TECHNICAL EVALUATION

&

PRELIMINARY DETERMINATION

APPLICANT

Seminole Energy, LLC
1930 Ease Osceola Road, Geneva
Novi, Michigan 48337

Osceola Road Solid Waste Management Facility
ARMS Facility ID No. 1170084

PROJECT

Draft Permit No. PSD-FL-376B
Project No. 1170084-009-AC

Landfill Gas-to-Energy Project CO Modification

COUNTY

Seminole County, Florida

PERMITTING AUTHORITY

Florida Department of Environmental Protection
Division of Air Resource Management
Office of Permitting and Compliance
2600 Blair Stone Road, MS#5505
Tallahassee, Florida 32399-2400

January 3, 2012

1. GENERAL PROJECT INFORMATION

Facility Description and Location

The facility is a Municipal Solid Waste (MSW) Class I Landfill with a Standard Industrial Classification (SIC) Code No. 4953. The facility is located at 1930 E. Osceola Road, Geneva, Seminole County, Florida. The UTM coordinates are Zone 17, 492.00 km E and 3184.50 km N.

Seminole Energy was approved to use all of the available landfill gas (LFG) generated by Osceola Road Solid Waste Management Facility to power their electricity generation plant in Permit No. 1170084-005-AC. The permitted electricity generation plant consists of six identical lean-burn engine/generator sets, CAT Model G3520C engines used to power electricity generators. Four of the engine/generator sets have been installed and the remaining two engine/generator sets will be installed in Phase II. The electricity generation plant reduces the amount of LFG wasted by flaring while creating electricity for Florida Power & Light. The permittee requests a revision in the carbon monoxide (CO) Best Available Control Technology (BACT) limit as the degradation of the performance of the engines from siloxanes in the LFG makes it difficult to maintain the engines tuned for low CO and nitrogen oxides (NOx) emissions. This request has been approved by the Department recently for other landfill electricity generation plants.

Primary Regulatory Categories

- The facility is not a major source of hazardous air pollutants (HAP).
- The facility has no units subject to the acid rain provisions of the Clean Air Act.
- The facility is a Title V major source of air pollution in accordance with Chapter 213, Florida Administrative Code, (F.A.C.).
- The facility is a major stationary source in accordance with Rule 62-212.400, F.A.C.

Project Description

Seminole Energy, LLC submitted an application on October 18, 2011 for an air construction permit subject to the preconstruction review requirements of the Prevention of Significant Deterioration (PSD) of Air Quality pursuant to Rule 62-212.400, F.A.C. The permittee has requested a modification to the CO emissions standard as Best Available Control Technology (BACT) for the permitted engine/generator sets under Permit No. 01170084-05-AC. Four of the permitted engine/generator sets (Emissions Unit Nos. 002-005) have been installed and the other two engine/generator sets (Emissions Unit Nos. 006-007) will be constructed within 18 months of issuance of this final permit or the PSD review will require reevaluation for the BACT determination.

The following existing emissions units will be affected by this project.

ID No.	Description
002 - 005	Four Caterpillar Model G3520C landfill gas-fueled internal combustion engines and electricity generators. Each engine has a power generation rating of 2,233 brake horsepower at 100 percent load. The generator has a power output rating of 1,600 kilowatt. The engines will be fueled exclusively with landfill gas (LFG) generated by and received from the Osceola Road Solid Waste Management Facility. The landfill gas will go through a gas treatment system prior to combustion in the engines.
006 - 007	Two Caterpillar Model G3520C landfill gas-fueled internal combustion engines and electricity generators. Each engine has a power generation rating of 2,233 brake horsepower at 100 percent load. The generator has a power output rating of 1,600 kilowatt. The engines will be fueled exclusively with landfill gas (LFG) generated by and received from the Osceola Road Solid Waste Management Facility. The landfill gas will go through a gas treatment system prior to combustion in the engines.

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; 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.

2. PSD APPLICABILITY REVIEW

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 (Fl); 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.

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 Seminole County, which is in an area that is currently in attainment with the state and federal AAQS or otherwise designated as unclassifiable. The facility emits or has the potential to emit 250 tons per year or more of at least one PSD pollutant. Therefore, the facility is a major stationary source and the project is subject to a PSD applicability review. The following table identifies the estimated CO emissions increases based on the initial application.

Summary of the Applicant's PSD Applicability Analysis

Engines	CO Baseline Emissions Years 2009 & 2010 (tpy)	CO Projected Emissions (tpy)	CO Net Emissions Increase (tpy)
EU002-005	190.1	302	112
EU006-007[a]	0	151	151
Total	308.8	453	263

(a) Baseline emissions for EU006-007 are based on potential emissions as those engines have not been installed.

As shown in the table above, the project is subject to PSD preconstruction review for emissions of CO. The net CO emissions increase is 263 tons/year which is greater than the significant emissions rate (SER) of 100 tons/year for CO. Therefore, a BACT determination and an air quality modeling analysis are required for CO emissions.

