STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

January 5, 1984

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. James C. Welsh
Utilities Director
Kissimmee Utilities
Post Office Box 1608
Kissimmee, Florida 32741

Dear Mr. Welsh:

RE: Preliminary Determination - Kissimmee Utilities
Combined Cycle Unit #1, Osceola County
State Permit No. AC 49-74856, Federal Permit No. PSD-FL-087

The Florida Department of Environmental Regulation, under the authority delegated by the U.S. Environmental Protection Agency, Region IV, has reviewed your application to modify the referenced source under the provisions of the Prevention of Significant Deterioration Regulations (40 CFR 52.21) and has made a preliminary determination of approval with conditions. Please find enclosed one copy of the Preliminary Determination and proposed state and federal permits.

Before final action can be taken on your proposed permit, you are required by Florida Administrative Code Rule 17-1.62(3) to publish the attached Notice of Proposed Agency Action in the legal advertising section of a newspaper of general circulation in Osceola County no later than fourteen days after receipt of this letter. The department must be provided with proof of publication within seven days of the date the notice is published. Failure to publish the notice may be grounds for denial of the permit.

A copy of the Preliminary Determination and your application will be open to public review and comment for a period of 30 days after publication of the notice. The public can also request a public hearing to review and discuss specific issues. At the end of this period, the department will evaluate the comments received and make a final determination regarding the proposed construction.

The Preliminary Determination and proposed permit constitutes a proposed action of the department and is subject to administrative hearing under the provisions of Chapter 120, Florida Statutes, if requested within fourteen days from receipt of this letter. Any petition for hearing must comply with the requirements of Florida Administrative Code Rule 28-5.201 and be filed with the Office of General Counsel, Florida Department of Environmental Regulation, Twin Towers Office Building, 2600 Blair Stone Road, Tallahassee, Florida 32301. Failure to file a request for hearing within fourteen days shall constitute a waiver of your right to a hearing. Filing is deemed complete upon receipt by the Office of General Counsel.

Please submit, in writing, any comments which you wish to have considered concerning the department's proposed action to Mr. Bill Thomas of the Bureau of Air Quality Management.

Sincerely,

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

CHF/TH/pa

Attachments

cc: David A. Buff, P.E., Environmental Science and Engineering
Charles Collins, DER St. Johns River District

Technical Evaluation

and

Preliminary Determination

Kissimmee Utilities

Osceola County

49.9 MW Combined Cycle Gas Turbine

Permit Numbers:

State AC 49-74856

Federal PSD-FL-087

Florida Department of Environmental Regulation

Bureau of Air Quality Management

Central Air Permitting

January 4, 1984

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PUBLIC NOTICE

A modification to an existing air pollution source is being proposed by Kissimmee Utilities located in the City of Kissimmee, Osceola County, Florida. The proposed modification is the construction of a 49.9 MW combined cycle gas turbine. The modification will increase emissions of air pollutants, in tons per year, by the following amounts:

PM	SO_2	NO_x	CO	VOC
96	1702	1029	349	83

The proposed modification has been reviewed by the Florida Department of Environmental Regulation (FDER) under Chapter 403, Florida Statutes, and Federal regulation 40 CFR 52.21, Prevention of Significant Deterioration (PSD). The Department has made a preliminary determination that the construction can be approved provided certain conditions are met. A summary of the basis for the determination and the application for State and Federal permits submitted by Kissimmee Utilities are available for public review at the following offices:

Bureau of Air Quality Management
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

St. Johns River District
Department of Environmental Regulation
3319 Maguire Blvd., Suite 232
Orlando, Florida 32803

Kissimmee Public Library
305 E. Broadway
Kissimmee, Florida 32741

The maximum percentages of allowable PSD increments consumed by the proposed modification will be as follows:

	Annual	24-Hour	3-Hour
PM	Negligible	Negligible	NA
SO_2	5	11	9

Any person may submit written comments to FDER regarding the proposed modification. All comments, postmarked not later than 30 days from the date of notice, will be considered by FDER in making a final determination regarding approval for construction of this source. Those comments will be made available for public review on request. Furthermore, a public hearing can be requested by any person. Such request should be submitted within

14 days of the date of this notice. Letters should be addressed to:

Mr. C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

INTRODUCTION

Kissimmee Utilities has reapplied (September 6, 1983) for a permit to construct a combined cycle unit. An original application for the same unit was submitted to the department in August 1983. A state and federal permit were issued on November 25, 1981 and February 19, 1982 respectively. The state permit expired on January 30, 1983.

A revised preliminary determination has been performed for the new permit application. This revised preliminary determination covers changes which have been made to the permit specific conditions and to the BACT emission limits. All sections have been revised to reflect the modifications requested in the new permit application.

The organization pattern of the original determination has not varied.

