce NOx to nitrogen and water vapor in exhaust gas streams containing less than 3% oxygen. This technology has been applied to automobiles and stationary reciprocating engines with variable control efficiencies.
- *Oxidation Catalyst*: An oxidation catalyst consists of a noble metal catalyst section incorporated into the combustion turbine exhaust. The catalyst would promote oxidation of CO to carbon dioxide (CO_2) at much lower temperatures (650° F to 1150° F) than under normal conditions. The control efficiency is primarily a function of gas residence time and can exceed 90%.
- *Selective Catalytic Reduction (SCR)*: This is an add-on control technology in which ammonia is injected into the exhaust gas stream in the presence of a catalyst (typically vanadium) to combine with NOx in a reduction reaction forming nitrogen and water. For this reaction to proceed satisfactorily, the exhaust gas temperature must be maintained between 450° F and 850° F. SCR is a commercially available, demonstrated control technology.

- *Selective Non-Catalytic Reduction (SNCR)*: In the SNCR process, ammonia or urea is injected at high temperatures without a catalyst to reduce NOx emissions to nitrogen and water vapor. The exhaust temperature must typically be maintained above 1600° F to allow the reaction to occur; otherwise uncontrolled NOx will be emitted as well as unreacted ammonia. Also, the exhaust temperature must not exceed 2000° F or ammonia will actually be oxidized creating additional NOx emissions. The engine exhaust temperature is 820° F, which makes this technology unfeasible.

However, LFG contains siloxanes, which are a class of compounds that exist in the form of R_2SiO, where R is a hydrogen atom or a hydrocarbon and Si is silicon. Siloxanes are present in certain landfill waste streams such as toiletries, cosmetics, and other personal grooming items. When combusted, such compounds produce silica (SiO_2), which can quickly poison a catalyst. A separate treatment system to remove siloxanes (SiO_2) would be necessary to avoid adverse effects of deposits and the rapid decrease in reactivity of the catalyst.

The California Air Resource Board (CARB) has developed and published *Guidance for the Permitting of Electrical Generation Technologies* in July 2002, to assist companies and organizations in the permitting of electrical generating equipment. In this guidance document, CARB:

- Recognizes the benefits of generating electricity from waste gases (landfill and digester gas) and the recovery of useful energy.
- Indicates that waste gases "… contain impurities that, if combusted will likely poison catalyst-based post combustion control systems."
- Determines that additional fuel treatment and post combustion controls have limited success and/or have not been proven to be cost effective in reducing air pollutant emissions from waste combustion applications.

Other state regulatory agencies (e.g., Texas, Rhode Island and New Jersey) have made similar determinations and issued permits that specify BACT for LFG-fueled engines that do not include the use of add-on emission controls because of catalyst poisoning by siloxanes. Such poisoning leads to poor reduction efficiencies and eventually destruction and early replacement of the catalyst.

To employ a catalytic technology would require a siloxane removal system. The Department contacted Applied Filter Technology (AFT), which has been active in the biogas-to-energy business since 1996 and has 167 biogas-to-energy systems in operation around the world. For ten years, the AFT siloxane removal systems have primarily been used in conjunction with combustion turbines to achieve guaranteed LFG specifications that are intended to protect the combustion turbines, which operate within close mechanical tolerances. The percentage of siloxane removal required for protecting a combustion turbine is much less than the siloxane removal efficiency required for protecting a catalyst. In addition, AFT does not have any experience in using the siloxane removal system for engines and the protection of the catalyst used in add-on control. The siloxane removal system that can protect the engines as well as the catalyst is still on the horizon.

The remaining technology for reducing emissions when firing LFG engines is the efficient combustion provided by lean-burn engines. Lean-burn engines are the preferred choice for LFG applications because these engines have the lowest NOx emissions without add-on control. Information gathered by the Department also shows that the majority of landfill applications use lean-burn engines. The engines are supplied with after-coolers and operate at 100% excess air, which also helps to minimize emissions. Emissions of NOx when firing LFG are also lower than traditional fuels such as diesel.

Identifying Add-On Emission Controls for Particulate Matter

There are many types of add-on control technologies for removing particulate matter from a gas stream including fabric filters, wet scrubbers and electrostatic precipitators. However, these technologies are impractical for controlling engines because of the relatively small scale of the engines as well as issues with back-pressure. In

addition, these technologies would not be cost-effective given the amounts of particulate matter available for control. The remaining control technologies are fuel pretreatment and the efficient combustion of clean fuels.

Documented RACT/BACT/LAER Determinations

The EPA Office of Air Quality Planning and Standards (OAQPS) maintains the Reasonably Available Control Technology/Best Available Control Technology/Lowest Achievable Emission Rate (RACT/BACT/LAER) Clearinghouse (RBLC), which is a database that includes BACT and LAER determinations and identifies the emissions limit and the corresponding control technology. This database indicates that no add-on emission controls have been established as BACT or LAER for LFG engines. In addition, only one source is identified that uses dual-fuel engines. The RBLC indicates that most LFG engines use one or more of the following control methods for controlling CO and NO_X: lean-burn technology, good combustion practices, air-to-fuel ratio controllers and/or turbo charging. For controlling particulates, the following control methods are identified: gas pretreatment, proper operation and maintenance and good combustion practices.

The Department issued PSD permits during 2006-2007 to Trail Ridge Energy, LLC, Seminole Energy, LLC and Brevard Energy, LLC for the installation of six LFG engines at each location. No add-on emission controls were required for these projects. It is noted that only LFG is fired in these engines.

The state of Texas issued PSD permit (PSD-TX-1034) to Bio Energy Texas, LLC on July 23, 2004 for the installation of eight LFG engines. No add-on emission controls were required for this project. The same Caterpillar engines as those proposed for the Florida projects were installed at Bio Energy Texas, LLC.

In 2006, the State of New Jersey completed a non-attainment area (NAA) review for ozone (LAER for NO_X) and a PSD review for CO (BACT) for Ocean Energy Corporation, Inc., which is a Landfill Energy Systems Company. The project was for the installation of six LFG engines and no add-on emission controls were required.

Table 1. Control Technologies and Methods for Reducing CO and NO_X Emissions.

