Golder Associates Inc.

6241 NW 23rd Street, Suite 500
Gainesville, FL 32653-1500
Telephone (352) 336-5600
Fax (352) 336-6603

RECEIVED
MAR 01 2002
BUREAU OF AIR REGULATION

Golder Associates

February 27, 2002

0139517-0100

Florida Department of Environmental Protection
111 South Magnolia Drive, Suite 4
Magnolia Park Courtyard
Tallahassee, FL 32301

Attention: Joseph Kahn, P.E. Administrator, Emissions Monitoring Section

RE: SHADY HILLS GENERATING STATION (FACILITY ID - 1010373) – REQUEST FOR ONE LOAD TESTING

Dear Joe:

This letter serves as a request in behalf of Shady Hills Generating Station located in Pasco County to perform one-load testing on their combustion turbines for their determination of initial compliance. This request refers specifically to Florida Department of Environmental Protection (FDEP) Air Construction Permit PSD-FL-280 (1010373-001-AC) Permit Condition III.29 as follows:

"29. Initial (I) performance tests (for both fuels) shall be performed on each unit while firing natural gas as well as while firing oil. Initial tests shall also be conducted after any modifications (and shake down period not to exceed 100 days after re-starting the CT) of air pollution equipment such as change or tuning of combustors. Annual (A) compliance tests shall be performed during every federal fiscal year (October 1 – September 30) pursuant to Rule 62-297.310(7), F.A.C., on each unit as indicated. The following reference methods shall be used. No other test methods may be used for compliance testing unless prior FDEP approval is received in writing.

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The applicable NSPS (i.e., 40 CFR 60 Subpart GG) specifies that performance testing for NO_x at "30, 50, 75 and 100 percent of peak load or at four points in the normal operating range of the gas turbine, including minimum point in the range and peak load". [See Section 60.335 (c)(2) and (3)]

The turbines associated with the project normally run at peak load. In addition, due to the wintertime period, sufficient natural gas is not available to test at four load points. Therefore, it is requested that the Department approve for initial testing at one-load point for the turbines. These turbines are equipped with continuous emission monitoring systems (CEMs) for NO_x, which will monitor compliance at other operating loads. These CEMs will be required to undergo RATA testing each years to support the 40 CFR Part 75 requirements.

Please call me at (352) 336-5600 if you have any questions.

Sincerely,

GOLDER ASSOCIATES INC.

Kennard F. Kosky

Kennard F. Kosky, P.E.
Principal

KFK/EG/nav

cc: A. A. Linero, FDEP New Source review
Teresa Heron, FDEP New Source Review
L. Glenn Keeling, Mirant Corporation
Bruce Lobach, Shady Hills Generating Station
Allen Dial, Shady Hills Generating station

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RECEIVED MAR 1 2002 Bureau of Air Monitoring & Mobile Sources

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Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

April 8, 2002

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Kennard F. Kosky, P.E
Principal
Golder Associates Inc
6241 NW 23rd Street, Suite 500
Gainesville, Florida 32653-1500

Re: Request For One Load Testing
Shady Hills Generating Station Combustion Turbines Units 1 through 3
DEP File No. PSD-FL-280 (1010373-001-AC)

Dear Mr. Kosky:

The Department has reviewed your letter dated February 27, 2002, on behalf of Shady Hills Generating Station (SHGS) requesting to perform one-load testing on their combustion turbines for their determination of initial compliance. Following is the response to the regulatory issue you submitted for our review and concurrence.

Department Response: Based on the guidance given in the EPA memo dated May, 26 2000, this facility is hereby authorized to test at a single load in lieu of the four 4 loads. CEMS will be used for continuous compliance with the NO_X standards. Refer to Appendix GG, attached.

A copy of this letter and attached Appendix GG shall be filed with the referenced permit and shall become part of the permit. This permitting decision is issued pursuant to Chapter 403, Florida Statutes.

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

A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner, the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action; and (g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the agency to take with respect to the agency's proposed action.

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

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above. Mediation is not available in this proceeding.

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

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

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

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

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

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

Executed in Tallahassee, Florida

Howard L. Rhodes

Howard L. Rhodes, Director
Division of Air Resources
Management

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this PERMIT MODIFICATION was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 4/9/02 to the person(s) listed:

Ken Kosky, P.E.*
Bruce Lobach, SHGS
Jerry Kissel, SWD-DEP

Clerk Stamp

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

Victoria Gibson April 9, 2002
(Clerk) (Date)

NSPS SUBPART GG REQUIREMENTS

[Note: Inapplicable provisions have been deleted in the following conditions, but the numbering of the original rules has been preserved for ease of reference to the original rules. The term "Administrator" when used in 40 CFR 60 shall mean the Department's Secretary or the Secretary's designee. Department notes and requirements related to the Subpart GG requirements are shown in **bold** immediately following the section to which they refer. The rule basis for the Department requirements specified below is Rule 62-4.070(3), F.A.C.]

Pursuant to 40 CFR 60.332 Standard for Nitrogen Oxides:

(a) On and after the date of the performance test required by § 60.8 is completed, every owner or operator subject to the provisions of this subpart as specified in paragraph (b) section shall comply with:

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

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

where:

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

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

F = NOx emission allowance for fuel-bound nitrogen as defined in paragraph (a)(3) of this section.

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

Fuel-bound nitrogen (percent by weight)	F (NOx percent by volume)
$N \leq 0.015$	0
$0.015 < N \leq 0.1$	0.04(N)
$0.1 < N \leq 0.25$	0.004+0.0067(N–0.1)
$N > 0.25$	0.005

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

Department requirement: While firing gas, the "F" value shall be assumed to be 0.

[Note: This is required by EPA's March 12, 1993 determination regarding the use of NOx CEMS. The "Y" value for this unit is approximately 10 for natural gas. The equivalent emission standard is 108 ppmvd at 15% oxygen. The emissions standards of this permit is more stringent than this requirement.]

(b) Electric utility stationary gas turbines with a heat input at peak load greater than 107.2 gigajoules per hour (100 million Btu/hour) based on the lower heating value of the fuel fired shall comply with the provisions of paragraph (a)(1) of this section.

Pursuant to 40 CFR 60.333 Standard for Sulfur Dioxide:

On and after the date on which the performance test required to be conducted by 40 CFR 60.8 is completed, every owner or operator subject to the provision of this subpart shall comply with:

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

<u>Pursuant to 40 CFR 60.334 Monitoring of Operations</u>:

(b) The owner or operator of any stationary gas turbine subject to the provisions of this subpart shall monitor sulfur content and nitrogen content of the fuel being fired in the turbine. The frequency of determination of these values shall be as follows:

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

<u>Department requirement</u>: The requirement to monitor the nitrogen content of natural gas fired is waived. For purposes of complying with the sulfur content monitoring requirements of this rule, the owner or operator shall obtain a monthly report from the vendor indicating the sulfur content of the natural gas being supplied for each month of operation.

[Note: This is consistent with EPA's custom fuel monitoring policy and guidance from EPA Region 4.]

(c) For the purpose of reports required under 40 CFR 60.7(c), periods of excess emissions that shall be reported are defined as follows:

(1) *Nitrogen oxides.* Any one-hour period during which the average water-to-fuel ratio, as measured by the continuous monitoring system, falls below the water-to-fuel ratio determined to demonstrate compliance with 40 CFR 60.332 by the performance test required in § 60.8 or any period during which the fuel-bound nitrogen of the fuel is greater than the maximum nitrogen content allowed by the fuel-bound nitrogen allowance used during the performance test required in § 60.8. Each report shall include the average water-to-fuel ratio, average fuel consumption, ambient conditions, gas turbine load, and nitrogen content of the fuel during the period of excess emissions, and the graphs or figures developed under 40 CFR 60.335(a).

<u>Department requirement</u>: NOx emissions monitoring by CEM system shall substitute for the requirements of paragraph (c)(1) because a NOx monitor is required to demonstrate compliance with the standards of this permit. Data from the NOx monitor shall be used to determine "excess emissions" for purposes of 40 CFR 60.7 subject to the conditions of the permit.

[Note: As required by EPA's March 12, 1993 determination, the NOx monitor shall meet the applicable requirements of 40 CFR 60.13, Appendix B and Appendix F for certifying, maintaining, operating and assuring the quality of the system; shall be capable of calculating NOx emissions concentrations corrected to 15% oxygen; shall have no less than 95% monitor availability in any given calendar quarter; and shall provide a minimum of four data points for each hour and calculate an hourly average. The requirements for the CEMS specified by the specific conditions of this permit satisfy these requirements.]

(2) *Sulfur dioxide.* Any daily period during which the sulfur content of the fuel being fired in the gas turbine exceeds 0.8 percent.

Pursuant to 40 CFR 60.335 Test Methods and Procedures:

(a) To compute the nitrogen oxides emissions, the owner or operator shall use analytical methods and procedures that are accurate to within 5 percent and are approved by the Administrator to determine the nitrogen content of the fuel being fired.

(b) In conducting the performance tests required in 40 CFR 60.8, the owner or operator shall use as reference methods and procedures the test methods in appendix A of this part or other methods and procedures as specified in this section, except as provided for in 40 CFR 60.8(b). Acceptable alternative methods and procedures are given in paragraph (f) of this section.

(c) The owner or operator shall determine compliance with the nitrogen oxides and sulfur dioxide standards in 40 CFR 60.332 and 60.333(a) as follows:

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

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

where:

NOx	=	emission rate of NOx at 15 percent O_2 and ISO standard ambient conditions, volume percent.
NOxo	=	observed NOx concentration, ppm by volume.
Pr	=	reference combustor inlet absolute pressure at 101.3 kilopascals ambient pressure, mm Hg.
Po	=	observed combustor inlet absolute pressure at test, mm Hg.
Ho	=	observed humidity of ambient air, g H_2O/g air.
e	=	transcendental constant, 2.718.
Ta	=	ambient temperature, °K.

Department requirement: **The owner or operator is not required to have the NOx monitor required by this permit continuously calculate NOx emissions concentrations corrected to ISO conditions. However, the owner or operator shall keep records of the data needed to make the correction, and shall make the correction when required by the Department or Administrator.**

[Note: This is consistent with guidance from EPA Region 4.]

(2) The monitoring device of 40 CFR 60.334(a) shall be used to determine the fuel consumption and the water-to-fuel ratio necessary to comply with 40 CFR 60.332 at 30, 50, 75, and 100 percent of peak load or at four points in the normal operating range of the gas turbine, including the minimum point in the range and peak load. All loads shall be corrected to ISO conditions using the appropriate equations supplied by the manufacturer.

Department requirement: **The owner or operator is allowed to conduct initial performance tests at a single load because a NOx monitor shall be used to demonstrate compliance with the BACT NOx limits of this permit.**

[Note: This is consistent with guidance from EPA Region 4.]

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

Department requirement: The owner or operator is allowed to make the initial compliance demonstration for NOx emissions using certified CEM system data, provided that compliance be based on a minimum of three test runs representing a total of at least three hours of data, and that the CEMS be calibrated in accordance with the procedure in section 6.2.3 of Method 20 following each run. Alternatively, initial compliance may be demonstrated using data collected during the initial relative accuracy test audit (RATA) performed on the NOx monitor. The span value specified in the permit shall be used instead of that specified in paragraph (c)(3) above.

[Note: These initial compliance demonstration requirements are consistent with guidance from EPA Region 4. The span value is changed pursuant to Department authority and is consistent with guidance from EPA Region 4.]

(d) The owner or operator shall determine compliance with the sulfur content standard in 40 CFR 60.333(b) as follows: ASTM D 2880-71 shall be used to determine the sulfur content of liquid fuels and ASTM D 1072-80, D 3031-81, D 4084-82, or D 3246-81 shall be used for the sulfur content of gaseous fuels (incorporated by reference – see 40 CFR 60.17). The applicable ranges of some ASTM methods mentioned above are not adequate to measure the levels of sulfur in some fuel gases. Dilution of samples before analysis (with verification of the dilution ratio) may be used, subject to the approval of the Administrator.

Department requirement: The permit specifies sulfur testing methods.

[Note: This requirement establishes different methods than provided by paragraph (d) above, but the requirements are equally stringent and will ensure compliance with this rule.]

(e) To meet the requirements of 40 CFR 60.334(b), the owner or operator shall use the methods specified in paragraphs (a) and (d) of this section to determine the nitrogen and sulfur contents of the fuel being burned. The analysis may be performed by the owner or operator, a service contractor retained by the owner or operator, the fuel vendor, or any other qualified agency.

[Note: The fuel analysis requirements of the permit meet or exceed the requirements of this rule and will ensure compliance with this rule.]

Golder Associates Inc.

6241 NW 23rd Street, Suite 500
Gainesville, FL 32653-1500
Telephone (352) 336-5600
Fax (352) 336-6603

Golder Associates

February 27, 2002

0139517-0100

Florida Department of Environmental Protection
111 South Magnolia Drive, Suite 4
Magnolia Park Courtyard
Tallahassee, FL 32301

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Sincerely,

GOLDER ASSOCIATES INC.

Kennard F. Kosky

Kennard F. Kosky, P.E.
Principal

KFK/EG/nav

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Teresa Heron, FDEP New Source Review
L. Glenn Keeling, Mirant Corporation
Bruce Lobach, Shady Hills Generating Station
Allen Dial, Shady Hills Generating station

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RECEIVED
MAR 01 2002
BUREAU OF AIR REGULATION

Gibson, Victoria

From: Heron, Teresa
Sent: Tuesday, April 09, 2002 3:40 PM
To: Gibson, Victoria
Subject: RE: Shady Hills Address

Ken K. is going to send me an e-mail with this address. Thnaks, teresa

-----Original Message-----
From: Gibson, Victoria
Sent: Tuesday, April 09, 2002 9:07 AM
To: Heron, Teresa
Subject: Shady Hills Address

I called on Friday to Shady Hills & got their address. Vickie 4/12/02

Good morning.

When your ready to send out this minor modification, would you provide the address of Bruce Loach for me as well?

Thanks.

Vickie

Victoria Gibson
Administrative Secretary to the Bureau Chief
Bureau of Air Regulation
Division of Air Resources Management
Department of Environmental Regulation
850-921-9504 FAX: 850-922-6979
Email: vickie.gibson@dep.state.fl.us

SENDER: *COMPLETE THIS SECTION*

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

1. Article Addressed to:

Ken Kosky, P. E.
Golder Associates
6241 NW 23 St - Ste 500
Gainesville, FL 32653-1500

COMPLETE THIS SECTION ON DELIVERY

A. Received by *(Please Print Clearly)*

B. Date of Delivery 4/12/02

C. Signature
X

☐ Agent
☐ Addressee

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

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

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

7001 0320 0001 3692 9021

PS Form 3811, July 1999 Domestic Return Receipt 102595-00-M-0952

U.S. Postal Service
CERTIFIED MAIL RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

OFFICIAL USE

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

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Sent To Ken Kosky, P. E.
Golder Associates
Street, Apt. or PO Box N 6241 NW 23 St - Ste 500
City, State, Gainesville, FL 32653-1500

PS Form 3800, January 2001 See Reverse for Instructions

SENDER: *COMPLETE THIS SECTION*

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1. Article Addressed to:

Ken Kosky, P. E.
Golder Associates
6241 NW 23 St - Ste 500
Gainesville, FL 32653-1500

COMPLETE THIS SECTION ON DELIVERY

A. Received by *(Please Print Clearly)*

B. Date of Delivery 4/12/02

C. Signature
X
☐ Agent
☐ Addressee

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

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

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

7001 0320 0001 3692 9021

PS Form 3811, July 1999 Domestic Return Receipt 102595-00-M-0952

U.S. Postal Service
CERTIFIED MAIL RECEIPT
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OFFICIAL USE

7001 0320 0001 3692 9021

Postage	$
Certified Fee	
Return Receipt Fee (Endorsement Required)	
Restricted Delivery Fee (Endorsement Required)	
Total Post	

Postmark Here

Sent To Ken Kosky, P. E.
Golder Associates
Street, Apt. or PO Box N 6241 NW 23 St - Ste 500
City, State, Gainesville, FL 32653-1500

PS Form 3800, January 2001 See Reverse for Instructions

Golder Associates Inc.

5100 West Lemon Street, Suite 114
Tampa, FL USA 33609
Telephone (813) 287-1717
Fax (813) 287-1716

RECEIVED

JAN 14 2002

Bureau of Air Monitoring
& Mobile Sources

Golder Associates

January 9, 2002

Project No. 013-9517

Mr. Joe Kahn
Emissions Monitoring Section
Bureau of Air Regulation
Florida Department of Environmental Protection
Mail Station #5505
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: DEP FILE NO. 1010373-001-AC/PSD-FL-280
SHADY HILLS ENERGY PARK

Dear Mr. Kahn:

In accordance with telephone conversations with staff from your office and representatives from Shady Hills Energy Park (Shady Hills), this letter is written to notify you of the necessity to conduct the initial performance tests at a single operating load at Shady Hills. The recent cold weather in Florida has resulted in insufficient gas capacity to conduct the performance tests at multiple loads. Although 40 CFR Section 60.335(c)(2), Subpart GG requires that performance tests be conducted at four different loads across the unit operating range, Shady Hills is requesting a waiver of the multiple load performance test requirements since CEMS is used to satisfy the NO_x monitoring requirements, as allowed in the EPA Policy Letter dated May 26, 2000.

A permit modification request to document the official request for the waiver of the multiple load test requirements will be submitted to your office under separate cover. We appreciate your assistance in this matter. If you have any questions, please contact Mr. Ken Kosky at (352) 336-5600.

Very truly yours,

GOLDER ASSOCIATES INC.

Manitia Moultrie
Senior Project Manager

MM/nd

Enclosures

cc: Glenn Keeling, Mirant Americas
Carlton Hall, Shady Hills Energy Park
Ken Kosky, Golder Associates Inc. - Gainseville

H:\GolderVol1\PROJECTS\2001proj\013-9517 Mirant - Shady Hills Compliance\Correspondence\LOT 010902

JAN-09-2002 16:56 P.01/02

FACSIMILE TRANSMISSION

To: Joe Kahn **Date:** 1/9/01

Fax No.: 850-922-6979 **Our Ref:** 013.9517

From: Mauricio Hattrio **e-mail:**

RE: Shady Hills

Total Pages (including cover): 2 **Hard copy to follow** __ **Yes** __ **No**

MESSAGE

Joe
attached is letter notification regarding the necessity to conduct a single load test.
Mauricio

RECEIVED
JAN 10 2002
Bureau of Air Monitoring & Mobile Sources

Golder Associates

Golder Associates Inc.
5100 West Lemon Street, Suite 114
Tampa, Florida 33609
Telephone (813) 287-1717
Fax (813) 287-1716

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Offices in United States and Australia, Brazil, Canada, Chile, China, Fiji, Finland, Germany, Hong Kong, Hungary, Indonesia, Italy, Peru, Philippines, Sweden, Thailand, and United Kingdom

PLEASE MARK TIME AFTER TRANSMISSION

Sent at ________ **am/pm**
By ________________

Golder Associates Inc.

6241 NW 23rd Street, Suite 500
Gainesville, FL 32653-1500
Telephone (352) 336-5600
Fax (352) 336-6603

RECEIVED

OCT 25 2000

BUREAU OF AIR REGULATION

Golder Associates

October 24, 2000

9939525-0300

Florida Department of Environmental Protection
Bureau of Air Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Fl 32399-2400

Attention: Mr. A.A. Linero, P.E., Administrator, New Source Review Section

RE: Shady Hills Generating Station
DEP File No. 1010373-001-AC (PSD-FL-280)
Increase in Stack Height; Decrease in Stack Diameter

Dear Al:

This correspondence is being submitted to update the Department on the final stack design for the project. In the permit application, the stack was originally contemplated to be 60 feet high and 22 feet in diameter. The final stack design will be 75 feet high and 18 feet in diameter based on General Electric's recommendation and design for the Frame 7FA gas turbine. The increase in stack height coupled with about a 50 percent increase in stack velocity would generally improve dispersion over initial stack design. Golder Associates has performed modeling to confirm this observation. The modeling confirmed that the impacts for the facility are equal to or less than the results submitted in the application. Indeed, the impacts are still below the Prevention of Significant Deterioration significant impact levels for all pollutant and averaging times. These results can be submitted if desired by the Department. In addition, the updated stack design will meet all requirements of Rule 62-297.310(6) F.A.C.

Please call if you have any questions.

Sincerely,

GOLDER ASSOCIATES INC.

Kennard F. Kosky

Kennard F. Kosky, P.E.
Principal

KFK/arz

cc: Betty Robinson, Golder Tampa
Jon Stroble, Shady Hills Power Company, L.L.C.
C. Carlson

P:\Projects\1999\9939\9939525a\03\#03-ltr.doc

FLORIDA

Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

October 19, 2000

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Jon C. Stroble, Project Manager
Shady Hills Power Company, L.L.C.
1001 Louisiana Street
Houston, Texas 77002

Mr. John S. Ellis
IPS Avon Park Corporation
1560 Gulf Boulevard, #701
Clearwater, Florida 32767

Re: DEP File No. 1010373-001-AC (PSD-FL-280)
Shady Hills Generating Station
Transfer of Ownership

Gentlemen:

This letter is to acknowledge receipt of the attached letter dated October 9, 2000 from Golder Associates requesting a transfer of ownership of the Shady Hills Generating Station from IPS Avon Park Corporation to Shady Hills Power Company, L.L.C. Shady Hills Power Company L.L.C. is an affiliate of El Paso Energy Corporation. The proposed facility will be constructed pursuant to the referenced air construction permit near Hudson in Pasco County, Florida.

Golder Associates was the consultant for the original applicant and owner, IPS Avon Park Corporation. The request from Golder Associates includes a signature from a representative of Shady Hills Power Company, L.L.C. Accordingly, the Department has reasonable assurance that a transfer of ownership is in effect between the two parties. The Department has amended its records in the Air Resources Management System to reflect new ownership.

Please advise the Department immediately if any facts stated above are in error. If you have any questions regarding this matter, please call Al Linero at 850/921-9523.

Sincerely,

C. H. Fancy, P.E., Chief,
Bureau of Air Regulation

CHF/al

Enclosure

Cc: Ken Kosky, P.E., Golder Associates
Betty Robinson, Golder Associates
Bill Thomas, DEP SWD

U.S. Postal Service

CERTIFIED MAIL RECEIPT

(Domestic Mail Only; No Insurance Coverage Provided)

7099 3400 0000 1449 4758

Article Sent To:

Mr. John S. Ellis, IPS Avon Park

Postage	$
Certified Fee	
Return Receipt Fee (Endorsement Required)	
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$

Postmark Here

Name (Please Print Clearly) (to be completed by mailer)
Mr. John S. Ellis

Street, Apt. No.; or PO Box No.
1560 Gulf Blvd., #701

City, State, ZIP+4
Clearwater, FL 32767

PS Form 3800, July 1999 — See Reverse for Instructions

SENDER: ***COMPLETE THIS SECTION***

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

1. Article Addressed to:

Mr. John S. Ellis
IPS Avon Park Corp.
1560 Gulf Boulevard, #701
Clearwater, FL [redacted]

COMPLETE THIS SECTION ON DELIVERY

A. Received by *(Please Print Clearly)* N McIntyre

B. Date of Delivery 10/24

C. Signature
X [illegible signature]
☐ Agent
☐ Addressee

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☑ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number *(Copy from service label)*
7099 3400 0000 1449 4758

PS Form 3811, July 1999 Domestic Return Receipt 102595-99-M-1789

U.S. Postal Service
CERTIFIED MAIL RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

7099 3400 0000 1449 4727

Article Sent To:
Jon C. Stroble, Project Mgr.

Postage	$	Shady Hills Power Co.
Certified Fee		Postmark Here
Return Receipt Fee (Endorsement Required)		
Restricted Delivery Fee (Endorsement Required)		
Total Postage & Fees	$	

Name (Please Print Clearly) (to be completed by mailer)
Jon C. Stroble
Street, Apt. No.; or PO Box No.
1001 Louisiana St.
City, State, ZIP+4
Houston, TX 77002

PS Form 3800, July 1999 See Reverse for Instructions

SENDER: *COMPLETE THIS SECTION*

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

1. Article Addressed to:

Jon C. Stroble, Project Mgr.
Shady Hills Power Co., L.L.C.
1001 Louisiana St.
Houston, TX 77002

COMPLETE THIS SECTION ON DELIVERY

A. Received by *(Please Print Clearly)* B. Date of Delivery OCT 25 2000

C. Signature
X [signature] 10/25 ☐ Agent ☐ Addressee

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number *(Copy from service label)*
7099 3400 000 1449 4727

PS Form 3811, July 1999 Domestic Return Receipt 102595-99-M-1789

Golder Associates Inc.

6241 NW 23rd Street, Suite 500
Gainesville, FL 32653-1500
Telephone (352) 336-5600
Fax (352) 336-6603

Golder Associates

October 9, 2000

9939525A/02

Florida Department of Environmental Protection
Bureau of Air Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Fl 32399-2400

RECEIVED
OCT 10 2000
BUREAU OF AIR REGULATION

Attention: Mr. C. H. Fancy, P.E., Chief

RE: SHADY HILLS GENERATING STATION
DEP FILE NO. 1010373 (PSD-FL-280)

Dear Clair:

This correspondence is being submitted to request a transfer in the ownership of the Shady Hills Generating Station from IPS Avon Park Corporation to Shady Hill Power Company, L.L.C. Attached please find pages 1, 3, and 7 of the DEP Form No. 62-210.900(1) with the relevant information. I understand, after discussions with your Bureau's staff, that DEP Form 62-1.201 is no longer valid.

Please call if you have any questions.

Sincerely,

GOLDER ASSOCIATES INC.

Ken

Kennard F. Kosky, P.E.
Principal

KFK/jkw

Enclosures

cc: Betty Robinson, Golder Tampa
John Ellis, IPS Avon Park Corporation
Jon Stroble, Shady Hills Power Company, L.L.C.
Al Linero

Department of Environmental Protection

Division of Air Resources Management

APPLICATION FOR AIR PERMIT - TITLE V SOURCE

See Instructions for Form No. 62-210.900(1)

I. APPLICATION INFORMATION

Identification of Facility

1. Facility Owner/Company Name: **Shady Hills Power Company, L.L.C.**	
2. Site Name: **Shady Hills Energy Park**	
3. Facility Identification Number: [X] Unknown	
4. Facility Location: Street Address or Other Locator: City: **Unincorporated** County: **Pasco** Zip Code:	
5. Relocatable Facility? [ ] Yes [X] No	6. Existing Permitted Facility? [ ] Yes [X] No

Application Contact

1. Name and Title of Application Contact: **Jon C. Stroble, Project Manager**
2. Application Contact Mailing Address: Organization/Firm: **Shady Hills Power Company, L.L.C.** Street Address: **1001 Louisiana Street** City: **Houston** State: **TX** Zip Code: **77002**
3. Application Contact Telephone Numbers: Telephone: (**713**) **420-2844** Fax: (**713**) **420-2483**

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	
2. Permit Number:	
3. PSD Number (if applicable):	
4. Siting Number (if applicable):	

Owner/Authorized Representative or Responsible Official

1.	Name and Title of Owner/Authorized Representative or Responsible Official: **Jon C. Stroble, Project Manager**
2.	Owner/Authorized Representative or Responsible Official Mailing Address: Organization/Firm: **Shady Hills Power Company, L.L.C.** Street Address: **1001 Louisiana Street** City: **Houston** State: **TX** Zip Code: **77002**
3.	Owner/Authorized Representative or Responsible Official Telephone Numbers: Telephone: **(713) 420-2844** Fax: **(713) 420-2483**
4.	Owner/Authorized Representative or Responsible Official Statement: *I, the undersigned, am the owner or authorized representative*(check here [X], if so) or the responsible official (check here [ ], if so) of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions unit.* Jon Stroble Signature Date 9/26/00

* Attach letter of authorization if not currently on file.