3. DEPARTMENT'S PROJECT REVIEW

Phases

Air Construction Permit No. 1170084-005-AC authorized the installation of Emission Units No. 002-005 as Phase I. The permit authorized the installation of Emission Unit No. 006 within five (5) years after the commencement of the initial electricity generation operations as Phase II. The permit authorized the installation of Emission Unit 007 within ten (10) years after the commencement of the initial electricity generation

operations as Phase III. The startup date for Phase I was November 15, 2007. With that date, Phase II must begin construction before November 15, 2012 and Phase III must begin before November 15, 2017. Permit No. 1170084-005-AC has expired and the permittee expects to construct the two remaining engine/generator sets within 18 months of issuance of this permit, approximately by mid 2013. Phases II and III have been combined into Phase II to start construction within 18 months of issuance of the final permit or the PSD review must be re-evaluated.

Criteria Applicability for Project

Rule 62-210.200, F.A.C. defines a "modification" as a physical change or change in the method of operation. The project will not increase the capacity of the permitted engine/generator sets. The only increase in emission is CO due to the relationship with maintaining low NOx emissions. The other pollutant emissions are not increasing from the permitted emission standards. Emission Units 002-005 were manufactured prior to July 1, 2007 and engines manufactured prior to June 12, 2006 are not subject to NSPS Subpart JJJJ. Emission Units 002-005 have a construction commencement date prior to June 12, 2006, since the engine manufacturing/order dates have been submitted to the Department, the engines are subject to the maintenance and inspection requirements in NESHAP Subpart ZZZZ, with a compliance date of October 19, 2013. New engines if manufactured after July 1, 2007, such as Emission Units 006 and 007, meet the requirements of NESHAP Subpart ZZZZ by meeting the requirements in NSPS Subpart JJJJ.

Pollutant	Existing Limits	Permitted Limits	Proposed Limits	Regulation
CO	2.75 g/bhp	2.75 g/bhp	3.5 g/bhp-hr	Rule 62-212.400(BACT), F.A.C. (Revised BACT)
NOx	0.6 g/bhp-hr	0.6 g/bhp-hr	N/A	Rule 62-212.400(BACT), F.A.C.
VOC	0.24 g/bhp-hr	0.24 g/bhp-hr	N/A	Rule 62-212.400(BACT), F.A.C.
PM_{10}	0.24 g/bhp-hr	0.24 g/bhp-hr	N/A	Rule 62-212.400(BACT), F.A.C.

A revised BACT was established for CO while NOx, VOC and PM_{10} BACT limits were re-validated based on recent projects that were issued by the Department.

PROJECT DETAILS

LFG Fuel Requirement/Availability

The Seminole Landfill currently has two existing flares, a 2,145 scfm open flare, 3,000 scfm open flare and four existing gas IC engines. The LFG fuel has a minimum lower heating value (LHV) of 430 Btu/scf (British thermal units per standard cubic foot) and higher heating value (HHV) of 510 Btu/scf, with an average heating value of 445 Btu/scf resulting in approximately 580 scfm of LFG fuel utilization for each engine. The operation of the six gas IC engines under base load conditions (100% capacity) will result in average LFG fuel utilization rates of approximately 580 scfm and 5.01 million standard cubic feet per day (MMscf/day). The four engine/generator sets operated at approximately 80-90% of maximum capacity in 2010.

Approximately 5,145 scfm of LFG is the maximum combined capacity of the flaring system, which has a LHV of approximately 443.5 Btu/scf that is expected to be at least 450 Btu/scf at the time full fuel demand is required by all of the engines. At current permitted waste placement capacity, LFG generation estimates a peak gas flow of 6,000 scfm, with a collection efficiency of 75% resulting in 4,500 scfm. An adequate amount of LFG is currently available to fuel the existing 4 engine facility. Historical data indicate that each CAT 3520 uses approximately 520 scfm of LFG, which correlates to 3,120 scfm for the 6 Seminole Energy engines (4 existing

and 2 to be installed). It is anticipated by the permittee that the two remaining IC engine/generators will be start construction within 18 months of issuance of this final permit. The LFG generation model indicates that the Seminole Landfill may produce additional quantities of LFG to support the operation of the remaining two IC engine/generator sets based on permitted capacity and waste placement values. The permittee will provide requests for permit extensions should they be determined to be necessary. The permittee has been made aware that authorization to construct shall expire if construction is not commenced within 18 months after receipt of the final permit or if construction is discontinued for a period of 18 months. The permittee will be required to submit construction schedule for the two remaining IC engine/generators.

The existing LFG flaring system will be periodically operated during periods of equipment downtime and maintenance, and continually operated when future LFG collection and extraction rates (from new waste placement) exceed the fuel supply requirement of the installed and operated engines.

Treatment of Landfill Gas

The collected landfill gas is treated (dewatered, filtered and compressed) prior to its combustion as fuel in the engines.

New Source Performance Standards (NSPS) Provisions

The landfill gas engines and generator sets are subject to applicable NSPS provisions in 40 Code of Federal Regulations (CFR) 60 for Subpart A (General Provisions) and the proposed Phase II landfill gas engines and generator sets are subject to Subpart JJJJ (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines). These regulations establish operating limitations and emissions standards including CO emissions. The vendor, Caterpillar, will not certify the CAT G3520C engines when burning landfill gas as fuel. Therefore, the engines must meet the following emission standard required by 40 CFR 60.4233(e), as defined by Table B of this subpart.