Facility (State)	Engine Size (MW)	(MMBtu/hr)	(bhp)	Fuel	CO Control	NOx Control
Bio-Energy, LLC (OH)	_	15	_	LFG	NA*	Lean Burn Technology
Lorraine County Landfill (OH)	–	–	5500	LFG	NA*	Lean Burn Technology
INGENCO (VA)	12.6 (Total)	_	–	Dual-fuel (LFG & oil)	Fuel limit	Air to fuel ratio, turbo charging
Sumter Energy (MI)	_	8.6	_	Treated LFG	Good combustion practices	Good combustion
Bio Energy Texas, LLC (TX)	1.6	–	2172	LFG	Operation & Maintenance	Lean Burn Technology
New England Waste Services (VT)	1.6	–	2221	LFG	Low Emission Design	Low Emission Design
Ridgewood Power Management (RI)	–	–	2229	LFG	Good combustion practices	Lean Burn, Air/Fuel ratio, Intercoolers
MM San Bernardino Energy (CA)	–	–	1850	LFG	Turbocharged, intercooled air/fuel controller	Turbocharged, intercooled air/fuel controller
Trail Ridge Energy, LLC	1.6	–	2233	LFG	Good combustion	Good combustion

Facility (State)	Engine Size (MW)	(MMBtu/hr)	(bhp)	Fuel	CO Control	NOx Control
(FL)					practices	
Burlington County (NJ)	1.5	12.5	_	LFG	NA*	Good combustion
Manchester Renewable (NJ)	_	16.4	_	LFG	NA*	Air/Fuel ratio
Seminole Energy, LLC (FL)	1.6	_	2233	LFG	Good combustion practices	Good combustion
Brevard Energy, LLC (FL)	1.6	_	2233	LFG	Good combustion practices	Good combustion
University of New Hampshire (NH)	1.6	14.3	_	LFG	Good combustion practices	Lean Burn, Air/Fuel ratio, Intercoolers

* = Not Available

Table 2. Permitted Emissions Limits for CO, NO_X and PM/PM_{10} in EPA RBLC Database.

FACILITY	ENGINE SIZE	DATE	TYPE	CO g/bhp-hr	NOx g/bhp-hr	PM/PM_{10}
University of New Hampshire (NH)	14.3 MMBtu/hr	7/2007	BACT	2.75	0.5	0.1 g/bhp-hr
Brevard Energy, LLC (FL)	2233 hp	3/2007	BACT	2.75	0.6	0.24 g/bhp-hr
Seminole Energy, LLC (FL)	2233 hp	1/2007	BACT	2.75	0.6	0.24 g/bhp-hr
Monmouth County (NJ)	9.81 MMBtu/hr	12/2006	BACT	2.53	0.53	0.0591 lb/MMBtu
Manchester Renewable (NJ)	16.38 MMBtu/hr	10/2006	BACT	2.75	0.5	0.05983 lb/MMBtu
Trail Ridge Energy, LLC (FL)	2233 hp	10/2006	BACT	2.75	0.6	0.24 g/bhp-hr
Burlington County (NJ)	1500 kW	08/2006	BACT	2.5	0.6	0.06 lb/MMBtu
Ocean Energy Corp. (NJ)	2233 hp	2006	BACT/LAER	2.75	0.6	NA
New England Waste Svcs. (VT)	2221 hp	12/21/2005	BACT/LAER	2.75	0.5	NA
Ridgewood Power Mgmt. (RI)	2229 hp	06/24/2005	BACT/LAER	2.75	0.5	NA
Bio Energy Texas, LLC (TX)	2172 hp	07/23/2004	BACT/LAER	2.8	0.6	0.1291 lb/MMBtu
INGENCO (VA)	12.6 MW (Total)	12/17/2003	BACT	3.2 lb/MMBtu	2.1 lb/MMBtu	NA
Northwest Regional Landfill (AZ)	1410 hp	10/27/2003	BACT	2.5	0.6	NA
Bio-Energy, LLC (OH) (Lorraine County Landfill)	1877 hp	04/22/2003	BACT	2.4	1.4	NA
Bio-Energy, LLC (OH) (Carbon Limestone LFG)	1877 hp	04/10/2003	BACT	2.3	1.2	0.0286 lb/MMBtu
MM San Bernardino Energy (CA)	1850 hp	05/16/2002	BACT	2.5	0.6	NA

FACILITY	ENGINE SIZE	DATE	TYPE	CO g/bhp-hr	NOx g/bhp-hr	PM/PM_{10}
Northern Tier Landfill (PA)	815 kW	01/29/2002	BACT	3.0	2.0	NA
Reliant Associates (TX)	2343 hp	01/24/2002	BACT	3.0	0.6	NA
Sumpter Energy Associates (MI)	1138 hp	12/20/2001	BACT	2.9	2.0	NA
Bio-Energy (Azusa) LLC (CA)	1850 hp	02/22/2000	LAER	2.0	0.6	NA
Kiefer Landfill (CA)	4230 hp	01/18/2000	LAER	2.7	0.55	NA
MM Hackensack Energy (NJ)	1340 hp	04/09/1998	LAER	2.0	1.0	NA

Notes:

hp = Horsepower; kW = kilowatt; MMBtu/hr = million British thermal units per hour; g/bhp-hr = grams per brake horsepower per hour; and NA = Not Available

Applicant's Proposal for BACT

Based on a review of previous similar projects, the applicant proposed the following BACT limits based on the combustion design of the LFG engines.

Pollutant	Proposed Emission Limits Per Engine	Control Technology
CO	0.86 lb/MMBtu and 3.15 lb/hour (3.00 grams/bhp-hour)	Lean-burn engine with air-to-fuel ratio control
NO_X	0.65 lb/MMBtu and 2.42 lb/hour (2.34 grams/bhp-hour)	Lean-burn engine with air-to-fuel ratio control
PM/PM_{10}	0.075 lb/MMBtu and 0.28 lb/hour (0.26 grams/bhp-hour)	Treatment of LFG fuel with 10-micron filter

Department's BACT Analysis

Engine Type

The engines proposed for the project are Detroit Diesel Series 60 dual-fuel engines, which each produce a maximum of 469 bhp when coupled to a 350 kW generator (nominal rating). This type of engine appears fairly unique for application to LFG-to-energy projects. With a rating of 469 bhp, this engine model is much smaller than the engines identified in the above RBLC summary tables. In addition, this engine model is a compression ignition reciprocating internal combustion engine designed to fire LFG along with diesel/biodiesel. Diesel/biodiesel is relied upon for startup of the engines (typically less than 30 minutes) and LFG is gradually blended in. After startup, the engines will operate at a LFG fraction of 90% or more. At this point, a small amount of diesel/biodiesel is fired to stabilize combustion. The above graph shows how CO and NOx emissions vary with the LFG fraction.