I. SYNOPSIS OF APPLICATION

A. Name and Address of Applicant

Kissimmee Utilities
P. O. Box 1608
Kissimmee, Florida 32741

B. Source Location

The proposed source is located at 112 Ruby Street in the City of Kissimmee, in Osceola County, Florida. The UTM coordinates are: Zone 17-460.1 Km East and 3,129.3 Km North.

C. Project Description

The applicant proposes to install and operate a combined cycle combustion gas turbine, with a total net generating capacity of 46.5 megawatts (MW) and a gross generating capacity of 49.9 MW. The turbine will be fired with natural gas. No. 2 fuel oil, having a maximum sulfur content of 0.5 percent, will be used as a standby fuel. The maximum heat input will be 441.7 MMBTU/hr (LHV).

Kissimmee Utilities (KU) currently operates 12 diesel generating units with a total output rated at 26.8 MW at this site.

II. RULE APPLICABILITY

A. Federal Regulations

The proposed project is subject to preconstruction review under federal Prevention of Significant Deterioration (PSD) regulation, Section 52.21 of Title 40 of the Code of Federal Regulations as amended in the Federal Register of August 7, 1980 (45 CFR 52.21). Specifically, Kissimmee Utilities' combined cycle combustion gas turbine is a major stationary source (40 CFR 52.21(b)(1)) located in an area currently designated as attainment in accordance with 40 CFR 81.310 for all criteria pollutants regulated under the Clean Air Act (CAA).

The proposed source will be a major modification (40 CFR 52.21(b)(2) for particulate matter (PM), sulfur dioxide (SO_2), nitrogen oxides (NO_x), volatile organic compounds (VOC), and carbon monoxide (CO). Emissions of PM, SO_2, NO_x, VOC and CO will increase above the significant criteria set in the PSD regulations. Therefore, the proposed project is subject to PSD review for these pollutants.

This review consists of a determination of Best Available Control Technology (BACT) and unless otherwise exempted, an analysis of the air quality impact of the increased emissions. No air quality impact analysis is required for ozone, even though there will be a significant increase in VOC emissions, because this increase is less than 100 tons per year. The review also includes an analysis of the project's impacts on soils, vegetation and visibility along with air quality impacts resulting from associated commercial, residential and industrial growth.

The proposed project is also subject to the provisions of the federal New Source Performance Standard (NSPS) for gas turbines, 40 CFR 60, Subpart GG.

B. State Regulations

The proposed project is subject to preconstruction review under the provisions of Chapter 403, Florida Statutes, and Chapter 17-2, Florida Administrative Code. Specifically, the proposed source is a major emitting facility for NO_x and SO_2 as defined in Chapter 17-2 because the potential emissions of each pollutant exceed 250 tons per year.

This project shall comply with provisions of Rule 17-2.500, Prevention of Significant Deterioration (PSD), 17-2.660, New Source Performance Standards (NSPS) for gas turbines 40 CFR, Subpart GG and 17-2.700 Stationary Point Source Emissions Test Procedures.

The proposed source is exempt from provisions of Rule 17-2.510, New Source Review for Nonattainment Areas.

III. SOURCE IMPACT ANALYSIS

A. Emissions Limitations

The operation of the proposed combined cycle gas turbine, will produce emissions of particulate matter (PM), sulfur dioxide (SO_2), nitrogen oxides (NO_x), beryllium (Be), Mercury (Hg), carbon monoxide (CO) and volatile organic compounds (VOC) to the atmosphere.

Table 1 summarizes potential to emit of all pollutants regulated under the Act which are affected by the proposed source.

Best Available Control Technology (BACT) has been determined for NO_x, SO_2, PM, VOC, and CO. The emission limiting standards selected as BACT and made a condition of the permit are listed in Table 2. Justification for the standards selected is included in Technical Appendix A.

The permitted emissions, including those determined as BACT, are in compliance with New Source Performance Standard (NSPS) requirements of 40 CFR 60, Subpart GG.

B. Air Quality Impacts

An air quality impacts analysis has been performed to evaluate the impact of the proposed project on ambient concentrations of NO_x, SO_2, PM, and CO. Dispersion modeling was used to evaluate the impacts.

Results of the analysis provide reasonable assurance that the project, as described in this permit and subject to the conditions herein, will not lead to any violation of National Ambient Air Quality Standards or PSD increments. Details of the analysis are discussed in the Technical Appendix B.