Table B: CAT G3520C Emission Limits

Pollutant	NSPS Subpart JJJJ Emission Standards	Proposed BACT Limit	Regulation
CO	5.0 g/bhp-hr	3.5 g/bhp-hr	Rule 62-212.400(BACT), F.A.C.

The engines must be tested to demonstrate compliance with this emissions standard. The draft permit will identify NSPS Subparts A and JJJJ in the Appendices.

In addition, the existing landfill gas collection and control system must meet the applicable requirements of the following NSPS provisions: Subpart A (General Provisions) and Subpart WWW (Standards of Performance for Municipal Solid Waste Landfills) in 40 CFR 60. When operating, the CAT G3520C engines will serve as the control device to meet the applicable NSPS Subpart WWW requirements.

National Emission Standards for Hazardous Air Pollutants (NESHAP) Provisions

The reciprocating IC engine National Emission Standards for Hazardous Air Pollutants (RICE NESHAP, 40 CFR Part 63 Subpart ZZZZ) applies to major sources of HAPs that operate RICE rated for 500 bhp or greater. Major is defined as a facility that has the potential to emit in excess of 25 TPY of any combination of HAP compounds or 10 TPY of any single HAP. The individual RICE will have power ratings that exceed 500 bhp. However, the maximum HAP emissions will be limited to less than the major facility thresholds. Therefore, the proposed facility is not subject to the emission limitations and operating limitations but will be subject to the initial notification, reporting and recordkeeping requirement of the subpart applicable NESHAP provisions in 40 CFR 63 for Subpart A (General Provisions) and Subpart ZZZZ (Reciprocating Internal Combustion Engines). Pursuant to 40 CFR 63.6590, these units comply with NESHAP Subpart ZZZZ by complying with NSPS Subpart JJJJ. The draft permit will identify NESHAP Subpart A and ZZZZ in the Appendices.

CO BACT Emission Standard

Seminole Energy, LLC proposes the following maximum CO emission rates for the CAT G3520C engines:

From	2.75 g/bhp-hr	To	3.5 g/bhp-hour
	13.54 lb/hr and 59.30 TPY		17.2 lb/hour and 75.5 TPY per engine
	355.8 TPY for all six engines		453 TPY for all six engines

Potential CO emissions were based on the results of BACT analyses. These emissions were estimated using emission factors developed based on operating similar units at Ocean Energy Corp., CAT G3520C engine/generator specifications and revised CO BACT limits in recently revised permits. There is no other change in emissions.

Hazardous Air Pollutants

Hazardous Air Pollutants (HAP) as specified in Rule 62-210.200(155), F.A.C are produced during the combustion of landfill gas to be used as fuel by the internal combustion engines since:

1. HAP compounds are present in the gas generated by Seminole Landfill and the fuel combustion process is not 100% complete (i.e. a small portion of the HAPs pass through the fuel combustion system).
2. When combusted, chlorinated compounds present in landfill gas can form hydrogen chloride (HCl), which is a regulated HAP.

The emission rate of HCl from each engine/generator set is limited to 10.9 lb/MMscf and 1.66 TPY in the permit to maintain the facility as a minor source of HAP emissions with total HCl emissions limited to 9.96 TPY. The table below shows the actual HCl emissions from sampling the LFG.

Emission Units	Year	HCl emissions (lb/MMscf) Each Engine	HCl emissions (TPY) Each Engine	HCl emissions (TPY) Six Engines
002-005	2011	0.47	0.07	0.42
002-005	2010	0.47	0.07	0.42
002-005	2010	0.43	0.06	0.36

The permit condition limiting HCl emissions was based on USEPA AP-42 LFG composition data, an HCl emission factor of 11.95 lb/MMscf. The HCl emission factor developed from sampling as shown above is 0.43 to 0.47 lb/MMscf of LFG(<1.08 lb/MMscf of LFG with the incorporation of all non-measured chemicals at its reporting limit).

Other site-specific HAP content analyses have not been performed on the landfill gas generated by Seminole Landfill. Therefore, data developed by EPA in AP-42, Section 2.4 (Table 2.4-1) actual emission factors from testing were used to estimate the total potential HCl HAP content of the landfill gas to be used as fuel. Based on the maximum operating scenarios, the applicant estimates total annual HAP emissions (all six engines plus flares) to be 12.6 tons per year (TPY) and is well under the 25 TPY thresholds.

Flares (Emission Unit ID No. 001)

The two existing candlestick flares are part of the municipal solid waste landfill emissions unit.

NSPS Provisions

The existing Seminole Landfill is subject to the following applicable provisions: NSPS Subparts A (General Provisions) and WWW (Standards of Performance for Municipal Solid Waste Landfills) in 40 CFR 60. The existing flares have met the applicable requirements of these subparts.

NESHAP Provisions

The existing Seminole Landfill is subject to the following applicable NESHAP provisions: Subpart M (Standards for Asbestos) in 40 CFR 61; and Subparts A (General Provisions) and AAAA (National Emission Standards for Hazardous Air Pollutants for Municipal Solid Waste Landfills) in 40 CFR 63. The existing flares have met the applicable requirements of these subparts.