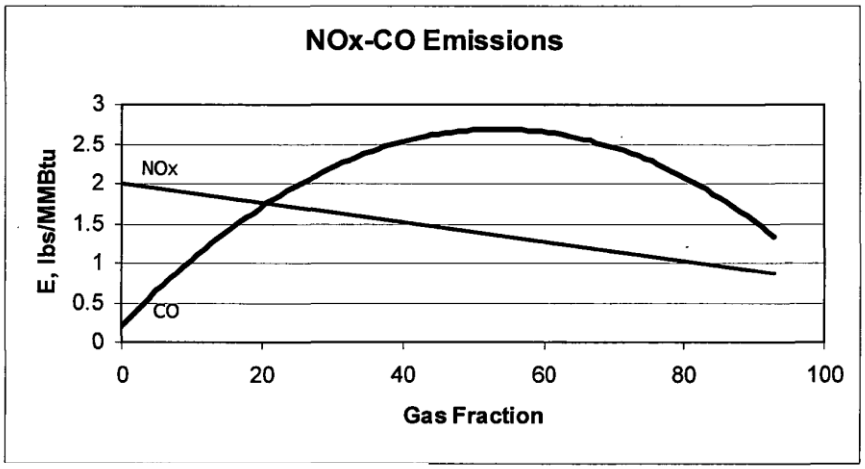

Figure 8 – NO_X-CO Emissions

In addition, the Department considered the new NSPS standards for compression ignition engines in NSPS Subpart IIII of 40 CFR 60. However, LFG is not a regulated fuel for compression ignition engines in this Subpart.

The applicant states that the LFG engines proposed for the project have a manufacture date that predates each of the applicability dates for lean-burn engines firing LFG. Therefore, the NSPS standards are not applicable to these engines. The permittee shall provide the following documentation to the Division of Air Resource Management and the Compliance Authority: verification that each of the engines was manufactured prior to April 1, 2006 (applicability deadline for NSPS Subpart IIII); a statement that the proposed engines have not been modified nor reconstructed; and information from the vendor indicating that the engines were designed as stationary engines to fire landfill gas. This will establish the engines as existing engines that predate the NSPS Subpart IIII provisions. The permittee shall obtain a modification of this permit to install another model/type of engine.

BACT for CO and NOx

The Department agrees that there is no practicably feasible or cost effective post combustion treatment technology for reducing CO and NOx emissions from the dual-fueled engines for this project. The LFG contains impurities (particularly siloxanes) that, when combusted, will readily poison a catalyst. Data in EPA's RBLC identified one BACT determination for engines operating on LFG and diesel: a similar INGENCO project in Virginia, with BACT limits of 3.2 lb CO/MMBtu (11.4 g CO/bhp-hour) and 2.1 lb NOx/MMBtu (7.5 g NOx/bhp-hour). In general, the RBLC data shows BACT limits ranging from 2.3 to 3.2 g CO/bhp-hour and 0.5 to 2.0 g NOx/bhp-hour, which are based on lean-burn engines with air-to-fuel ratio controllers or simply identified "clean-burn engine".

The applicant proposed a CO BACT of 0.86 lb/MMBtu (3.0 g/bhp-hour) and a NOx BACT limit of 0.65 lb/MMBtu (2.34 g/bhp-hour). These were based on requested annual emission limits of 331 tons of CO per year and 254 tons of NOx per year for all 24 engines. The application also contained the following emissions data as a function of LFG fraction taken from actual operation of the engines at the INGENCO facility in Virginia.

Gas Fraction	gine Output (k	NOx lb/mmbtu	CO lb/mmbtu	No Engines Single Fuel	NO Engines Dual Fuel	MMBtu/hr single Fuel	MMBtu/hr Dual Fuel	Fuel Oil gal/hr	LFG CFH	NOx lb/hr	CO lb/hr
90%	300	0.78	0.9978	0	24	0.0	75.6	55	126933	59.08	75.44
91%	300	0.73	0.9373	0	24	0.0	75.6	50	128343	55.10	70.85
92%	300	0.68	1.0000	0	24	0.0	75.6	44	129754	51.12	75.60
93%	320	0.62	0.8162	0	24	0.0	80.6	41	139908	50.28	65.82
94%	330	0.57	0.7557	0	24	0.0	83.2	36	145832	47.48	62.84
95%	340	0.52	0.6952	0	24	0.0	85.7	31	151849	44.40	59.56
96%	350	0.47	0.6347	0	24	0.0	88.2	26	157961	41.07	55.98

This data shows that at a LFG fraction of 90%, predicted CO emissions are approximately 1.0 lb/MMBtu and begin to steadily decrease above a LFG fraction of 92%. Similarly, at a LFG fraction of 90%, predicted NOx emissions are approximately 0.8 lb/MMBtu and begin to steadily decrease with increasing LFG fraction. Therefore, based on lean-burn design of the engine with an air-to-fuel ratio controller and the available data, the preliminary BACT determinations for each engine are:

CO BACT: 1.0 lb/MMBtu and 3.7 lb/hour/engine (equivalent to 3.6 grams/bhp-hour)

NOx BACT: 0.8 lb/MMBtu and 2.9 lb/hr/engine (equivalent to 2.8 g/bhp-hour)

Although this is at the higher end of recent BACT determinations, this is appropriate considering the specific dual-fuel engine type, much smaller size and short-term emissions rates. These limits are much less than the similar INGENCO project in Virginia. The draft permit also includes a requirement to operate the engines at a LFG fraction of at least 90%.

BACT for PM/PM_{10}

Data presented in EPA's RBLC for LFG engines show PM/PM_{10} BACT limits ranging from approximately 0.03 lb/MMBtu to 0.13 lb/MMBtu. Pretreatment of the LFG to remove condensate and particulate matter without the use of add-on control equipment is consistently specified as the BACT method of control.

As required in NSPS Subpart WWW in 40 CFR 60, the applicant proposed a LFG pretreatment filter of only 10 microns. However, as for other projects, the Department will require the use of 1 micron primary and polishing filters to remove particulate matter from the LFG as part of the Treatment System prior to combustion in the engines. Combined with the efficient lean-burn combustion design, this additional requirement will enable the engines to achieve an equivalent PM/PM_{10} emission rate of approximately 0.075 lb/MMBtu or less. To further minimize particulate matter emissions, the Department will require the following fuel sulfur specification, "Diesel and biodiesel shall have a maximum sulfur content of 0.0015% by weight.

Due to the difficulties in isokinetically testing the small diameter engine stacks for PM_{10} emissions, the Department establishes the following work practice standards as BACT for PM/PM_{10} emissions:

- The permittee shall design, install and maintain the LFG Treatment System with 1 micron primary and polishing filters to remove particulate matter from the LFG prior to combustion in the engines.
- Diesel and biodiesel shall have a maximum sulfur content of 0.0015% by weight.
- As determined by EPA Method 9, opacity from the engine stacks shall not exceed 10% based on a 6-minute average.
- The work practice standards are equivalent to PM/PM_{10} emissions of *0.075 lb/MMBtu and 0.27 g/bhp-hr).*

Compliance Procedures

Compliance with the BACT limits shall be in accordance with the following methods.