TABLE 1
SUMMARY OF EMISSIONS
(Tons Per Year)*

Pollutant	Gas-Fired			Fuel-Oil Fired			PSD
	Turbine	Supplemental Firing	Total	Turbine	Supplemental Firing	Total	Significant Emission Rate[e]
Potential NOx[a]	1877	28	1905	1927	27	1954	--
Actual NOx[b]	976	28	1004	1002	27	1029	40
Hydrocarbons (as CH_4)	82	1	83	73	1	73	40
Carbon Monoxide	224	7	231	342	7	349	100
Particulate	27	1	28	93	3	96	25
Sulfur Dioxide[c]	19	2	21	1,542	160	1,702	40
Mercury[d]	0.02	--	0.02	0.002	--	0.002	0.1
Beryllium[d]	--	--	--	0.0006	--	0.0006	0.0004

(a) Potential emissions in accordance with state and federal definitions as estimated by the applicant. A 48 percent emission reduction is expected with the proposed water injection technique.

(b) Based upon turbine gas flow rate and 129 ppm Nox according to the following equation: (DSCFM)(NOx ppm)(2000 ug/m3-ppm)(0.0283 m3/ft3)(10^{-6} g/ug)(60 min/hr)(8760 hr/yr)(1 lb/454g)(1 ton/2000 lb).

(c) Assumed natural gas has 0.01 percent sulfur content. Fuel oil calculations based on total conversion of 0.8 percent sulfur in fuel oil to sulfur dioxide, as requested by the applicant.

(d) Emissions calculated based on emissions factors from Stationary Conventional Combustion Processes, EPA, (450/2-80-074).

(e) 40 CFR 52.21(b)(23).

* Calculations are based on 8760 hours per year operating time.

C. Additional Impact Analysis

An additional impacts analysis has been performed to assess (1) the impact of the proposed project on soils, vegetation, and visibility and (2) any air quality impacts resulting from associated commercial, residential, or industrial growth. No adverse impacts are expected; details of the analysis are discussed in Technical Appendix C.

IV. CONCLUSIONS

Base on review of the data submitted by Kissimmee Utilities for the installation and operation of a 49.9 MW combined cycle gas turbine, the FDER concludes that compliance with all applicable federal and state air quality regulations will be achieved provided certain specific conditions are met. The NSPS emission limits for NO_x, SO_2, and the permitted emissions limits of 0.0004 lb/hr for Hg, 0.00004 lb/hr, for Be, 22 lb/hr for PM, 19 lb/hr for VOC and 80 lb/hr for CO have been determined to be Best Available Control Technology (BACT) for this source. The impact of the emissions from the 49.9 MW combined cycle gas turbine will not cause or contribute to a violation of any ambient air quality standard or PSD increment. Appendix D includes the proposed general and specific conditions in the draft state permit (AC 49-74856) and federal permit (PSD-FL-087).

TECHNICAL APPENDIX A

FEDERAL BACT ANALYSIS

The applicant is required, under the provisions of 40 CFR 52.21, as revised August 7, 1980 (45 FR 52676), to apply BACT to all criteria and noncriteria pollutants emitted in significant levels. BACT is determined for each pollutant on a case-by-case review taking into account energy, environmental and economic impacts.

The applicant has proposed BACT for each applicable pollutant and has presented justification for the standards selected. The Department of Environmental Regulation (DER) has reviewed and accepted the technology and emission limits proposed as BACT. The federal PSD permit shall include these limits or any more stringent emission standards that are imposed by the State of Florida. These limits are summarized in Table 2. A discussion of the BACT for each pollutant follows:

PM Control

The BACT limitation proposed for particulate matter (PM), 22 lb/hr, is based upon emission for Stationary Gas Turbines AP-42.

Particulate emissions from stationary gas turbines depend on the ash content of the fuel which is minimal for the proposed fuels. The applicant has reported an ash percentage of less than 0.1 in the fuel oil analysis. Therefore, FDER feels that the applicant proposed 0.0498 lb/MMBTU (22 lb/hr) emission limit for PM is reasonable as BACT.

Carbon Monoxide and Hydrocarbon Control

The applicant proposes emissions levels for carbon monoxide (CO) and volatile organic compounds (VOC) based on emission estimates from Stationary Gas Turbines AP-42.

CO and HC emissions are function of combustion efficiency. The higher the percentage of peak load at which a turbine operates, the more efficient the combustion of the fuel.

HC and CO emissions from stationary gas turbines operating at peak load are relatively low. Gas turbines normally operate at 80 to 100 percent of peak load with HC emission averaging less than 50 ppm and CO emission averaging less than 500 ppm concentration at 15 percent oxygen.

Based on the above facts, FDER agrees that emission limits of 0.1811 lb/MMBTU (80 lb/hr) for CO and 0.043 lb/MMBTU (19 lb/hr) for VOC constitute BACT for the proposed source.

SO_2 Control

The applicant proposes an emission limit of 388 lb SO_2/hr and 0.8 percent sulfur content in the fuel oil. The basis of this proposed emission limit is found in the AP-42 emission factors for Stationary Gas Turbines and NSPS for Gas Turbines.