4. DEPARTMENT REVIEW

Carbon Monoxide – Existing and Proposed Engines (Emission Unit ID Nos. 002-005 and 006-007)

Emissions data from Caterpillar indicates a not to exceed (NTE) CO emissions limit of 4.13 g/bhp-hr. Annual compliance tests conducted at the facility over the past three years report CO emissions ranging between 2.52 and 2.66 g/bhp-hr. While these CO compliance test results are significantly less than the manufacturers NTE limit, variability in the LFG fuel methane content and engine maintenance cycles will have a significant impact on projected emissions in the future.

The original CO BACT determination was based on the engine design and good combustion practices (including maintenance). The Department is unaware of any new control equipment that would be cost effective. The LFG contains siloxanes, which are silica compounds that form glass-like deposits on the pistons, cylinders, valves, intake manifold and exhaust manifolds of the engine. These deposits degrade the performance of the engine and extensive maintenance is required to restore the combustion equipment to proper operation. As the engine performance degrades, it is difficult to maintain the engine tuned for low CO and NOx emissions.

In support of this concept, the Department found a recent white paper report by the Bay Area Air Quality Management District (BAAQMD) titled, "Revisiting BACT for Lean-Burn Landfill Gas Fired Internal Combustion Engines" from February of 2009. The study discovered that the variability in engine combustion efficiency was not being accounted for since, "… *CO deterioration during the year is not typically detected nor limited*". Existing BACT emissions limits "achieved in practice" were based on once per year compliance tests. Such tests do not account for variability of emissions due to degraded engine performance resulting from siloxane deposits on combustion surfaces. In addition, existing BACT limits were "… *established based on early, limited source test data for digester gas fired engines …*" and as such, are not appropriate for LFG combustion engines. Wastewater digester gas has higher methane content than LFG meaning that it also has a higher amount of energy per unit volume. The BAAQMD concluded that "… *Our discussions with waste gas engine operators lead us to believe that engines generally perform at their best after overhaul events and that combustion performance tends to deteriorate as siloxane deposits form throughout the combustion surfaces."* The white paper concluded "… *it is apparent that:*

1. *it is normal for CO emissions to increase as the engines are operated, and*
2. *establishment of not to exceed limits based on a nominal rate of CO increase would seem to be a reasonable approach for these engines, and*
3. *additional monitoring is needed to ensure that the engines get needed maintenance in a timely fashion. Engine maintenance events may not have a significant impact on NOx emissions, but for landfill gas engines, regular maintenance is of paramount importance for minimizing CO emissions*." The BAAQMD recommends a NTE emissions limit of 3.6 g/bhp-hr for low-CO biased engines.

The Department also agrees that additional flexibility with CO emissions is necessary to concurrently maintain and tune the engines for low NOx emissions. Therefore, the current CO BACT emission standards for each existing engine/generator set will be revised as follows:

- From 2.75 to 3.5 g/bhp-hr;
- From 13.54 to 17.2 lb/hour; and
- From 59.3 to 75.5 tons/year.

General Discussion of Emissions

The CAT G3520C engines are the primary source of CO NO_X and PM_{10} emissions from the engine/generator sets. Based on the requested CO BACT, the potential annual CO emissions produced from all engines will be 453 tons/year.

The applicant reviewed data in EPA's RACT/BACT/LAER Clearinghouse (RBLC) to identify control technology determinations for the operation of reciprocating internal combustion engines firing landfill gas. The following table summarizes this information.

Table D: CO and NO_X BACT Determination for landfill gas fired internal combustion engines.

Facility	Engine Type and Size	Date	Control Method CO/NO_X	Type	g/bhp-hour	
					CO	NO_X
Trail Ridge Energy, LLC (FL)	CAT 3520 2233 HP	09/28/2011	GCP	BACT	3.5	0.6
Brevard Energy, LLC (FL)	CAT 3520 2233 HP	06/21/2011	GCP	BACT	3.5	0.6
Waste Management Medley (FL)	CAT G3520C 2233 HP	8/25/2011	GCP	BACT	3.5	0.6
Sampson County Disposal, LLC (NC)	CAT 3520 2233 HP	09/09/2009	GCP	BACT	2.75	0.5
Pine Tree Landfill (ME)	LFG-ICE 1359 HP	10/15/2007	---	BACT	2.75	0.65
University of New Hampshire (NH)	LFG-ICE 2233 HP	07/25/2007	Combustion Controls	BACT/LAER	2.75	0.5
Waste Management Midpenn (VA)	CAT 3516 1148 HP	05/29/2007	GCP	BACT	2.7[a]	1.45[a]
Monmouth County Reclamation Center (NJ)	LFG-ICE 1468 HP	12/12/2006	---	CBC/LAER	2.53	0.53
Manchester Renewable Power Corp. (NJ)	CAT 2233 HP	10/06/2006	A/F Controller	BACT/LAER	2.75	0.5
Burlington County Resource Recovery (NJ)	Jenbacher 2012 HP	08/03/2006	GCP	CBC/LAER	2.5	0.6
Ridgewood Rhode Island Generation (RI)	CAT 3520 2229 HP	01/05/2005	A/F Controller	BACT/LAER	2.75	0.5
Bio Energy Texas, LLC (TX)	CAT 3520 2172 HP	07/23/2004	Lean Burn Design	BACT	2.8	0.6
Carlton Farms Landfill (MI)	LFG-ICE 1095 HP	12/23/2003	GCP			
Northwest Regional Landfill (AZ)	LFG-ICE 1410 HP	10/27/2003	Proper Operation & Maintenance	BACT	2.5	0.6
Carbon Limestone LFG (OH)	LFG-ICE 1877 HP	04/10/2003	Lean Burn Design	BACT	2.27	1.2
Chino Basin Desalter Authority (CA)	LFG/DG-ICE 1408 HP	06/18/2002	A/F Controller	BACT	2.5	0.6
MM San Bernardino Energy (CA)	LFG-ICE 1850 HP	05/16/2002	A/F Controller	BACT	2.5	0.6
Reliant Security LFGTE (TX)	Jenbacher 2231 HP	01/31/2002	GCP	BACT	3.0	0.6
Reliant Energy Galveston Plant (TX)	Jenbacher 2343 HP	01/24/2002	---	CBC	3.0	0.6