Professional Engineer Certification

1.	Professional Engineer Name: **Kennard F. Kosky** Registration Number: **14996**
2.	Professional Engineer Mailing Address: Organization/Firm: **Golder Associates Inc.** Street Address: **6241 NW 23rd Street, Suite 500** City: **Gainesville** State: **FL** Zip Code: **32653-1500**
3.	Professional Engineer Telephone Numbers: Telephone: **(352) 336 - 5600** Fax: **(352) 336 - 6603**

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates: Zone: **17** East (km): **347.0** North (km): **3139.0**			
2. Facility Latitude/Longitude: Latitude (DD/MM/SS): **28 / 22 / 00** Longitude (DD/MM/SS): **82 / 30 / 00**			
3. Governmental Facility Code: **0**	4. Facility Status Code: **C**	5. Facility Major Group SIC Code: **49**	6. Facility SIC(s): **4911**
7. Facility Comment (limit to 500 characters): **Project consists of three 170-MW dual-fuel, General Electric Frame 7FA combustion turbines(CT) that will use dry low-nitrogen oxide combustion technology when firing natural gas and water injection when firing distillate fuel oil. Each CT will operate up to 3,390 hours per year. The fuel oil tank will hold approximately 2.8 million gallons of very low sulfur content fuel oil.**			

Facility Contact

1. Name and Title of Facility Contact: **Jon C. Stroble, Project Manager**
2. Facility Contact Mailing Address: Organization/Firm: **Shady Hills Power Company, L.L.C.** Street Address: **1001 Louisiana Street** City: **Houston** State: **TX** Zip Code: **77002**
3. Facility Contact Telephone Numbers: Telephone: **(713) 420-2844** Fax: **(713) 420-2483**

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

FEB 04 2000

RECEIVED
FEB 10 2000
BUREAU OF AIR REGULATION

4APT-ARB

Mr. A. A. Linero, P.E.
Administrator
New Source Review Section
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

SUBJECT: Custom Fuel Monitoring Schedule Proposed for IPS Avon Park Corporation - Shady Hills Generating Station located in Pasco County, Florida

Dear Mr. Linero:

This letter is in response to your November 30, 1999, request for approval of a custom fuel monitoring schedule for IPS Avon Park Corporation - Shady Hills Generating Station. IPS Shady Hills will operate three natural gas-fired simple cycle combustion turbines subject to 40 C.F.R. Part 60, Subpart GG - Standards of Performance for Stationary Gas Turbines. As requested, Specific Conditions 40, 41, 42, 44 and 45 have been reviewed. Region 4 has concluded that the use of acid rain nitrogen oxides (NO_X) continuous emission monitoring system (CEMS) for demonstrating compliance, as described in Specific Conditions 40, 41 and 42, is acceptable. Region 4 has also concluded that the natural gas custom fuel monitoring schedule proposed in Specific Condition 44 and the fuel oil monitoring schedule described in Specific Condition 45 are both acceptable.

According to 40 C.F.R. 60.334(b)(2), owners and operators of stationary gas turbines subject to Subpart GG are required to monitor fuel nitrogen and sulfur content on a daily basis if a company does not have intermediate bulk storage for its fuel. 40 C.F.R. 60.334(b)(2) also contains provisions allowing owners and operators of turbines that do not have intermediate bulk storage for their fuel to request approval of custom fuel monitoring schedules that require less frequent monitoring of fuel nitrogen and sulfur content.

Region 4 reviewed Specific Condition 44 which allows SO_2 emissions to be quantified using procedures in 40 C.F.R. 75 Appendix D in lieu of daily sampling as required by 40 C.F.R. 60.334(b). Since the specific limitations listed in the permit condition are consistent with previous determinations, we have concluded that the use of this custom fuel monitoring schedule is acceptable.

Specific Conditions 40, 41 and 42 involve the method used to monitor NO_X excess emissions. Under the provisions for 40 C.F.R. 60.334(c)(1), the operating parameters used to identify NO_X excess emissions for Subpart GG turbines are water-to-fuel injection rates and fuel nitrogen content. As an alternative to monitoring NO_X excess emissions using these parameters, IPS Shady Hills is proposing to use a NO_X CEMS that is certified for measuring NO_X emissions under 40 C.F.R. Part 75. Based upon a determination issued by EPA on March 12, 1993, NO_X CEMS can be used to monitor excess emissions from Subpart GG turbines if a number of conditions specified in the determination are met and included in the permit condition.

Specific Condition 40 addresses the potential for correcting results to ISO standard day conditions. The basis for this requirement is that, under the provisions of 40 C.F.R. 60.335(c), NO_x results from performance tests must be converted to ISO standard day conditions. As an alternative to continuously correcting results to ISO standard day conditions, IPS Shady Hills plans to keep records of the data needed to make this conversion, so that NO_x results could be calculated on an ISO standard day condition basis anytime at the request of EPA or the Florida DEP. This approach is acceptable, since the construction permit contains NO_x limits that are more stringent than those in Subpart GG, and compliance with Subpart GG for these units would be a concern only in cases when a turbine is in violation of the NO_x limits in its permit.

Finally, Specific Condition 45 addresses the monitoring schedule for fuel oil. According to 40 C.F.R. 60.334(b)(1), the nitrogen and sulfur content of the fuel oil must be monitored each time a new shipment of fuel oil is transferred to bulk storage. IPS Shady Hills is proposing to use the fuel analysis provided by the fuel vendor instead of sampling each shipment directly. Provided that all the oil received at the plant complies with the applicable sulfur content limit of 0.8 weight percent, this approach is acceptable, since the specific condition states that the fuel vendor's analyses will comply with the test method requirements of 40 C.F.R. 60.335(d).

If you have any questions about the determination provided in this letter, please contact Katy Forney of my staff at 404-562-9130.

Sincerely,

Douglas Neeley

R. Douglas Neeley
Chief
Air and Radiation Technology Branch
Air, Pesticides and Toxics
Management Division

cc: SWD
NPS
Golden Assoc.
J. Ellis, IPS, APC

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NOTICE OF FINAL PERMIT

In the Matter of an
Application for Permit by:

Mr. John S. Ellis
IPS Avon Park Corporation
1560 Gulf Boulevard
Clearwater, Florida 32767

DEP File No. 1010373-001
Permit No.: PSD-FL-280
Shady hills Generating Station
Pasco County

_____________________________/

Enclosed is the Final Permit Number PSD-FL-280 to construct: three nominal 170 megawatt (MW) natural gas and distillate fuel oil-fired combustion turbine-electrical generators with 60-foot stacks and one 2.8 million gallon fuel oil storage tanks for the proposed Shady Hills Generating Station to be located in unincorporated Pasco County. This permit is issued pursuant to Chapter 403, Florida Statutes.

Any party to this order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, F.S., by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Legal Office; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 (thirty) days from the date this Notice is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

C.H. Fancy, P.E., Chief
Bureau of Air Regulation

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF FINAL PERMIT (including the FINAL permit) was sent by certified mail* and copies were mailed by U.S. Mail before the close of business on 1-13-00 to the person(s) listed:

John S. Ellis, IPSAPC*
Gregg Worley, EPA
John Bunyak, NPS
Bill Thomas, DEP SWD
Ken Kosky, P.E., Golder Associates
Chair, Pasco County BCC

Clerk Stamp

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

(Clerk) 1-13-00 (Date)

FINAL DETERMINATION
SHADY HILLS GENERATING STATION
PASCO COUNTY
THREE SIMPLE CYCLE COMBUSTION TURBINES

The Department distributed a Public Notice package on November 30, 1999 for the project to construct a nominal 510 megawatt (MW) natural gas and distillate fuel oil-fired simple cycle power plant near Hudson, Pasco County. The project includes: three nominal 170 MW combustion turbine-electrical generators with 60-foot stacks and one 2.8 million gallon distillate fuel oil storage tank. The Public Notice of Intent to Issue was published on December 14 in The Tampa Tribune.

No written comments were received by the Department from the public, the applicant, or the U.S. EPA Region IV. Comments were received from the Fish and Wildlife Service (FWS) in a letter dated December 16.

The Department previously received written comments from EPA Region IV on the (almost identical) Vandolah Power Project and Draft Permit. Those comments were addressed in the Final Determination for the Vandolah project dated December 16, 1999. The Department's resolution of those comments was also incorporated into the present Shady Hills Generating Station Permit.

EPA verbally advised that SCONOX™ technology for nitrogen oxides control is now available from ABB Alstom Power for large combustion turbines and requested that this be mentioned in future technology discussions.

The FWS concurred that Dry Low NO_X technology to achieve 9 ppmvd of NO_X is best available control technology (BACT) for this simple cycle project. FWS also concurred with use of 0.05 percent sulfur fuel oil and a NO_X limit of 42 ppmvd as BACT during the limited oil firing.

FWS advised that the visibility analysis was performed correctly and that there would be low potential for impacts to visibility due to plumes in the Class I Area. FWS expressed concern about modeled exceedances of Class I sulfur dioxide increments. Because this specific project does not contribute significantly to increment consumption, it is considered to comply with the increments.

FWS requests that the Department identify the sources of the exceedances and take remedial action to rectify the exceedances.

The final action is to issue the permit as proposed with minor changes in the BACT write-up to reflect the present status of both the SCONOX and XONON™ nitrogen oxides control technologies.

Z 031 391 918

US Postal Service

Receipt for Certified Mail

No Insurance Coverage Provided.

Do not use for International Mail *(See reverse)*

Sent to John Ellis	
Street & Number IPS Shady Hills	
Post Office, State, & ZIP Code Clearwater Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 1010373-001AC PSD-Fl-280 1-13-99	

PS Form **3800**, April 1995

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
John J. Ellis
IPS Avon Park Corp.
1560 Gulf Blvd
Clearwater, Fl
32767

4a. Article Number
Z 031 391 918

4b. Service Type
☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
1 - 18 - 00

5. Received By: *(Print Name)*
Linda Ellis

6. Signature: *(Addressee or Agent)*
X Linda Ellis

8. Addressee's Address *(Only if requested and fee is paid)*

PS Form **3811**, December 1994 102595-98-B-0229 Domestic Return Receipt

Thank you for using Return Receipt Service.

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Department of Environmental Protection

Jeb Bush
Governor

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

David B. Struhs
Secretary

PERMITTEE:

IPS Avon Park Corporation
1560 Gulf Boulevard, # 701
Clearwater, Florida 32767

Permit No.	PSD-FL-280
File No.	1010373-001-AC
SIC No.	4911
Expires:	July 1, 2002

Authorized Representative:

John S. Ellis

PROJECT AND LOCATION:

Air Construction Permit pursuant to the requirements for the Prevention of Significant Deterioration of Air Quality Permit for: three dual-fuel nominal 170 megawatt (MW) General Electric PG7241FA combustion turbine-electrical generators; one 2.8-million gallon fuel oil storage tank; and three 60-foot stacks. The units will operate in simple cycle mode and intermittent duty. The units will be equipped with Dry Low NO_X (DLN-2.6) combustors and wet injection capability.

The project will be located East of Hudson and North of SR 52 in unincorporated, Pasco County. UTM coordinates are: Zone 17; 347.0 km E; 3139.0 km N.

STATEMENT OF BASIS:

This Air Construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.). The above named permittee is authorized to modify the facility in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department of Environmental Protection (Department).

Attached Appendices and Tables made a part of this permit:

Appendix BD	BACT Determination
Appendix GC	Construction Permit General Conditions

Howard L. Rhodes

Howard L. Rhodes, Director
Division of Air Resources
Management

SECTION I. FACILITY INFORMATION

FACILITY DESCRIPTION

This facility is a new site. This permitting action is to install three dual-fuel nominal 170 megawatt (MW) General Electric PG7241FA combustion turbine-electrical generators with three 60-foot stacks and one 2.8-million gallon fuel oil storage tanks. Emissions from the new units will be controlled by Dry Low NO_X (DLN-2.6) combustors when operating on natural gas and wet injection when firing fuel oil. Inherently clean fuels and good combustion practices will be employed to control all pollutants.

EMISSION UNITS

This permit addresses the following emission units:

ARMS EMISSIONS UNIT	SYSTEM	EMISSION UNIT DESCRIPTION
001	Power Generation	One nominal 170 Megawatt Gas Simple Cycle Combustion Turbine-Electrical Generator
002	Power Generation	One nominal 170 Megawatt Simple Cycle Gas Combustion Turbine-Electrical Generator
003	Power Generation	One nominal 170 Megawatt Simple Cycle Gas Combustion Turbine-Electrical Generator
004	Fuel Storage	One 2.8 Million Gallon Fuel Oil Storage Tank

REGULATORY CLASSIFICATION

The facility is classified as a Major or Title V Source of air pollution because emissions of at least one regulated air pollutant, such as particulate matter (PM/PM_{10}), sulfur dioxide (SO_2), nitrogen oxides (NO_X), carbon monoxide (CO), or volatile organic compounds (VOC) exceeds 100 tons per year (TPY).

This facility is not within an industry included in the list of the 28 Major Facility Categories per Table 212.400-1, F.A.C. Because emissions are greater than 250 TPY for at least one criteria pollutant, the facility is also a Major Facility with respect to Rule 62-212.400, Prevention of Significant Deterioration (PSD). Pursuant to Table 62-212.400-2, modifications at this facility resulting in emissions increases greater than any of the following values require review per the PSD rules as well as a determination of Best Available Control Technology (BACT): 40 TPY of NO_X, SO_2, or VOC; 25/15 TPY of PM/PM_{10}; 100 TPY of CO; or 7 TPY of sulfuric acid mist (SAM). This facility and the project are also subject to applicable provisions of Title IV, Acid Rain, of the Clean Air Act.

SECTION I. FACILITY INFORMATION

PERMIT SCHEDULE

- 12/14/99 Notice of Intent published in The Tampa tribune
- 11/30/99 Distributed Intent to Issue Permit
- 10/26/99 Application deemed complete
- 10/26/99 Received Application

RELEVANT DOCUMENTS:

The documents listed below are the basis of the permit. They are specifically related to this permitting action, but not all are incorporated into this permit. These documents are on file with the Department.

- Application received on October 26, 1999
- Letter from the U.S. Fish and Wildlife Service dated December 16, 1999
- Department's Intent to Issue and Public Notice Package dated November 30, 1999
- Department's Final Determination and Best Available Control Technology Determination issued concurrently with this permit.

SECTION II. ADMINISTRATIVE REQUIREMENTS

1. Regulating Agencies: All documents related to applications for permits to construct, operate or modify an emissions unit should be submitted to the Bureau of Air Regulation (BAR), Florida Department of Environmental Protection (FDEP), at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400 and phone number (850) 488-0114. All documents related to reports, tests, and notifications should be submitted to the DEP Southwest District office, 3804 Coconut Palm Drive, Tampa, Florida 33619-8218 and phone number 813/744-6100.

2. General Conditions: The owner and operator is subject to and shall operate under the attached General Permit Conditions G.1 through G.15 listed in Appendix GC of this permit. General Permit Conditions are binding and enforceable pursuant to Chapter 403 of the Florida Statutes. [Rule 62-4.160, F.A.C.]

3. Terminology: The terms used in this permit have specific meanings as defined in the corresponding chapters of the Florida Administrative Code.

4. Forms and Application Procedures: The permittee shall use the applicable forms listed in Rule 62-210.900, F.A.C. and follow the application procedures in Chapter 62-4, F.A.C. [Rule 62-210.900, F.A.C.]

5. Modifications: The permittee shall give written notification to the Department when there is any modification to this facility. This notice shall be submitted sufficiently in advance of any critical date involved to allow sufficient time for review, discussion, and revision of plans, if necessary. Such notice shall include, but not be limited to, information describing the precise nature of the change; modifications to any emission control system; production capacity of the facility before and after the change; and the anticipated completion date of the change. [Chapters 62-210 and 62-212]

6. Expiration: Approval to construct shall become invalid if construction is not commenced within 18 months after receipt of such approval, or if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time. The Department may extend the 18-month period upon a satisfactory showing that an extension is justified. [40 CFR 52.21(r)(2)].

7. BACT Determination: In accordance with Rule 62-212.400(6)(b), F.A.C. (and 40 CFR 51.166(j)(4)), the Best Available Control Technology (BACT) determination shall be reviewed and modified as appropriate in the event of a plant conversion. This paragraph states: "For phased construction project, the determination of best available control technology shall be reviewed and modified as appropriate at the latest reasonable time which occurs no later than 18 months prior to commencement of construction of each independent phase of the project. At such time, the owner or operator of the applicable stationary source may be required to demonstrate the adequacy of any previous determination of best available control technology for the source." This reassessment will also be conducted for this project if there are any increases in heat input limits, hours of operation, oil firing, low or baseload operation (e.g. conversion to combined-cycle operation) short-term or annual emission limits, annual fuel heat input limits or similar changes. [40 CFR 51.166(j)(4) and Rule 62-212.400(6)(b), F.A.C.]

SECTION II. ADMINISTRATIVE REQUIREMENTS

8. Application for Title V Permit: An application for a Title V operating permit, pursuant to Chapter 62-213, F.A.C., must be submitted to the DEP's Bureau of Air Regulation, and a copy to the Department's Southwest District office. [Chapter 62-213, F.A.C.]

9. New or Additional Conditions: Pursuant to Rule 62-4.080, F.A.C., for good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.]

10. Annual Reports: Pursuant to Rule 62-210.370(2), F.A.C., Annual Operation Reports, the permittee is required to submit annual reports on the actual operating rates and emissions from this facility. Annual operating reports shall be sent to the DEP's Southwest District office by March 1st of each year. [Rule 62-210.370(2), F.A.C.]

11. Stack Testing Facilities: Stack sampling facilities shall be installed in accordance with Rule 62-297.310(6), F.A.C.

12. Permit Extension: The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit [Rule 62-4.080, F.A.C.]

13. Quarterly Reports: Quarterly excess emission reports, in accordance with 40 CFR 60.7 (a)(7) (c) (1998 version), shall be submitted to the DEP's Southwest District office. Each excess emission report shall include the information required in 40 CFR 60.7(c) and 60.334.

SECTION III. EMISSION UNITS SPECIFIC CONDITIONS

APPLICABLE STANDARDS AND REGULATIONS:

1. Unless otherwise indicated in this permit, the construction and operation of the subject emission unit(s) shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of Chapter 403, F.S. and Florida Administrative Code Chapters 62-4, 62-103, 62-204, 62-210, 62-212, 62-213, 62-214, 62-296, 62-297; and the applicable requirements of the Code of Federal Regulations Section 40, Parts 60, 72, 73, and 75.

2. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements or regulations. [Rule 62-210.300, F.A.C.]

3. These emission units shall comply with all applicable requirements of 40CFR60, Subpart A, General Provisions including:

   - 40CFR60.7, Notification and Recordkeeping
   - 40CFR60.8, Performance Tests
   - 40CFR60.11, Compliance with Standards and Maintenance Requirements
   - 40CFR60.12, Circumvention
   - 40CFR60.13, Monitoring Requirements
   - 40CFR60.19, General Notification and Reporting requirements

4. ARMS Emission Units 001-003, Power Generation, consisting of three 170 megawatt combustion turbines shall comply with all applicable provisions of 40CFR60, Subpart GG, Standards of performance for Stationary Gas Turbines, adopted by reference in Rule 62-204.800(7)(b), F.A.C. The Subpart GG requirement to correct test data to ISO conditions applies. However, such correction is not used for compliance determinations with the BACT standard(s). [Rule 62-204.800(7)(b), F.A.C.]

5. ARMS Emission Unit 004, Fuel Storage, consisting of one 2.8 million gallon distillate fuel oil storage tanks shall comply with all applicable provisions of 40CFR60, Subpart Kb, Standards of Performance for Volatile Organic Liquid Storage Vessels, adopted by reference in Rule 62-204.800, F.A.C. [Rule 62-204.800(7)(b), F.A.C.]

6. All notifications and reports required by the above specific conditions shall be submitted to the DEP's Southwest District.

GENERAL OPERATION REQUIREMENTS

7. Fuels: Only pipeline natural gas or maximum 0.05 percent sulfur fuel oil No. 2 or superior grade of distillate fuel oil shall be fired in these units. [Applicant Request, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)] {Note: The limitation of this specific condition is more stringent than the NSPS sulfur dioxide limitation and thus assures compliance with 40 CFR 60.333 and 60.334}

SECTION III. EMISSION UNITS SPECIFIC CONDITIONS

8. Capacity: The maximum heat input rates, based on the lower heating value (LHV) of each fuel to each Unit (1-3) at ambient conditions of 59°F temperature, 60% relative humidity, 100% load, and 14.7 psi pressure shall not exceed 1,612 million Btu per hour (MMBtu/hr) when firing natural gas, nor 1,806 MMBtu/hr when firing No. 2 or superior grade of distillate fuel oil. These maximum heat input rates will vary depending upon ambient conditions and the combustion turbine characteristics. Manufacturer's curves corrected for site conditions or equations for correction to other ambient conditions shall be provided to the Department of Environmental Protection (DEP) within 45 days of completing the initial compliance testing. [Design, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]

9. Unconfined Particulate Emissions: During the construction period, unconfined particulate matter emissions shall be minimized by dust suppressing techniques such as covering and/or application of water or chemicals to the affected areas, as necessary. [Rule 62-296.320(4)(c)., F.A.C.]

10. Plant Operation - Problems: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, the owner or operator shall notify the DEP Southwest District as soon as possible, but at least within (1) working day, excluding weekends and holidays. The notification shall include: pertinent information as to the cause of the problem; the steps being taken to correct the problem and prevent future recurrence; and where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with the conditions of this permit and the regulations. [Rule 62-4.130, F.A.C.]

11. Operating Procedures: Operating procedures shall include good operating practices and proper training of all operators and supervisors. The good operating practices shall meet the guidelines and procedures as established by the equipment manufacturers. All operators (including supervisors) of air pollution control devices shall be properly trained in plant specific equipment. [Rule 62-4.070(3), F.A.C.]

12. Circumvention: The owner or operator shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. [Rules 62-210.650, F.A.C.]

13. Maximum allowable hours: The stationary gas turbines shall only operate up to 3,390 hours per unit including up to 1000 hours on fuel oil during any calendar year. No single combustion turbine shall operate more than 5,000 hours in a single year. [Applicant Request, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions), Rule 62-212.400, F.A.C. (BACT)]

14. Fuel oil usage: The amount of back-up fuel (fuel oil) burned at the site (in BTU's) shall not exceed the amount of natural gas (primary fuel) burned at the site (in BTU's) during any consecutive 12-month period [Rule 62-210.200, F.A.C. (BACT)]

Control Technology

15. Dry Low NO_X (DLN-2.6) combustors shall be installed on the stationary combustion turbine to control nitrogen oxides (NO_X) emissions while firing natural gas. [Design, Rules 62-4.070 and 62-212.400, F.A.C. (BACT)]

16. A water injection (WI) system shall be installed for use when firing No. 2 or superior grade distillate fuel oil for control of NO_X emissions. [Design, Rules 62-4.070 and 62-212.400, F.A.C. (BACT)]

17. The permittee shall provide manufacturer's emissions performance versus load diagrams for the DLN and wet injection systems prior to their installation. DLN systems shall each be tuned upon initial operation to optimize emissions reductions consistent with normal operation and maintenance practices and shall be maintained to minimize NO_X emissions and CO emissions, consistent with normal operation and maintenance practices. Operation of the DLN systems in the diffusion-firing mode shall be minimized when firing natural gas. [Rule 62-4.070 and 62-210.650 F.A.C.]

EMISSION LIMITS AND STANDARDS

18. Following is a summary of the emission limits and required technology. Values for NO_X are corrected to 15 % O_2 on a dry basis. These limits or their equivalent in terms of lb/hr or NSPS units, as well as the applicable averaging times, are followed by the applicable specific conditions [Rules 62-212.400, 62-204.800(7)(b) (Subpart GG), 62-210.200 (Definitions-Potential Emissions) F.A.C.]

POLLUTANT	CONTROL TECHNOLOGY	EMISSION LIMIT
PM/PM_{10}, VE	Pipeline Natural Gas Good Combustion	10/17 lb/hr (Gas/Fuel Oil) 10 Percent Opacity (Gas or Fuel Oil)
VOC (not PSD)	As Above	1.4 ppmvd (Gas) 7 ppmvw (Fuel Oil)
CO	As Above	12 ppmvd (Gas) 20 ppmvd (Fuel Oil)
SO_2 and Sulfuric Acid Mist	Pipeline Natural Gas Low Sulfur Fuel Oil	1 gr S/100 ft^3 (in Gas) 0.05% S (in Fuel Oil)
NO_X	Dry Low NO_X for Natural Gas Wet Injection and limited Fuel Oil usage	9 ppmvd (Gas) 42 ppmvd (Fuel Oil)

19. Nitrogen Oxides (NO_X) Emissions:

- While firing Natural Gas: The emission rate of NO_X in the exhaust gas shall not exceed 9 ppmvd @15% O_2 on a 24 hr block average (of valid hours during which the unit is operated only) as measured by the continuous emission monitoring system (CEMS). Refer to Condition 30 for valid hours contributing to the block average.

In addition, NO_X emissions calculated as NO_2 shall not exceed 64.1 pounds per hour (at ISO conditions) and 9 ppmvd @15% O_2 to be demonstrated by the initial "new and clean" GE performance stack test. [Rule 62-212.400, F.A.C.]

- While firing Fuel Oil: The concentration of NO_X in the exhaust gas shall not exceed 42 ppmvd at 15% O_2 on the basis of a 3-hr average (of valid hour hours during which the unit is actually operated only) as measured by the continuous emission monitoring system (CEMS). In addition, NO_X emissions calculated as NO_2 shall not exceed 351 lb/hr (at ISO conditions) and 42 ppmvd @15% O_2 to be demonstrated by stack test. [Rule 62-212.400, F.A.C.]

  The permittee shall develop a NO_X reduction plan when the hours of oil firing reach the allowable limit of 1000 hours per year. This plan shall include a testing protocol designed to establish the maximum water injection rate and the lowest NO_X emissions possible without affecting the actual performance of the gas turbine. The testing protocol shall set a range of water injection rates and attempt to quantify the corresponding NO_X emissions for each rate and noting any problems with performance. Based on the test results, the plan shall recommend a new NO_X emissions limiting standard and shall be submitted to the Department's Bureau of Air Regulation and Compliance Authority for review. If the Department determines that a lower NO_X emissions standard is warranted for oil firing, this permit shall be revised. (BACT Determination].

20. Carbon Monoxide (CO) Emissions: The concentration of CO in the stack exhaust gas shall exceed neither 12 ppmvd and 42.5 lb/hr (at ISO conditions) while firing gas and neither 20 ppmvd and 71.4 lb/hr (at ISO conditions). The permittee shall demonstrate compliance with these limits by stack test using EPA Method 10. [Rule 62-212.400, F.A.C.]

21. Volatile Organic Compounds (VOC) Emissions: The concentration of VOC in the stack exhaust gas with the combustion turbine operating on natural gas shall exceed neither 1.4 ppmvd nor 2.8 lb/hr (ISO conditions) and neither 7 ppmvw nor 16.2 lb/hr (ISO conditions) while operating on oil to be demonstrated by initial stack test using EPA Method 18, 25 or 25A. [Applicant Request to Avoid PSD, Rule 62-212.400, F.A.C.]

22. Sulfur Dioxide (SO_2) Emissions: SO_2 emissions shall be limited by firing pipeline natural gas (sulfur content less than 1 grain per 100 standard cubic foot) or by firing No. 2 or superior grade distillate fuel oil with a maximum 0.05 percent sulfur for 1000 hours per year per unit. Emissions of SO_2 (at ISO conditions) shall not exceed 5 lb/hr (natural gas) and 98.7 lb/hr (fuel oil) as measured by applicable compliance methods described below. [40CFR60 Subpart GG and Rules 62-4.070, 62-212.400, and 62-204.800(7), F.A.C]

23. Particulate Matter (PM/PM_{10}) PM/PM_{10} emissions shall not exceed 10 lb/hr when operating on natural gas and shall not exceed 17 lb/hr when operating on fuel oil. Visible emissions testing shall serve as a surrogate for PM/PM_{10} compliance testing. [Rule 62-212.400, F.A.C.]

24. Visible Emissions (VE): VE emissions shall serve as a surrogate for PM/PM_{10} emissions and shall not exceed 10 opacity. Rules 62-4.070, 62-212.400, and 62-204.800(7), F.A.C.]

EXCESS EMISSIONS

25. Excess emissions resulting from startup, shutdown, or malfunction shall be permitted provided that best operational practices are adhered to and the duration of excess emissions shall be minimized. Excess emissions occurrences shall in no case exceed two hours in any 24-hour period for other reasons unless specifically authorized by DEP for longer duration. Operation below 50% output shall be limited to 2 hours per unit cycle (breaker closed to breaker open).