SO_2 emissions from stationary gas turbines depend on the sulfur content of the fuel since nearly 100 percent of the sulfur is converted to SO_2 during the combustion process. Due to the high volumes of exhaust gases, the cost of flue gas desulfurization (FGD) is considered unreasonable. Therefore, FDER determines that the selection of low sulfur oil (0.5), and an emission limit of 388 lb SO_2/hr is BACT for the proposed source.

NO_x Control

The applicant proposes to control NO_x with a wet control technique (water injection) and limiting the maximum fuel-bound nitrogen content to 0.25 percent.

Total NO_x emissions from any combustion source, including stationary gas turbines, are a function of both thermal NO_x and organic NO_x formation. Thermal NO_x is formed by a high temperature reaction between nitrogen and oxygen from the combustion air. Organic NO_x, however, is formed by the oxidation of fuel-bound nitrogen during combustion.

NO_x formation within a turbine generally increases exponentially with increased pressure and temperature. High efficiency turbines, therefore, generally discharge gases with higher NO_x concentrations than low efficiency turbines. Since the

relative fuel consumption of gas turbines varies linearly with efficiency, an adjustment factor was selected (NSPS) that permitted increased NO_x emissions for the efficient turbines.

Gas turbines with waste heat recovery (combined cycle gas turbine) have a higher overall efficiency than the gas turbine alone. The application of the efficiency adjustment factor to the entire system would permit greater NO_x emission. The efficiency adjustment factor in the selected NSPS must be based on the gas turbine efficiency itself, not the overall efficiency of a gas turbine combined with other equipment. This consideration is discussed at length in the preamble to the selected NSPS for stationary gas turbines.

Based on the above facts, the KU gas turbine would actually be allowed an emission rate of 79 PPM (gas) and 129 PPM (oil) due to the efficiency adjustment factor, which is an increase of the nominal 75 PPM NO_x emission by 5.64%. An additional 50 PPM would be the allowance for fuel-bound nitrogen when burning fuel oil No. 2. Therefore, FDER determines that the selected NSPS emission limit of 79 PPM (gas) and 129 PPM (oil), or $0.0075 \frac{(14.4)}{Y} + F$ (when applicable) at 15% oxygen on a dry basis (see formula, Table 2) is BACT for this source.

Beryllium Control

The applicant proposes an emission limit of 1.2 pounds per year (0.0014 NG/J) for beryllium based on the emission factor from Stationary Combustion Processes - EPA 450/2-80-074. This emission factor was based on characterization of fuel samples. A later publication, EPA 600/57/81-003b, presented an emission factor of 0.00004 NG/J based on uncontrolled emissions in the exhaust gases from a distillate oil-fired boiler.

Using the lowest emission factor of 0.35 pounds per year (0.00004 NG/J), the annual amount of beryllium emitted would be less than the significant increase - 0.8 pounds per year - for this pollutant.

BEST AVAILABLE CONTROL TECHNOLOGY (BACT) DETERMINATION
Kissimmee Utilities
Osceola County

Kissimmee Utilities, Kissimmee, Florida, plans to increase their existing electric generating capability by an additional 49.9 gross megawatts. The proposed supplementary-fired combined cycle gas turbine system is composed of one 400 million Btu/hr heat input gas turbine (30.9 megawatt gross output) from which the exhaust gases discharge into a waste heat boiler. The steam produced will operate two steam turbines each producing 9.5 megawatt gross output. The boiler has a 41.7 million Btu per hour supplemental heat source to generate additional steam.

The system will fire natural gas with No. 2 oil as stand-by fuel. Hourly fuel consumption at maximum firing will be 0.491 million cubic feet of gas or 78 barrels of oil. The system is scheduled to operate 8,760 hours per year.

BACT Determination Requested by the Applicant:

Pollutant	Emission Limit
NO_x	129 PPM when firing oil
SO_2	0.8% maximum fuel sulfur content

Date of Receipt of a BACT Application:

September 9, 1983

Date of Publication in the Florida Administrative Weekly:

September 4, 1981

Review Group Members:

Comments were obtained from the New Source Review Section, the Air Modeling Section, and the St. Johns River District Office.

BACT Determination by DER:

Turbine Emissions	Limit
NO_x (gas)	79 PPM (water injection)
NO_x (oil)	129 PPM (water injection)
SO_2	No. 2 distillate oil with sulfur content not to exceed 0.5 percent or natural gas as fuel
Visible Emissions	Maximum 20% opacity

Boiler Emissions	Limit
SO_2 & Particulates	Natural gas as fuel or No. 2 distillate oil with sulfur content not to exceed 0.5 percent
Visible Emissions	Not to exceed 20% opacity. 40% opacity is permitted for not more than two minutes in any one hour.

Turbine NO_x emission limits calculated using the NSPS formula in Subpart GG, subsection 40 CFR 60.332.

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

Y = Manufacturer's rated heat rate at manufacturers rated load. Applicant indicates this parameter is 13.66 kJ/watt-hr.