Emission Unit	Pollutant	Compliance Method
24 Dual-Fueled Internal Combustion Engines LFG with Diesel/Biodiesel	CO	EPA Method 10, stack test, three 1-hour runs
	NO_X	EPA Method 7 or 7E, stack test, three 1-hour runs
	PM/PM_{10}	1 Micron Filter: Design, installation and maintenance Diesel/Biodiesel Sulfur Content: Vendor certification or fuel analysis Opacity: EPA Method 9

For stack testing, these refer to the EPA Reference Methods as contained in 40 CFR 60, Appendix A or as otherwise approved by the Department.

The draft permit also includes the following emissions limits:

- Sulfur dioxide emissions from all engines shall not exceed 39.0 tons during any consecutive 12 months (to avoid PSD review). Emissions shall be calculated based on the representative sulfur content of each fuel and the actual monthly fuel consumption rate of the engines.
- Hydrochloric acid emissions from the facility shall not exceed 8.1 tons during any consecutive 12 months (maintains facility as minor with respect to HAP emissions). Emissions shall be calculated based on the representative chlorine content of LFG and the monthly LFG consumption rate by the engines as well as the amount of LFG flared.

For each calendar semiannual period (January – June and July – December), the permittee shall obtain a sample of LFG and have an analysis for sulfur and chlorine. Semiannual samples shall be taken at least five months apart. Each gas sample shall be collected under normal operating conditions (i.e., with valves open for all operating cells) by appropriate canisters (e.g. SUMMA® Bottle-Vac Sampler or equivalent). Based on Rule 62-

297.310(7)(b)(Special Compliance Tests), F.A.C., the Compliance Authority may request additional gas sampling and analyses. Results shall also be reported as SO_2 and HCl emission factors in terms of lb/million standard cubic feet (lb/MMscf) of landfill gas.

Startups, Shutdowns and Malfunctions

When firing 100% diesel/biodiesel during startup, data indicates NO_X emissions from all engines are more than 160 lb/hour, which could result in ambient air quality impacts greater than the new 1-hour NO_2 ambient standard. When firing under normal conditions with a LFG fraction of 90% or more, data indicates NO_X emissions from all engines are less than 60 lb/hour, which poses no adverse ambient impacts. However, the engines typically start up in less than 30 minutes. The following NOx emissions are estimated for the first hour of operation assuming all engines startup at the same time.

Operating Condition	Duration minutes	NOx Rate lb/hour (all engines)	
		Maximum Rate	Contribution to First Hour of Operation
Startup	30	187.38	93.69
Normal	30	59.08	29.54
Total	60	N/A	123.23

Since the cumulative hourly NOx emission rate is less than 160 lb/hour, it is unnecessary to restrict startup of the engines. The applicant indicates that engine startups are typically staggered. The draft permit will authorize excess emissions from startup and shutdown as long as the applicant minimizes the duration of startup to the extent practicable. In general, the operator should strive for startups of approximately 30 minutes or less. Once started, the draft permit requires operation with a LFG fraction of 90% or greater. If insufficient LFG is not available to operate all engines, the operator must take some of the engines off line to achieve a LFG fraction of at least 90%.

5. AIR QUALITY ANALYSIS

This section provides a general overview of the modeling analyses required for PSD preconstruction review followed by the specific analyses required for this project.

Overview of the Required Modeling Analyses

Pursuant to Rule 62-212.400, F.A.C., the applicant is required to conduct the following analyses for each PSD significant pollutant:

- A preconstruction ambient air quality analysis,
- A source impact analysis based on EPA-approved models, and
- An additional impact analysis.
- For the purposes of any required analysis, NO_X emissions will be modeled as NO_2 and only PM_{10} emissions will be considered when modeling particulate matter.

Preconstruction Ambient Monitoring Analysis

Generally, the first step is to determine whether the Department will require preconstruction ambient air quality monitoring. Using an EPA-approved air quality model, the applicant must determine the predicted maximum ambient concentrations and compare the results with regulatory thresholds for preconstruction ambient monitoring, known as de minimis air quality levels. The regulations establish de minimis air quality levels for

several PSD pollutants as shown in Table 3 below. For ozone, there is no de minimis air quality level because it is not emitted directly. However, since NO_2 and VOC are considered precursors for ozone formation, the applicant may be required to perform an ozone ambient impact analysis (including the gathering of ambient air quality data) for any net increase of 100 tons per year or more of NO_2 or VOC emissions.

If the predicted maximum ambient concentration is less than the corresponding de minimis air quality level, Rule 62-212.400(3)(e), F.A.C. exempts that pollutant from the preconstruction ambient monitoring analysis. If the predicted maximum ambient concentration is more than the corresponding de minimis air quality level (except for non-methane hydrocarbons), the applicant must provide an analysis of representative ambient air concentrations (pre-construction monitoring data) in the area of the project based on continuous air quality monitoring data for each such pollutant with an Ambient Air Quality Standard (AAQS). If no such standard exists, the analysis shall contain such air quality monitoring data as the Department determines is necessary to assess ambient air quality for that pollutant.

Table 3. Regulatory Thresholds for Preconstruction Ambient Monitoring

PSD Pollutant	De Minimis Air Quality Levels
Carbon monoxide (CO)	575 μg/m³, 8-hour average
Nitrogen dioxide (NO_2)	14 μg/m³, annual average
Particulate Matter (PM_{10})	10 μg/m³, 24-hour average
Sulfur dioxide (SO_2)	13 μg/m³, 24-hour average
Lead (Pb)	0.1 μg/m³, 3-month average
Fluorides (F)	0.25 μg/m³, 24-hour average
Total reduced sulfur (TRS)	10 μg/m³, 1-hour average
Hydrogen sulfide (H_2S)	0.2 μg/m³, 1-hour average
Reduced sulfur compounds (RSC)	10 μg/m³, 1-hour average
Mercury (Hg)	0.25 μg/m³, 24-hour average

If preconstruction monitoring data is necessary, the Department may require the applicant to collect representative ambient monitoring data in specified locations prior to commencing construction on the project. Alternatively, the Department may allow the requirement for preconstruction monitoring data to be satisfied with data collected from the Department's extensive ambient monitoring network. Preconstruction monitoring data must meet the requirements of Appendix B of 40 CFR 58 during the operation of the monitoring stations. The preconstruction monitoring data will be used to determine the appropriate ambient background concentrations to support any required AAQS analysis.

Finally, after completing the project, the Department may require the applicant to conduct post-construction ambient monitoring to evaluate actual impacts from the project on air quality.