26. Excess emissions entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction, shall be prohibited pursuant to Rule 62-210.700, F.A.C. These emissions shall be included in the 24-hr average for NO_X.

27. Excess Emissions Report: If excess emissions occur due to malfunction, the owner or operator shall notify DEP's Southwest District within (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. In addition, the Department may request a written summary report of the incident. Following the NSPS format, 40 CFR 60.7 Subpart A, periods of startup, shutdown, malfunction, shall be monitored, recorded, and reported as excess emissions when emission levels exceed the permitted standards listed in Specific Condition No. 18 and 19. [Rules 62-4.130, 62-204.800, 62-210.700(6), F.A.C., and 40 CFR 60.7 (1998 version)].

COMPLIANCE DETERMINATION

28. Compliance with the allowable emission limiting standards shall be determined within 60 days after achieving the maximum production rate, but not later than 180 days of initial operation of the unit, and annually thereafter as indicated in this permit, by using the following reference methods as described in 40 CFR 60, Appendix A (1998 version), and adopted by reference in Chapter 62-204.800, F.A.C.

29. Initial (I) performance tests (for both fuels) shall be performed on each unit while firing natural gas as well as while firing oil. Initial tests shall also be conducted after any modifications (and shake down period not to exceed 100 days after re-starting the CT) of air pollution control equipment such as change or tuning of combustors. Annual (A) compliance tests shall be performed during every federal fiscal year (October 1 - September 30) pursuant to Rule 62-297.310(7), F.A.C., on each unit as indicated. The following reference methods shall be used. No other test methods may be used for compliance testing unless prior DEP approval is received in writing.

- EPA Reference Method 9, "Visual Determination of the Opacity of Emissions from Stationary Sources" (I, A).
- EPA Reference Method 10, "Determination of Carbon Monoxide Emissions from Stationary Sources" (I, A).

SECTION III. EMISSION UNITS SPECIFIC CONDITIONS

- EPA Reference Method 20, "Determination of Oxides of Nitrogen Oxide, Sulfur Dioxide and Diluent Emissions from Stationary Gas Turbines." Initial test only for compliance with 40CFR60 Subpart GG and (I, A) short-term NO_X BACT limits (EPA reference Method 7E, "Determination of Nitrogen Oxides Emissions from Stationary Sources" or RATA test data may be used to demonstrate compliance for annual test requirements).
- EPA Reference Method 18, 25 and/or 25A, "Determination of Volatile Organic Concentrations." Initial test only.

30. Continuous compliance with the NO_X emission limits: Continuous compliance with the NO_X emission limits shall be demonstrated with the CEM system based on the applicable averaging time of 24-hr block average (DLN). Based on CEMS data, a separate compliance determination is conducted at the end of each operating day and a new average emission rate is calculated from the arithmetic average of all valid hourly emission rates from the previous operating day. A valid hourly emission rate shall be calculated for each hour in which at least two NO_X concentrations are obtained at least 15 minutes apart. Valid hourly emission rates shall not include periods of start up, shutdown, or malfunction unless prohibited by 62-210.700 F.A.C. These excess emissions periods shall be reported as required in Conditions 25 and 26. [Rules 62-4.070 F.A.C., 62-210.700, F.A.C., 40 CFR 75 and BACT]
    - All continuous monitoring systems (CEMS) shall be in continuous operation except for breakdowns, repairs, calibration checks, and zero and span adjustments. These CEMS shall meet minimum frequency of operation requirements: one cycle of operation (sampling, analyzing, and data recording) for each successive 15-minute period. Data recorded during periods of continuous monitoring system breakdowns, repairs, calibration checks, and zero and span adjustments shall not be included in the data average. [40CFR60.13]
31. Compliance with the SO_2 and PM/PM_{10} emission limits: Not withstanding the requirements of Rule 62-297.340, F.A.C., the use of pipeline natural gas, is the method for determining compliance for SO_2 and PM_{10}. For the purposes of demonstrating compliance with the 40 CFR 60.333 SO_2 standard, ASTM methods D4084-82 or D3246-81 (or equivalent) for sulfur content of gaseous fuel shall be utilized in accordance with the EPA-approved custom fuel monitoring schedule or natural gas supplier data may be submitted or the natural gas sulfur content referenced in 40 CFR 75 Appendix D may be utilized. However, the applicant is responsible for ensuring that the procedures in 40 CFR60.335 or 40 CFR75 are used when determination of fuel sulfur content is made. Analysis may be performed by the owner or operator, a service contractor retained by the owner or operator, the fuel vendor, or any other qualified agency pursuant to 40 CFR 60.335(e) (1998 version).

32. Compliance with CO emission limit: An initial test for CO shall be conducted concurrently with the initial NO_X test, as required. The initial NO_X and CO test results shall be the average of three valid one-hour runs. Annual compliance testing for CO may be conducted at less than capacity when compliance testing is conducted concurrent with the annual RATA testing for the NO_X CEMS required pursuant to 40 CFR 75

33. Compliance with the VOC emission limit: An initial test is required to demonstrate compliance with the VOC emission limit. Thereafter, the CO emission limit and periodic tuning data will be employed as surrogate and no annual testing is required.

34. Testing procedures: Testing of emissions shall be conducted with the combustion turbine operating at permitted capacity. Permitted capacity is defined as 90-100 percent of the maximum heat input rate allowed by the permit, corrected for the average ambient air temperature during the test (with 100 percent represented by a curve depicting heat input vs. ambient temperature). If it is impracticable to test at permitted capacity, the source may be tested at less than permitted capacity. In this case, subsequent operation is limited by adjusting the entire heat input vs. ambient temperature curve downward by an increment equal to the difference between the maximum permitted heat input (corrected for ambient temperature) and 110 percent of the value reached during the test until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purposes of additional compliance testing to regain the permitted capacity. Procedures for these tests shall meet all applicable requirements (i.e., testing time frequency, minimum compliance duration, etc.) of Chapters 62-204 and 62-297, F.A.C.

35. Test Notification: The DEP's Southwest District shall be notified, in writing, at least 30 days prior to the initial performance tests and at least 15 days before annual compliance test(s).

36. Special Compliance Tests: The DEP may request a special compliance test pursuant to Rule 62-297.310(7), F.A.C., when, after investigation (such as complaints, increased visible emissions, or questionable maintenance of control equipment), there is reason to believe that any applicable emission standard is being violated.

37. Test Results: Compliance test results shall be submitted to the DEP's Southwest District no later than 45 days after completion of the last test run. [Rule 62-297.310(8), F.A.C.].

NOTIFICATION, REPORTING, AND RECORDKEEPING

38. Records: All measurements, records, and other data required to be maintained by IPSAPC shall be recorded in a permanent form and retained for at least five (5) years following the date on which such measurements, records, or data are recorded. These records shall be made available to DEP representatives upon request.

39. Compliance Test Reports: A test report indicating the results of the required compliance tests shall be filed as per Condition No.36 above. The test report shall provide sufficient detail on the tested emission unit and the procedures used to allow the Department to determine if the test was properly conducted and if the test results were properly computed. At a minimum, the test report shall provide the applicable information listed in Rule 62-297.310(8), F.A.C.

MONITORING REQUIREMENTS

40. Continuous Monitoring System: The permittee shall install, calibrate, maintain, and operate a continuous emission monitor in the stack to measure and record the nitrogen oxides emissions from these units. Upon request from EPA or DEP, the CEMS emission rates for NO_X on these Units shall be corrected to ISO conditions to demonstrate compliance with the NO_X standard established in 40 CFR 60.332. [Rules 62-204.800, 62-210.700, 62-4.130, 62-4.160(8), F.A.C, 40 CFR 75and 40 CFR 60.7 (1998 version)].

41. CEMS for reporting excess emissions: Excess Emissions and Monitoring System Performance Reports shall be submitted as specified in 40 CFR 60.7(c). CEM monitor downtime shall be calculated and reported according to the requirements of 40 CFR 60.7(c)(3) and 40CFR 60.7(d)(2). Periods when NO_X emissions (ppmvd @ 15% oxygen) are above the BACT standards, listed in Specific Conditions No 18 and 19, shall be reported to the DEP Southwest District within one working day (verbally) followed up by a written explanation not later than three (3) working days (alternatively by facsimile within one working day).

42. CEMS in lieu of Water to Fuel Ratio: The NO_X CEMS shall be used in lieu of the water/fuel monitoring system for reporting excess emissions in accordance with 40 CFR 60.334(c)(1), Subpart GG (1998version). The calibration of the water/fuel monitoring device required in 40 CFR 60.335 (c)(2) (1998 version) will be replaced by the 40 CFR 75 certification tests of the NO_X CEMS

43. Continuous Monitoring Certification and Quality Assurance Requirements: The monitoring devices shall comply with the certification and quality assurance, and any other applicable requirements of Rule 62-297.520, F.A.C., 40 CFR 60.13, including certification of each device in accordance with 40 CFR 60, Appendix B, Performance Specifications and 40 CFR 60.7(a)(5) or 40 CFR Part 75. Quality assurance procedures must conform to all applicable sections of 40 CFR 60, Appendix F or 40CFR75. The monitoring plan, consisting of data on CEM equipment specifications, manufacturer, type, calibration and maintenance needs, and its proposed location shall be provided to the DEP Emissions Monitoring Section Administrator and EPA for review no later than 45 days prior to the first scheduled certification test pursuant to 40 CFR 75.62.

44. Natural Gas Monitoring Schedule: A custom fuel monitoring schedule pursuant to 40 CFR 75 Appendix D for natural gas may be used in lieu of the daily sampling requirements of 40 CFR 60.334 (b)(2) provided the following requirements are met:

    - The permittee shall apply for an Acid Rain permit within the deadlines specified in 40 CFR 72.30.
    - The permittee shall submit a monitoring plan, certified by signature of the Designated Representative, that commits to using a primary fuel of pipeline supplied natural gas (sulfur content less than 20 gr/100 scf pursuant to 40 CFR 75.11(d)(2)).
    - Each unit shall be monitored for SO_2 emissions using methods consistent with the requirements of 40 CFR 75 and certified by the USEPA.

This custom fuel monitoring schedule will only be valid when pipeline natural gas is used as a primary fuel. If the primary fuel for these units is changed to a higher sulfur fuel, SO_2 emissions must be accounted for as required pursuant to 40 CFR 75.11(d).

45. Fuel Oil Monitoring Schedule: The following monitoring schedule for No. 2 or superior grade fuel oil shall be followed: For all bulk shipments of No. 2 fuel oil received at this facility an analysis which reports the sulfur content and nitrogen content of the fuel shall be provided by the fuel vendor. The analysis shall also specify the methods by which the analyses were conducted and shall comply with the requirements of 40 CFR 60.335(d).

46. Determination of Process Variables:

- The permittee shall operate and maintain equipment and/or instruments necessary to determine process variables, such as process weight input or heat input, when such data is needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.
- Equipment and/or instruments used to directly or indirectly determine such process variables, including devices such as belt scales, weigh hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value [Rule 62-297.310(5), F.A.C]

APPENDIX BD

BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

Shady Hills Generating Station
PSD-FL-280 and 1010373-001-AC
Pasco County, Florida

BACKGROUND

The applicant, IPS Avon Park Corporation (IPSAPC) proposes to install three nominal 170-megawatt (MW) General Electric PG 7241 FA combustion turbine-electrical generators at the planned Shady Hills Generating Station, East of Hudson in unincorporated Pasco County. The proposed project will constitute a New Major Facility per Rule 62-212.400(d)2.a., Florida Administrative Code (F.A.C.) because it will have the potential to emit at least 250 tons per year of a regulated pollutant. It is therefore subject to review for the Prevention of Significant Deterioration (PSD) and a determination of Best Available Control Technology (BACT) per Rule 62-212.400, F.A.C. Emissions of particulate matter (PM and PM_{10}), carbon monoxide (CO), nitrogen oxides (NO_X), volatile organic compounds (VOC), sulfur dioxide (SO_2), and sulfuric acid mist (SAM) will exceed the "Significant Emission Rates" with respect to Table 212.400-2, (F.A.C.). PSD and BACT reviews are required for each of these pollutants.

The new units will operate in simple cycle mode and intermittent duty and exhaust through separate 60-foot stacks. IPSAPC proposes to operate these units up to 3,390 hours per year per unit of which 1000 hr/yr/unit may be on maximum 0.05 percent sulfur distillate fuel oil. Descriptions of the process, project, air quality effects, and rule applicability are given in the Technical Evaluation and Preliminary Determination dated November 30, 1999, accompanying the Department's Intent to Issue.

DATE OF RECEIPT OF A BACT APPLICATION:

The application was received on October 26, 1999 and included a proposed BACT proposal prepared by the applicant's consultant, Golder Associates.

REVIEW GROUP MEMBERS:

A. A. Linero, P.E.

BACT DETERMINATION REQUESTED BY THE APPLICANT:

POLLUTANT	CONTROL TECHNOLOGY	PROPOSED BACT LIMIT
Nitrogen Oxides	Dry Low NO_X Combustors Water Injection (Oil)	9 ppmvd @ 15% O_2 (gas) 42 ppmvd @ 15% O_2 (oil)
Particulate Matter	Pipeline Natural Gas No. 2 Distillate Oil (1000 hr/yr) Combustion Controls	10 pounds per hour (gas) 17 pounds per hour (oil)
Carbon Monoxide	As Above	12 ppmvd (gas, baseload) 20 ppmvd (oil baseload)
Sulfur Dioxide/Sulfuric Acid Mist	As Above	1 grain S/100 std cubic feet (gas) 0.05 percent sulfur (oil)

According to the application, the maximum emissions from the facility will be approximately 756 tons per year (TPY) of NO_X, 259 TPY of CO, 61 TPY of PM/PM_{10}, 166 TPY of SO_2, 25 TPY of SAM, and 34 TPY of VOC.

BACT DETERMINATION PROCEDURE:

In accordance with Rule 62-212.400, F.A.C., this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department of Environmental Protection (Department), on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that, in making the BACT determination, the Department shall give consideration to:

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

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

STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES:

The minimum basis for a BACT determination is 40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines (NSPS). The Department adopted subpart GG by reference in Rule 62-204.800, F.A.C. The key emission limits required by Subpart GG are 75 ppmvd NO_X @ 15% O_2 (assuming 25 percent efficiency) and 150 ppmvd SO_2 @ 15% O_2 (or <0.8% sulfur in fuel). The BACT proposed by IPSAPC is within the NSPS limit, which allows NO_X emissions in the range of 110 ppmvd for the high efficiency units to be purchased for the Shady Hills Station.

No National Emission Standard for Hazardous Air Pollutants exists for stationary gas turbines.

DETERMINATIONS BY EPA AND STATES:

The following table is based primarily on "F" Class intermittent-duty simple cycle turbines recently permitted or still under review. One project (PREPA) based on smaller units but permitted to operate continuously is included as an example of a simple cycle unit with add-on control equipment. Another continuous-duty project (Lakeland) based on the larger "G" Class is also included. The proposed IPSAPC Shady Hills Station is included to facilitate comparison.

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

Project Location	Power Output (MW)	NO_X Limit ppmvd @ 15% O_2 and Fuel	Technology	Comments
Shady Hills Pasco, FL	510	9 - NG 42 - No. 2 FO	DLN WI	3x170 MW GE PG7241FA CTs Application 10/99. 1000 hrs on oil
Vandolah Hardee, FL	680	9 - NG 42 - No. 2 FO	DLN WI	4x170 MW GE PG7241FA CTs Issued 11/99. 1000 hrs on oil
Oleander Brevard, FL	850	9 - NG 42 - No. 2 FO	DLN WI	5x170 MW GE PG7241FA CTs Issued 11/99. 1000 hrs on oil
JEA Baldwin, FL	510	10.5 - NG 42 - No. 2 FO	DLN WI	3x170 MW GE MS7241FA CTs Issued 10/99. 750 hrs on oil
Reliant Osceola, FL	510	10.5 - NG 42 - No. 2 FO	DLN WI	3x170 MW GE MS7241FA CTs Draft 11/99. 750 hrs on oil
TEC Polk Power, FL	330	10.5 – NG 42 – No. 2 F.O.	DLN WI	2x165 MW GE MS7241FA CTs Issued 10/99. 750 hrs on oil
Dynegy, FL	510	15 – NG	DLN	3x170 MW WH 501F CTs Application 10/99. Gas only
Dynegy Heard, GA	510	15 – NG	DLN	3x170 MW WH 501F CTs Application. Gas only
Tenaska Heard, GA	960	15 - NG 42 - No. 2 FO	DLN WI	6x170 MW GE PG7241FA CTs Issued 12/98. 720 hrs on oil
Thomaston, GA	680	15 - NG 42 - No. 2 FO	DLN WI	4x170 MW GE PG7241FA CTs Application. 1687 hrs on oil
Dynegy Reidsville, NC	900	15 – NG (by 2002) 42 – No. 2 FO	DLN WI	5x180 MW WH 501F CTs Initially 25 ppm NO_X limit on gas Draft 5/98. 1000 hrs on oil.
Lyondell Harris, TX	160	25 – NG	DLN	1x160 MW WH 501F CTs Issued 11/99. Gas only
Southern Energy, WI	525	15/12 – NG 42 - No. 2 FO	DLN WI	3x175 MW GE PG7241FA CTs 15/12 ppm are on 1/24 hr basis Issued 1/99. 800 hrs on oil
RockGen Cristiana, WI	525	15/12 – NG 42 - No. 2 FO	DLN WI	3x175 MW GE PG7241FA CTs 15/12 ppm are on 1/24 hr basis Issued 1/99. 800 hrs on oil
Lakeland, FL	250 CON	9/9 – NG (by 2002) 42/15 - No. 2 FO	DLN/HSCR WI/HSCR	250 MW WH 501G CT Initially 25 ppm NO_X limit on gas Issued 7/98. 250 hrs on oil.
PREPA, PR	248 CON	10 - No. 2 FO	WI & HSCR	3x83 MW ABB GT11N CTs Issued 12/95.

CON = Continuous
SC = Simple Cycle
INT = Intermittent

DLN = Dry Low NO_X Combustion
SCR = Selective Catalytic Reduction
HSCR = Hot SCR

FO = Fuel Oil
NG = Natural Gas
WI = Water or Steam Injection

GE = General Electric
WH = Westinghouse
ABB = Asea Brown Bovari

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

Project Location	CO - ppm (or as indicated)	VOC - ppm (or as indicated)	PM - lb/hr (or as indicated)	Technology and Comments
Shady Hills Pasco, FL	12 - NG 20 - FO	1.4 – NG 7 – FO	10 lb/hr - NG 17 lb/hr - FO	Clean Fuels Good Combustion
Vandolah Hardee, FL	12 - NG 20 - FO	1.4 – NG 7 – FO	10 lb/hr - NG 17 lb/hr - FO	Clean Fuels Good Combustion
Oleander Brevard, FL	12 - NG 20 - FO	3 – NG 6 – FO	10% Opacity	Clean Fuels Good Combustion
JEA Baldwin, FL	12 - NG 20 - FO	1.4 – NG/FO Not PSD	9/17 lb/hr – NG/FO 10% Opacity	Clean Fuels Good Combustion
Reliant Osceola, FL	10.5 - NG 20 - FO	2.8 lb/hr – NG 7.5 lb/hr – FO	9 lb/hr - NG 17 lb/hr - FO	Clean Fuels Good Combustion
TEC Polk Power, FL	15 - NG 33 - FO	7 – NG 7 – FO	10% Opacity	Clean Fuels Good Combustion
Dynegy, FL	25 - NG	? – NG	? - NG	Clean Fuels Good Combustion
Dynegy Heard Co., GA	25 - NG	? – NG	? - NG	Clean Fuels Good Combustion
Tenaska Heard Co., GA	15 - NG 20 - FO	? – NG ? – FO	? - NG ? lb/hr - FO	Clean Fuels Good Combustion
Dynegy Reidsville, NC	25 - NG 50 - FO	6 lb/hr – NG 8 lb/hr – FO	6 lb/hr - NG 23 lb/hr - FO	Clean Fuels Good Combustion
Lyondell Harris, TX	25 - NG			Clean Fuels Good Combustion
RockGen Cristiana, WI	12@>50% load – NG 15@>75% 24@<75% - FO	2 - NG 5 - FO	18 lb/hr – NG 44 lb/hr - FO	Clean Fuels Good Combustion
RockGen Cristiana, WI	12@>50% load – NG 15@>75% 24@<75% - FO	2 - NG 5 - FO	18 lb/hr – NG 44 lb/hr - FO	Clean Fuels Good Combustion
Lakeland, FL	25 - NG or 10 by Ox Cat 75 - FO @ 15% O_2	4 – NG 10 – FO	10% Opacity	Clean Fuels Good Combustion
PREPA, PR	9 – FO @15% O_2	11 – FO @15% O_2	0.0171 gr/dscf	Clean Fuels Good Combustion

OTHER INFORMATION AVAILABLE TO THE DEPARTMENT:

Besides the information submitted by the applicant and that mentioned above, other information available to the Department consists of:

- Comments from the Fish and Wildlife Service dated December 27 1999
- DOE website information on Advanced Turbine Systems Project
- Alternative Control Techniques Document - NO_X Emissions from Stationary Gas Turbines
- General Electric 39th Turbine State-of-the-Art Technology Seminar Proceedings
- GE Guarantee for JEA Brandy Branch Station Project
- GE Combustion Turbine Startup Curves
- Goal Line Environmental Technologies Website – www.glet.com
- Catalytica Website – www.catalytica-inc.com

REVIEW OF NITROGEN OXIDES CONTROL TECHNOLOGIES:

Some of the discussion in this section is based on a 1993 EPA document on Alternative Control Techniques for NO_X Emissions from Stationary Gas Turbines. Project-specific information is included where applicable.

Nitrogen Oxides Formation

Nitrogen oxides form in the gas turbine combustion process as a result of the dissociation of molecular nitrogen and oxygen to their atomic forms and subsequent recombination into seven different oxides of nitrogen. Thermal NO_X forms in the high temperature area of the gas turbine combustor. Thermal NO_X increases exponentially with increases in flame temperature and linearly with increases in residence time. Flame temperature is dependent upon the ratio of fuel burned in a flame to the amount of fuel that consumes all of the available oxygen.

By maintaining a low fuel ratio (lean combustion), the flame temperature will be lower, thus reducing the potential for NO_X formation. Prompt NO_X is formed in the proximity of the flame front as intermediate combustion products. The contribution of Prompt to overall NO_X is relatively small in near-stoichiometric combustors and increases for leaner fuel mixtures. This provides a practical limit for NO_X control by lean combustion.

Fuel NO_X is formed when fuels containing bound nitrogen are burned. This phenomenon is not important when combusting natural gas. It is not a significant issue for the Shady Hills project because these units will not be continuously operated, but rather will be "peakers". Also, low sulfur fuel oil (which has more fuel-bound nitrogen than natural gas) is proposed to be used for no more than 1000 hours per year (per CT).

Uncontrolled emissions range from about 100 to over 600 parts per million by volume, dry, corrected to 15 percent oxygen (ppmvd @15% O_2). The Department estimates uncontrolled emissions at approximately 200 ppmvd @15% O_2 for each turbine of the Shady Hills Project. The proposed NO_X controls will reduce these emissions significantly.

NO_X Control Techniques

Wet Injection

Injection of either water or steam directly into the combustor lowers the flame temperature and thereby reduces thermal NO_X formation. Typical emissions achieved by wet injection are in the range of 15–25 ppmvd when firing gas and 42 ppmvd when firing fuel oil in large combustion turbines. These values often form the basis, particularly in combined cycle turbines, for further reduction to BACT limits by other techniques. Carbon monoxide (CO) and hydrocarbon (HC) emissions are relatively low for most gas turbines. However steam and (more so) water injection may increase emissions of both of these pollutants.

Combustion Controls

The excess air in lean combustion cools the flame and reduces the rate of thermal NO_X formation. Lean premixing of fuel and air prior to combustion can further reduce NO_X emissions. This is accomplished by minimizing localized fuel-rich pockets (and high temperatures) that can occur when trying to achieve lean mixing within the combustion zones.

The above principle is depicted in Figure 1 for a General Electric DLN-1 can-annular combustor operating on gas. For ignition, warm-up, and acceleration to approximately 20 percent load, the first stage serves as the complete combustor. Flame is present only in the first stage, which is operated as lean stable combustion will permit. With increasing load, fuel is introduced into the secondary stage, and combustion takes place in both stages. When the load reaches approximately 40 percent, fuel is cut off to the first stage and the flame in this stage is extinguished. The venturi ensures the flame in the second stage cannot propagate upstream to the first stage. When the fuel in the first-stage flame is extinguished (as verified by internal flame detectors), fuel is again introduced into the first stage, which becomes a premixing zone to deliver a lean, unburned, uniform mixture to the second stage. The second stage acts as the complete combustor in this configuration.

To further reduce NO_X emissions, GE developed the DLN-2.0 (cross section shown in Figure 1) wherein air usage (other than for premixing) was minimized. The venturi and the centerbody assembly were eliminated and each combustor has a single burning zone. So-called "quaternary fuel" is introduced through pegs located on the circumference of the outward combustion casing.

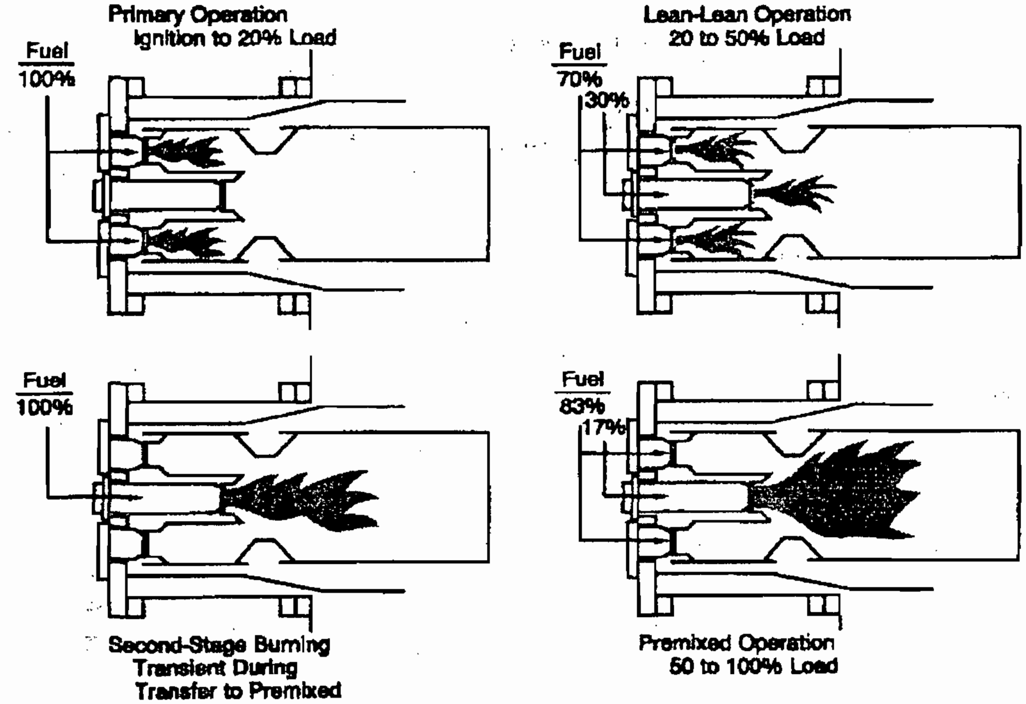
GE has made further improvements in the DLN design. The most recent version is the DLN-2.6 (proposed for the Shady Hills project). The combustor is similar to the DLN-2 with the addition of a sixth (center) fuel nozzle. The emission characteristics of the DLN-2.6 combustor while firing natural gas are given in Figure 2 for a unit tuned to meet a 15 ppmvd NO_X limit (by volume, dry corrected to at 15 percent oxygen) at JEA's Kennedy Station.

NO_X concentrations are higher in the exhaust at lower loads because the combustor does not operate in the lean pre-mix mode. Therefore such a combustor emits NO_X at concentrations of 15 ppmvd at loads between 50 and 100 percent of capacity, but concentrations as high as 100 ppmvd at less than 50 percent of capacity. Note that VOC comprises a very small amount of the "unburned hydrocarbons" which in turn is mostly non-VOC methane.