F = NO_x emission allowance for fuel-bound nitrogen. Applicant indicates this parameter is 0.005.

Compliance with the turbine NO_x emission limit shall be in accordance with 40 CFR 60, Appendix A; Method 20 as set forth in the NSPS subsection 40 CFR 60.335. The sampling site shall be located between the gas turbine and the boiler.

The excess emission reports required under subsection 40 CFR 60.7(c) are to be sent to the Department of Environmental Regulation, Bureau of Air Quality Management, 2600 Blair Stone Road, Tallahassee, Florida, 32301. The information to be submitted to the department is outlined in Subpart GG, subsection 40 CFR 60.334(c).

Compliance with the opacity limits shall be in accordance with DER Method 9 (Rule 17-2.700(6)(a)9.).

BACT Determination Rationale:

Nitric oxides produced by the combustion of fuel in the gas turbine are formed by the combination of nitrogen and oxygen in the combustion air. NO_x is also formed from the reaction of the nitrogen in the fuel with the oxygen in the combustion air. Formation of the latter NO_x will be minimized by the applicant's use of natural gas or distillate oil as fuel, both of which have low nitrogen content.

NO_x formation is extremely sensitive to flame temperature, therefore injecting water or steam into the gas turbine reaction zone will reduce production of NO_x. The use of the wet control technique to reduce NO_x emissions to or below the NSPS limits is determined to be BACT.

The SO_2 emissions from the gas turbine are strictly a function of the fuel sulfur content. Flue gas desulfurization systems are economically unattractive compared to the cost of low sulfur fuels. The firing of natural gas or No. 2 oil containing a maximum of 0.5% sulfur is determined as BACT for the control of SO_2 emissions.

The reduction of NO_x emissions results in an increase in CO emissions. CO emissions are considered to be a local problem since CO readily reacts to form CO_2. NO_x emissions, however, are linked to the formation of photochemical oxidants and are subject to long range transport. As a result of this trade-off, no emission limit for CO is specified in this determination.

The proposed stationary gas turbine is subject to the requirements of Subpart GG, New Source Performance Standards (NSPS) and Florida Administrative Code Rule 17-2.660. The Department has been delegated the authority to implement and enforce the NSPS program, therefore, the quarterly excess emission reports required by 40 CFR 60(c) are to be sent to the Department of Environmental Regulation.

The supplemental heat source to the waste heat recovery boiler is 41.7 million Btu per hour. The major air pollutant from this source would be SO_2 when firing No. 2 distillate oil. The emission rate of SO_2 will be 0.5 $lb/10^6$ Btu, which is less than the current NSPS standard for fossil-fuel-fired steam generators, therefore, the installation of a FGD system is not justified. The waste heat recovery boiler will not operate when the gas turbine is down.

The monitoring provisions of the NSPS for the gas turbine requires that the sulfur content and nitrogen content of the fuel

fired is determined as set forth in subsection 40 CFR 60.334. The same fuel source will be used to fire the boiler supplemental heaters, therefore, the Department has determined that only an opacity emission limit for the waste heat boiler is necessary to insure compliance.

The applicant indicated that beryllium emissions would be 1.2 pounds per year based upon an emission factor from the guideline publication EPA-450/2-80-074. The beryllium emission factor for distillate oil was based on characterization of fuel samples. A later publication, EPA-600/57-81-003b, presented a summary of uncontrolled emissions in the exhaust gas from a distillate oil-fired boiler. The emission factor for beryllium was 0.00004 Ng/J as compared to the applicants emission factor of .00014 Ng/J. Using the most recent emission factor the annual amount of beryllium emitted would be 0.35 pounds which is less than the significant emission rate of 0.8 pounds per year (Table 500-2).

Details of the Analysis May be Obtained by Contacting:

Edward Palagyi, BACT Coordinator
Department of Environmental Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32301

Recommended By:

_____
C. H. Fancy, Deputy Bureau Chief, BAQM

Date:

_____

Approved:

_____
Victoria J. Tschinkel, Secretary

Date:

_____

APPENDIX B

AIR QUALITY IMPACT ANALYSIS

A. Summary

The State PSD review for PM and SO_2 requires an air quality impact analysis which includes a PSD increment analysis and a Florida Ambient Air Quality Standards (FAAQS) analysis. The State PSD increment and FAAQS analyses depend on air quality modeling carried out in accordance with FDER-approved methods.

The air quality impact analysis required under federal PSD review for PM, SO_2, CO, and NO_x includes:

- An analysis of existing air quality;
- A PSD increment analysis (for PM and SO_2 only);
- A National Ambient Air Quality Standards (NAAQS) analysis; and,
- An analysis of impact on soils, vegetation and visibility and growth-related air quality impacts.