Abbreviations: Horsepower (HP); Landfill Gas (LFG); Internal Combustion Engines (ICE); Case-By-Case (CBC); Good Combustion Practices (GCP); Good Combustion (GC); and Air/Fuel Controller (A/F Controller)

a. Project shows BACT limit for CO as 453 tons/year and NO_X as 77.6 tons/year, conversion done for 6 engines operating 8,760 hours/year.

The specified CO and NO_X BACT/LAER determinations are applicable to the operation of lean-burn engines with air-to-fuel ratio control. The proposed CAT G3520C engines have a power rating of 2,233 bhp. As shown in the table, for landfill gas engines rated greater than 1,100 bhp and less than 2,400 bhp, the CO BACT ranges from 2.27 to 3.5 g/bhp-hour. The corresponding NO_X BACT/LAER range from approximately 0.5 to 0.6 g/bhp-hour. It is important to note that the low CO BACT determination of 2.27 g/bhp-hour corresponds to a NO_X BACT standard of 1.2 g/bhp-hour.

BACT Emission Limits Proposed by Applicant (per Engine)

Pollutant	Emission Limit	Control Technology
CO	3.5 g/bhp-hr and 17.23 lb/hour	Lean-burn engine with air-to-fuel controller

BACT for CO

Combustion byproducts are generally controlled by an efficient combustion design, but catalytic technologies are available for reducing these emissions.

<u>Identification of Control Technologies</u>

The applicant provided the following control technologies:

- *Combustion Design and Air-Fuel Controllers:* The design and operation of the combustion chamber is the primary mechanism in controlling CO emissions. The CAT G3520C engines are designed for high-combustion efficiency to extract the most useful energy from the landfill gas possible, which will minimize CO emissions. Combustion controls include technologies designed to limit the formation of CO and NO_X by controlling the combustion temperature and the mixing of air and fuel in the combustion zone. Combustion controls for NO_X include injection timing retard, pre-ignition chamber combustion, controlling air-to-fuel ratio, or de-rating of the engine. The primary NO_X control is a lean-burn combustion design, which uses approximately 75% more air than needed for complete combustion into the combustion chambers. The weak air-fuel mixture leads to lower combustion temperatures and therefore reduces thermal NO_X formation. The proposed CAT G3520C engines are lean-burn engines equipped with an electronic air-fuel ratio controller that will minimize incomplete combustion and maintain a proper balance between CO and NO_X emissions.
- *Oxidation Catalyst:* In the presence of an oxidation catalyst at a given temperature, excess oxygen in the exhaust reacts with CO to form CO_2. This option includes non-selective catalytic reduction (NSCR). The primary design is a flow through exhaust device that contains a honeycomb structure covered with a layer of chemical catalyst that operates at high temperatures. This layer contains small amounts of precious metal that promote the complete oxidation of pollutants in the exhaust stream. This control device will reduce CO emissions as well as VOC emissions, depending on the type and concentration. Destruction efficiencies for CO and VOC emissions can be greater than 90%.
- *Selective Catalytic Reduction (SCR):* The basic principle of SCR is the injection of ammonia (NH_3) into the exhaust stream prior to a catalyst. In the presence of a catalyst, ammonia and NO_X will be reduced to nitrogen (N_2) and water vapor (H_2O). Several different catalysts are available for use at different exhaust gas temperatures. Such systems can also include an oxidation catalyst for CO reduction. Removal efficiencies may be greater than 90%.
- *Regenerative Selective Catalytic Reduction (RSCR):* Regenerative selective catalytic reduction is a new technology targeted for tail-end applications. RSCR utilizes beds of ceramic media to retain the temperature of the flue gas in the optimum range for the catalytic reaction (approximately 300º F to 400º F), which is a

key operating parameter for effective NO_X removal. Such systems are capable of 95% heat recovery, which minimizes operating costs while reducing NOx emissions by 80% to 90% or more. Such systems can also include an oxidation catalyst for CO reduction.