The combustor can be tuned differently to achieve emissions as low as 9 ppm of NO_X and 9 ppm of CO. Emissions characteristics by wet injection NO_X control while firing oil are expected to be similar for the DLN-2.6 as they are for those of the DLN-2.0 shown in Figure 3. Simplified cross sectional views of the totally premixed (while firing natural gas) DLN-2.6 combustor to be installed at the Shady Hills project are shown in Figure 4.

In all but the most recent gas turbine combustor designs, the high temperature combustion gases are cooled to an acceptable temperature with dilution air prior to entering the turbine (expansion) section. The sooner this cooling occurs, the lower the thermal NO_X formation. Cooling is also required to protect the first stage nozzle. When this is accomplished by air cooling, the air is injected into the component and is ejected into the combustion gas stream, causing a further drop in combustion gas temperature. This, in turn, lowers achievable thermal efficiency for the unit.

Larger units, such as the Westinghouse 501 G or the planned General Electric 7H, use steam in a closed loop system to provide much of the cooling. The fluid is circulated through the internal portion of the nozzle component or around the transition piece between the combustor and the nozzle and does not enter the exhaust stream. Instead it is normally sent back to a steam generator. The difference between flame temperature and firing temperature into the first stage is minimized and higher efficiency is attained.



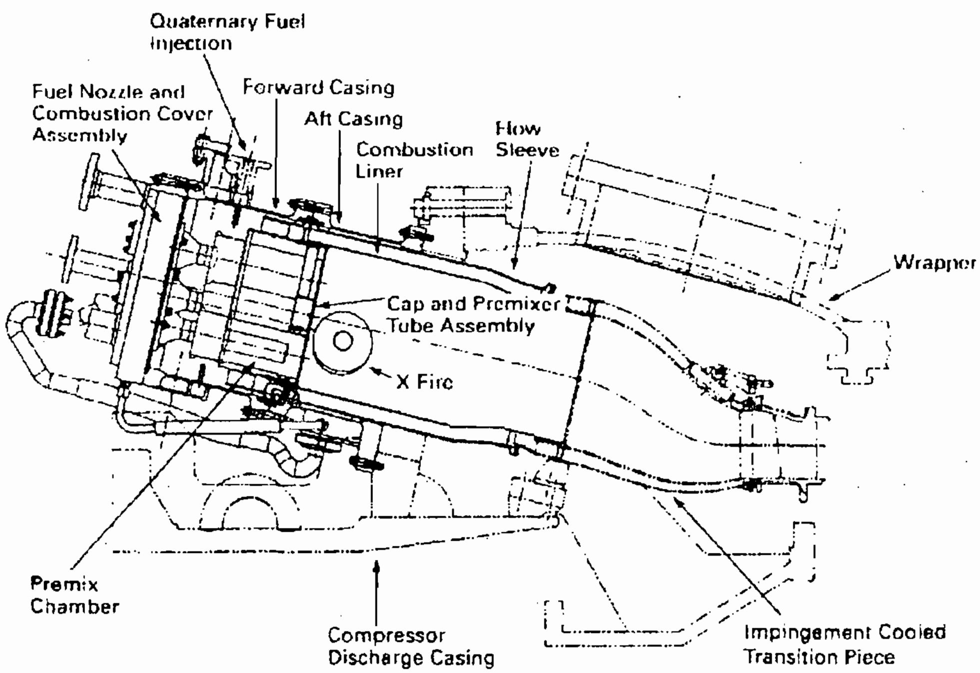


Figure 1 – Dry Low NO_X Operating Modes – DLN-1
Cross Section of GE DLN-2

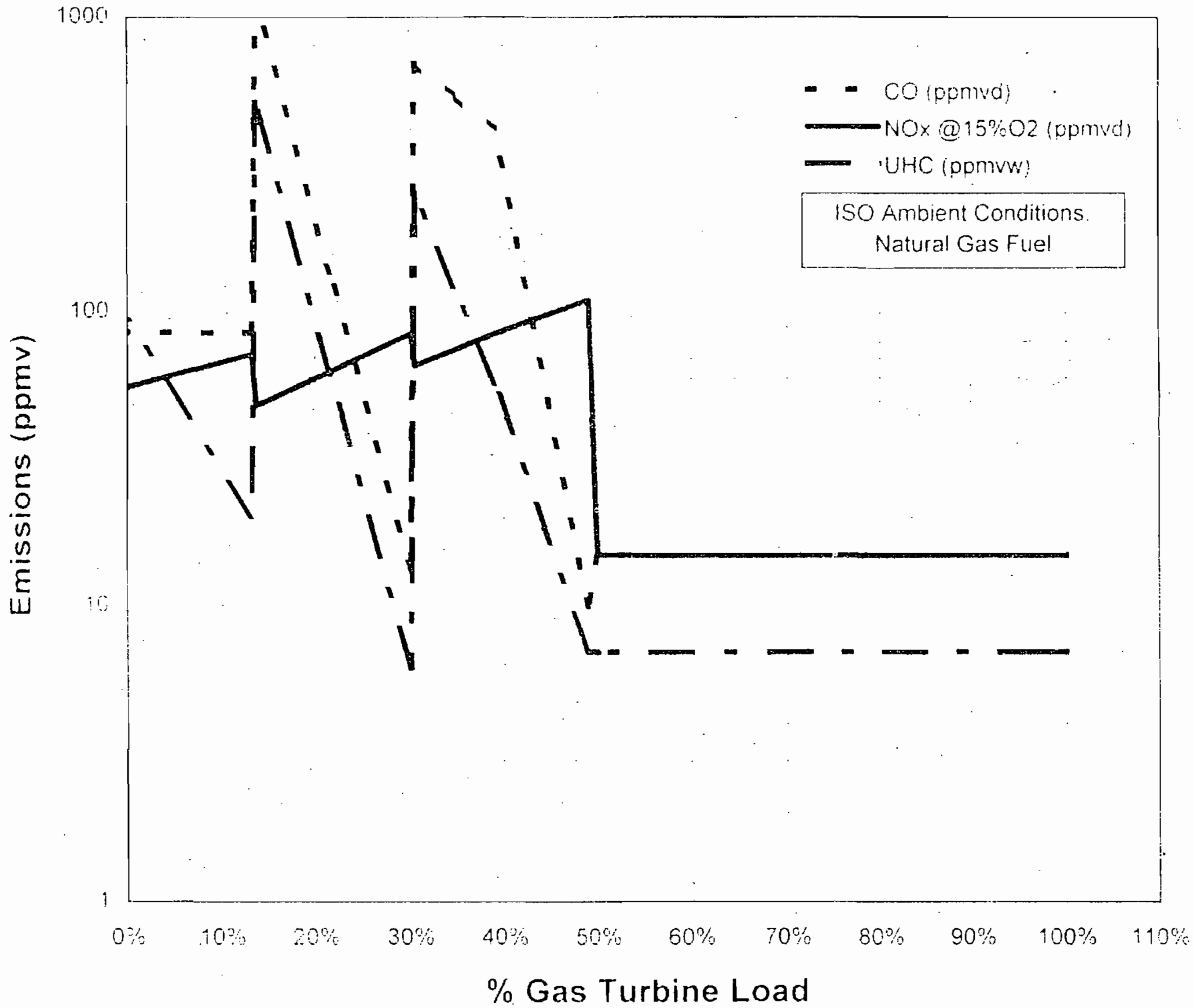


Figure 2 – Emissions Performance Curves for GE DLN-2.6 Combustor Firing Natural Gas in a Dual Fuel GE 7FA Combustion Turbine

(Simple Cycle Intermittent Duty – If Tuned to 15 ppmvd NO_x)

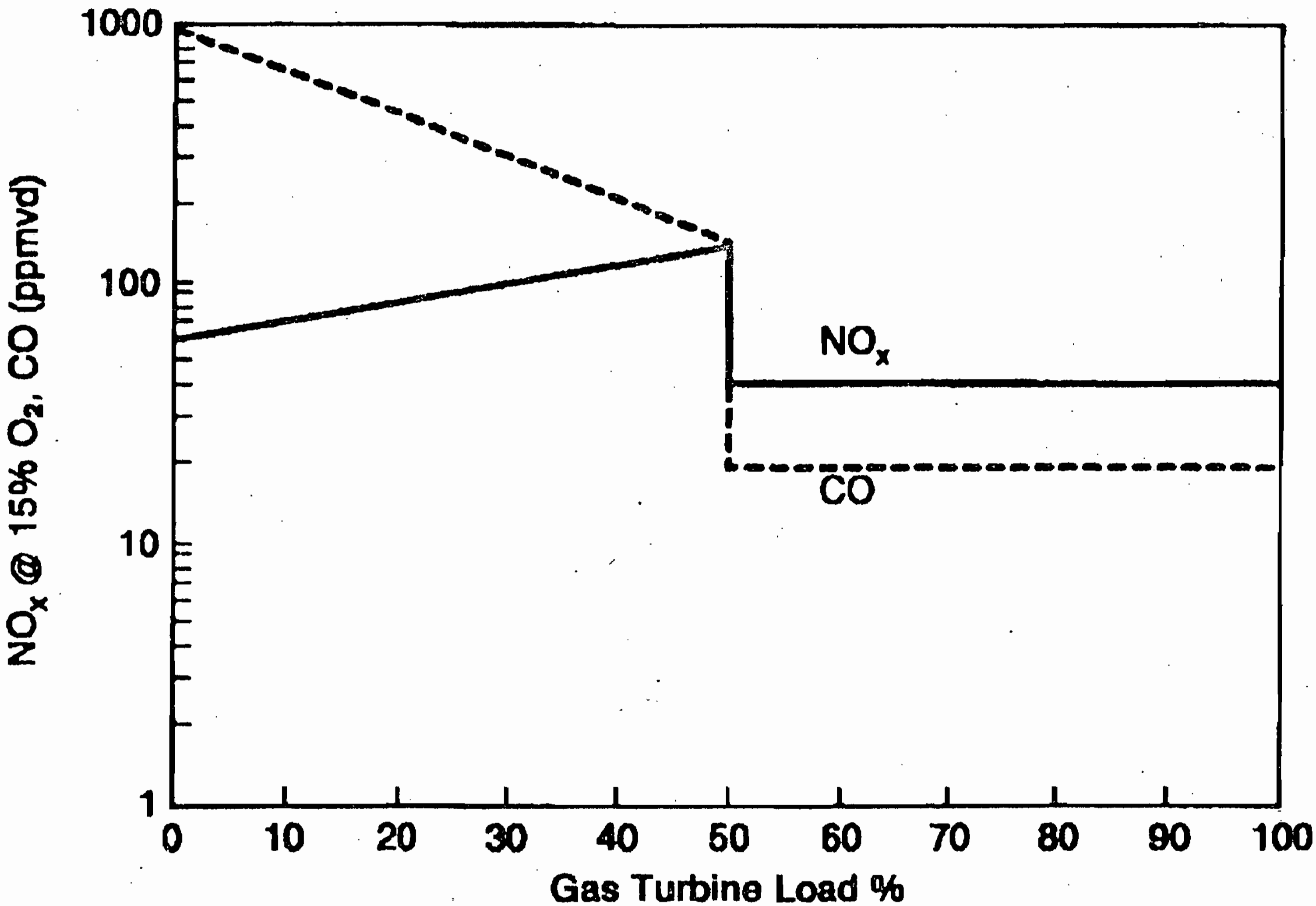


Figure 3 – Emissions Performance for DLN-2 Combustors
Firing Fuel Oil in Dual Fuel GE 7FA Turbine

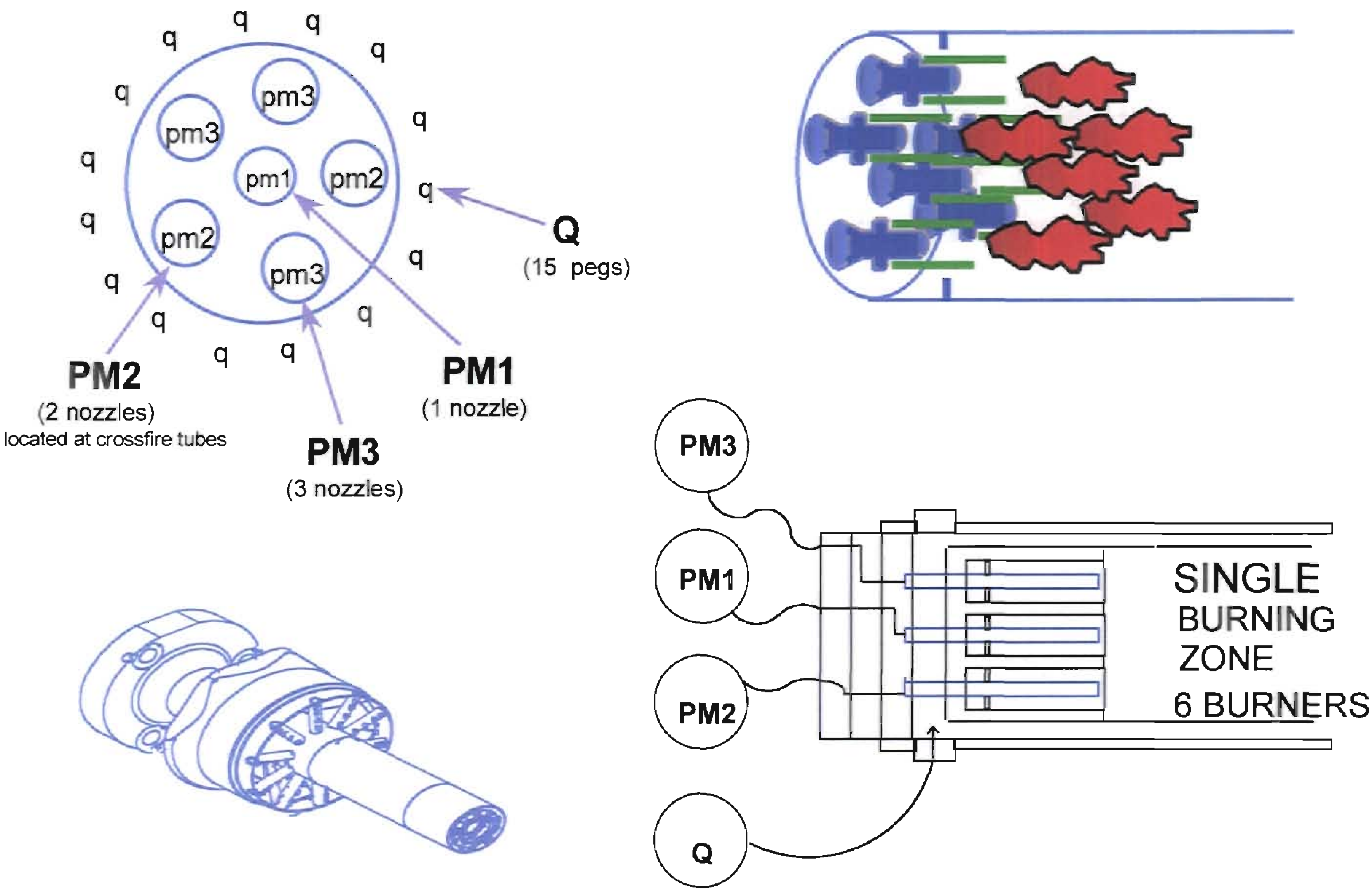


Figure 4 - DLN2.6 Fuel Nozzle Arrangement

Another important result of steam cooling is that a higher firing temperature can be attained with no increase in flame temperature. Flame temperatures and NO_X emissions can therefore be maintained at comparatively low levels even at high firing temperatures. At the same time, thermal efficiency should be greater when employing steam cooling. A similar analysis applies to steam cooling around the transition piece between the combustor and first stage nozzle.

The relationship between flame temperature, firing temperature, unit efficiency, and NO_X formation can be appreciated from Figure 5 which is from a General Electric discussion on these principles. In addition to employing pre-mixing and steam cooling, further reductions are accomplished through design optimization of the burners, testing, further evaluation, etc.

At the present time, emissions achieved by combustion controls are as low as 9 ppmvd from large gas turbines, such as the GE 7FA line. Specialized dual fuel DLN burners were installed in a project in Israel[1], but their performance on fuel oil is not known to the Department.

Selective Catalytic Combustion

Selective catalytic reduction (SCR) is an add-on NO_X control technology that is employed in the exhaust stream following the gas turbine. SCR reduces NO_X emissions by injecting ammonia into the flue gas in the presence of a catalyst. Ammonia reacts with NO_X in the presence of a catalyst and excess oxygen yielding molecular nitrogen and water. The catalysts used in combined cycle, low temperature applications (conventional SCR), are usually vanadium or titanium oxide and account for almost all installations. For high temperature applications (Hot SCR up to 1100 °F), such as simple cycle turbines, zeolite catalysts are available but used in few applications to-date. SCR units are typically used in combination with wet injection or DLN combustion controls.

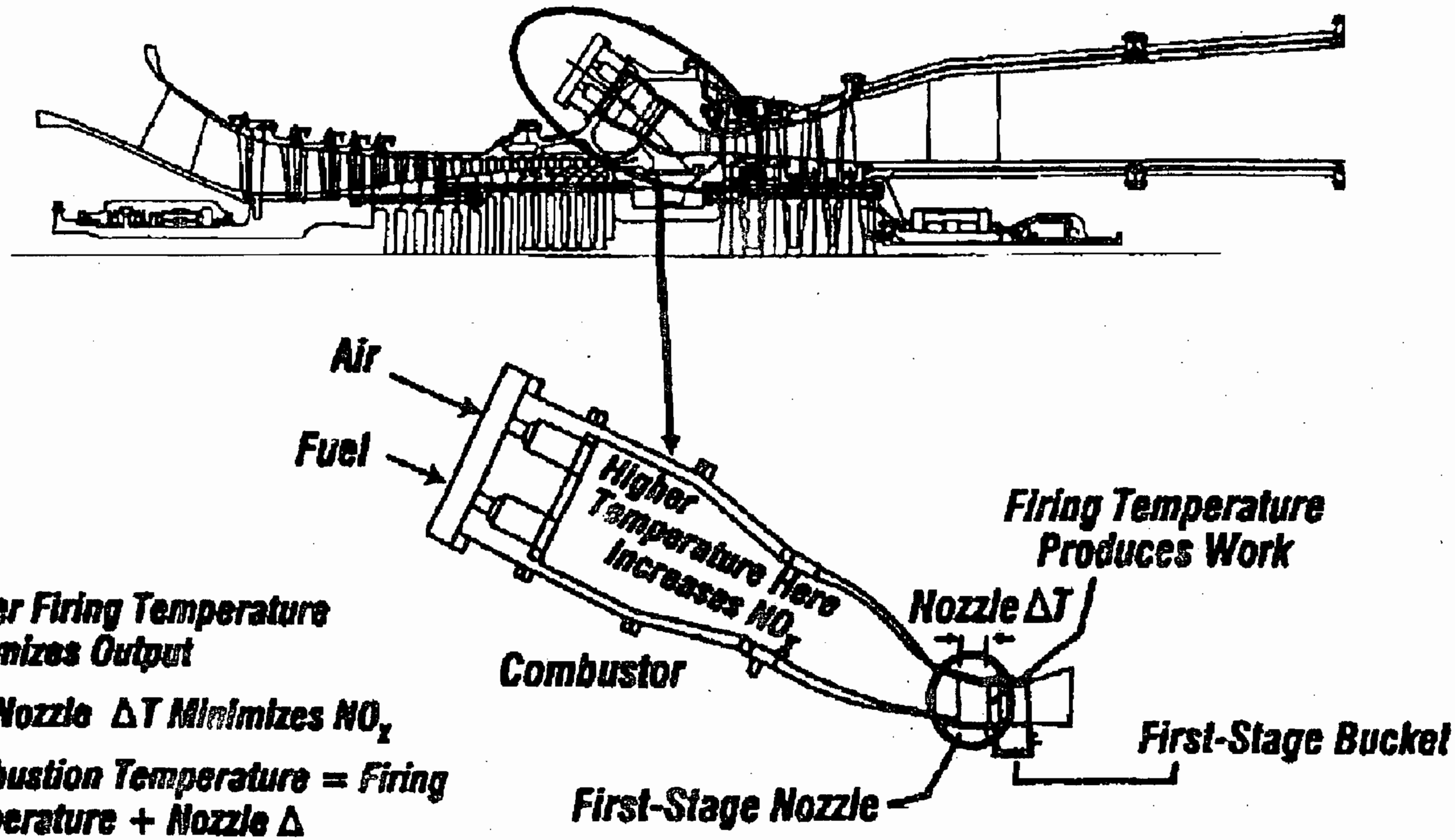
In the past, sulfur was found to poison the catalyst material. Sulfur-resistant catalyst materials are now becoming more available. Catalyst formulation improvements have proven effective in resisting sulfur-induced performance degradation with fuel oil in Europe and Japan, where conventional SCR catalyst life in excess of 4 to 6 years has been achieved, while 8 to 10 years catalyst life has been reported with natural gas.

Excessive ammonia use tends to increase emissions of CO, ammonia (slip) and particulate matter (when sulfur-bearing fuels are used).

As of early 1992, over 100 gas turbine installations already used SCR in the United States. Only one combustion turbine project in Florida (FPC Hines Power Block 1) employs SCR. The equipment was installed on a temporary basis because Westinghouse had not yet demonstrated emissions as low as 12 ppmvd by DLN technology at the time the units were to start up in 1998. Seminole Electric will install SCR on a previously permitted 501F unit at the Hardee Unit 3 project. The reasons are similar to those for the FPC Hines Power Block I.

Permit limits as low as 2.0 to 3.5 ppmvd NO_X have been specified using SCR on combined cycle F Class projects throughout the country. The recently permitted Kissimmee Cane Island Unit 3 project is one example.[2]

Gas Turbine - Hot Gas Path Parts



- *Higher Firing Temperature Maximizes Output*
- *Low Nozzle ΔT Minimizes NO_x*
- *Combustion Temperature = Firing Temperature + Nozzle Δ*

Figure 5 – Relation Between Flame Temperature and Firing Temperature

Selective Non-Catalytic Combustion

Selective non-catalytic reduction (SNCR) reduction works on the same principle as SCR. The differences are that it is applicable to hotter streams than conventional or hot SCR, no catalyst is required, and urea can be used as a source of ammonia. No applications have been identified wherein SNCR was applied to a gas turbine because the exhaust temperature of 1100 °F is too low to support the NO_X removal mechanism.

The Department did, however, specify SNCR as one of the available options for the combined cycle Santa Rosa Energy Center. The project will incorporate a large 600 MMBtu/hr duct burner in the heat recovery steam generator (HRSG) and can provide the acceptable temperatures (between 1400 and 2000 °F) and residence times to support the reactions.

Emerging Technologies: $SCONO_X$™ and XONON™

$SCONO_X$™ is a catalytic technology that achieves NO_X control by oxidizing and then absorbing the pollutant onto a honeycomb structure coated with potassium carbonate. The pollutant is then released as harmless molecular nitrogen during a regeneration cycle that requires dilute hydrogen gas. The technology has been demonstrated on small units in California and has been purchased for a small source in Massachusetts.[3] California regulators and industry sources have stated that the first 250 MW block to install $SCONO_X$ ™ will be at PG&E's La Paloma Plant near Bakersfield.[4] The overall project includes several more 250 MW blocks with SCR for control.[5] USEPA has identified an "achieved in practice" BACT value of 2.0 ppmvd over a three-hour rolling average based upon the recent performance of a Vernon, California natural gas-fired 32 MW combined cycle turbine equipped with $SCONO_X$™.

$SCONO_X$™ technology (at 2.0 ppmvd) is considered to represent LAER in non-attainment areas where cost is not a factor in setting an emission limit. It competes with less-expensive SCR in those areas, but has the advantages that it does not cause ammonia emissions in exchange for NO_X reduction. Advantages of the $SCONO_X$ ™ process include in addition to the reduction of NO_X, the elimination of ammonia and the control of VOC and CO emissions. $SCONO_X$™ has not been applied on any major sources in ozone attainment areas.

In a letter dated March 23, 1998 to Goal Line Environmental Technologies, the $SCONO_X$™ process was deemed as technically feasible for maintaining NO_X emissions at 2 ppmvd on a combined cycle unit. According to a recent press release, the Environmental Segment of ABB Alstom Power is now offering the technology (with performance guarantees) to "all owners and operators of natural gas-fired combined cycle combustion turbines, regardless of size."[6]

$SCONO_X$ requires a much lower temperature regime that is not available in simple cycle units and is therefore not feasible for this project. Therefore the $SCONO_X$ system cannot be considered as achievable or demonstrated in practice for this application.

XONON™, which works by partially burning fuel in a low temperature pre-combustor and completing the combustion in a catalytic combustor. The overall result is low temperature partial combustion (and thus lower NO_X combustion) followed by flameless catalytic combustion to further attenuate NO_X formation. The technology has been demonstrated on combustors on the same order of size as $SCONO_X$™ has. XONON™ avoids the emissions of ammonia and the need to generate hydrogen. It is also extremely attractive from a mechanical point of view.

Catalytica Combustion Systems, Inc. develops, manufactures and markets the XONON™ Combustion System. In a press release on October 8, 1998 Catalytica announced the first installation of a gas turbine equipped with the XONON™ Combustion System in a municipally owned utility for the production of electricity. The turbine was started up on that day at the Gianera Generating Station of Silicon Valley Power, a municipally owned utility serving the City of Santa Clara, Calif. The XONON™ Combustion System, deployed for the first time in a commercial setting, is designed to enable turbines to produce environmentally sound power without the need for expensive cleanup solutions. Previously, this XONON™ system had successfully completed over 1,200 hours of extensive full-scale tests which documented its ability to limit emissions of nitrogen oxides, a primary air pollutant, to less than 3 parts per million.

Recently, Catalytica and GE announced that the XONON™ combustion system has been specified as the preferred emissions control system with GE 7FA turbines that have been ordered for Enron's proposed 750 MW Pastoria Energy Facility.[7] The project will enter commercial operation by the Summer of 2001.

In principle, XONON™ will work on a simple cycle project. However, the Department does not have sufficient information regarding the status of the technology to for fuel oil firing and cycling operations.

REVIEW OF SULFUR DIOXIDE (SO_2) AND SULFURIC ACID MIST (SAM)

SO_2 control processes can be classified into five categories: fuel/material sulfur content limitation, absorption by a solution, adsorption on a solid bed, direct conversion to sulfur, or direct conversion to sulfuric acid. A review of the BACT determinations for combustion turbines contained in the BACT Clearinghouse shows that the exclusive use of low sulfur fuels constitutes the top control option for SO_2.

For this project, the applicant has proposed as BACT the use of 0.05% sulfur oil and pipeline natural gas. The applicant estimated total emissions for the project at 221 TPY of SO_2 and 34 TPY of SAM. The Department expects the emissions to be lower because of the limited oil consumption and the typical natural gas in Florida that contains less than 1 grain of sulfur per 100 standard cubic feet (gr S/100scf). This value is well below the "default" maximum value of 20 gr. S/100 scf, but high enough to require a BACT determination.

REVIEW OF PARTICULATE MATTER (PM/PM_{10}) CONTROL TECHNOLOGIES:

Particulate matter is generated by various physical and chemical processes during combustion and will be affected by the design and operation of the NO_X controls. The particulate matter emitted from this unit will mainly be less than 10 microns in diameter (PM_{10}).

Natural gas and 0.05 percent sulfur No. 2 (or superior grade) distillate fuel oil will be the only fuels fired and are efficiently combusted in gas turbines. Such fuels are necessary to avoid damaging turbine blades and other components already exposed to very high temperature and pressure. Natural gas is an inherently clean fuel and contains no ash. The fuel oil to be combusted contains a minimal amount of ash and its use is proposed for only 1000 hours per year making any conceivable add-on control technique for PM/PM_{10} either unnecessary or impractical.

A technology review indicated that the top control option for PM/PM_{10} is a combination of good combustion practices, fuel quality, and filtration of inlet air. Total annual emissions of PM_{10} for the project are expected to be approximately 82 tons per year.

REVIEW OF CARBON MONOXIDE (CO) CONTROL TECHNOLOGIES

CO is emitted from combustion turbines due to incomplete fuel combustion. Combustion design and catalytic oxidation are the control alternatives that are viable for the project. The most stringent control technology for CO emissions is the use of an oxidation catalyst.