Source Impact Analysis

For each PSD-significant pollutant identified above, the applicant is required to conduct a source impact analysis for affected PSD Class I and Class II areas. This analysis is to determine if emissions from this project will significantly impact levels established for Class I and II areas. Class I areas include protected federal parks and national wilderness areas (NWA) that are under the protection of federal land managers. Table 4 identifies the Class I areas located in Florida or that are within 200 kilometers (km) in nearby states. Class II areas represent all other areas in the vicinity of the facility open to public access that are not Class I areas.

Table 4. Class I Areas

Class I Area	State	Federal Land Manger
Bradwell Bay NWA	Florida	U.S. Forest Service
Chassahowitzka NWA	Florida	U.S. Fish and Wildlife Service
Everglades National Park	Florida	National Park Service
Okefenokee NWA	Georgia	U.S. Fish and Wildlife Service
St. Marks NWA	Florida	U.S. Fish and Wildlife Service
Wolf Island NWA	Georgia	U.S. Fish and Wildlife Service

An initial significant impact analysis is conducted using the worst-case emissions scenario for each pollutant and corresponding averaging time. The regulations define separate significant impact levels for Class I and Class II areas for CO, NO_2, Pb, PM_{10} and SO_2. Based on the initial significant impact analysis, no additional modeling is required for any pollutant with a predicted ambient concentration less than the corresponding significant impact

level. However, for any pollutant with a predicted ambient concentration exceeding the corresponding significant impact level, the applicant must conduct a full impact analysis. In addition to evaluating impacts caused by the project, a full impact modeling analysis also includes impacts from other nearby major sources (and any potentially-impacting minor sources within the radius of significant impact) as well to determine compliance with:

- The PSD increments and the federal air quality related values (AQRV) for Class I areas.
- The PSD increments and the AAQS for Class II areas.

As previously mentioned, for any net increase of 100 tons per year or more of VOC or NO_2 subject to PSD, the applicant may be required to perform an ambient impact analysis for ozone including the gathering of ambient ozone data.

PSD Class I and II Model

The EPA-approved American Meteorological Society and EPA Regulatory Model (AERMOD) dispersion model was used to evaluate short range impacts from the proposed project in the surrounding Class II Area and also in the Class I area. In November of 2005, the EPA promulgated AERMOD as the preferred regulatory model for predicting pollutant concentrations within 50 kilometers of a source. The AERMOD model is a replacement for the Industrial Source Complex Short-Term model (ISCST3). The AERMOD model calculates hourly concentrations based on hourly meteorological data. The model can predict pollutant concentrations for annual, 24-hour, 8-hour, 3-hour and 1-hour averaging periods. In addition to the PSD Class II modeling, it is also used to model the predicted impacts for comparison with the de minimis ambient air quality levels when determining preconstruction monitoring requirements.

For evaluating plume behavior within the building wake of structures, the AERMOD model incorporates the Plume Rise Enhancement (PRIME) downwash algorithm developed by the Electric Power Research Institute (EPRI). A series of specific model features recommended by the EPA are referred to as the regulatory options. The applicant used the EPA-recommended regulatory options in each modeling scenario and building downwash effects were evaluated for stacks below the good engineering practice (GEP) stack heights.

Meteorological data used in the AERMOD model consisted of a concurrent five-year period of hourly surface weather observations from the National Weather Service office located at Miami International Airport and twice-daily upper air soundings from Florida International University (FIU) in Miami. The five-year period of meteorological data was from 2001 through 2005. This station was selected for use in the evaluation because it is the closest primary weather station to the project area and is most representative of the project site.

Stack Height Considerations

GEP stack height means the greater of 65 meters (213 feet) or the maximum nearby building height plus 1.5 times the building height or width, whichever is less. Where the affected stacks did not meet the requirements for GEP stack height, building downwash was considered in the modeling analyses. Based on a review of this application, the Department determines that the project complies with the applicable provisions of the stack height regulations as revised by EPA on July 8, 1985 (50 FR 27892). Portions of the regulations have been remanded by a panel of the U.S. Court of Appeals for the D.C. Circuit in NRDC v. Thomas, 838 F. 2d 1224 (D.C. Cir. 1988). Consequently, this permit may be subject to modification if and when EPA revises the regulation in response to the court decision. This may result in revised emission limitations or may affect other actions taken by the source owners or operators.

Additional Impact Analysis

In addition to the above analyses, the applicant must provide an evaluation of impacts to: soils, vegetation, and wildlife; air quality related to general commercial, residential and industrial growth in the area that may result from the project; and regional haze in the affected Class I areas.

PSD Significant Pollutants for the Project

As discussed previously, the proposed project will increase emissions of the following pollutants in excess of the PSD significant emissions rates: NO_X, CO and PM/PM_{10}. For the purposes of any required analysis, NO_X emissions will be modeled as NO_2 and only PM_{10} emissions will be considered when modeling particulate matter.

Preconstruction Ambient Monitoring Analysis

Using the AERMOD model, the applicant predicted the following maximum ambient impacts from the project.

Table 5. De Minimis Air Quality Levels

Pollutant	Averaging Time	Maximum Predicted Impact (µg/m^3)	De Minimis Concentration (µg/m^3)	Greater than De Minimis?
NO_2	Annual	9.7	14	NO
PM_{10}	24-hr	19.7	10	YES
CO	8-hr	814	575	YES

As shown above, NO_2 is exempt from preconstruction monitoring because the predicted impacts are less than the de minimis levels. CO and PM_{10} are not exempt because their predicted impacts are greater than the de minimis levels. In addition, the project results in PSD net emissions increases of 254 tons/year of NO_2, which is above the threshold of 100 tons/year, which requires an ozone ambient impact analysis including the gathering of ambient air quality data. The Department maintains an extensive quality-assured ambient monitoring network throughout the state and data gathered from these monitors can be used to address the ozone, CO and PM_{10} impacts. Unless otherwise noted, Table 6 summarizes ambient data from 2008-2010 available from existing nearby monitoring locations in Miami-Dade.

Table 6. Ambient Air Quality Measurements Nearest to the Project Site (2008 - 2010)

Pollutant	Location	Averaging Period	Ambient Concentration			
			Compliance Period	Value	Standard	Units
Ozone	Perdue Medical Center	8-hour	2008-10	67[a]	75 [a]	ppb
PM_{10}	Miami Fire Station	24-hour	2008-10	65	150 [b]	µg/m^3
		Annual	2008-10	26[c]	50 [c]	µg/m^3
$PM_{2.5}$	Homestead Fire Station	24-hour	2008-10	15[d]	35[d]	µg/m^3
		Annual	2008-10	7[e]	15[e]	µg/m^3
NO_2	Metro Annex	Annual	2008-10	18	100 [c]	µg/m^3
CO	Metro Annex	1-hour	2008-10	4,300	40,000 [f]	µg/m^3
		8-hour	2008-10	2,700	10,000 [f]	µg/m^3

a. Three year average of the 4th highest daily maximum.
b. Not to be exceeded on more than an average of one day per year over a three-year period.
c. Arithmetic mean.
d. Three year average of the 98th percentile of 24-hour concentrations.
e. Three year average of the weighted annual mean.
f. Not to be exceeded more than once per year.