- *Selective Non-Catalytic Reduction (SNCR)*: Selective non-catalytic reduction uses ammonia injection into the high temperature combustion zone or flue gas. This is a post-combustion control technology that reduces NO_X to nitrogen and water vapor. The chemical reaction for this technology is driven by high temperatures (1600ºF to 2100ºF) normally found in combustion sources. Removal efficiencies may be greater than 50% depending on the application.

Discussion of Technically Infeasible Control Options and Ranking of Remaining Options

Landfill gas 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 rendering it ineffective. A separate treatment system to remove SiO_2 would be necessary to avoid the 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. In the preamble to the NSPS for Stationary Spark Ignition Internal Combustion engines and the NESHAP for Reciprocating Internal Combustion Engines, EPA agrees siloxanes will poison the catalyst in add-on control technologies such as SCR, NSCR and oxidation catalysts, which makes the equipment ineffective in a very short period of time.

To employ a catalytic technology would require a siloxane removal system. For a previous project 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. It appears that a siloxane removal system that can protect the landfill gas engines as well as the control catalyst is still on the horizon.

The siloxane content in LFG is higher than the level recommended by the engine manufacturer, Caterpillar (0.60 ug/Btu). This will mean more frequent preventative maintenance as well as major maintenance overhauls. Therefore, add-on control technologies using a catalyst are considered technically infeasible for this project due to premature deactivation by siloxanes. Also, SNCR is not feasible for the landfill gas engines because there is no high-temperature window that will forward this chemical reaction. The remaining control option is combustion design and controls. As previously shown by the applicant, data in the RBLC database (2002 –

2011) supports the lean-burn combustion design, air-fuel controller and good combustion practices as BACT for landfill gas engines.

Selection of BACT and Rationale

The applicant proposes to use efficient combustion design and air-fuel controllers to establish BACT for CO as 3.5 g/bhp-hour. As shown in previous Table D summarizing BACT standards posted in the RBLC database, the range of previous CO BACT standards is 2.27 to 3.5 g/bhp-hour. The applicant's proposed limits are based on operating similar landfill gas-fired engines and the ambient temperatures by Ocean Energy Corp. Caterpillar LLC states that a nominal CO emission rate from the CAT G3520C engines is 2.5 g/bhp-hour; however, this is only representative of the first 100 hours of operation. Caterpillar LLC also specifies a "not to exceed" limit of 4.13 g CO/bhp-hour at 100% load. The proposed limit is lower than NSPS Subpart JJJJ emissions standards of 5.0 g CO/bhp-hour.

For several previous projects using the CAT G3520C engines firing landfill gas, the Department established CO BACT as 2.75 g/bhp-hour, which were based on the applicant's proposals as well as the efficient combustion design and air-fuel controllers. The engines have been installed and are in operation. Other applicants have been granted approval to increase the CO emissions standards based on the gradual degradation of the engines causing higher CO emissions. The Department reconsidered these previous determinations because of the inverse relationship between CO and NOx emissions. In other words, an engine can be tuned to achieve low NOx emissions at the price of higher CO emissions or vice versa. The Department has approved in final permits BACT for CO as 3.5 g/bhp-hour for Brevard Energy, Medley Landfill and Trail Ridge Energy.

In 2009, the Bay Air Quality Management District issued a white paper[1] discussing this very issue. Based on actual test data (62 individual tests) for firing landfill gas in three types of spark-ignited reciprocating internal combustion engines (15 total engines), the report indicates the following:

- The engines were annually demonstrating compliance with the CO and NOx standards; however, this appeared to be more of a function of careful preparation of the engine for the annual test rather than the design of the engine.
- The same engine type could be "biased for low NOx emissions" (0.5 g NOx/bhp-hour or less with greater than 2.1 g CO/bhp-hour) or "biased for low CO emissions" (2.1 g CO/bhp-hour or less with greater than 0.5 g NOx/bhp-hour) depending on the air-fuel controller.
- The exhaust from some of the tested engines was periodically monitored throughout the year by hand-held portable probes. This data showed degradation with regard to CO emissions such that many engines were frequently in excess of the CO standard. The report indicates a gradual CO increase of up to 1.5 g/bhp-hour over a year of operation.

The conclusion of the report is that CO and NOx emissions standards should be paired when relying on combustion design and control. As shown below, the Bay Air Quality Management District chose to establish standards based on a low NOx bias or a low CO bias and then allow the CO standard to increase approximately 1.5 g/bhp-hour over a year of operation calling the upper CO standard a "not to exceed (NTE)" limit:

Low NOx Bias:	NOx:	0.5 g/bhp-hour
	CO:	2.5 g/bhp-hour (and NTE 3.9 g/bhp-hour)
Low CO Bias:	NOx:	0.6 g/bhp-hour
	CO:	2.1 g/bhp-hour (and NTE 3.6 g/bhp-hour)

The applicant's proposed BACT limits of 3.5 g CO/bhp-hour appears to be in line with this concept and is based on actual performance of these engines at Ocean Energy Corp. and other facilities. The Department has established a BACT limit of 3.5 g CO/bhp-hour for the same engine/generator sets at other facilities in Florida.

[1] "Revisiting BACT for Lean Burn Landfill Gas Fired Internal Combustion Engines"; Toxics Section, Engineering Division, Bay Air Quality Management District; February 26, 2009.