All combustion turbines using catalytic oxidation appear to be combined cycle units. Among the most recently permitted ones are the 500 MW Wyandotte Energy project in Michigan, the El Dorado project in Nevada, Ironwood in Pennsylvania, Millenium in Massachusetts, and Sutter Calpine in California. The permitted CO values of these units are between 3 and 5 ppm. Catalytic oxidation was recently installed at a cogeneration plant at Reedy Creek (Walt Disney World), Florida to avoid PSD review which would have been required due to increased operation at low load. Seminole Electric recently proposed catalytic oxidation in order to meet the permitted CO limit at its planned 244 MW Westinghouse 501FD combined cycle unit in Hardee County, Florida.[8]

Most combustion turbines incorporate good combustion to minimize emissions of CO. So far this appears to be the only technology proposed at simple cycle turbine projects. These installations are typically permitted between 10 and 25 ppmvd at full load while firing gas. The values of 12 and 20 ppm for gas and oil respectively at baseload proposed in IPSAPC's original application are within the range of recent determinations for simple cycle CO BACT determinations. Values given in GE-based applications are representative of operations between 50 and 100 percent of full load.

REVIEW OF VOLATILE ORGANIC COMPOUND (VOC) CONTROL TECHNOLOGIES

Volatile organic compound (VOC) emissions, like CO emissions, are formed due to incomplete combustion of fuel. There are no viable add-on control techniques, particularly for simple cycle combustion turbines. The high flame temperature is very efficient at destroying VOC. The applicant has proposed good combustion practices to control VOC. The limits proposed by IPSAPC for this project are 1.4 ppmvd for gas and 7 ppmvw for oil firing at baseload. These limits are sufficient to keep annual emissions of VOC below the 40 TPY threshold and a BACT determination is not required. According to GE, VOC emissions less than 1.4 ppm were achieved during recent tests of the DLN-2.6 technology when firing natural gas.[9]

BACKGROUND ON PROPOSED GAS TURBINE

IPSAPC plans the purchase of three 170 MW (nominal) General Electric PG 7241FA simple cycle gas turbines. This is the most recent designation of GE's line of "F" Class units.

The first commercial GE 7F (or 7FA) unit was installed in a combined cycle project at the Virginia Power Chesterfield Station in 1990.[10] The initial units had a firing temperature of 2300 °F and a combined cycle efficiency exceeding 50 percent. By the mid-90s, the line was improved by higher combustor pressure, a firing temperature of 2400 °F, and a combined cycle efficiency of approximately 56 percent based on a 167 MW combustion turbine.

The first GE 7F/FA project in Florida was at the FPL Martin Plant in 1993 and entered commercial service in 1994.[11] The units were equipped with DLN-2 combustors with a permitted NO_X limit of 25 ppmvd. These actually achieved emissions of 13-25 ppmvd of NO_X, 0-3 ppm of CO, and 0-0.17 ppm of VOC.[12] The City of Tallahassee received a permit in 1998 to install a GE PG7231FA combustion turbine at its Purdom Plant.[13] Although permitted emissions are 12 ppmvd of NO_X, the City obtained a performance guarantee from GE of 9 ppmvd.[14]

FPL also obtained a guarantee and permit limit of 9 ppmvd NO_X for fourteen GE 7241FA turbines to be installed at the Fort Myers and Sanford Repowering Projects.[15, 16] The Santa Rosa Energy Center and the Lake Worth LLC projects in Florida also received a permit with a 9 ppmvd NO_X limit for a GE 7241FA turbine with DLN-2.6 burners.[17]

Most recently, the Department issued BACT determinations for the simple cycle Oleander project in Brevard County, the Vandolah Power Project in Hardee County, the TEC project in Polk County and the JEA Brady Branch Project in Duval County. These five permits also include "new and clean" NO_X limits of 9 ppmvd based on the DLN-2.6 technology installed on F Class units. The Oleander and Vandolah Projects will meet 9 ppmvd on a 24-hour basis and will be allowed to burn fuel oil for 1000 hr/yr/unit. The TEC and JEA projects will meet 10.5 ppmvd on a 24-hour basis, but will limited in oil firing to 750 hr/yr/unit.

General Electric has primarily relied on further advancement and refinement of DLN technology to provide sufficient NO_X control for their combustion turbines in Florida. When required by BACT determinations of most states, General Electric incorporates SCR in combined cycle projects.[18] In its recent permits, Florida has included separate and lower limits in the event that GE's DLN technology does not achieve 9 ppmvd or the applicant selects a manufacturer that does not provide combustors capable of meeting 9 ppmvd.

GE's approach of progressively refining such technology is a proven one, even on some relatively large units. Recently GE Frame 7FA units met performance guarantees of 9 ppmvd with "DLN-2.6" burners at Fort St. Vrain, Colorado and Clark County, Washington.[19] Although the permitted limit is 15 ppmvd, GE has already achieved emission levels of approximately 7-9 ppmvd on gas at a dual-fuel 7EA (120 MW combined cycle) KUA Cane Island Unit 2.[20] Unit 2 is equipped with DLN-1 combustors. Performance guarantees less than 9 ppmvd can be expected for DLN-2.6 combustors on units delivered in a couple of years.[21]

The 9-ppmvd NO_X limit on natural gas proposed by IPSAPC is very stringent for simple cycle 7FA combustion turbines. Typically, companies obtain a guarantee from GE to achieve 9 ppmvd during a test on a "new and clean unit." The test must be conducted at a steady-state load of 50 to 100 percent and completed within the first 100 fired hours of operation.

With the frequent start-ups and shutdowns of the unit, some applicants, such as TEC and JEA, are concerned about the ability to maintain the low NO_X values for long periods of time. As a result, TEC and JEA agreed to a "new and clean" limit of 9 ppmvd but a continuing limit of 10.5 ppmvd. Their permits reflect fewer hours on oil for the higher NO_X value on gas. Presumably, their concern would be lessened should these units be converted to baseload combined cycle operation. Although the Department is not fully aware of the details of the GE guarantee for Shady Hills (proposed 9 ppmvd on a simple cycle unit), the Department is aware from discussions with other applicants that a continuing guarantee may be available at a substantial cost.[22]

The GE Speedtronic™ Mark V Gas Control System will be used. This control system is designed to fulfill all gas turbine control requirements. These include control of liquid, gas, or both fuels in accordance with the requirements of the speed, load control under part-load conditions, temperature control under maximum capability conditions, or during start-up conditions. The Mark V also monitors the DLN process and controls fuel staging and combustion modes to maintain the programmed NO_X values.[23]

DEPARTMENT BACT DETERMINATION

Following are the BACT limits determined for the Shady Hills project assuming full load. Values for NO_X are corrected to 15% O_2 on a dry volume basis. The emission limits or their equivalents in terms of pounds per hour and NSPS units, as well as the applicable averaging times, are given in the permit Specific Conditions Nos. 18 through 23.

POLLUTANT	CONTROL TECHNOLOGY	PROPOSED BACT LIMIT
PM/PM_{10}, VE	Pipeline Natural Gas Good Combustion	10 Percent Opacity 10/17 lb/hr – Gas/Fuel Oil
CO	As Above	12 ppmvd – Gas 20 ppmvd – Fuel Oil
SO_2/SAM	As Above	1 grain of sulfur per 100 ft^3 gas 0.05 Percent Sulfur in Fuel Oil
NO_X	Dry Low NO_X, WI for F.O., limited oil use	9 ppmvd – Gas 42 ppmvd – F.O. for 1000 of 3,390 hours

RATIONALE FOR DEPARTMENT'S DETERMINATION

- The Top technology and Lowest Achievable Emission Rate (LAER) for simple cycle combustion turbines are Hot SCR and an emission limit of 5 ppmvd and possibly less. It is possible that XONON™ can be applied to this project.
- An example of the above is the Carson Plant in Sacramento, California where there is a Hot SCR system on a simple cycle LM6000PA combustion turbine. Emissions of ammonia are more than 10 ppmvd at the Carson Plant.

- Hot SCR is not commonly used on simple cycle combustion turbines. Although it was required on the fuel oil-fired PREPA project (to achieve 10 ppmvd), the requirement has been removed from the permit. This does not mean that it is not feasible for intermittent duty simple cycle combustion turbines firing natural gas.
- Hot SCR is required at the simple cycle continuous duty Lakeland McIntosh Unit 5 Project if the Westinghouse 501 G unit fails to achieve 9 ppmvd while firing natural gas. Hot SCR was considered cost-effective because the unit will operate continuously and the expected NO_X reduction is from 25^+ to 9 ppmvd). The ammonia slip guarantee is 10 ppmvd.
- The levelized costs of NO_X removal by Hot SCR for the Shady Hills project were estimated by Golder at $14,900 per ton assuming 3,390 hours of operation on natural gas and a reduction from 9 to 3.6 ppmvd on gas and 42 to 17 ppmvd on fuel oil. The estimate is based on an ammonia slip of 10 ppmvd.
- The Department believes that the cost of NO_X control estimated for the Shady Hills project is on the "high side." This is partly based on EPA Region IV comments on the Vandolah Power Project.[24] Also certain repetitive costs such as Engineering within Indirect Costs for three units are not likely to be three times as much as they are for a single units.
- In the face of a real requirement to install Hot SCR, a system could be engineered to cool the gases and use the heat in a recuperator of some kind. Additionally a once-through steam generator could accomplish the same end with the generated steam used for steam augmentation. This could increase revenues to pay for the additional equipment and possibly reduce the cost-effectiveness values.
- The Department believes, nevertheless, that the cost effectiveness of NO_X control by Hot SCR is still more than $10,000 per ton of NO_X removed.
- Hot SCR is not commonly used in PSD attainment areas. Although the Department does not have a "bright line" cost-effectiveness figure and does not necessarily adopt the precise cost calculations for the Shady Hills Station, Hot SCR is not cost-effective for this project. Therefore it is rejected as BACT.
- The Department will limit operation of the three units to 3,390 hours per year per unit. No single unit may operate more than 5,000 hours per year to insure that the conclusion regarding cost-effectiveness remains applicable.
- The units will be operated in intermittent duty and simple cycle mode. Therefore control options, which are feasible only for combined cycle units, are not applicable. This rules out Low Temperature (conventional) SCR, which achieves 3.5 ppmvd NO_X or lower. It also rules out the possibility of $SCONO_X$. XONON is available for F Class gas-fired projects. However the status of its development for use in fuel oil or cycling operations is not known.
- General Electric has provided a "clean and new" guarantee of 9 ppmvd NO_X. This value is equal to that required at the Lakeland continuous duty combustion turbine.

- Typical permit limits nation-wide for these GE 7FA units while operating on natural gas and in simple cycle mode and intermittent duty are 9-15 ppmvd even though GE provides the same "new and clean" guarantees for them. Limits as high as 25 ppmvd have been recently proposed by some for similar units produced by other manufacturers.
- A level of 9 ppmvd NO_X by DLN has been demonstrated on GE 7FA combustion turbines at Fort St. Vrain, Colorado and Clark County, Washington. However the permitted limits are actually higher at these two facilities providing some level of operating margin.
- A long-term limit of 9 ppmvd is required for the for five GE7 FA units in the Oleander Project in Brevard County and for four identical units in the IPSAPC Vandolah Power Project in Hardee County. A BACT level of 9 ppmvd has been proposed by Virginia Power for a GE 7FA unit to avoid non-attainment New Source Review.
- The 9 ppmvd limit at Oleander, Vandolah, Shady Hills, and Virginia Power while firing natural gas is the lowest known BACT value for an "F" frame combustion turbine operating in simple cycle mode and intermittent duty. The 42 ppmvd limit while firing fuel oil is typical.
- The gas-based NO_X emission limit of 9 ppmvd will be difficult to maintain over short term averaging times. That is the main reason why some operators cannot provide reasonable assurance they can meet such a low limit by DLN. The Department believes a 24-hour averaging time is appropriate. Only periods during which the unit is operated will contribute to the 24 hour average. For example if the unit operates only 6 hours in 24 hours and averages 9 ppmvd during the 6 hours, the reported concentration will still be 9 ppmvd.
- The Department prefers not to set a 24-hour average limit that includes start-up emissions for a peaking unit. There will be a short period during start-up when emissions will actually exceed 100 ppmvd (see Figure 2). Such periods can probably be absorbed into an emissions limit with a long-term averaging time for a continuous duty. It would be much more difficult for an intermittent duty unit that might run only a few continuous hours on occasion.
- The fuel oil-based NO_X emissions limit of 42 ppmvd can be maintained over a short-term averaging period by varying the amount of water injected. The Department has determined that a 3-hour averaging time is appropriate.
- The Department issued permits for the TEC Polk Power, JEA Brandy Branch, and Reliant Osceola Projects with 10.5 ppmvd limit for the same simple cycle GE 7241FA units, but limited the hours of operation on fuel oil to only 750 hours compared with 1000 hours at Oleander, Vandolah and Shady Hills.
- The proposed BACT limit of 9 ppmvd is about less than one-tenth of the applicable NSPS limit per 40 CFR 60, Subpart GG for units as efficient as the 7FA.
- Comments from the National Park Service on the Oleander project suggested that a reduction from 42 to 25 ppmvd in NO_X emissions while burning fuel oil is possible. GE has advised that 42 ppmvd NO_X is the lowest guarantee on F Class units when firing oil. The Department has requested that GE work on developing wet or dry technologies to reduce NO_X emissions for units permitted to fire substantial amounts of fuel oil.[25]

- The Department is aware that ABB offers a DLN technology for fuel oil firing applicable to at least certain smaller combustion turbines (ABB-GTX). It is noted, however, that ABB does not offer a guarantee of 9 ppmvd on the same unit when firing natural gas.
- It is possible that the NO_X emissions while firing oil from may be reduced from 42 ppmvd by increasing the water injection rate. In order to address this possibility, a specific condition will be added to conduct appropriate testing and prepare an engineering report. The report will be submitted for the Department's review to ensure that the lowest reliable NO_X emission rates while firing oil have been achieved.
- The Department's overall BACT determination is equivalent to approximately 0.4 lb/MW-hr by Dry Low NO_X. For reference, the new NSPS promulgated on September 3, 1998 requires that new conventional power plants (based on boilers, etc.) meet a limit of 1.6 lb/MW-hr.
- VOC emissions of 1.4 ppmvd while firing gas and 7 ppmvw proposed by the applicant are achievable and will insure that PSD is not triggered for this pollutant.
- The Department will set CO limits achievable by good combustion at full load as 12 ppm (gas) and 20 ppm (oil). These values are equal to the lowest values from permitted or proposed simple cycle units. These limits are equal to those proposed by the Department for the Oleander, Vandolah, Reliant, JEA Brandy Branch, and TEC Polk Power projects.
- Golder evaluated the use of an oxidation catalyst for the Shady Hills project with an 80 percent control efficiency. The oxidation catalyst control system was estimated to increase the capital cost of the project by $1,700,000 per unit with an annualized cost of $466,000 per year per unit. Golder estimated levelized costs for CO catalyst control at $9,000 per ton. The Department does not necessarily adopt this estimate, but would agree that even much lower estimates would not be cost-effective for removal of CO.
- BACT for PM_{10} was determined to be good combustion practices consisting of: inlet air filtering; use of pipeline natural gas; use of clean, low ash, low sulfur fuels, and operation of the unit in accordance with the manufacturer-provided manuals. The emission limits for PM10 will be set at 10 pounds per hour during gas operation and 17 pounds per hour while operating on fuel oil.
- PM_{10} emissions will be very low and difficult to measure. Additionally, the higher emission mode will involve fuel oil firing which will occur only approximately 1000 hours per year. It is not practical to require running the turbine on oil, simply to conduct tests. Therefore, the Department will set a Visible Emission standard of 10 percent opacity as BACT for both natural gas and fuel oil firing, consistent with the definition of BACT. Examples of installations with similar VE limits include the City of Lakeland, JEA Brandy Branch, TEC Polk Power, Oleander Power and quite a number of combined cycle projects.

POLLUTANT	COMPLIANCE PROCEDURE
Visible Emissions	Method 9
Carbon Monoxide	Annual Method 10 (can use RATA if at capacity)
NO_X (performance)	Annual Method 20 (can use RATA if at capacity)
NO_X (gas - 24-hr block average) (oil – 3-hr block average)	NO_X CEMS, O_2 or CO_2 diluent monitor, and flow device as needed. During gas operation, a separate compliance determination is conducted at the end of each operating day and a new average emission rate is calculated from the arithmetic average of all valid hourly emission rates from the previous operating day. A valid hourly emission rate shall be calculated for each hour in which at least two NO_X concentrations are obtained at least 15 minutes apart. Valid hourly emission rates shall not include periods of start up, shutdown, or malfunction unless prohibited by 62-210.700 F.A.C.
SO_2 and SAM	Custom Fuel Monitoring Schedule

DETAILS OF THE ANALYSIS MAY BE OBTAINED BY CONTACTING:

A. A. Linero, P.E. Administrator 1/1?
New Source Review Section
Department of Environmental Protection
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended By:

C. H. Fancy, P.E., Chief
Bureau of Air Regulation

Date: 1/11/00

Approved By:

Howard L. Rhodes, Director
Division of Air Resources Management

Date: 1/11/00

REFERENCES

[1] Telecom. Linero, A.A., FDEP and Chalfin, J., GE. NO_X control technology for fuel oil.

[2] Permit. Florida DEP. Kissimmee Utility Authority Cane Island Unit 3. File PSD-FL-254. November, 1999.

[3] News Release. Goaline Environmental. Genetics Institute Buys $SCONO_X$ Clean Air System. August 20, 1999.

[4] "Control Maker Strives to Sway Utility Skeptics." Air Daily. Volume 5, No. 199. October 14, 1998.

[5] Telecom. Linero, A.A., FDEP, and Beckham, D., U.S. Generating. Circa November 1998.

[6] News Release. ABB Alstom Power, Environmental Segment. ABB Alstom Power to Supply Groundbreaking SCONOX™ Technology. December 1, 1999.

[7] News Release. Catalytica. XONON™ Specified With GE 7FA Gas Turbines For Enron Power Project. December 15, 1999.

[8] Letter. Opalinski, M.P., SECI to Linero, A.A., FDEP. Turbines and Related Equipment at Hardee Unit 3. December 9, 1998.

[9] Telecon. Vandervort, C., GE, and Linero, A.A., DEP. "VOC Emissions from FA Gas Turbines with DLN-2.6 Combustors."

[10] Brochure. General Electric. "GE Gas Turbines - MS7001FA." Circa 1993.

[11] Davis, L.B., GE. "Dry Low NO_X Combustion Systems for GE Heavy Duty Gas Turbines." 1994.

[12] Report. Florida Power & Light. "Final Dry Low NO_X Verification Testing at Martin Combine Cycle Plant." August 7, 1995.

[13] Permit. Florida DEP. City of Tallahassee Purdom Unit 8. File PSD-FL-239. May, 1998.

[14] Application. City of Tallahassee. PSD/Site Certification Application. April, 1997.

[15] Permit. Florida DEP. FPL Fort Myers Repowering Project. File 0710002-004-AC. November, 1998.

[16] Permit. Florida DEP. FPL Sanford Repowering Project. File 1270009-004-AC. September, 1998.

[17] Permit. Florida DEP. Santa Rosa Energy Center. File 1130168-001-AC. December, 1998.

[18] Permit. State of Alabama. Alabama Power Plant Barry. 1998.

[19] Telecon. Schorr, M., GE, and Costello, M., Florida DEP. March 31, 1998. Status of DLN-2.6 Program

[20] Monthly Report. Florida DEP Bureau of Air Regulation. June, 1998.

[21] Telecon. Schorr, M., GE, and Linero, A.A., Florida DEP. August, 1998. Cost effectiveness of DLN versus SCR.

[22] Telecon. Gianazza, N.B., JEA, and Linero, A.A., Florida DEP. Proposed NO_X limits at Brandy Branch Project.

[23] Rowen, W.I. "General Electric Speedtronic™ Mark V Gas Turbine Control System. 1994."

[24] Letter. Neeley, R.D., EPA Region IV to Linero, A.A., FDEP. Draft Permit for IPS Avon Park Vandolah Power Project. November 19, 1999.

[25] Letter. Linero, A. A., FDEP to Forry, J. and Chalfin, J. General Electric. NO_X emissions control while firing fuel oil in Simple Cycle Units. October 12, 1999.

G.1 The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

G.2 This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings or exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

G.3 As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

G.4 This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

G.5 This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

G.6 The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

G.7 The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

a) Have access to and copy and records that must be kept under the conditions of the permit;
b) Inspect the facility, equipment, practices, or operations regulated or required under this permit, and,
c) Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

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

G.8 If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

a) A description of and cause of non-compliance; and
b) The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

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

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

G.10 The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

G.11 This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

G.12 This permit or a copy thereof shall be kept at the work site of the permitted activity.

G.13 This permit also constitutes:

a) Determination of Best Available Control Technology (X)
b) Determination of Prevention of Significant Deterioration (X); and
c) Compliance with New Source Performance Standards (X).

G.14 The permittee shall comply with the following:

a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application or this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

c) Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements;
2. The person responsible for performing the sampling or measurements;
3. The dates analyses were performed;
4. The person responsible for performing the analyses;
5. The analytical techniques or methods used; and
6. The results of such analyses.

G.15 When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

Memorandum

Florida Department of Environmental Protection

BAR

TO: Howard L. Rhodes

THRU: Clair Fancy

FROM: Al Linero 1/10

DATE: January 10, 2000

SUBJECT: IPSAPC Shady Hills Generating Station
Three 170 MW Combustion Turbines
DEP File No. 1010373-001-AC (PSD-FL-280)

Attached is the Final Determination, Notice, Permit, and BACT for construction of three dual-fuel, intermittent duty, simple cycle, 170 MW combustion turbines and one 2.8 million gallon fuel oil storage tanks at the planned Shady Hills Generating Station near Hudson in Pasco County.

Nitrogen Oxides (NO_X) emissions from the gas turbine will be controlled by Dry Low NO_X (DLN-2.6). The applicant proposed an NO_X emission limit of 9 ppmvd @15% O_2. The use of fuel oil will be allowed up to 1000 hours per year per unit. The NO_X and fuel oil hours are equal to the values in the Final Oleander permit and the Final IPSAPC Vandolah Power permit. For reference, JEA and TEC were allowed 10.5 ppmvd NO_X on gas, but only 750 hours per year per unit of operation on fuel oil.

NO_X emissions will be controlled to 42 ppmvd during the limited fuel oil use. Emissions of carbon monoxide, volatile organic compounds, sulfur dioxide, sulfuric acid mist, and particulate matter (PM/PM_{10}) will be very low because of the inherently clean pipeline quality natural gas, limited fuel oil use and, especially, the design of the GE unit.

The project will be located only 28 km South of the Chassahowitzka Class I Area. The modeling of all sources contributing to increment indicated modeled exceedances of the Class I sulfur dioxide increments. Because this project does not contribute significantly to the exceedances, the Fish and Wildlife Sevice did not object to its construction. However they requested by letter that the Department identify the sources responsible for the exceedances and take remedial action.

I recommend your approval and signature on the Permit and BACT determination.

AAL/al

Attachments

IN REPLY REFER TO:

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1875 Century Boulevard
Atlanta, Georgia 30345
December 16, 1999

Re: PSD-FL-280

RECEIVED
DEC 27 1999
BUREAU OF AIR REGULATION

Mr. C. H. Fancy
Chief, Bureau of Air Regulation
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road, MS 48
Tallahassee, Florida 32399-2400

Dear Mr. Fancy:

Our Air Quality Branch has reviewed the Prevention of Significant Deterioration Application for IPS Avon Park Corporation's (IPS), proposal to construct a 510 MW power production facility known as the Shady Hills Generating Station in Pasco County, Florida. The facility is located 28 km south of Chassahowitzka Wilderness, a Class I area, administered by the U.S. Fish and Wildlife Service.

The technical review comments from our Air Quality Branch are enclosed. IPS's analyses were performed correctly and predicted that the project would not adversely affect Chassahowitzka. However, IPS's analyses predicted several exceedances of the Class I sulfur dioxide increments. Because IPS did not contribute significantly to increment consumption at the time of the exceedances, IPS is considered to comply with the increments. However, we are concerned about these exceedances and ask that your Department identify the sources responsible for the exceedances and take remedial action to rectify the exceedances. Please respond to the Air Quality Branch as soon as possible on this issue.

Thank you for giving us the opportunity to comment on this permit application. We appreciate your cooperation in notifying us of proposed projects with the potential to impact the air quality and air quality related resources of our Class I air quality areas. If you have questions, please contact Ms. Ellen Porter of our Air Quality Branch in Denver at 303/969-2617.

Sincerely yours,

H Dale Hall
for Sam D. Hamilton
Regional Director

Enclosure

cc: T. Heron, BAR
SWD
EPA
J. Ellis, IPS
K. Kosky, Golder Assoc.

cc:
Mr. Doug Neeley
Chief, Air and Radiation Branch
U.S. EPA, Region IV
100 Alabama St., SW.
Atlanta, Georgia 30303

bcc:
FWS-REG. 4: AQC
Refuge Manager, Chassahowitzka NWR, FL
AQD-DEN: Ms. Ellen Porter
National Park Service - AIR
P.O. Box 25287
Denver, CO 80225

Technical Review of Prevention of Significant Deterioration Permit Application
For the Construction of a 510 MW Power Production Facility
Shady Hills Generating Station
Pasco County, Florida
PSD-FL-280

by

Air Quality Branch, Fish and Wildlife Service – Denver
August 31, 1999

IPS Avon Park Corporation (IPS) proposes to construct a 510 MW power production facility, composed of three 170 MW General Electric GE PG7241 (FA) simple cycle gas/oil turbines. The facility would be located in Pasco County, Florida, 28 km south of Chassahowitzka Wilderness, a Class I area administered by the U.S. Fish and Wildlife Service (FWS).

This project will result in PSD-significant increases in emissions of nitrogen oxides (NO_X), sulfur dioxide (SO_2), sulfuric acid mist (SAM), particulate matter (PM-10), and carbon monoxide (CO). Emissions (in tons per year – TPY) are summarized below.

POLLUTANT	EMISSIONS INCREASE (TPY)
NO_X	756
SO_2	166
SAM	25
PM-10	61
CO	259

Class I Increment Exceedances

IPS's analyses predicted several exceedances of the Class I SO_2 increments. IPS evaluated the project's contribution to Class I increments with the Industrial Source Complex (ISCST3) model and predicted that the project would contribute significantly (i.e., maximum impacts exceeded the Environmental Protection Agency's significant impact levels) to the 3-hour and 24-hour Class I SO_2 increments. Therefore, as required, IPS performed a cumulative analysis with the CALPUFF model, modeling SO_2 emissions from all increment-consuming sources within 150 km of Chassahowitzka. The cumulative analysis predicted one exceedance of the 3-hour and three exceedances of the 24-hour SO_2 increments, respectively. However, the Shady Hills project did not contribute significantly to these exceedances and, therefore, is considered to comply with the Class I increments.

It is now the responsibility of the Florida Department of Environmental Protection (FDEP) to determine which sources are significantly contributing to the increment exceedances and take remedial actions to rectify the exceedances.

Best Available Control Technology (BACT) Analysis

The use of dry low-NO_x burners to meet a 9-ppm NO_x limit represents BACT for a simple cycle turbine burning natural gas; 42-ppm is acceptable for limited oil firing.

Use of 0.05% sulfur oil represents BACT for a back-up fuel.

Shady Hills' BACT analysis is acceptable.

Air Quality Related Values Analysis

The visibility analysis was done correctly and indicated that there would be low potential for impacts to visibility due to plumes in the Class I area.

Contact: Ellen Porter, Air Quality Branch (303) 969-2617.

THE TAMPA TRIBUNE
Published Daily
Tampa, Hillsborough County, Florida

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DEC 23 1999

BUREAU OF AIR REGULATION

State of Florida }
County of Hillsborough } ss.

Before the undersigned authority personally appeared J. Rosenthal, who on oath says that she is Classified Billing Manager of The Tampa Tribune, a daily newspaper published at Tampa in Hillsborough County, Florida; that the attached copy of advertisement being a

LEGAL NOTICE (PASCO)

in the matter of

PUBLIC NOTICE OF INTENT

was published in said newspaper in the issues of

DECEMBER 14, 1999

Affiant further says that the said The Tampa Tribune is a newspaper published at Tampa in said Hillsborough County, Florida, and that the said newspaper has heretofore been continuously published in said Hillsborough County, Florida, each day and has been entered as second class mail matter at the post office in Tampa, in said Hillsborough County, Florida for a period of one year next preceding the first publication of the attached copy of advertisement: and affiant further says that she has neither paid nor promised any person, this advertisement for publication in the said newspaper.