The analysis of existing air quality may require preconstruction monitoring; the PSD and NAAQS analyses depend on air quality modeling carried out in accordance with EPA-approved methods. Federal PSD review also requires a good engineering practice (GEP) stack height evaluation..

Based on these required State and federal air quality impact analyses, FDER has reasonable assurance that the KU modification, as described in this permit and subject to the conditions of approval proposed herein, will not cause or contribute to a violation of any State or federal PSD increment or ambient air quality standard. A discussion of the required analyses follows.

B. Discussion

1. Modeling Methodology

Two FDER and EPA-approved dispersion models were used in the State and federal air quality impact analyses. These were the Single-Source (CRSTER) and Industrial Source Complex (ISC) models.

These models were used to determine the maximum predicted annual concentrations and to identify the absolute worst-case short-term meteorological conditions which would affect emissions from KU after the proposed modification is completed. They were also used to identify days on which meteorological conditions produced worst-case short-term KU impacts in the vicinity of the facility with interacting sources located directly upwind.

The maximum short-term impacts due to emissions from KU and all major interacting sources were analyzed using a refined grid spacing of 0.1 to 0.2 kilometers between receptors and only the days on which worst-case meteorological conditions occurred.

Since worst-case impacts for each pollutant subject to analysis occur under different fuel burning conditions, modeling and analysis for each of these pollutants was performed using the worst-case fuel.

The surface meteorological data used in the models were National Weather Service data collected at Orlando, Florida during the period 1974-78. Upper air meteorological data used in the models were collected during the same time period at Tampa, Florida.

Final stack parameters and emission rates used in evaluating the proposed KU modification are contained in Tables B-1 and B-2.

Table B-1

Stack Parameters for Kissimmee Utilities - Baseline Case

Emissions Unit	Stack Height (m)	Stack Diameter (m)	Exit Velocity (m/s)	Exit Temperature (K)	Emission Rate (g/sec) SO_2	PM
Unit #7	13.11	.61	16.30	466.50	.87	.52
Units #8,#9	16.15	.85	17.60	477.60	3.36	2.01
Units #10,#11	7.01	.76	9.60	466.50	2.28	1.36
Units #14-#18	13.41	.80	8.70	505.40	5.37	3.21
Units #19,#20	8.69	.90	17.20	505.40	2.89	1.73

TABLE B-2

Stack Parameters for Kissimmee Utilities - Projected Case

Emissions Unit	Stack Height (m)	Stack Diameter (m)	Exit Velocity (m/s)	Exit Temperature (K)	Emission Rate (g/sec) SO_2	PM	NO_x	CO
Unit #7	13.11	.61	16.30	466.50	.87	.52	4.46	.79
Units #8, #9	16.15	.85	17.60	477.60	3.36	2.01	17.10	3.16
Units #10, #11	7.01	.76	9.60	466.50	2.28	1.36	10.58	2.12
Units #14-#18	13.41	.80	8.70	505.40	5.37	3.21	11.34	5.45
Units #19,#20	8.69	.90	17.20	505.40	2.89	1.73	14.66	2.64
Combustion Turbine	18.29	3.66	38.03	422.00	48.9	2.77	30.70	10.08

2. Analysis of Existing Air Quality

In order to evaluate exisitng air quality in the area of a proposed project, FDER may require a period of continuous preconstruction monitoring for any pollutant subject to PSD review. An exemption from this requirement may be obtained if the net emissions increase of the pollutant from the modification would cause an air quality impact less than a certain de minimus level as defined in 40 CFR 52.21(i)(8). Based on the modeling results shown in the following table, this exemption is applicable to the proposed modification for all of the pollutants subject to PSD review. Therefore, no preconstruction monitoring has been required.

Projected Air Quality Impacts From Combustion Turbine

Pollutant	Averaging Time	Projected Impact (ug/m^3)	De Minimus Level (ug/m^3)
SO_2	24-hour	10	13
TSP	24-hour	<1	10
NO_x	24-hour	6	14
CO	8-hour	<10	575

There are no FDER or EPA-approved TSP, SO_2, NO_x, or CO monitors within 25 kilometers of the KU facility. Since the KU facility is located in a remote area with respect to nonspecified sources, FDER has assumed the following pollutant background values: 0 ug/m^3 for CO, 20 ug/m^3 for SO_2 and NO_x, 40 ug/m^3 for TSP. These background values are used for all

averaging times and are consistent with EPA monitoring guidelines.

3. PSD Increment Analysis

Both the State and federal PSD increment analyses pertain to PM and SO_2 for which maximum allowable increases (increments) are defined. The proposed KU modification will be located in an area where the Class II increments apply. The nearest Class I area is more than 100 kilometers away from the proposed site.

The predicted maximum TSP and SO_2 increment consumption is the same in both the State and federal PSD increment analyses. Increment consumption at KU is affected by the construction of the combustion turbine alone.