The existing monitoring data show no violations of any ambient air quality standards. The Department determines that the data collected from these monitors is representative of the air quality in the vicinity of the project and may be used to satisfy the preconstruction monitoring requirements for PM_{10}, CO, NO_2 and ozone. As necessary, the above ambient concentrations will be used as the ambient background concentrations for any required AAQS analysis.

Ozone is a key indicator of the overall state of regional air quality. It is not emitted directly from combustion processes. Rather it is formed from VOC and NO_X emitted primarily from regional industrial and transportation sources. VOC is also emitted from fires and vegetation (e.g. isoprene). These two precursors participate in photochemical reactions that occur on an area-wide basis and are highly dependent on meteorological factors.

There are two ozone monitors in Miami-Dade. Ozone limits and measurements are summarized on three year blocks, rolled annually. The reported value was calculated by taking the maximum 8-hour readings recorded each day during the three years. The fourth highest of the recorded maxima are identified for each year and then the average of those three values is identified as the compliance value. The average of the annual fourth highest measurements (design value) over the period 2008-2010 at the monitor (designated as University of Miami-Rosenstiel) recording the highest readings in Miami-Dade is 68 parts per billion (ppb).

The largest NO_X sources in the area are the Florida Power and Light Turkey Point Station approximately 10 km south, the Miami-Dade Resource Recovery facility approximately 30 km north, and Titan Industries Pennsuco Cement about 35 km north of the proposed project. These facilities had annual emissions of 2100, 1300 and 1200 tons, respectively, of NO_X in 2008. These values are significantly less than annual emissions from theses sources in 2002, which were 6300, 5000, and 2500 tons, respectively. In addition, for reference, NO_X emissions have greatly decreased from the power plants in the south Florida area since 1998 when annual emissions from NO_X were approximately 46,000 tons. For power plant sources in 2008 these emissions were 12,000 tons, and for 2009 they were even less at 9200 tons. These values represent reductions of 74 percent and 80 percent, respectively.

The Department considered available options for potentially predicting ambient ozone impacts caused by the NO_2 emissions increases (ozone precursor pollutant) from the project. No stationary point source models are available or approved for use in predicting ozone impacts. Although regional models exist for predicting ambient ozone levels, it is unlikely that impact caused by this project could be adequately evaluated because it is so small compared to regional effects. In addition due to the trend of decreasing NO_X emissions, the Department determines that the use of a regional model incorporating the complex chemical mechanisms for predicting ozone formation is not appropriate for this project, and no further modeling is required for ozone impacts.

$PM_{2.5}$ (also known as PM_{fine}) is another key indicator of the overall state of regional air quality. Some is directly emitted as a product of combustion from transportation and industrial sources as well as fires. Much of it consists of particulate nitrates and sulfates formed through chemical reactions between gaseous precursors such as SO_2 and NO_X from combustion sources and ammonia (NH_3) naturally present in the air or added by other industrial sources. In addition to NO_X emissions, SO_2 emissions from power plant sources in the south Florida area have also decreased significantly since 1998 when annual emissions were approximately 110,000 tons. In 2008 these emission were approximately 13,000 tons, and for 2009 they were even less at approximately 10,000 tons. Other large sources of SO_2 in Miami-Dade have had significant decreases, too.

These NO_X and SO_2 emissions trends provide insight regarding the likely direction of regional ambient air quality drivers (excluding meteorology) for pollutants like ozone and $PM_{2.5}$ that are formed from precursors such as SO_2 and NO_X.

There are three $PM_{2.5}$ monitors in Miami-Dade. $PM_{2.5}$ limits and measurements are summarized on three year blocks, rolled annually. The reported value for $PM_{2.5}$ given in Table 6 was calculated by taking the average 24-hour readings recorded each day during the three years (2008-2010). The value for each year that exceeds 98% of all daily measurements within that year is identified for each year and then the average of those three numbers is identified as the value compared with the standard. The value calculated in the described manner for $PM_{2.5}$

measured at the Homestead Fire Station is given in Table 6 as 15 micrograms per cubic meter ($\mu g/m^3$) compared with a standard of 35 $\mu g/m^3$.

The simple average of all measurements within each three years (2008-2010) was also calculated and then the mean of the three annual averages (7 $\mu g/m^3$) was reported and compared with the standard of 15 $\mu g/m^3$. Although the $PM_{2.5}$ stations are not used for official attainment determinations, they accurately reflect regional $PM_{2.5}$ concentrations.

Source Impact Analysis for PSD Class I Areas

Affected PSD Class I Areas

For PSD Class I areas within 200 kilometers of the facility, Table 7 below identifies each affected Class I area as well as the distance to the facility and the number of receptors used in the modeling analysis.

Table 7. Affected PSD Class I Modeling Identities

PSD Class I Area	Distance	Receptors
Everglades National Park	20	265

For the preliminary significant impact analysis, the highest short-term predicted concentrations will be compared to the respective significant impact levels. Since five years of data are available, the highest-second-high (HSH) short-term predicted concentrations will be used for any required AAQS and PSD Class II increment analysis with regard to short-term averages. However, for annual averages, the highest predicted annual average will be compared with the corresponding annual level.

Results of PSD Class I Significant Impact Analysis

Using the AERMOD model, the applicant predicted the following maximum ambient impacts from the project.

Table 8. Significant Impact Analysis for PSD Class I Area

Pollutant	Averaging Time	Maximum Predicted Impact ($\mu g/m^3$)	Significant Impact Level ($\mu g/m^3$)	Significant Impact?	Affected Class I Area
NO_2	Annual	0.097	0.1	NO	Everglades National Park
PM_{10}	24-hour	0.28	0.30	NO	Everglades National Park
	Annual	0.01	0.20	NO	Everglades National Park

As shown above, the maximum predicted impacts are less than the corresponding significant impact levels for each pollutant. Therefore, a full impact analysis for the PSD Class I areas is not required.

Source Impact Analysis for PSD Class II Areas

For the preliminary significant impact analysis, the highest short-term predicted concentrations will be compared to the respective significant impact levels. Since five years of data are available, the highest-second-high (HSH) short-term predicted concentrations will be used for any required AAQS and PSD Class II increment analysis with regard to short-term averages. However, for annual averages, the highest predicted annual average will be compared with the corresponding annual level.