J. Rosenthal

Sworn to and subscribed before me, this 14 day of DECEMBER, A.D. 1999

Personally Known____or Product Identification______
Type of Identification Produced________

CHARLOTTE A. OFFNER
Notary Public, State of Florida
My comm. expires April 21, 2000
No. CC548844

(SEAL)

Charlotte A. Offner

cc: SWD
EPA
NPS

PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT
STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
DEP File No. 1010373-001-AC (PSD-FL-280)
Shady Hills Generating Station - Units 1-3
Pasco County

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit under the requirements for the Prevention of Significant Deterioration (PSD) of Air Quality to IPS Avon Park Corporation. The permit is to construct three nominal 170 megawatt (MW) natural gas and distillate fuel oil-fired combustion turbine-electrical generators with 60-foot stacks and one 2.8 million gallon fuel oil storage tank for the proposed Shady Hills Generating Station East of Hudson in unincorporated Pasco County. A Best Available Control Technology (BACT) determination was required for sulfur dioxide (SO2), particulate matter (PM/PM10), nitrogen oxides (NOx), sulfuric acid mist (SAM), and carbon monoxide (CO) pursuant to Rule 62-212.400, F.A.C. The applicant's name and address are IPS Avon Park Corporation, 1560 Gulf Boulevard, #701, Clearwater, Florida 33767.

The new units will be General Electric nominal 170 MW PG7241FA combustion turbines-electrical generators. The units will operate in simple cycle mode and intermittent duty. The units will operate primarily on natural gas and will be permitted to operate 3,390 hours per year of which no more than 1000 hours per year will be using 0.05 percent sulfur distillate fuel oil.

NOx emissions will be controlled by Dry Low NOx (DLN-2.6) combustors. The units must meet a continuous emission limit of 9 parts per million by volume at 15 percent oxygen (ppm). NOx will be controlled to 42 ppm by wet injection when firing fuel oil. Sulfuric acid mist, SO2, and PM/PM10 will be limited by use of clean fuels. Emissions of VOC and CO will be controlled by good combustion practices.

The maximum emissions from the combustion turbines in tons per year based on the original application are summarized below. There will be minor emissions of VOC from the fuel oil storage tank. However total VOC emissions will still be less than significant for PSD purposes.

Pollutant	Maximum Potential Emissions	PSD Significant Emission Rate
PM/PM10	61	25/15
CO	259	100
NOx	756	40
VOC	34	40
SO2	166	40
Sulfuric Acid Mist	25	7

Air quality and regional haze impact analyses were conducted. Maximum predicted impacts due to proposed emissions from the project are less than the applicable PSD Class I and Class II significant impact levels. There will be insignificant impacts on visibility in the Class I Chassahowitzka National Wildlife Area. Based on the required analyses, the Department has reasonable assurance that the proposed project will not cause or significantly contribute to a violation of any AAQS or PSD increment.

The Department will issue the FINAL Permit, in accordance with the conditions of the DRAFT Permit, unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments and requests for public meetings concerning the proposed permit issuance action for a period of 30 (thirty) days from the date of publication of this Public Notice of Intent to Issue Air Construction Permit. Written comments and requests for public meetings should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit and require, if applicable, another Public Notice.

The Department will issue the permit with the attached conditions unless a timely petition for an administrative hearing is filed pursuant to sections 120.569 and 120.57 F.S., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below. Mediation is not available in this proceeding.

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

A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner, the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action; and (g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the agency to take with respect to the agency's proposed action.

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

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

A complete project file is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environmental Protection
Bureau of Air Regulation
111 S. Magnolia Drive, Suite 4
Tallahassee, Florida 32301
Telephone: 850/488-0114
Fax: 850/922-6979

Department Environmental Protection
Southwest District Office
3804 Coconut Palm Drive
Tampa, Florida 33619-8218
Telephone: 813/744-6100
Fax: 813/744-6084

The complete project file includes the application, technical evaluations, Draft Permit, and the information submitted by the responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Administrator, New Resource Review Section at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-0114, for additional information.

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Department of Environmental Protection

Jeb Bush
Governor

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

David B. Struhs
Secretary

November 30, 1999

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Gregg Worley, Chief
Preconstruction/HAP Section
Air, Radiation Technology Branch
US EPA Region IV
61 Forsyth Street
Atlanta, GA 30303

Re: PSD Review and Custom Fuel Monitoring Schedule
IPSAPC Shady Hills Generating Station
PSD-FL-280

Dear Mr. Worley:

Enclosed are two copies of the Department's Intent to Issue package for the IPSAPC Shady Hills Generating Station in Pasco County. It will be a natural gas and oil-fired simple cycle facility consisting of three nominal 170-megawatt (MW) simple cycle combustion turbine-electrical generators.

Please provide your comments on the Draft BACT determination and Draft Permit. The project is not subject to the Florida's Power Plant Siting procedure because it will generate no electricity from steam.

Please send your written comments on or approval of the applicant's proposed custom fuel monitoring schedule. The plan is based on the letter dated January 16, 1996 from Region V to Dayton Power and Light. The Subpart GG limit on SO_2 emissions is 150 ppmvd @ 15% O_2 or a fuel sulfur limit of 0.8% sulfur. Neither of these limits could conceivably be violated by the use of pipeline quality natural gas with a sulfur limit of 1 grain per 100 standard cubic feet or by back-up fuel oil with a 0.05% sulfur content. The requirements have been incorporated into the enclosed draft permit as Specific Conditions 44 and 45 and read as follows:

44. Natural Gas Monitoring Schedule: A custom fuel monitoring schedule pursuant to 40 CFR 75 Appendix D for natural gas may be used in lieu of the daily sampling requirements of 40 CFR 60.334 (b)(2) provided the following requirements are met:

   - The permittee shall apply for an Acid Rain permit within the deadlines specified in 40 CFR 72.30.

   - The permittee shall submit a monitoring plan, certified by signature of the Designated Representative, that commits to using a primary fuel of pipeline supplied natural gas (sulfur content less than 20 gr/100 scf pursuant to 40 CFR 75.11(d)(2)).

- Each unit shall be monitored for SO_2 emissions using methods consistent with the requirements of 40 CFR 75 and certified by the USEPA.
- This custom fuel monitoring schedule will only be valid when pipeline natural gas is used as a primary fuel. If the primary fuel for these units is changed to a higher sulfur fuel, SO_2 emissions must be accounted for as required pursuant to 40 CFR 75.11(d).

45. Fuel Oil Monitoring Schedule: The following monitoring schedule for No. 2 or superior grade fuel oil shall be followed: For all bulk shipments of No. 2 fuel oil received at this facility an analysis which reports the sulfur content and nitrogen content of the fuel shall be provided by the fuel vendor. The analysis shall also specify the methods by which the analyses were conducted and shall comply with the requirements of 40 CFR 60.335(d).

Please comment on Specific Conditions 40 and 41 which allow the use of the acid rain NO_X CEMS for demonstrating compliance as well as reporting excess emissions, as well as Specific Condition 42 which allows the use of CEMS in lieu of measuring the water to fuel ratio. Typically NO_X emissions will be less than 9 ppmvd @15% O_2 (natural gas) which is less than one-tenth of the applicable Subpart GG limit based on the efficiency of the unit. A CEMS requirement is stricter and more accurate than any Subpart GG requirement for determining excess emissions.

The Department recommends your approval of the custom fuel monitoring schedule and these NO_X monitoring provisions. If you have any questions on these matters please contact me at 850/921-9523.

Sincerely,

AA Lin 11/30

A. A. Linero, P.E. Administrator
New Source Review Section

AAL/al

Enclosures

Z 031 392 024

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to Gregg Worley	
Street & Number EPA	
Post Office, State, & ZIP Code Atlanta GA	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 11-29-99 1010373-001-AC PSD-FL-280	

PS Form **3800**, April 1995

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Mr. Gregg Worley, Chief
Air, Radiation Technology Branch
Preconstruction/HAP Section
U.S. EPA - Region IV
61 Forsyth Street
Atlanta, GA 30303

4a. Article Number
Z 031 392 024

4b. Service Type
☐ Registered ☑ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery

5. Received By: *(Print Name)*
JOYCE EVANS

6. Signature: *(Addressee or Agent)*
X DEC -2 1999

8. Addressee's Address *(Only if requested and fee is paid)*

Is your RETURN ADDRESS completed on the reverse side?

Thank you for using Return Receipt Service.

PS Form **3811**, December 1994 102595-98-B-0229 Domestic Return Receipt

Department of Environmental Protection

Jeb Bush
Governor

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

David B. Struhs
Secretary

November 30, 1999

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. John S. Ellis
IPS Avon Park Corporation
1560 Gulf Boulevard, #701
Clearwater, Florida 32767

Re: DEP File No. 1010373-001-AC (PSD-FL-280)
Shady Hills Generating Station
Three Simple Cycle Combustion Turbines

Dear Mr. Ellis:

Enclosed is one copy of the Draft Permit, Technical Evaluation and Preliminary Determination, and Draft BACT Determination, for the Shady Hills Generating Station to be located near Hudson in unincorporated Pasco County. The Department's Intent to Issue Air construction Permit and the "Public Notice of Intent to Issue Air Construction Permit" are also included.

The Public Notice must be published one time only as soon as possible in a newspaper of general circulation in the area affected, pursuant to Chapter 50, Florida Statutes. Proof of publication, i.e., newspaper affidavit, must be provided to the Department's Bureau of Air Regulation office within 7 (seven) days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

Please provide any updates to this application in response to the comments received from EPA (letter dated November 9) by the Department for the almost identical Vandolah Power Project. Submit any other written comments you wish to have considered concerning the Department's proposed action to A. A. Linero, P.E., Administrator, New Source Review Section at the above letterhead address or contact him at 850/921-9523.

Sincerely,

AA Linero P.E. 11/30

for C. H. Fancy, P.E., Chief,
Bureau of Air Regulation

CHF/al

Enclosures

Z 031 392 025

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to John Ellis	
Street & Number IPS	
Post Office, State, & ZIP Code Shady Hills	
Postage Clearwater	$ Fl
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 11-29-99 1D1D373-001-AC PSD-Fl-280	

PS Form **3800**, April 1995

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
John Ellis
IPS Avm Park Corp.
1560 Gulf Blvd, # 701
Clearwater, Fl
32767

4a. Article Number
Z 031 392 025

4b. Service Type
- ☐ Registered
- ☐ Express Mail
- ☐ Return Receipt for Merchandise
- ☒ Certified
- ☐ Insured
- ☐ COD

7. Date of Delivery
12 · 2 · 99

5. Received By: *(Print Name)*
John Ellis

8. Addressee's Address *(Only if requested and fee is paid)*

6. Signature: *(Addressee or Agent)*
X John S. Ellis

PS Form **3811,** December 1994 102595-98-B-0229 Domestic Return Receipt

Thank you for using Return Receipt Service.

In the Matter of an
Application for Permit by:

Mr. John S. Ellis
IPS Avon Park Corporation
1560 Gulf Boulevard, # 701
Clearwater, FL 32767

DEP File No. 1010373-001-AC (PSD-280)
Shady Hills Station, Units 1 – 3
Pasco County

INTENT TO ISSUE AIR CONSTRUCTION PERMIT

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit (copy of DRAFT Permit attached) for the proposed project, detailed in the application specified above and the attached Technical Evaluation and Preliminary Determination, for the reasons stated below.

The applicant, IPS Avon Park Corporation, applied on October 26, 1999 to the Department for an air construction permit to construct three 170-MW dual-fuel "F" class combustion turbines and one 2.8 million gallon fuel oil storage tank for the Shady Hills Generating Station to be located near Hudson in Pasco County.

The Department has permitting jurisdiction under the provisions of Chapter 403, Florida Statutes (F.S.), and Florida Administrative Code (F.A.C.) Chapters 62-4, 62-210, and 62-212. The above actions are not exempt from permitting procedures. The Department has determined that an air construction permit under the provisions for the Prevention of Significant Deterioration (PSD) of Air Quality is required for the proposed work.

The Department intends to issue this air construction permit based on the belief that reasonable assurances have been provided to indicate that operation of these emission units will not adversely impact air quality, and the emission units will comply with all appropriate provisions of Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297, F.A.C.

Pursuant to Section 403.815, F.S., and Rule 62-110.106(7)(a)1., F.A.C., you (the applicant) are required to publish at your own expense the enclosed Public Notice of Intent to Issue Air Construction Permit. The notice shall be published one time only in the legal advertisement section of a newspaper of general circulation in the area affected. Rule 62-110.106(7)(b), F.A.C., requires that the applicant cause the notice to be published as soon as possible after notification by the Department of its intended action. For the purpose of these rules, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. If you are uncertain that a newspaper meets these requirements, please contact the Department at the address or telephone number listed below. The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400 (Telephone: 850/488-0114; Fax 850/ 922-6979). You must provide proof of publication within seven days of publication, pursuant to Rule 62-110.106(5), F.A.C. No permitting action for which published notice is required shall be granted until proof of publication of notice is made by furnishing a uniform affidavit in substantially the form prescribed in section 50.051, F.S. to the office of the Department issuing the permit. Failure to publish the notice and provide proof of publication may result in the denial of the permit pursuant to Rules 62-110.106(9) & (11), F.A.C.

The Department will issue the final permit with the attached conditions unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments and requests for public meetingsconcerning the proposed permit issuance action for a period of 30 (thirty) days from the date of publication of Public Notice of Intent to Issue Air Permit. Written comments and requests for public meetings should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit and require, if applicable, another Public Notice.

The Department will issue the permit with the attached conditions unless a timely petition for an administrative hearing is filed pursuant to sections 120.569 and 120.57 F.S., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below.

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

A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner, the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action; and (g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the agency to take with respect to the agency's proposed action.

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

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above. Mediation is not available in this proceeding.

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

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

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

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

Executed in Tallahassee, Florida.

P.E. 11/30

for C. H. Fancy, P.E., Chief
Bureau of Air Regulation

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this INTENT TO ISSUE AIR CONSTRUCTION PERMIT (including the PUBLIC NOTICE, Technical Evaluation and Preliminary Determination, Draft BACT Determination, and the DRAFT permit) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 11-29-99 to the person(s) listed:

John S. Ellis, IPS Avon Park*
Gregg Worley, EPA
John Bunyak, NPS
Bill Thomas, DEP SWD
Chair, Pasco County BCC
Ken Kosky, P.E., Golder

Clerk Stamp

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

(Clerk) 11-29-99 (Date)

PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DEP File No. 1010373-001-AC (PSD-FL-280)

Shady Hills Generating Station – Units 1-3
Pasco County

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit under the requirements for the Prevention of Significant Deterioration (PSD) of Air Quality to IPS Avon Park Corporation. The permit is to construct three nominal 170 megawatt (MW) natural gas and distillate fuel oil-fired combustion turbine-electrical generators with 60-foot stacks and one 2.8 million gallon fuel oil storage tank for the proposed Shady Hills Generating Station East of Hudson in unincorporated Pasco County. A Best Available Control Technology (BACT) determination was required for sulfur dioxide (SO_2), particulate matter (PM/PM_{10}), nitrogen oxides (NO_x), sulfuric acid mist (SAM), and carbon monoxide (CO) pursuant to Rule 62-212.400, F.A.C. The applicant's name and address are IPS Avon Park Corporation, 1560 Gulf Boulevard, # 701, Clearwater, Florida 33767.

The new units will be General Electric nominal 170 MW PG7241FA combustion turbines-electrical generators. The units will operate in simple cycle mode and intermittent duty. The units will operate primarily on natural gas and will be permitted to operate 3,390 hours per year of which no more than 1000 hours per year will be using 0.05 percent sulfur distillate fuel oil.

NO_X emissions will be controlled by Dry Low NO_X (DLN-2.6) combustors. The units must meet a continuous emission limit of 9 parts per million by volume at 15 percent oxygen (ppm). NO_X will be controlled to 42 ppm by wet injection when firing fuel oil. Sulfuric acid mist, SO_2, and PM/PM_{10} will be limited by use of clean fuels. Emissions of VOC and CO will be controlled by good combustion practices.

The maximum emissions from the combustion turbines in tons per year based on the original application are summarized below. There will be minor emissions of VOC from the fuel oil storage tank. However total VOC emissions will still be less than significant for PSD purposes.

Pollutant	Maximum Potential Emissions	PSD Significant Emission Rate
PM/PM_{10}	61	25/15
CO	259	100
NO_X	756	40
VOC	34	40
SO_2	166	40
Sulfuric Acid Mist	25	7

Air quality and regional haze impact analyses were conducted. Maximum predicted impacts due to proposed emissions from the project are less than the applicable PSD Class I and Class II significant impact levels. There will be insignificant impacts on visibility in the Class I Chassahowitzka National Wildlife Area .Based on the required analyses, the Department has reasonable assurance that the proposed project will not cause or significantly contribute to a violation of any AAQS or PSD increment.

The Department will issue the FINAL Permit, in accordance with the conditions of the DRAFT Permit, unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments and requests for public meetings concerning the proposed permit issuance action for a period of 30 (thirty) days from the date of publication of this Public Notice of Intent to Issue Air Construction Permit. Written comments and requests for public meetings should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit and require, if applicable, another Public Notice.

The Department will issue the permit with the attached conditions unless a timely petition for an administrative hearing is filed pursuant to sections 120.569 and 120.57 F.S., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below. Mediation is not available in this proceeding.

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

A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner, the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action; and (g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the agency to take with respect to the agency's proposed action.

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

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

A complete project file is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environmental Protection
Bureau of Air Regulation
111 S. Magnolia Drive, Suite 4
Tallahassee, Florida 32301
Telephone: 850/488-0114
Fax: 850/922-6979

Department Environmental Protection
Southwest District Office
3804 Coconut Palm Drive
Tampa, Florida 33619-8218
Telephone: 813/744-6100
Fax: 813/744-6084

The complete project file includes the application, technical evaluations, Draft Permit, and the information submitted by the responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Administrator, New Resource Review Section at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-0114, for additional information.

TECHNICAL EVALUATION

AND

PRELIMINARY DETERMINATION

IPSAPC Shady Hills Generating Station Units 1 - 3

Three 170-Megawatt Combustion Turbines
One 2.8-Million Gallon Fuel Oil Storage Tank
Pasco County

DEP File No. 1010373-001-AC (PSD-FL-280)

Department of Environmental Protection
Division of Air Resources Management
Bureau of Air Regulation

November 30, 1999

1. APPLICATION INFORMATION

1.1 Applicant Name and Address

IPS Avon Park Corporation
1560 Gulf Boulevard, # 701
Clearwater, Florida 32767

Authorized Representative: *Mr. John S. Ellis*

1.2 Reviewing and Process Schedule

10-26-99: Date of Receipt of Application
11-30-99: Intent Issued

2. FACILITY INFORMATION

2.1 Facility Location

Refer to Figures 1 and 2 below. The IPSAPC Shady Hills Project will be located in unincorporated Pasco County, Northeast of Bayonet Point. The site is approximately 4 miles North of SR 52, 6 miles East of Hudson and immediately West of Shady Hills Road. The location is approximately 28 kilometers South Southeast from the Chassahowitzka Class I National Wilderness Area. UTM coordinates for this facility are Zone 17; 347.0 km E; 3139.0 km N.

Figure 1 – Regional Location

Figure 2 – East of Hudson, Pasco County

2.2 Standard Industrial Classification Codes (SIC)

Industry Group No.	49	Electric, Gas, and Sanitary Services
Industry No.	4911	Electric Services

2.3 Facility Category

This proposed facility will generate 510 megawatts (nominal MW) of electrical power. The facility is classified as a Major or Title V Source of air pollution because emissions of at least one regulated air pollutant, such as particulate matter (PM/PM_{10}), sulfur dioxide (SO_2), nitrogen oxides (NO_X), carbon monoxide (CO), or volatile organic compounds (VOC) exceeds 100 TPY.

This facility is <u>not</u> within an industry included in the list of the 28 Major Facility Categories per Table 62-212.400-1, F.A.C. Because emissions are greater than 250 TPY for at least one criteria pollutant, the facility is also a major facility with respect to Rule 62-212.400, F.A.C., Prevention of Significant Deterioration (PSD), and a Best Available control Technology determination is required. Given that emissions of at least one single criteria pollutant will exceed 250 TPY, PSD Review and a BACT determination are required for each pollutant emitted in excess of the Significant Emission Rates listed in Table 62-212.400-2, F.A.C. These values are: 40 TPY for NO_X, SO_2, and VOC; 25/15 TPY of PM/PM_{10}; 7 TPY of Sulfuric Acid Mist (SAM); and 100 TPY of CO.

3. PROJECT DESCRIPTION

This permit addresses the following emissions units:

EMISSION UNIT	SYSTEM	Emission Unit Description
001	Power Generation	One nominal 170 Megawatt Gas Combustion Turbine-Electrical Generator
002	Power Generation	One nominal 170 Megawatt Gas Combustion Turbine-Electrical Generator
003	Power Generation	One nominal 170 Megawatt Gas Combustion Turbine-Electrical Generator
004	Fuel Storage	One 2.8-Million Gallon Fuel Oil Storage Tank

IPSAPC proposes to construct three nominal 170 MW General Electric PG7241FA simple cycle, intermittent duty combustion turbine-electrical-generators with 60-foot stacks and one 2.8-million gallon fuel oil storage tank at the planned Shady Hills Generating Station.

According to the application, the facility will emit approximately 756 tons per year (TPY) of NO_X, 259 TPY of CO, 61 TPY of PM/PM_{10}, 166 TPY of SO_2, 34 TPY of VOC, and 25 TPY of SAM.

Significant emission rate increases per Table 212.400-2, F.A.C. will occur for carbon monoxide (CO), sulfur dioxide (SO_2), sulfuric acid mist (SAM), particulate matter (PM/PM_{10}) and nitrogen oxides (NO_X). A BACT determination is required for each of these pollutants. An air quality impact review is also required for CO, PM/PM_{10}, NO_X, and SO_2.

Each turbine will be equipped with Dry Low NO_X (DLN-2.6) combustors for the control of NO_X emissions to 9 ppmvd at 15% O_2 from 50% load up to 100% load conditions during normal operations. Each turbine will have a maximum heat input rating of 1,670 (gas) and 1,858 (oil) mmBtu/hr lower heating value (LHV) at 32°F while operating at 100% load. The main fuel will be natural gas and the units are proposed by IPSAPC to operate up to 3,390 hours per year per unit of which 1000 hours per year per unit may be on maximum 0.05 percent sulfur distillate fuel oil.

The key components of the GE MS 7001FA (a predecessor of the PG 7241FA) are identified in Figure 3. An exterior view is also shown. Each unit will be delivered with 14 can-annular design, DLN-2.6 combustors instead of the earlier-generation combustors supplied with the MS7001FA.

4. PROCESS DESCRIPTION

Much of the following discussion is from a 1993 EPA document on Alternative Control Techniques for NO_X Emissions from Stationary Gas turbines. Project specific information is interspersed where appropriate.

A gas turbine is an internal combustion engine that operates with rotary rather than reciprocating motion. Ambient air is drawn into the 18-stage compressor of the GE 7FA where it is compressed by a pressure ratio of about 15 times atmospheric pressure. The compressed air is then directed to the combustor section, where fuel is introduced, ignited, and burned. The combustion section consists of 14 separate can-annular combustors.

Flame temperatures in a typical combustor section can reach 3600 degrees Fahrenheit (°F). Units such as the 7FA operate at lower flame temperatures, which minimize NO_X formation. The hot combustion gases are then diluted with additional cool air and directed to the turbine section at temperatures of approximately 2400 °F. Energy is recovered in the turbine section in the form of shaft horsepower, of which typically more than 50 percent is required to drive the internal compressor section. The balance of recovered shaft energy is available to drive the external load unit such as an electrical generator.

In the Shady Hills Project, the units will operate as peaking units in the simple cycle mode. Cycle efficiency, defined as a percentage of useful shaft energy output to fuel energy input, is approximately 35 percent for F-Class combustion turbines in the simple cycle mode. In addition to shaft energy output, 1 to 2 percent of fuel input energy can be attributed to mechanical losses. The balance is exhausted from the turbine in the form of heat.

In combined cycle projects, the gas turbine drives an electric generator while the exhausted gases are used to raise additional steam in a heat recovery steam generator. The steam, in-turn, drives another electrical generator producing an additional 80-90 MW. In combined cycle mode, the thermal efficiency of the 7FA can exceed 56 percent.

At high ambient temperature, the units cannot generate as much power because of lower compressor inlet density. To compensate for the loss of output (which can be on the order of 20 MW compared to referenced temperatures), an evaporative inlet cooler (fogger) can be installed ahead of the combustion turbine inlet. At an ambient temperature of 95 °F, roughly 7-14 MW of power can be regained per unit by using the foggers.

Additional process information related to the combustor design, and control measures to minimize pollutant emissions are given in the draft BACT determination distributed with this evaluation.

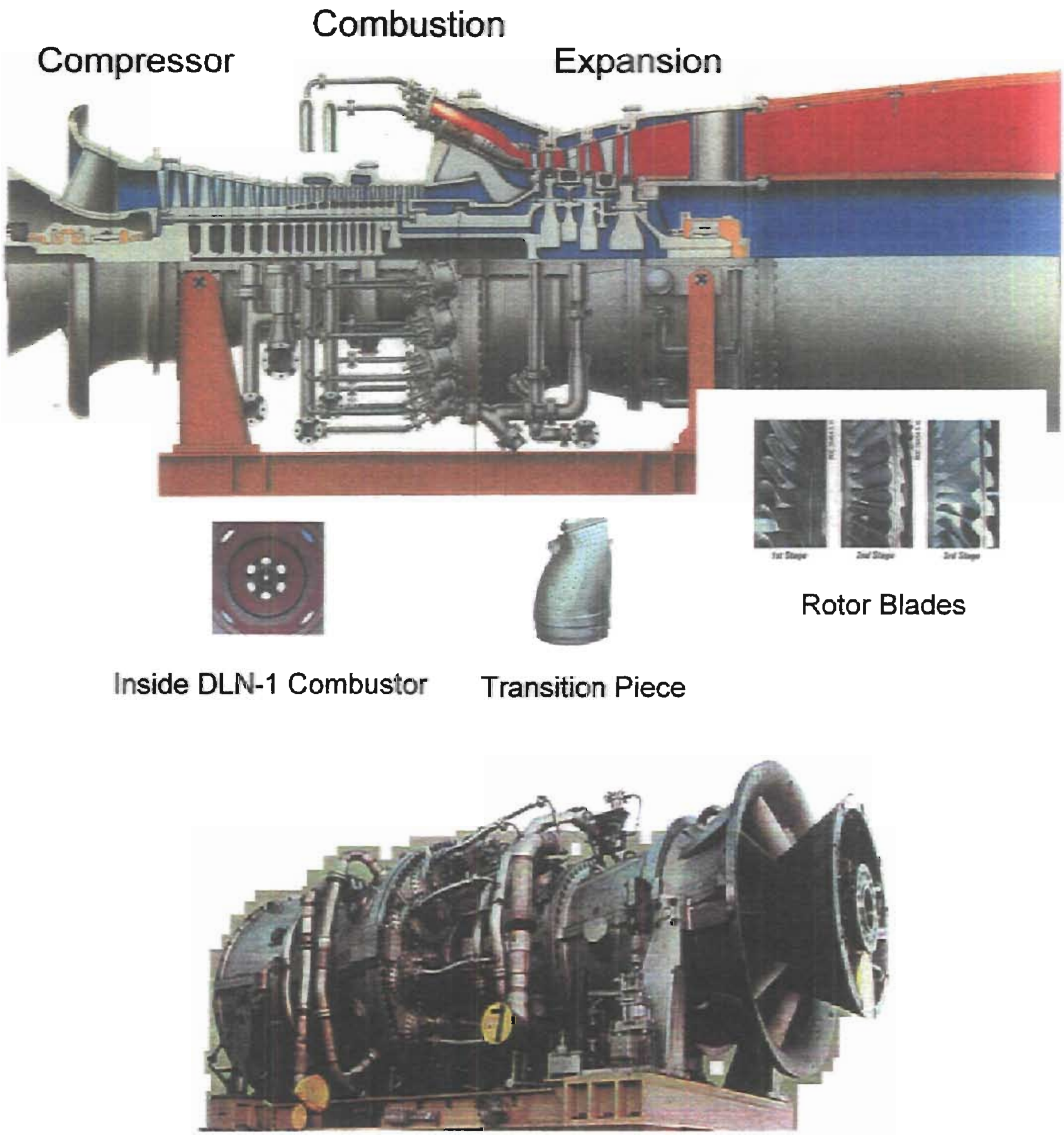


Figure 3 - Internal and External Views of GE MS7001FA

5. RULE APPLICABILITY

The proposed project is subject to preconstruction review requirements under the provisions of Chapter 403, Florida Statutes, and Chapters 62-4, 62-204, 62-210, 62-212, 62-214, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.).