As shown in the following table, modeling results predict that the maximum TSP and SO_2 increment consumption will not exceed allowable increments. The highest, second-highest short-term predicted concentrations are given in the table since five years of meteorological data were used in the modeling.

Maximum Increment Consumption

(ug/m^3)

State and Federal

	Averaging Time		
Pollutant	3-hour	24-hour	Annual
SO_2: Maximum KU Impact	44	10	< 1
SO_2: Allowable Class II Increment	512	91	20
PM: Maximum KU Impact	NA	< 1	< 1
PM: Allowable Class II Increment	NA	37	19

There are other increment consuming sources within the vicinity of KU. Even though these sources consume increment in the area around KU, this consumption is very small. The combined impacts of these sources and KU in the interacting directions are less than the maximum increment consumed by KU only.

The nearest Class I area is Chassahowitza National Wilderness Area which is 125 kilometers away from KU. At this distance, it can be assumed that no Class I increment will be consumed as a result of emissions from KU.

4. Ambient Air Quality Standards Analysis

Both State and federal PSD regulations require the permit applicant to demonstrate that, given existing air quality in an area, a proposed emissions increase subject to PSD review will not cause or contribute to any violation of ambient air quality standards. For the proposed project at KU, an ambient air quality standards analysis is required for PM, SO_2, CO and NO_x.

As shown in the following table, modeling results predict that maximum ground-level concentrations for each of these pollutants will be below both the FAAQS and NAAQS. The highest, second-highest short-term predicted values are given in this table since five years of meteorological data were used in the modeling.

Pollutant	Averaging Time	Projected Air Quality* (ug/m^3)	NAAQS (ug/m^3)	FAAQS (ug/m^3)
SO_2	annual	40	80	60
	24-hour	155	365	260
	3-hour	392	1300	1300
TSP	annual	52	75	60
	24-hour	121	150	150
NO_2	annual	89	100	100
CO	8-hour	< 500	10,000	10,000
	1-hour	< 1000	40,000	40,000

*Includes background concentrations of 40 ug/m^3 for annual and 24-hour TSP, 20 ug/m^3 for SO_2 for all averaging times, and 20 ug/m^3 for NO_2.

** Air quality impact calculated for the proposed modification only.

Modeling was also performed to evaluate the impacts of interactions of emissions from other sources with those from KU. Maximum contributions from surrounding sources are very small compared to maximum ground-level concentrations from KU and they occur in non-critical directions. Therefore, no violations are predicted to occur due to interacting sources.

5. Good Engineering Practice Stack Height Evaluation

The stack height proposed for the KU combustion turbine is less than the Good Engineering Practice (GEP) stack height of 65 meters for stacks uninfluenced by structures or terrain. A building downwash analysis was not performed since the new stack will not be within the area of influence of any structure with the potential to cause downwash conditions.

APPENDIX C

ANALYSIS OF IMPACT ON SOILS, VEGETATION AND VISIBILITY AND GROWTH-RELATED AIR QUALITY IMPACTS

The maximum impact of the proposed modification, as demonstrated through the air quality analysis, will be below the national secondary air quality standards for PM and SO_2. These standards were established to protect public welfare related values. Also, the maximum impact of the proposed modification on NO_2, and CO concentrations will be insignificant. Therefore, no adverse effects on soils, vegetation and visibility is expected.

There will be no increase in the number of employees at this site due to the project. Therefore no secondary residential, commercial or industrial growth which will adversely affect air quality in the area is expected.

APPENDIX D

SPECIFIC CONDITIONS

FDER proposes a preliminary determination of approval with conditions for the project (construction of a 49.9 MW combined cycle gas turbine) requested by Kissimmee Utilities in the permit applications submitted on September 6, 1983.

Special conditions listed in the draft State permit AC 49-74856, are adopted as special conditions for the draft federal permit, PSD-FL-087, for this source.

The attached General Conditions (federal) are also made a part of the proposed federal permit PSD-FL-087.

GENERAL CONDITIONS

1. The permittee shall notify the permitting authority in writing of the beginning of construction of the permitted source within 30 days of such action and the estimated date of start-up of operation.

2. The permittee shall notify the permitting authority in writing of the actual start-up of the permitted source within 30 days of such action and the estimated date of demonstration of compliance as required in the specific conditions.

3. Each emission point for which an emission test method is established in this permit shall be tested in order to determine compliance with the emission limitations contained herein within sixty (60) days of achieving the maximum production rate, but in no event later than 180 days after initial start-up of the permitted source. The permittee shall notify the permitting authority of the scheduled date of compliance testing at least thirty (30) days in advance of such test. Compliance test results shall be submitted to the permitting authority within forty-five (45) days after the complete testing. The permittee shall provide (1) sampling ports adequate for test methods applicable to such facility, (2) safe sampling platforms, (3) safe access to sampling platforms, and (4) utilities for sampling and testing equipment.