Therefore, considering all available information, the Department establishes the following preliminary paired BACT standards (NOx is an existing standard) for the six engines:

CO: 3.5 g/bhp-hour and 17.2 lb/hour (initial and annual EPA Method 10 stack test)
NOx: 0.6 g/bhp-hour and 3.0 lb/hour (initial and annual EPA Method 7E stack test)

This will allow the engines to be tuned for NOx emissions while providing adequate room for reasonable CO emission levels.

6. 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 analyses.

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 the following table. 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 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.

PSD Pollutant	De Minimis Air Quality Levels
CO	575 μg/m3, 8-hour average
NO_2	14 μg/m3, annual average;
PM_{10}	10 μg/m3, 24-hour average
SO_2	13 μg/m3, 24-hour average
Pb	0.1 μg/m3, 3-month average
Fl	0.25 μg/m3, 24-hour average
TRS	10 μg/m3, 1-hour average
H_2S	0.2 μg/m3, 1-hour average
RSC	10 μg/m3, 1-hour average
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 to 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. The table identifies the Class I areas located in Florida or that are within 200 kilometers 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.

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 II Area Model

The EPA-approved American Meteorological Society and EPA Regulatory Model (AERMOD) dispersion model is used to evaluate short range impacts from the proposed project and other existing major sources. AERMOD version (09292) was used. 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. AERMOD contains two input data processors, AERMET and AERMAP. AERMAP is the terrain processor and AERMET is the meteorological data processor. 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.

The AERMET meteorological data used in the AERMOD model consisted of a concurrent five-year period of hourly surface weather observations and twice-daily upper air soundings from the meteorological station in Orlando. The five-year period of meteorological data was from 2006 through 2010. This station was selected for use in the evaluation because they are the closest primary weather stations to the project area and are 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. The calculated GEP stack height for the proposed facility is 11.4 meters (37.5 feet). Therefore, the release height of emissions from the proposed facility are less than GEP height, and have the potential to be influenced by aerodynamic downwash created by buildings that house the equipment. Therefore, building downwash was considered in the modeling analyses, as part of the PRIME downwash algorithm mentioned above.

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. Additionally, the proposed project will be located 150 km from the closest portion of the nearest PSD Class I area, the Chassahowitzka NWA. Because the project is more than 50 km from the Class I area, a visibility impairment modeling analysis was not required.

PSD Significant Pollutants for the Project

As discussed previously, the proposed project modification will increase emissions of CO in excess of the PSD significant emissions rates.

Major Stationary Sources Near the Proposed Modification of Seminole Energy

To provide some perspective on the relative scale of the proposed project modification, the following table lists the largest stationary source of CO in and around Seminole County. The maximum expected future emissions in TPY from the proposed project modification are also shown for comparison.

Table 14 - Largest Sources of CO (2010) Nearest to the Proposed Facility Modification (TPY)

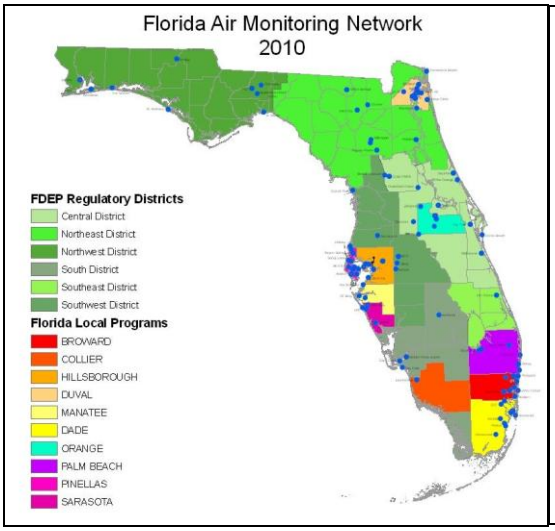
Owner/Company Name	Site Name	County	Emission
Orlando Utilities Commission	Stanton Energy Center	Orange	1,748
Seminole Energy	**Seminole Landfill**	**Seminole**	**450 (proposed)**
Cutrale Citrus Juices	Cutrale Citrus Juices – Leesburg	Lake	330
Brevard Co County Commissioners	Brevard Co Central Disposal Facility	Brevard	301
Lake Cogen	Lake Cogen	Lake	169
Marion Co County Commissioners	Baseline Landfill	Marion	142
Florida Power Corporation	Intercession City Plant	Osceola	121
Omni Waste of Osceola Co	JED Solid Waste Management Facility	Osceola	119
FP&L	Cape Canaveral Plant	Brevard	110