This facility will be located in Pasco County, an area designated as attainment for all criteria pollutants in accordance with Rule 62-204.360, F.A.C. The proposed project is subject to review under Rule 62-212.400, F.A.C., Prevention of Significant Deterioration (PSD) for the reasons given in Section 2.3, Facility Category, above.

This PSD review consists of an evaluation of resulting ambient air pollutant concentrations, and increases with respect to the National Ambient Air Quality Standards and Increments as well as a determination of Best Available Control Technology (BACT) for PM/PM_{10}, CO, SO_2, SAM and NO_X. An analysis of the air quality impact from proposed project upon soils, vegetation and visibility is required along with air quality impacts resulting from associated commercial, residential, and industrial growth

The emission units affected by this air construction permit shall comply with all applicable provisions of the Florida Administrative Code (including applicable portions of the Code of Federal Regulations incorporated therein) and, specifically, the following Chapters and Rules:

5.1 State Regulations

Chapter 62-4	Permits.
Rule 62-204.220	Ambient Air Quality Protection
Rule 62-204.240	Ambient Air Quality Standards
Rule 62-204.260	Prevention of Significant Deterioration Increments
Rule 62-204.800	Federal Regulations Adopted by Reference
Rule 62-210.300	Permits Required
Rule 62-210.350	Public Notice and Comments
Rule 62-210.370	Reports
Rule 62-210.550	Stack Height Policy
Rule 62-210.650	Circumvention
Rule 62-210.700	Excess Emissions
Rule 62-210.900	Forms and Instructions
Rule 62-212.300	General Preconstruction Review Requirements
Rule 62-212.400	Prevention of Significant Deterioration
Rule 62-213	Operation Permits for Major Sources of Air Pollution
Rule 62-214	Requirements For Sources Subject To The Federal Acid Rain Program
Rule 62-296.320	General Pollutant Emission Limiting Standards
Rule 62-297.310	General Test Requirements
Rule 62-297.401	Compliance Test Methods
Rule 62-297.520	EPA Continuous Monitor Performance Specifications

5.2 Federal Rules

40 CFR 60	Applicable sections of Subpart A, General Requirements, NSPS Subparts GG and Kb
40 CFR 72	Acid Rain Permits (applicable sections)
40 CFR 73	Allowances (applicable sections)
40 CFR 75	Monitoring (applicable sections including applicable appendices)
40 CFR 77	Acid Rain Program-Excess Emissions (future applicable requirements)

6. SOURCE IMPACT ANALYSIS

6.1 Emission Limitations

The proposed Units 1-3 will emit the following PSD pollutants (Table 212.400-2, F.A.C.): PM/PM_{10}, SO_2, NO_X, CO, SAM, and negligible quantities of fluorides (F), mercury (Hg) and lead (Pb). The applicant's proposed annual emissions are summarized in the Table below and form the basis of the source impact review. The Department's proposed permitted allowable emissions for Units 1-3 are summarized in the Draft BACT document and Specific Condition Nos. 18-23 of Draft Permit PSD-FL-280.

6.2 Emission Summary

The annual emissions increases for all PSD pollutants as a result of the project are presented below:

PROJECT EMISSIONS (TPY) AND PSD APPLICABILITY

Pollutant	Gas Firing[1]	Oil Firing[2]	Total[2]	PSD Significance	PSD REVIEW?
PM/PM_{10}	26	51	61	25	Yes
SO_2	25	148	166	40	Yes
NO_X	326	526	756	40	Yes
CO	216	104	259	100	Yes
Ozone(VOC)	14	24	34	40	No
Sulfuric Acid Mist			25	7	Yes
Total Fluorides	~0	0.09	0.09	3	No
Mercury	<0.00001	0.0018	0.0018	0.1	No
Lead	~0	0.04	0.04	0.6	No

1. Based on 3,390 hours of gas firing per year per unit. Reference ambient temperature is 59 °F.
2. Based on 2,390 hours of gas firing and 1000 hours of fuel oil firing per year per unit.

6.3 Control Technology

The PSD regulations require new major stationary sources to undergo a control technology review for each pollutant that may be potentially emitted above significant amounts. The control technology review requirements of the PSD regulations are applicable to emissions of NO_X, SO_2, CO, SAM, and PM/PM_{10}. Emissions control will be accomplished primarily by good combustion of clean natural gas and the limited use of low sulfur (0.05 percent) distillate fuel oil. The combustors will operate in lean pre-mixed mode to minimize the flame temperature and nitrogen oxides formation potential. A full discussion is given in the Draft Best Available Control Technology (BACT) Determination (see Permit Appendix BD). The Draft BACT is incorporated into this evaluation by reference.

6.4 Air Quality Analysis

6.4.1 Introduction

The proposed project will increase emissions of five pollutants at levels in excess of PSD significant amounts: PM/PM_{10}, CO, NO_X, SO_2, and SAM. PM_{10}, SO_2 and NO_X are criteria pollutants and have national and state ambient air quality standards (AAQS), PSD increments, and significant impact levels defined for them. CO is a criteria pollutant and has only AAQS and significant impact levels defined for it. There are no applicable PSD increments or AAQS for SAM.

The applicant's initial PM_{10}, CO, and NO_X air quality impact analyses for this project predicted no significant impacts; therefore, further applicable AAQS and PSD increment impact analyses for these pollutants were not required. However, the initial SO_2 analysis showed a significant impact in a Class I area; therefore, a Class I PSD increment analysis for SO_2 was conducted. Based on the preceding discussion the air quality analyses required by the PSD regulations for this project are the following:

- A significant impact analysis for PM_{10}, CO, SO_2, and NO_X;
- A Class I PSD increment analysis for SO_2;
- An analysis of impacts on soils, vegetation, visibility, and of growth-related air quality modeling impacts.

Based on these required analyses, the Department has reasonable assurance that the proposed project, as described in this report and subject to the conditions of approval proposed herein, will not cause or significantly contribute to a violation of any AAQS or PSD increment. However, the following EPA-directed stack height language is included: "In approving this permit, the Department has determined that the application complies with the applicable provisions of the stack height regulations as revised by EPA on July 8, 1985 (50 FR 27892). Portions of the regulations have been remanded by a panel of the U.S. Court of Appeals for the D.C. Circuit in NRDC v. Thomas, 838 F. 2d 1224 (D.C. Cir. 1988). Consequently, this permit may be subject to modification if and when EPA revises the regulation in response to the court decision. This may result in revised emission limitations or may affect other actions taken by the source owners or operators." A more detailed discussion of the required analyses follows.

6.4.2 Models and Meteorological Data Used in the Significant Impact Analysis

The EPA-approved Industrial Source Complex Short-Term (ISCST3) dispersion model was used to evaluate the pollutant emissions from the proposed project. This model determines ground-level concentrations of inert gases or small particles emitted into the atmosphere by point, area, and volume sources. It incorporates elements for plume rise, transport by the mean wind, Gaussian dispersion, and pollutant removal mechanisms such as deposition. The ISCST3 model allows for the separation of sources, building wake downwash, and various other input and output features. 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. Direction-specific downwash parameters were used for all sources for which downwash was considered. The stacks associated with this project all satisfy the good engineering practice (GEP) stack height criteria.

Meteorological data used in the ISCST3 model consisted of a concurrent 5-year period of hourly surface weather observations and twice-daily upper air soundings from the National Weather Service (NWS) stations at Tampa, Florida (surface data) and Ruskin, Florida (upper air data). The 5-year period of meteorological data was from 1987 through 1991. These NWS stations were selected for use in the study because they are the closest primary weather stations to the study area and are most representative of the project site. The surface observations included wind direction, wind speed, temperature, cloud cover, and cloud ceiling.

For determining the project's significant impact area in the vicinity of the facility and if there are significant impacts from the project on any PSD Class I area, the highest predicted short-term concentrations and highest predicted annual averages were compared to their respective significant impact levels.

6.4.3 Significant Impact Analysis

Initially, the applicant conducts modeling using only the proposed project's emissions at worst load conditions. In order to determine worst-case load conditions the ISCST3 model was used to evaluate dispersion of emissions from the simple cycle facility for three loads (50%, 75% and 100%) and two seasonal operating conditions (summer, and winter). Once the worst-case loads are identified, the applicant utilizes the ISCST3 model to evaluate impacts at these loads, and compares the results to the significant impact levels. If this modeling at worst load conditions shows significant impacts, additional multi-facility modeling is required to determine the project's impacts on the existing air quality and any applicable AAQS or PSD increments.

Receptors were placed around the facility, which is located in a PSD Class II area. They were also placed in the Chassahowitzka National Wilderness Area (CNWA), which is the closest PSD Class I area. The CNWA is located approximately 28 km northwest of the project. The receptor grid for predicting maximum concentrations in the vicinity of the project was a polar receptor grid that contained 19 rings with 10° spacing radials. The dimensions of the grid were centered upon the proposed combustion turbines. Along each radial, receptors were located at the intersection point with each of the 19 rings at distances of 0.1, 0.2, 0.3, 0.5, 0.7, 1.0, 1.5, 2.0, 2.5, 3.0, 4.0, 5.0, 7.0, 10.0, 12.0, 15.0, 20.0, 25.0, and 30.0 km. For predicting impacts at the CNWA, thirteen discrete receptors along the border of the PSD Class I area were used. For each pollutant subject to PSD and also subject to PSD increment and/or AAQS analyses, this modeling compares maximum predicted impacts due to the project with PSD significant impact levels to determine whether significant impacts due to the project are predicted in the vicinity of the facility or in the CNWA. The tables below show the results of the significant impact modeling.

MAXIMUM PROJECT AIR QUALITY IMPACTS FOR COMPARISON TO THE PSD CLASS II SIGNIFICANT IMPACT LEVELS IN THE VICINITY OF THE FACILITY

Pollutant	Averaging Time	Max Predicted Impact (ug/m^3)	Significant Impact Level (ug/m^3)	Significant Impact?
PM_{10}	Annual	0.015	1	NO
	24-hour	0.19	5	NO
CO	8-hour	1.6	500	NO
	1-hour	6.8	2000	NO
NO_2	Annual	0.21	1	NO
SO_2	Annual	0.06	1	NO
	24-hour	0.82	5	NO
	3-hour	3.6	25	NO

MAXIMUM PROJECT AIR QUALITY IMPACTS FOR COMPARISON TO THE PSD CLASS I SIGNIFICANT IMPACT LEVELS (CNWA)

Pollutant	Averaging Time	Max. Predicted Impact at Class I Area (ug/m^3)	Proposed EPA Significant Impact Level (ug/m^3)	Significant Impact?
PM_{10}	Annual	0.006	0.2	NO
	24-hour	0.1	0.3	NO
NO_2	Annual	0.09	0.1	NO
SO_2	Annual	0.03	0.1	NO
	24-hour	0.4	0.2	YES
	3-hour	2.4	1	YES

The results of the significant impact modeling show that there are no significant impacts predicted due to the emissions from this project in the Class II area. However, the maximum predicted air quality impact due to SO2 emissions is greater than the significant impact levels in the CNWA Class I area for the 24-hour and 3-hour averaging periods. Therefore, the applicant was required to conduct full impact SO2 modeling in the CNWA Class I area. Full impact modeling is modeling that considers not only the impact of the project but the impacts of the existing facility and other major sources located within the vicinity of the project and the Class I area. No further modeling of any other pollutants were required.

Since full impact modeling requires assessing air quality impacts from PSD sources that are located as far as 150 km from the CNWA, the NPS and the Department directed the applicant to further evaluate the SO_2 impacts on the Class I area by using the long-range transport model CALPUFF. CALPUFF is a non-steady state, Lagrangian, long-range transport model that incorporates Gaussian puff dispersion algorithms, and it is a more applicable model for assessing impacts from sources that are located at distances greater than 100 km from the Class I area.

6.4.4 PSD Increment Analysis

The PSD increment represents the amount that new sources in an area may increase ambient ground level concentrations of a pollutant. Atmospheric dispersion modeling, as previously described, was performed to quantify the amount of PSD increment consumed in the CNWA Class I area. The results of this analysis are shown in the table below. Maximum SO_2 concentrations predicted for the proposed project at receptors in the CNWA show impacts greater than the PSD Class I increments for the 3-hour and 24-hour averaging times on four occasions. In order to assess the proposed project's contribution to any predicted CNWA Class I exceedances, an analysis was performed to determine all time periods and receptors at which an exceedance was predicted to occur. For each case, the proposed modification's impact was determined and compared to the EPA recommended significance levels of 1 ug/m^3 and 0.2 ug/m^3 for the 3-hour and 24-hour averaging times, respectively. The impact of the proposed project was always less than these significance levels at any receptor and for any time period when there were predicted exceedances or violations of increments. Therefore, the proposed modification will not contribute significantly to any predicted exceedance or violation of Class I increments and may be permitted by Department rules.

PSD CLASS I INCREMENT ANALYSIS (CNWA)

Pollutant	Averaging Time	Max. Predicted Impact (ug/m^3)	Impact Greater Than Allowable Increment ?	Allowable Increment (ug/m^3)	Maximum Project Contribution To Any Exceedance	EPA Significant Impact Level	Project Contribution Significant ?
SO_2	24-hr	5.33	YES	5.0	0.0	0.2	NO
	3-hr	29.6	YES	25.0	0.0	1.0	NO

6.4.5 <u>Impacts Analysis</u>

Impact Analysis Impacts On Soils, Vegetation, And Wildlife

Very low emissions are expected from this natural gas-fired combustion turbine in comparison with conventional power plant generating equal power. Emissions of acid rain and ozone precursors will be very low. The maximum ground-level concentrations predicted to occur for PM_{10}, CO, NO_X, SO_2 and sulfuric acid mist as a result of the proposed project, including background concentrations and all other nearby sources, will be less than the respective ambient air quality standards (AAQS). The project impacts are less than the significant impact levels which in-turn are less than the applicable allowable increments for each pollutant. Because the AAQS are designed to protect both the public health and welfare and the project impacts are less than significant, it is reasonable to assume the impacts on soils, vegetation, and wildlife will be minimal or insignificant.

Impact On Visibility

Natural gas and low ash distillate fuel oil are clean fuels and produce little ash. This will minimize smoke formation. The low NO_X and SO_2 emissions will also minimize plume opacity. Because no add-on control equipment and no reagents are required, there will be no steam plume or tendency to form ammoniated particulate species.

Due to the close proximity of this project to the CNWA Class I area, a visibility analysis was performed with The Visual Impact Screening and Analysis (VISCREEN) computer model. This EPA-approved computer model was used to estimate the impact of the proposed project's emission on the visibility in the CNWA. Based on the VISCREEN model results, no significant impact on visibility due to this project is expected in the CNWA.

Growth-Related Air Quality Impacts

There will be short-term increases in the labor force to construct the project. These temporary increases will not result in significant commercial and residential growth in the vicinity of the project. Operation of the additional unit will require few new permanent employees, which will cause no significant impact on the local area.

Over the past few years the Public Service Commission has determined that a number of power projects are needed to help meet the low electrical reserve capacity throughout the State of Florida. The project is a response to state-wide and regional growth and also accommodates more growth. There are no adequate procedures under the PSD rules to fully assess these impacts. However, the type of project proposed has a small overall physical "footprint," low water requirements, and among the lowest air emissions per unit of electric power generating capacity for intermittent duty.

Hazardous Air Pollutants

The project is not a major source of hazardous air pollutants (HAPs) and is not subject to any specific industry or HAP control requirements pursuant to Section 112 of the Clean Air Act.

8. CONCLUSION

Based on the foregoing technical evaluation of the application and additional information submitted by the applicant, the Department has made a preliminary determination that the proposed project will comply with all applicable state and federal air pollution regulations, provided the Department's BACT determination is implemented.

A. A. Linero, P.E., Administrator
Chris Carlson, Meteorologist

PERMITTEE:

IPS Avon Park Corporation
1560 Gulf Boulevard, # 701
Clearwater, Florida 32767

Permit No.	PSD-FL-280
File No.	1010373-001-AC
SIC No.	4911
Expires:	July 1, 2002

Authorized Representative:

John S. Ellis

PROJECT AND LOCATION:

Air Construction Permit pursuant to the requirements for the Prevention of Significant Deterioration of Air Quality Permit for: three dual-fuel nominal 170 megawatt (MW) General Electric PG7241FA combustion turbine-electrical generators; one 2.8-million gallon fuel oil storage tank; and three 60-foot stacks. The units will operate in simple cycle mode and intermittent duty. The units will be equipped with Dry Low NO_X (DLN-2.6) combustors and wet injection capability.

The project will be located East of Hudson and North of SR 52 in unincorporated, Pasco County. UTM coordinates are: Zone 17; 347.0 km E; 3139.0 km N.

STATEMENT OF BASIS:

This Air Construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.). The above named permittee is authorized to modify the facility in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department of Environmental Protection (Department).

Attached Appendices and Tables made a part of this permit:

Appendix BD	BACT Determination
Appendix GC	Construction Permit General Conditions

Howard L. Rhodes, Director
Division of Air Resources
Management

SECTION I. FACILITY INFORMATION

FACILITY DESCRIPTION

This facility is a new site. This permitting action is to install three dual-fuel nominal 170 megawatt (MW) General Electric PG7241FA combustion turbine-electrical generators with three 60-foot stacks and one 2.8-million gallon fuel oil storage tanks. Emissions from the new units will be controlled by Dry Low NO_X (DLN-2.6) combustors when operating on natural gas and wet injection when firing fuel oil. Inherently clean fuels and good combustion practices will be employed to control all pollutants.

EMISSION UNITS

This permit addresses the following emission units:

ARMS Emissions Unit	System	Emission Unit Description
001	Power Generation	One nominal 170 Megawatt Gas Simple Cycle Combustion Turbine-Electrical Generator
002	Power Generation	One nominal 170 Megawatt Simple Cycle Gas Combustion Turbine-Electrical Generator
003	Power Generation	One nominal 170 Megawatt Simple Cycle Gas Combustion Turbine-Electrical Generator
004	Fuel Storage	One 2.8 Million Gallon Fuel Oil Storage Tank

REGULATORY CLASSIFICATION

The facility is classified as a Major or Title V Source of air pollution because emissions of at least one regulated air pollutant, such as particulate matter (PM/PM_{10}), sulfur dioxide (SO_2), nitrogen oxides (NO_X), carbon monoxide (CO), or volatile organic compounds (VOC) exceeds 100 tons per year (TPY).

This facility is not within an industry included in the list of the 28 Major Facility Categories per Table 212.400-1, F.A.C. Because emissions are greater than 250 TPY for at least one criteria pollutant, the facility is also a Major Facility with respect to Rule 62-212.400, Prevention of Significant Deterioration (PSD). Pursuant to Table 62-212.400-2, modifications at this facility resulting in emissions increases greater than any of the following values require review per the PSD rules as well as a determination of Best Available Control Technology (BACT): 40 TPY of NO_X, SO_2, or VOC; 25/15 TPY of PM/PM_{10}; 100 TPY of CO; or 7 TPY of sulfuric acid mist (SAM). This facility and the project are also subject to applicable provisions of Title IV, Acid Rain, of the Clean Air Act.

SECTION I. FACILITY INFORMATION

PERMIT SCHEDULE

- mm/dd/99 Notice of Intent published in ____________
- 11/30/99 Distributed Intent to Issue Permit
- 10/26/99 Application deemed complete
- 10/26/99 Received Application

RELEVANT DOCUMENTS:

The documents listed below are the basis of the permit. They are specifically related to this permitting action, but not all are incorporated into this permit. These documents are on file with the Department.

- Application received on October 26, 1999
- Department's Intent to Issue and Public Notice Package dated November 30, 1999
- Department's Final Determination and Best Available Control Technology Determination issued concurrently with this permit.

SECTION II. ADMINISTRATIVE REQUIREMENTS

1. Regulating Agencies: All documents related to applications for permits to construct, operate or modify an emissions unit should be submitted to the Bureau of Air Regulation (BAR), Florida Department of Environmental Protection (FDEP), at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400 and phone number (850) 488-0114. All documents related to reports, tests, and notifications should be submitted to the DEP Southwest District office, 3804 Coconut Palm Drive, Tampa, Florida 33619-8218 and phone number 813/744-6100.
2. General Conditions: The owner and operator is subject to and shall operate under the attached General Permit Conditions G.1 through G.15 listed in Appendix GC of this permit. General Permit Conditions are binding and enforceable pursuant to Chapter 403 of the Florida Statutes. [Rule 62-4.160, F.A.C.]
3. Terminology: The terms used in this permit have specific meanings as defined in the corresponding chapters of the Florida Administrative Code.
4. Forms and Application Procedures: The permittee shall use the applicable forms listed in Rule 62-210.900, F.A.C. and follow the application procedures in Chapter 62-4, F.A.C. [Rule 62-210.900, F.A.C.]
5. Modifications: The permittee shall give written notification to the Department when there is any modification to this facility. This notice shall be submitted sufficiently in advance of any critical date involved to allow sufficient time for review, discussion, and revision of plans, if necessary. Such notice shall include, but not be limited to, information describing the precise nature of the change; modifications to any emission control system; production capacity of the facility before and after the change; and the anticipated completion date of the change. [Chapters 62-210 and 62-212]
6. Expiration: Approval to construct shall become invalid if construction is not commenced within 18 months after receipt of such approval, or if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time. The Department may extend the 18-month period upon a satisfactory showing that an extension is justified. [40 CFR 52.21(r)(2)].
7. BACT Determination: In accordance with Rule 62-212.400(6)(b), F.A.C. (and 40 CFR 51.166(j)(4)), the Best Available Control Technology (BACT) determination shall be reviewed and modified as appropriate in the event of a plant conversion. This paragraph states: "For phased construction project, the determination of best available control technology shall be reviewed and modified as appropriate at the latest reasonable time which occurs no later than 18 months prior to commencement of construction of each independent phase of the project. At such time, the owner or operator of the applicable stationary source may be required to demonstrate the adequacy of any previous determination of best available control technology for the source." This reassessment will also be conducted for this project if there are any increases in heat input limits, hours of operation, oil firing, low or baseload operation (e.g. conversion to combined-cycle operation) short-term or annual emission limits, annual fuel heat input limits or similar changes. [40 CFR 51.166(j)(4) and Rule 62-212.400(6)(b), F.A.C.]

SECTION II. ADMINISTRATIVE REQUIREMENTS

8. Application for Title V Permit: An application for a Title V operating permit, pursuant to Chapter 62-213, F.A.C., must be submitted to the DEP's Bureau of Air Regulation, and a copy to the Department's Southwest District office. [Chapter 62-213, F.A.C.]
9. New or Additional Conditions: Pursuant to Rule 62-4.080, F.A.C., for good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.]
10. Annual Reports: Pursuant to Rule 62-210.370(2), F.A.C., Annual Operation Reports, the permittee is required to submit annual reports on the actual operating rates and emissions from this facility. Annual operating reports shall be sent to the DEP's Southwest District office by March 1st of each year. [Rule 62-210.370(2), F.A.C.]
11. Stack Testing Facilities: Stack sampling facilities shall be installed in accordance with Rule 62-297.310(6), F.A.C.
12. Permit Extension: The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit [Rule 62-4.080, F.A.C.]
13. Quarterly Reports: Quarterly excess emission reports, in accordance with 40 CFR 60.7 (a)(7) (c) (1998 version), shall be submitted to the DEP's Southwest District office. Each excess emission report shall include the information required in 40 CFR 60.7(c) and 60.334.

APPLICABLE STANDARDS AND REGULATIONS:

1. Unless otherwise indicated in this permit, the construction and operation of the subject emission unit(s) shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of Chapter 403, F.S. and Florida Administrative Code Chapters 62-4, 62-103, 62-204, 62-210, 62-212, 62-213, 62-214, 62-296, 62-297; and the applicable requirements of the Code of Federal Regulations Section 40, Parts 60, 72, 73, and 75.
2. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements or regulations. [Rule 62-210.300, F.A.C.]
3. These emission units shall comply with all applicable requirements of 40CFR60, Subpart A, General Provisions including:
   - 40CFR60.7, Notification and Recordkeeping
   - 40CFR60.8, Performance Tests
   - 40CFR60.11, Compliance with Standards and Maintenance Requirements
   - 40CFR60.12, Circumvention
   - 40CFR60.13, Monitoring Requirements
   - 40CFR60.19, General Notification and Reporting requirements
4. ARMS Emission Units 001-003, Power Generation, consisting of four 170 megawatt combustion turbines shall comply with all applicable provisions of 40CFR60, Subpart GG, Standards of performance for Stationary Gas Turbines, adopted by reference in Rule 62-204.800(7)(b), F.A.C. The Subpart GG requirement to correct test data to ISO conditions applies. However, such correction is not used for compliance determinations with the BACT standard(s). [Rule 62-204.800(7)(b), F.A.C.]
5. ARMS Emission Unit 004, Fuel Storage, consisting of one 2.8 million gallon distillate fuel oil storage tanks shall comply with all applicable provisions of 40CFR60, Subpart Kb, Standards of Performance for Volatile Organic Liquid Storage Vessels, adopted by reference in Rule 62-204.800, F.A.C. [Rule 62-204.800(7)(b), F.A.C.]
6. All notifications and reports required by the above specific conditions shall be submitted to the DEP's Southwest District.

GENERAL OPERATION REQUIREMENTS

7. Fuels: Only pipeline natural gas or maximum 0.05 percent sulfur fuel oil No. 2 or superior grade of distillate fuel oil shall be fired in these units. [Applicant Request, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)] {Note: The limitation of this specific condition is more stringent than the NSPS sulfur dioxide limitation and thus assures compliance with 40 CFR 60.333 and 60.334}

8. Capacity: The maximum heat input rates, based on the lower heating value (LHV) of each fuel to each Unit (1-3) at ambient conditions of 59°F temperature, 60% relative humidity, 100% load, and 14.7 psi pressure shall not exceed 1,612 million Btu per hour (MMBtu/hr) when firing natural gas, nor 1,806 MMBtu/hr when firing No. 2 or superior grade of distillate fuel oil. These maximum heat input rates will vary depending upon ambient conditions and the combustion turbine characteristics. Manufacturer's curves corrected for site conditions or equations for correction to other ambient conditions shall be provided to the Department of Environmental Protection (DEP) within 45 days of completing the initial compliance testing. [Design, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]

9. Unconfined Particulate Emissions: During the construction period, unconfined particulate matter emissions shall be minimized by dust suppressing techniques such as covering and/or application of water or chemicals to the affected areas, as necessary. [Rule 62-296.320(4)(c)., F.A.C.]

10. Plant Operation - Problems: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, the owner or operator shall notify the DEP Southwest District as soon as possible, but at least within (1) working day, excluding weekends and holidays. The notification shall include: pertinent information as to the cause of the problem; the steps being taken to correct the problem and prevent future recurrence; and where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with the conditions of this permit and the regulations. [Rule 62-4.130, F.A.C.]

11. Operating Procedures: Operating procedures shall include good operating practices and proper training of all operators and supervisors. The good operating practices shall meet the guidelines and procedures as established by the equipment manufacturers. All operators (including supervisors) of air pollution control devices shall be properly trained in plant specific equipment. [Rule 62-4.070(3), F.A.C.]

12. Circumvention: The owner or operator shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. [Rules 62-210.650, F.A.C.]