4. The permittee shall retain records of all information resulting from monitoring activities and information indicating operating parameters as specified in the specific conditions of this permit for a minimum of two (2) years from the date of recording.

5. If, for any reason, the permittee does not comply with or will not be able to comply with the emission limitations specified in this permit, the permittee shall immediately notify the State District Manager by telephone and provide the District Office and the permitting authority with the following information in writing within four (4) days of such conditions:

   (a) description for noncomplying emission(s),

   (b) cause of noncompliance,

   (c) anticipated time the noncompliance is expected to continue or, if corrected, the duration of the period of noncompliance,

(d) steps taken by the permittee to reduce and eliminate the noncomplying emission,

and

(e) steps taken by the permittee to prevent recurrence of the noncomplying emission.

Failure to provide the above information when appropriate shall constitute a violation of the terms and conditions of this permit. Submittal of this report does not constitute a waiver of the emission limitations contained within this permit.

6. Any change in the information submitted in the application regarding facility emissions or changes in the quantity or quality of materials processed that will result in new or increased emissions must be reported to the permitting authority. If appropriate, modifications to the permit may then be made by the permitting authority to reflect any necessary changes in the permit conditions. In no case are any new or increased emissions allowed that will cause violation of the emission limitations specified herein.

7. In the event of any change in control or ownership of the source described in the permit, the permittee shall notify the succeeding owner of the existence of this permit by letter and forward a copy of such letter to the permitting authority.

8. The permittee shall allow representatives of the State environmental control agency or representatives of the Environmental Protection Agency, upon the presentation of credentials:

(a) to enter upon the permittee's premises, or other premises under the control of the permittee, where an air pollutant source is located or in which any records are required to be kept under the terms and conditions of the permit;

(b) to have access to any copy at reasonable times any records required to be kept under the terms and conditions of this permit, or the Act;

(c) to inspect at reasonable times any monitoring equipment or monitoring method required in this permit;

(d) to sample at reasonable times any emission of pollutants;

and

(e) to perform at reasonable times an operation and maintenance inspection of the permitted source.

9. All correspondence required to be submitted to this permit to the permitting agency shall be mailed to:

Mr. James T. Wilburn
Chief, Air Management Branch
Air & Waste Management Division
U.S. EPA, Region IV
345 Courtland Street, NE
Atlanta, GA 30365

10. The conditions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

The emission of any pollutant more frequently or at a level in excess of that authorized by this permit shall constitute a violation of the terms and conditions of this permit.

ATTACHMENT 1

No. 0158242

RECEIPT FOR CERTIFIED MAIL

**NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL**

(See Reverse)

SENT TO
Mr. James C. Welsh

STREET AND NO.

P.O., STATE AND ZIP CODE

POSTAGE		$
CONSULT POSTMASTER FOR FEES — OPTIONAL SERVICES: CERTIFIED FEE		¢
SPECIAL DELIVERY		¢
RESTRICTED DELIVERY		¢
RETURN RECEIPT SERVICE: SHOW TO WHOM AND DATE DELIVERED		¢
SHOW TO WHOM, DATE, AND ADDRESS OF DELIVERY		¢
SHOW TO WHOM AND DATE DELIVERED WITH RESTRICTED DELIVERY		¢
SHOW TO WHOM, DATE AND ADDRESS OF DELIVERY WITH RESTRICTED DELIVERY		¢
TOTAL POSTAGE AND FEES		$

POSTMARK OR DATE

1/5/84

PS Form 3800, Apr. 1976

PS Form 3811, Jan. 1979

SENDER: Complete items 1, 2, and 3.
Add your address in the "RETURN TO" space on reverse.

1. The following service is requested (check one.)
- ☒ Show to whom and date delivered..... ¢
- ☐ Show to whom, date and address of delivery.... ¢
- ☐ RESTRICTED DELIVERY
  Show to whom and date delivered..... ¢
- ☐ RESTRICTED DELIVERY.
  Show to whom, date, and address of delivery.$

(CONSULT POSTMASTER FOR FEES)

2. ARTICLE ADDRESSED TO:
Mr. James C. Welsh
P. O. Box 1608
Kissimmee, Florida 32741

3. ARTICLE DESCRIPTION:

REGISTERED NO.	CERTIFIED NO.	INSURED NO.
	0158242	

(Always obtain signature of addressee or agent)

I have received the article described above.
SIGNATURE ☐Addressee ☐Authorized agent

4. DATE OF DELIVERY: JAN 9 1984 POSTMARK

5. ADDRESS (Complete only if requested)

6. UNABLE TO DELIVER BECAUSE: CLERK'S INITIALS

RETURN RECEIPT, REGISTERED, INSURED AND CERTIFIED MAIL

☆GPO : 1979-300-459