Results of the Significant Impact Analysis

Table 9 below shows the results of the preliminary PSD Class II significant impact analysis.

Table 9. Significant Impact Analysis for PSD Class II Areas (Vicinity of Facility)

Pollutant	Averaging Time	Maximum Predicted Impact (µg/m^3)	Significant Impact Level (µg/m^3)	Significant Impact?	Radius of Significant Impact (km)
NO_2	Annual	9.7	1	YES	3.5
PM_{10}	24-hour	19.7	5	YES	0.7
	Annual	1.5	1	YES	
CO	1-hour	1,076	2,000	NO	0.7
	8-hour	814	500	YES	

The predicted impacts of NO_2, PM_{10} and CO for the 8 hour averaging time are greater than the corresponding PSD Class II significant impact levels; therefore, a full impact analysis for each of these pollutants is required within the applicable significant impact area as defined by the predicted radius of significant impact identified above. For NO_2 and PM_{10} emissions, a PSD Class II increment analysis and an AAQS analysis was conducted. An AAQS analysis only is required for CO.

Receptor Grids for Performing PSD Increments and AAQS Analyses

For the PSD Class II increment and AAQS analyses, receptor grids are normally based on the size of the significant impact area for each pollutant. As shown in the previous section, the predicted radius of significant impact for NO_2, CO and PM_{10} were 3.5, 0.7 and 0.7 kilometers, respectively.

PSD Class II Increment Analysis

The PSD increment represents the amount that new sources in an area may increase ambient ground level concentrations of a pollutant from a regulatory baseline concentration. For PM_{10}, the baseline concentrations were established in 1977 with a baseline year of 1975 for existing major sources. For NO_2, the baseline concentration was established in 1988 with a baseline year of 1988 for existing major sources. The emission values input into the model for predicting increment consumption are based on the maximum emissions rates from increment-consuming sources at the facility as well as all other increment-consuming sources in the vicinity of the facility. The preliminary analysis indicated NO_2 and PM_{10} to be significant for this project. The following table summarizes the results of the PSD Class II increment analysis.

Table 10. PSD Class II Increment Analysis

Pollutant	Averaging Time	Maximum Predicted Impacts (µg/m^3)	Allowable Increment (µg/m^3)	Greater than PSD Class II Allowable Increment?
NO_2	Annual	18	25	NO
PM_{10}	24-hour	23	30	NO
	Annual	3	17	NO

As shown above, the maximum predicted impacts are less than the allowable PSD Class II increments.

AAQS Analysis

For each pollutant subject to an AAQS analysis, the total impact on ambient air quality is obtained by adding an ambient background concentration to the maximum predicted concentration from modeled sources. The ambient background concentration accounts for all sources that are not explicitly modeled. The following table summarizes the results of the AAQS analysis for the affected pollutants.

Table 11. AAQS Analysis

Pollutant	Averaging Time	Modeled Sources (μg/m^3)	Ambient Background Concentration (μg/m^3)	Total Impact (μg/m^3)	AAQS (μg/m^3)	Greater than AAQS?
PM_{10}	24-hour	23	53	76	150	NO
	Annual	3	26	29	50	NO
NO_2	Annual	18	26	44	100	NO
CO	1-hour	6,900	4,300	11,200	40,000	NO
	8-hour	4,500	2,300	6,800	10,000	NO

As shown in this table, impacts from the proposed project are not expected to cause or significantly contribute to a violation of any AAQS.

Additional Impacts Analysis

Impacts on Soils, Vegetation and Wildlife

The maximum predicted ground-level concentrations of NO_2, CO and PM_{10} from the proposed project and all other nearby sources are below the corresponding AAQS. The AAQS are designed to protect both the public health and welfare. As such, this project is not expected to have a harmful impact on soils, vegetation or wildlife in the vicinity of the project.

Air Quality Impacts Related to Growth

The proposed modification will not significantly change employment, population, housing, commercial development, or industrial development in the area to the extent that a significant air quality impact will result.

Visibility Analysis

At the request of the federal land manager, the applicant conducted a visibility AQRV analysis for the Class I area and the Biscayne National Park (BNP) Class II area located within 1.1 kilometers of the facility at its closest point. The analysis to determine the potential adverse plume visibility effects in the portions of the Everglades located within 50 kilometers of the facility and the BNP were based on Visual Impact Screening and Analysis (VISCREEN) computer model. Both a Level 1 and Level 2 analysis were performed. The federal land manager concluded from the VISCREEN analysis that no significant impact on the Class I area were expected. However, the federal land manager is concerned about the BNP. In order to mitigate predicted visibility impacts in the BNP, INGENCO will be filtering the LFG before it is combusted in the engines with a 1 micron filter instead of a 10 micron filter. Also, INGENCO will be using biodiesel or ultra low sulfur fuel oil with a maximum sulfur content of 0.0015 percent to minimize particulate emissions.

Nitrogen and Sulfur Deposition

Total nitrogen deposition rates on the PSD Class I area was also predicted using AERMOD. The maximum predicted nitrogen deposition rates are below the threshold levels recommended by the federal land manager.

New EPA Standard for NO_2

On February 9, 2010, EPA issued a new 1-hour NAAQS for NO_2. The new NAAQS is 100 ppb (equivalent to 188 ug/m^3) and became effective on April 12, 2010. Although a draft permit was issued on March 3, 2010, INGENCO did not publish the required public notice and did not obtain a final permit before the effective date of the new NO_2 ambient standard. At that time, EPA required such projects to also demonstrate compliance with the new 1-hour NO_2 ambient standard by conducting a revised air quality modeling analysis. The consultant for INGENCO had difficulties in making this demonstration for a variety of reasons including the stringency of the new standard, the stringency of the significant impact level and the conservative assumptions EPA required when

conducting the modeling analysis. EPA also maintained that there would be no "grandfathering" of projects whereby the standard would not apply if the project did not have a final permit before the effective date of the new NO_2 ambient standard.

However, EPA received several legal challenges from projects under review as well as the technical challenges encountered with the preparation and review of information needed to predict the hourly NO_2 ambient impacts. As shown by the case of the Avenal Power Center, LLC (Avenal) project in California, EPA is reconsidering this position and preparing a policy that may be appropriate under certain narrow circumstances to grandfather pending PSD projects from the requirement to demonstrate compliance with the new 1-hour NO_2 standard. EPA now believes that it may not be appropriate to retroactively require such an additional air quality modeling analysis for an ambient standard that became effective after the application was complete. For federal PSD permit projects, EPA has a statutory obligation to grant or deny a PSD permit within one year of a complete application. EPA is in the process of extending similar relief to other similar permit applications and is taking public comments on this approach.