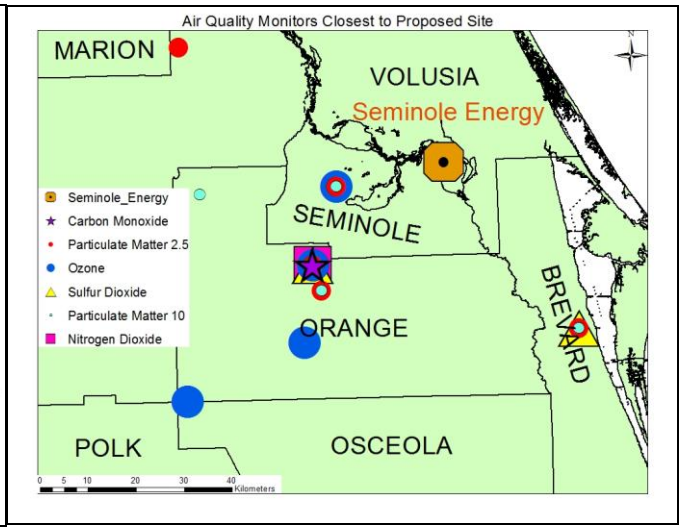
Preconstruction Ambient Monitoring Analysis

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

De Minimis Air Quality Levels				
Pollutant	**Averaging Time**	**Maximum Predicted Impact (µg/m^3)**	**De Minimis Concentration (µg/m^3)**	**Greater than De Minimis?**
CO	8-hr	479	575	No

As shown above, all pollutants are exempt from preconstruction monitoring because the predicted impacts are less than the de minimis levels. Nevertheless, the Department and local air pollution control programs maintain an extensive quality-assured ambient monitoring network throughout the state. As the following figures indicate, the ambient air monitoring sites are concentrated in areas of high population density, along the coasts and near major highways in the interior portion of the state.





These monitors are used to estimate the existing air quality in the area of the proposed facility. The following table summarizes CO, PM_{10}, $PM_{2.5}$, SO_2 and NO_X ambient data from 2010 available for existing nearby monitoring locations. 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. As necessary, the above ambient concentrations will be used as the ambient background concentrations for any required AAQS analysis.

Representative Ambient Concentrations			
Pollutant	**Averaging Time**	**2010 Ambient Concentration**	**Monitor Location**
CO	8-hour	1.7 ppm	Winter Park
	1-hour	1.3 ppm	

The Winter Park CO monitor, located in Orange County, is closest to and most representative of the ambient air quality at the proposed Seminole Electric project modification.

Source Impact Analysis for PSD Class I Areas

Affected PSD Class I Areas

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

PSD Class I Area	Distance	Receptors
Chassahowitzka NWR (ONWR)	150 km	none

highest short-term predicted concentrations will be compared to the significant impact levels. Results from the Significant Impact Level (SIL) modeling demonstration indicate that maximum ambient air CO impacts are less than the SIL. For this reason, combined with the large distance to the nearest Class I area, a Class I ambient air impact analysis was not performed for the proposed CO emission rate increase.

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

The following table shows the results of the preliminary PSD Class II significant impact analysis.

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)**
CO	8-hr	479	500	NO	NONE
	1-hr	833	2,000	NO	NONE

As shown above, the predicted impacts of CO are well below the corresponding PSD Class II significant impact level and no further analysis is required. Also, because no increments exist for any averaging period of CO, an increment analysis was not performed.

Additional Impacts Analysis

Impacts on Soils, Vegetation and Wildlife

The effects that air pollutants have on vegetation can be classified into three general categories: acute, chronic and long term. Acute effects are those that result from relatively short exposures (i.e., less than one month) to high concentrations of pollutant emissions. Chronic effects occur when organisms are exposed for months or even years to certain threshold levels of pollutants. Long-term effects include abnormal changes in ecosystems and subtle physiological alterations in organisms. Acute and chronic effects are caused by pollutants acting directly on an organism, and long-term effects can be indirectly caused by secondary agents such as changes in the pH of soil.

The USEPA Air Quality Planning and Standards, Air Strategies and Standards Division, has developed secondary NAAQS for the protection of the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutant in the ambient air. The values set for the secondary NAAQS incorporate the protection of ecosystems, which include vegetation and soil.

The Seminole Energy Facility is located within the boundaries of an existing active landfill. The proposed CO emission rate increase will not disturb vegetation, soil, or wildlife habits that are not already being affected by the existing electricity generation or landfill facilities, and no land clearing of forested or heavily vegetated area will be required. The maximum ground-level concentrations predicted to occur due to CO emissions as a result of the proposed modification are less than the associated secondary NAAQS. The NAAQS are designed to protect both the public health and welfare. As such, this project is not expected to have a harmful impact on soils and vegetation in the PSD Class II area.

Air Quality Impacts Related to Growth

The proposed modification of the Seminole Energy facility will not effect on commercial growth in the Geneva,

Florida area. The facility interconnects with the local utility through an existing nearby power distribution line, and power generated by the facility is used to satisfy electricity demands within the general area. No air pollution emissions from residential or commercial construction and growth, and other activities will occur as a result of the proposed facility modification.

Conclusion on Air Quality Impacts

As described in this report and based on the required ambient impact 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.

7. PRELIMINARY DETERMINATION

The Department makes a preliminary determination that the proposed project will comply with all applicable state and federal air pollution regulations as conditioned by the Draft Permit. This determination is based on a technical review of the complete application, reasonable assurances provided by the applicant, and the conditions specified in the Draft Permit. Leigh Ann Pell, the project engineer, and Christy DeVore, the professional engineer, are responsible for reviewing the application and drafting the permit documents. Melody Lovin 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 Office of Permitting and Compliance at Mail Station #5505, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.