EPA proposes to approve the Avenal project without requiring a demonstration that the project will not cause or contribute to a violation of the hourly NO_2 ambient standard. In addition, EPA will not require the Avenal project to establish BACT emissions limits for greenhouse gases or demonstrate that the project will not cause or contribute to a violation of the new hourly ambient SO_2 standard which became effective on August 23, 2010. After the public comment period EPA will be able to address the public comments and estimates a complete final action on the Avenal project permit application by May 27, 2011.

The INGENCO project was also held up due to unfortunate timing with the new hourly NO_2 ambient standard. Based on EPA's reconsideration of the Avenal project, the Department will also reconsider the INGENCO project. INGENCO's application has been with the Department since June 2, 2009. As with EPA, the Department has an obligation to issue permits in a timely manner. Based on this reconsideration, the Department intends to re-issue a draft permit for the INGENCO project and may issue a final permit before the EPA's estimated final action on the Avenal project permit. The Department considered the following criteria that are similar to the Avenal project when reaching this conclusion:

- The application was prepared and submitted when the old annual NO_2 ambient standard was in place.
- The application was deemed complete before EPA issued the new hourly NO_2 ambient standard.
- A draft permit was issued before the new hourly NO_2 ambient standard became effective.
- This INGENCO project is unique because it is the only project in Florida that was affected in this manner by the timing of the new hourly NO_2 ambient standard.

Since the NO_2 hourly regulation went into effect, INGENCO has been compiling additional information to demonstrate the project will not cause or contribute to a violation of the hourly NO_2 standard. Aside from comments by INGENCO on the draft permit, the new NO_2 hourly standard has been the real challenge for this project. INGENCO conducted an air quality modeling analysis, which showed several issues with the new standard as well as the historical modeling assumptions.

First of all, the NO_2 NAAQS was revised from 53 ppb (equivalent to 100 ug/m^3) based on an annual average to 100 ppb (equivalent to 188 ug/m^3) based on a 1-hour average. Secondly, on June 29, 2010, EPA issued guidance that set the interim significant impact level at 4 ppb in accordance with long-established policy for the older ambient standards. This ultra conservative significant impact level for an already stringent 1-hour standard makes many small projects significant for modeling purposes. This means that a more comprehensive multi-source air quality analysis must be conducted, which requires the air dispersion modeling of many other facilities. When this is conducted for the INGENCO project, engine-generator sets from the nearby Miami-Dade Water and Sewer Department (WASD) must be included. Although these engines serve a backup role and operate infrequently, the June 29, 2010 EPA guidance requires such units to be modeled. Emissions from these sources combined with the project's emissions show predicted violations of the new hourly NO_2 ambient standard. The WASD facility brings the backup units on line when there is the threat of a severe storm. INGENCO indicates

that the LFG engines would likely be brought off line during severe storms. So, it is unlikely these WASD sources will operate simultaneously with INGENCO's sources. Lastly, the June 29, 2010 EPA guidance required an in-stack NO_2/NOx ratio of 1.0 despite the actual ratio for many combustion sources being much less than 1.0.

Even though it is considering grandfathering this project, the Department still required an air quality analysis to demonstrate that the proposed INGENCO project by itself does not violate the new hourly NO_2 standard. This is because EPA also stated that air quality modeling must be used to determine areas that are not in attainment with the new hourly NO_2 ambient standard. Based on subsequent modeling analyses conducted by INGENCO and the Department, emissions from the proposed INGENCO project are not predicted to violate the new 1-hour NO_2 ambient standard. As was done for the initial air quality analysis, AERMOD was used with 2001-2005 meteorological data from the National Weather Service office located at Miami International Airport and twice-daily upper air soundings from Florida International University (FIU) in Miami. In addition background ozone data from the Cutler Road Perdue Medical Center ozone monitoring site in Miami-Dade county was deemed appropriate for use in the modeling analysis.

In addition, the case-by-case Tier 3 Plume Volume Molar Ratio Method (PVMRM) screening model technique was used. When this technique is used, a site-specific in-stack ratio for NO_2/NOx of less than 1.0 may be used if properly justified. The applicant submitted information to support in-stack NO_2/NOx ratios for the engines of 0.10 for firing LFG and 0.05 for firing diesel. However, the Department used a more conservative in-stack ratio of 0.15 for landfill gas and 0.20 for diesel. The form of the standard is the 3-year average of the 98th percentile of the annual distribution of daily maximum 1-hour average concentrations. However, 40 C.F.R. Part 51, Appendix W, adopted and incorporated by reference in Rule 62-204.800, F.A.C. requires 5 years of National Weather Service data be used. Therefore, the 5-year average serves as an unbiased estimate of the 3-year average for purposes of modeling demonstrations of compliance with the new standard. The Department has taken a more conservative approach and has used the highest high predicted value over 5 years. The predicted maximum NO_2 impact from the INGENCO project is 185 ug/m^3 when firing 100% diesel and 99 ug/m^3 when firing LFG, which are less than the new hourly ambient standard of 188 ug/m^3. The maximum NO_2 emission rate input into the model was 160 lb/hour for diesel and 60 lb/hour for LFG. At the maximum modeled emissions rate, the predicted impact from firing 100% diesel is very near the new standard; therefore the permit should ensure that NOx emissions do not exceed 160 lb/hour.

In summary, the INGENCO project will use LFG that is currently being flared as fuel to produce energy for Florida Power and Light's electric grid. This project benefits the environment by recovering useful energy in the LFG and generating electricity. The Department encourages renewable energy projects, including waste-to-energy projects. The air quality analyses show that emissions from the INGENCO project on its own will not exceed the NAAQS in place at the time of a complete application nor for the new hourly NO_2 ambient standard.

Conclusion on Air Quality Impacts

As described in this report and based on the required analyses, the Department has reasonable assurance that the proposed project will not cause, or significantly contribute to, a violation of any AAQS or PSD increment.

6. CONCLUSION

Based on the foregoing technical evaluation of the application and additional information submitted by INGENCO the Department has made a preliminary determination that the proposed project will comply with all applicable state air pollution regulations provided that the Department's Best Available Control Technology Determination is implemented and certain conditions are met. The General and Specific Conditions are listed in the attached draft conditions of approval. Syed Arif was the project engineer on the original draft permit. For the revised draft permit, Christy DeVore was the project engineer and Jeff Koerner, supervisor, jointly reviewed and prepared the revised draft permit documents. Cleve Holladay is the meteorologist responsible for reviewing and approving the ambient air quality analyses. Additional details of this analysis may be obtained by contacting the project engineer at the Department's Bureau of Air Regulation at Mail Station #5505, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.