13. Maximum allowable hours: The stationary gas turbines shall only operate up to 3,390 hours per unit including up to 1000 hours on fuel oil during any calendar year. No single combustion turbine shall operate more than 5,000 hours in a single year. [Applicant Request, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions), Rule 62-212.400, F.A.C. (BACT)]

14. Fuel oil usage: The amount of back-up fuel (fuel oil) burned at the site (in BTU's) shall not exceed the amount of natural gas (primary fuel) burned at the site (in BTU's) during any consecutive 12-month period [Rule 62-210.200, F.A.C. (BACT)]

Control Technology

15. Dry Low NO_X (DLN-2.6) combustors shall be installed on the stationary combustion turbine to control nitrogen oxides (NO_X) emissions while firing natural gas. [Design, Rules 62-4.070 and 62-212.400, F.A.C. (BACT)]

16. A water injection (WI) system shall be installed for use when firing No. 2 or superior grade distillate fuel oil for control of NO_X emissions. [Design, Rules 62-4.070 and 62-212.400, F.A.C. (BACT)]

17. The permittee shall provide manufacturer's emissions performance versus load diagrams for the DLN and wet injection systems prior to their installation. DLN systems shall each be tuned upon initial operation to optimize emissions reductions consistent with normal operation and maintenance practices and shall be maintained to minimize NO_X emissions and CO emissions, consistent with normal operation and maintenance practices. Operation of the DLN systems in the diffusion-firing mode shall be minimized when firing natural gas. [Rule 62-4.070 and 62-210.650 F.A.C.]

EMISSION LIMITS AND STANDARDS

18. Following is a summary of the emission limits and required technology. Values for NO_X are corrected to 15 % O_2 on a dry basis. These limits or their equivalent in terms of lb/hr or NSPS units, as well as the applicable averaging times, are followed by the applicable specific conditions [Rules 62-212.400, 62-204.800(7)(b) (Subpart GG), 62-210.200 (Definitions-Potential Emissions) F.A.C.]

POLLUTANT	CONTROL TECHNOLOGY	EMISSION LIMIT
PM/PM_{10}, VE	Pipeline Natural Gas Good Combustion	10/17 lb/hr (Gas/Fuel Oil) 10 Percent Opacity (Gas or Fuel Oil)
VOC (not PSD)	As Above	1.4 ppmvd (Gas) 7 ppmvw (Fuel Oil)
CO	As Above	12 ppmvd (Gas) 20 ppmvd (Fuel Oil)
SO_2 and Sulfuric Acid Mist	Pipeline Natural Gas Low Sulfur Fuel Oil	1 gr S/100 ft^3 (in Gas) 0.05% S (in Fuel Oil)
NO_X	Dry Low NO_X for Natural Gas Wet Injection and limited Fuel Oil usage	9 ppmvd (Gas) 42 ppmvd (Fuel Oil)

19. Nitrogen Oxides (NO_X) Emissions:

- While firing Natural Gas: The emission rate of NO_X in the exhaust gas shall not exceed 9 ppmvd @15% O_2 on a 24 hr block average (of valid hours during which the unit is operated only) as measured by the continuous emission monitoring system (CEMS). Refer to Condition 30 for valid hours contributing to the block average.

SECTION III. EMISSION UNITS SPECIFIC CONDITIONS

In addition, NO_X emissions calculated as NO_2 shall not exceed 64.1 pounds per hour (at ISO conditions) and 9 ppmvd @15% O_2 to be demonstrated by the initial "new and clean" GE performance stack test. [Rule 62-212.400, F.A.C.]

- While firing Fuel Oil: The concentration of NO_X in the exhaust gas shall not exceed 42 ppmvd at 15% O_2 on the basis of a 3-hr average (of valid hour hours during which the unit is actually operated only) as measured by the continuous emission monitoring system (CEMS). In addition, NO_X emissions calculated as NO_2 shall not exceed 351 lb/hr (at ISO conditions) and 42 ppmvd @15% O_2 to be demonstrated by stack test. [Rule 62-212.400, F.A.C.]

The permittee shall develop a NO_X reduction plan when the hours of oil firing reach the allowable limit of 1000 hours per year. This plan shall include a testing protocol designed to establish the maximum water injection rate and the lowest NO_X emissions possible without affecting the actual performance of the gas turbine. The testing protocol shall set a range of water injection rates and attempt to quantify the corresponding NO_X emissions for each rate and noting any problems with performance. Based on the test results, the plan shall recommend a new NO_X emissions limiting standard and shall be submitted to the Department's Bureau of Air Regulation and Compliance Authority for review. If the Department determines that a lower NO_X emissions standard is warranted for oil firing, this permit shall be revised. (BACT Determination].

20. Carbon Monoxide (CO) Emissions: The concentration of CO in the stack exhaust gas shall exceed neither 12 ppmvd and 42.5 lb/hr (at ISO conditions) while firing gas and neither 20 ppmvd and 71.4 lb/hr (at ISO conditions). The permittee shall demonstrate compliance with these limits by stack test using EPA Method 10. [Rule 62-212.400, F.A.C.]

21. Volatile Organic Compounds (VOC) Emissions: The concentration of VOC in the stack exhaust gas with the combustion turbine operating on natural gas shall exceed neither 1.4 ppmvd nor 2.8 lb/hr (ISO conditions) and neither 7 ppmvw nor 16.2 lb/hr (ISO conditions) while operating on oil to be demonstrated by initial stack test using EPA Method 18, 25 or 25A. [Applicant Request to Avoid PSD, Rule 62-212.400, F.A.C.]

22. Sulfur Dioxide (SO_2) Emissions: SO_2 emissions shall be limited by firing pipeline natural gas (sulfur content less than 1 grain per 100 standard cubic foot) or by firing No. 2 or superior grade distillate fuel oil with a maximum 0.05 percent sulfur for 1000 hours per year per unit. Emissions of SO_2 (at ISO conditions) shall not exceed 5 lb/hr (natural gas) and 98.7 lb/hr (fuel oil) as measured by applicable compliance methods described below. [40CFR60 Subpart GG and Rules 62-4.070, 62-212.400, and 62-204.800(7), F.A.C]

23. Particulate Matter (PM/PM_{10}) PM/PM_{10} emissions shall not exceed 10 lb/hr when operating on natural gas and shall not exceed 17 lb/hr when operating on fuel oil. Visible emissions testing shall serve as a surrogate for PM/PM_{10} compliance testing. [Rule 62-212.400, F.A.C.]

24. Visible Emissions (VE): VE emissions shall serve as a surrogate for PM/PM_{10} emissions and shall not exceed 10 opacity. Rules 62-4.070, 62-212.400, and 62-204.800(7), F.A.C.]

EXCESS EMISSIONS

25. Excess emissions resulting from startup, shutdown, or malfunction shall be permitted provided that best operational practices are adhered to and the duration of excess emissions shall be minimized. Excess emissions occurrences shall in no case exceed two hours in any 24-hour period for other reasons unless specifically authorized by DEP for longer duration. Operation below 50% output shall be limited to 2 hours per unit cycle (breaker closed to breaker open).

26. Excess emissions entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction, shall be prohibited pursuant to Rule 62-210.700, F.A.C. These emissions shall be included in the 24-hr average for NO_X.

27. Excess Emissions Report: If excess emissions occur due to malfunction, the owner or operator shall notify DEP's Southwest District within (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. In addition, the Department may request a written summary report of the incident. Following the NSPS format, 40 CFR 60.7 Subpart A, periods of startup, shutdown, malfunction, shall be monitored, recorded, and reported as excess emissions when emission levels exceed the permitted standards listed in Specific Condition No. 18 and 19. [Rules 62-4.130, 62-204.800, 62-210.700(6), F.A.C., and 40 CFR 60.7 (1998 version)].

COMPLIANCE DETERMINATION

28. Compliance with the allowable emission limiting standards shall be determined within 60 days after achieving the maximum production rate, but not later than 180 days of initial operation of the unit, and annually thereafter as indicated in this permit, by using the following reference methods as described in 40 CFR 60, Appendix A (1998 version), and adopted by reference in Chapter 62-204.800, F.A.C.

29. Initial (I) performance tests (for both fuels) shall be performed on each unit while firing natural gas as well as while firing oil. Initial tests shall also be conducted after any modifications (and shake down period not to exceed 100 days after re-starting the CT) of air pollution control equipment such as change or tuning of combustors. Annual (A) compliance tests shall be performed during every federal fiscal year (October 1 - September 30) pursuant to Rule 62-297.310(7), F.A.C., on each unit as indicated. The following reference methods shall be used. No other test methods may be used for compliance testing unless prior DEP approval is received in writing.

   - EPA Reference Method 9, "Visual Determination of the Opacity of Emissions from Stationary Sources" (I, A).

- EPA Reference Method 10, "Determination of Carbon Monoxide Emissions from Stationary Sources" (I, A).
- EPA Reference Method 20, "Determination of Oxides of Nitrogen Oxide, Sulfur Dioxide and Diluent Emissions from Stationary Gas Turbines." Initial test only for compliance with 40CFR60 Subpart GG and (I, A) short-term NO_X BACT limits (EPA reference Method 7E, "Determination of Nitrogen Oxides Emissions from Stationary Sources" or RATA test data may be used to demonstrate compliance for annual test requirements).
- EPA Reference Method 18, 25 and/or 25A, "Determination of Volatile Organic Concentrations." Initial test only.

30. Continuous compliance with the NO_X emission limits: Continuous compliance with the NO_X emission limits shall be demonstrated with the CEM system based on the applicable averaging time of 24-hr block average (DLN). Based on CEMS data, a separate compliance determination is conducted at the end of each operating day and a new average emission rate is calculated from the arithmetic average of all valid hourly emission rates from the previous operating day. A valid hourly emission rate shall be calculated for each hour in which at least two NO_X concentrations are obtained at least 15 minutes apart. Valid hourly emission rates shall not include periods of start up, shutdown, or malfunction unless prohibited by 62-210.700 F.A.C. These excess emissions periods shall be reported as required in Conditions 25 and 26. [Rules 62-4.070 F.A.C., 62-210.700, F.A.C., 40 CFR 75 and BACT]

    - All continuous monitoring systems (CEMS) shall be in continuous operation except for breakdowns, repairs, calibration checks, and zero and span adjustments. These CEMS shall meet minimum frequency of operation requirements: one cycle of operation (sampling, analyzing, and data recording) for each successive 15-minute period. Data recorded during periods of continuous monitoring system breakdowns, repairs, calibration checks, and zero and span adjustments shall not be included in the data average. [40CFR60.13]

31. Compliance with the SO_2 and PM/PM_{10} emission limits: Not withstanding the requirements of Rule 62-297.340, F.A.C., the use of pipeline natural gas, is the method for determining compliance for SO_2 and PM_{10}. For the purposes of demonstrating compliance with the 40 CFR 60.333 SO_2 standard, ASTM methods D4084-82 or D3246-81 (or equivalent) for sulfur content of gaseous fuel shall be utilized in accordance with the EPA-approved custom fuel monitoring schedule or natural gas supplier data may be submitted or the natural gas sulfur content referenced in 40 CFR 75 Appendix D may be utilized. However, the applicant is responsible for ensuring that the procedures in 40 CFR60.335 or 40 CFR75 are used when determination of fuel sulfur content is made. Analysis may be performed by the owner or operator, a service contractor retained by the owner or operator, the fuel vendor, or any other qualified agency pursuant to 40 CFR 60.335(e) (1998 version).

32. Compliance with CO emission limit: An initial test for CO shall be conducted concurrently with the initial NO_X test, as required. The initial NO_X and CO test results shall be the average of three valid one-hour runs. Annual compliance testing for CO may be conducted at less than capacity when compliance testing is conducted concurrent with the annual RATA testing for the NO_X CEMS required pursuant to 40 CFR 75

33. Compliance with the VOC emission limit: An initial test is required to demonstrate compliance with the VOC emission limit. Thereafter, the CO emission limit and periodic tuning data will be employed as surrogate and no annual testing is required.

34. Testing procedures: Testing of emissions shall be conducted with the combustion turbine operating at permitted capacity. Permitted capacity is defined as 90-100 percent of the maximum heat input rate allowed by the permit, corrected for the average ambient air temperature during the test (with 100 percent represented by a curve depicting heat input vs. ambient temperature). If it is impracticable to test at permitted capacity, the source may be tested at less than permitted capacity. In this case, subsequent operation is limited by adjusting the entire heat input vs. ambient temperature curve downward by an increment equal to the difference between the maximum permitted heat input (corrected for ambient temperature) and 110 percent of the value reached during the test until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purposes of additional compliance testing to regain the permitted capacity. Procedures for these tests shall meet all applicable requirements (i.e., testing time frequency, minimum compliance duration, etc.) of Chapters 62-204 and 62-297, F.A.C.

35. Test Notification: The DEP's Southwest District shall be notified, in writing, at least 30 days prior to the initial performance tests and at least 15 days before annual compliance test(s).

36. Special Compliance Tests: The DEP may request a special compliance test pursuant to Rule 62-297.310(7), F.A.C., when, after investigation (such as complaints, increased visible emissions, or questionable maintenance of control equipment), there is reason to believe that any applicable emission standard is being violated.

37. Test Results: Compliance test results shall be submitted to the DEP's Southwest District no later than 45 days after completion of the last test run. [Rule 62-297.310(8), F.A.C.].

NOTIFICATION, REPORTING, AND RECORDKEEPING

38. Records: All measurements, records, and other data required to be maintained by IPSAPC shall be recorded in a permanent form and retained for at least five (5) years following the date on which such measurements, records, or data are recorded. These records shall be made available to DEP representatives upon request.

39. Compliance Test Reports: A test report indicating the results of the required compliance tests shall be filed as per Condition No.36 above. The test report shall provide sufficient detail on the tested emission unit and the procedures used to allow the Department to determine if the test was properly conducted and if the test results were properly computed. At a minimum, the test report shall provide the applicable information listed in Rule 62-297.310(8), F.A.C.

MONITORING REQUIREMENTS

40. Continuous Monitoring System: The permittee shall install, calibrate, maintain, and operate a continuous emission monitor in the stack to measure and record the nitrogen oxides emissions from these units. Upon request from EPA or DEP, the CEMS emission rates for NO_X on these Units shall be corrected to ISO conditions to demonstrate compliance with the NO_X standard established in 40 CFR 60.332. [Rules 62-204.800, 62-210.700, 62-4.130, 62-4.160(8), F.A.C, 40 CFR 75and 40 CFR 60.7 (1998 version)].

41. CEMS for reporting excess emissions: Excess Emissions and Monitoring System Performance Reports shall be submitted as specified in 40 CFR 60.7(c). CEM monitor downtime shall be calculated and reported according to the requirements of 40 CFR 60.7(c)(3) and 40CFR 60.7(d)(2). Periods when NO_X emissions (ppmvd @ 15% oxygen) are above the BACT standards, listed in Specific Conditions No 18 and 19, shall be reported to the DEP Southwest District within one working day (verbally) followed up by a written explanation not later than three (3) working days (alternatively by facsimile within one working day).

42. CEMS in lieu of Water to Fuel Ratio: The NO_X CEMS shall be used in lieu of the water/fuel monitoring system for reporting excess emissions in accordance with 40 CFR 60.334(c)(1), Subpart GG (1998version). The calibration of the water/fuel monitoring device required in 40 CFR 60.335 (c)(2) (1998 version) will be replaced by the 40 CFR 75 certification tests of the NO_X CEMS

43. Continuous Monitoring Certification and Quality Assurance Requirements: The monitoring devices shall comply with the certification and quality assurance, and any other applicable requirements of Rule 62-297.520, F.A.C., 40 CFR 60.13, including certification of each device in accordance with 40 CFR 60, Appendix B, Performance Specifications and 40 CFR 60.7(a)(5) or 40 CFR Part 75. Quality assurance procedures must conform to all applicable sections of 40 CFR 60, Appendix F or 40CFR75. The monitoring plan, consisting of data on CEM equipment specifications, manufacturer, type, calibration and maintenance needs, and its proposed location shall be provided to the DEP Emissions Monitoring Section Administrator and EPA for review no later than 45 days prior to the first scheduled certification test pursuant to 40 CFR 75.62.

44. Natural Gas Monitoring Schedule: A custom fuel monitoring schedule pursuant to 40 CFR 75 Appendix D for natural gas may be used in lieu of the daily sampling requirements of 40 CFR 60.334 (b)(2) provided the following requirements are met:

- The permittee shall apply for an Acid Rain permit within the deadlines specified in 40 CFR 72.30.
- The permittee shall submit a monitoring plan, certified by signature of the Designated Representative, that commits to using a primary fuel of pipeline supplied natural gas (sulfur content less than 20 gr/100 scf pursuant to 40 CFR 75.11(d)(2)).

- Each unit shall be monitored for SO_2 emissions using methods consistent with the requirements of 40 CFR 75 and certified by the USEPA.

This custom fuel monitoring schedule will only be valid when pipeline natural gas is used as a primary fuel. If the primary fuel for these units is changed to a higher sulfur fuel, SO_2 emissions must be accounted for as required pursuant to 40 CFR 75.11(d).

45. Fuel Oil Monitoring Schedule: The following monitoring schedule for No. 2 or superior grade fuel oil shall be followed: For all bulk shipments of No. 2 fuel oil received at this facility an analysis which reports the sulfur content and nitrogen content of the fuel shall be provided by the fuel vendor. The analysis shall also specify the methods by which the analyses were conducted and shall comply with the requirements of 40 CFR 60.335(d).

46. Determination of Process Variables:

- The permittee shall operate and maintain equipment and/or instruments necessary to determine process variables, such as process weight input or heat input, when such data is needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.

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

Shady Hills Generating Station
PSD-FL-280 and 1010373-001-AC
Pasco County, Florida

BACKGROUND

The applicant, IPS Avon Park Corporation (IPSAPC) proposes to install three nominal 170-megawatt (MW) General Electric PG 7241 FA combustion turbine-electrical generators at the planned Shady Hills Generating Station, East of Hudson in unincorporated Pasco County. The proposed project will constitute a New Major Facility per Rule 62-212.400(d)2.a., Florida Administrative Code (F.A.C.) because it will have the potential to emit at least 250 tons per year of a regulated pollutant. It is therefore subject to review for the Prevention of Significant Deterioration (PSD) and a determination of Best Available Control Technology (BACT) per Rule 62-212.400, F.A.C. Emissions of particulate matter (PM and PM_{10}), carbon monoxide (CO), nitrogen oxides (NO_X), volatile organic compounds (VOC), sulfur dioxide (SO_2), and sulfuric acid mist (SAM) will exceed the "Significant Emission Rates" with respect to Table 212.400-2, (F.A.C.). PSD and BACT reviews are required for each of these pollutants.

The new units will operate in simple cycle mode and intermittent duty and exhaust through separate 60-foot stacks. IPSAPC proposes to operate these units up to 3,390 hours per year per unit of which 1000 hr/yr/unit may be on maximum 0.5 percent sulfur distillate fuel oil. Descriptions of the process, project, air quality effects, and rule applicability are given in the Technical Evaluation and Preliminary Determination dated November 30, 1999, accompanying the Department's Intent to Issue.

DATE OF RECEIPT OF A BACT APPLICATION:

The application was received on October 26, 1999 and included a proposed BACT proposal prepared by the applicant's consultant, Golder Associates.

REVIEW GROUP MEMBERS:

A. A. Linero, P.E.

BACT DETERMINATION REQUESTED BY THE APPLICANT:

POLLUTANT	CONTROL TECHNOLOGY	PROPOSED BACT LIMIT
Nitrogen Oxides	Dry Low NO_X Combustors Water Injection (Oil)	9 ppmvd @ 15% O_2 (gas) 42 ppmvd @ 15% O_2 (oil)
Particulate Matter	Pipeline Natural Gas No. 2 Distillate Oil (1000 hr/yr) Combustion Controls	10 pounds per hour (gas) 17 pounds per hour (oil)
Carbon Monoxide	As Above	12 ppmvd (gas, baseload) 20 ppmvd (oil baseload)
Sulfur Dioxide/Sulfuric Acid Mist	As Above	1 grain S/100 std cubic feet (gas) 0.05 percent sulfur (oil)

According to the application, the maximum emissions from the facility will be approximately 756 tons per year (TPY) of NO_X, 259 TPY of CO, 61 TPY of PM/PM_{10}, 166 TPY of SO_2, 25 TPY of SAM, and 34 TPY of VOC.

BACT DETERMINATION PROCEDURE:

In accordance with Rule 62-212.400, F.A.C., this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department of Environmental Protection (Department), on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that, in making the BACT determination, the Department shall give consideration to:

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

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

STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES:

The minimum basis for a BACT determination is 40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines (NSPS). The Department adopted subpart GG by reference in Rule 62-204.800, F.A.C. The key emission limits required by Subpart GG are 75 ppmvd NO_X @ 15% O_2 (assuming 25 percent efficiency) and 150 ppmvd SO_2 @ 15% O_2 (or <0.8% sulfur in fuel). The BACT proposed by IPSAPC is within the NSPS limit, which allows NO_X emissions in the range of 110 ppmvd for the high efficiency units to be purchased for the Shady Hills Station.

No National Emission Standard for Hazardous Air Pollutants exists for stationary gas turbines.

DETERMINATIONS BY EPA AND STATES:

The following table is based primarily on "F" Class intermittent-duty simple cycle turbines recently permitted or still under review. One project (PREPA) based on smaller units but permitted to operate continuously is included as an example of a simple cycle unit with add-on control equipment. Another continuous-duty project (Lakeland) based on the larger "G" Class is also included. The proposed IPSAPC Shady Hills Station is included to facilitate comparison.

APPENDIX BD

BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

Project Location	Power Output (MW)	NO_X Limit ppmvd @ 15% O_2 and Fuel	Technology	Comments
Shady Hills Pasco, FL	510	9 - NG 42 - No. 2 FO	DLN WI	3x170 MW GE PG7241FA CTs Application 10/99. 1000 hrs on oil
Vandolah Hardee, FL	680	9 - NG 42 - No. 2 FO	DLN WI	4x170 MW GE PG7241FA CTs Issued 11/99. 1000 hrs on oil
Oleander Brevard, FL	850	9 - NG 42 - No. 2 FO	DLN WI	5x170 MW GE PG7241FA CTs Issued 11/99. 1000 hrs on oil
JEA Baldwin, FL	510	10.5 - NG 42 - No. 2 FO	DLN WI	3x170 MW GE MS7241FA CTs Issued 10/99. 750 hrs on oil
Reliant Osceola, FL	510	10.5 - NG 42 - No. 2 FO	DLN WI	3x170 MW GE MS7241FA CTs Draft 11/99. 750 hrs on oil
TEC Polk Power, FL	330	10.5 – NG 42 – No. 2 F.O.	DLN WI	2x165 MW GE MS7241FA CTs Issued 10/99. 750 hrs on oil
Dynegy, FL	510	15 – NG	DLN	3x170 MW WH 501F CTs Application 10/99. Gas only
Dynegy Heard, GA	510	15 – NG	DLN	3x170 MW WH 501F CTs Application. Gas only
Tenaska Heard, GA	960	15 - NG 42 - No. 2 FO	DLN WI	6x170 MW GE PG7241FA CTs Issued 12/98. 720 hrs on oil
Thomaston, GA	680	15 - NG 42 - No. 2 FO	DLN WI	4x170 MW GE PG7241FA CTs Application. 1687 hrs on oil
Dynegy Reidsville, NC	900	15 – NG (by 2002) 42 – No. 2 FO	DLN WI	5x180 MW WH 501F CTs Initially 25 ppm NO_X limit on gas Draft 5/98. 1000 hrs on oil.
Lyondell Harris, TX	160	25 – NG	DLN	1x160 MW WH 501F CTs Issued 11/99. Gas only
Southern Energy, WI	525	15/12 – NG 42 - No. 2 FO	DLN WI	3x175 MW GE PG7241FA CTs 15/12 ppm are on 1/24 hr basis Issued 1/99. 800 hrs on oil
RockGen Cristiana, WI	525	15/12 – NG 42 - No. 2 FO	DLN WI	3x175 MW GE PG7241FA CTs 15/12 ppm are on 1/24 hr basis Issued 1/99. 800 hrs on oil
Lakeland, FL	250 CON	9/9 – NG (by 2002) 42/15 - No. 2 FO	DLN/HSCR WI/HSCR	250 MW WH 501G CT Initially 25 ppm NO_X limit on gas Issued 7/98. 250 hrs on oil.
PREPA, PR	248 CON	10 - No. 2 FO	WI & HSCR	3x83 MW ABB GT11N CTs Issued 12/95.

CON = Continuous
SC = Simple Cycle
INT = Intermittent

DLN = Dry Low NO_X Combustion
SCR = Selective Catalytic Reduction
HSCR = Hot SCR

FO = Fuel Oil
NG = Natural Gas
WI = Water or Steam Injection

GE = General Electric
WH = Westinghouse
ABB = Asea Brown Bovari

Project Location	CO - ppm (or as indicated)	VOC - ppm (or as indicated)	PM - lb/hr (or as indicated)	Technology and Comments
Shady Hills Pasco, FL	12 - NG 20 - FO	1.4 – NG 7 – FO	10 lb/hr - NG 17 lb/hr - FO	Clean Fuels Good Combustion
Vandolah Hardee, FL	12 - NG 20 - FO	1.4 – NG 7 – FO	10 lb/hr - NG 17 lb/hr - FO	Clean Fuels Good Combustion
Oleander Brevard, FL	12 - NG 20 - FO	3 – NG 6 – FO	10% Opacity	Clean Fuels Good Combustion
JEA Baldwin, FL	12 - NG 20 - FO	1.4 – NG/FO Not PSD	9/17 lb/hr – NG/FO 10% Opacity	Clean Fuels Good Combustion
Reliant Osceola, FL	10.5 - NG 20 - FO	2.8 lb/hr – NG 7.5 lb/hr – FO	9 lb/hr - NG 17 lb/hr - FO	Clean Fuels Good Combustion
TEC Polk Power, FL	15 - NG 33 - FO	7 – NG 7 – FO	10% Opacity	Clean Fuels Good Combustion
Dynegy, FL	25 - NG	? – NG	? - NG	Clean Fuels Good Combustion
Dynegy Heard Co., GA	25 - NG	? – NG	? - NG	Clean Fuels Good Combustion
Tenaska Heard Co., GA	15 - NG 20 - FO	? – NG ? – FO	? - NG ? lb/hr - FO	Clean Fuels Good Combustion
Dynegy Reidsville, NC	25 - NG 50 - FO	6 lb/hr – NG 8 lb/hr – FO	6 lb/hr - NG 23 lb/hr - FO	Clean Fuels Good Combustion
Lyondell Harris, TX	25 - NG			Clean Fuels Good Combustion
RockGen Cristiana, WI	12@>50% load – NG 15@>75% 24@<75% - FO	2 - NG 5 - FO	18 lb/hr – NG 44 lb/hr - FO	Clean Fuels Good Combustion
RockGen Cristiana, WI	12@>50% load – NG 15@>75% 24@<75% - FO	2 - NG 5 - FO	18 lb/hr – NG 44 lb/hr - FO	Clean Fuels Good Combustion
Lakeland, FL	25 - NG or 10 by Ox Cat 75 - FO @ 15% O_2	4 – NG 10 – FO	10% Opacity	Clean Fuels Good Combustion
PREPA, PR	9 – FO @15% O_2	11 – FO @15% O_2	0.0171 gr/dscf	Clean Fuels Good Combustion

OTHER INFORMATION AVAILABLE TO THE DEPARTMENT:

Besides the information submitted by the applicant and that mentioned above, other information available to the Department consists of:

- Comments from the Fish and Wildlife Service dated __________ 1999
- Comments from EPA Region IV dated __________ 1999
- DOE website information on Advanced Turbine Systems Project
- Alternative Control Techniques Document - NO_X Emissions from Stationary Gas Turbines
- General Electric 39th Turbine State-of-the-Art Technology Seminar Proceedings
- GE Guarantee for JEA Brandy Branch Station Project
- GE Combustion Turbine Startup Curves
- Goal Line Environmental Technologies Website – www.glet.com
- Catalytica Website – www.catalytica-inc.com

REVIEW OF NITROGEN OXIDES CONTROL TECHNOLOGIES:

Some of the discussion in this section is based on a 1993 EPA document on Alternative Control Techniques for NO_X Emissions from Stationary Gas Turbines. Project-specific information is included where applicable.

Nitrogen Oxides Formation

Nitrogen oxides form in the gas turbine combustion process as a result of the dissociation of molecular nitrogen and oxygen to their atomic forms and subsequent recombination into seven different oxides of nitrogen. Thermal NO_X forms in the high temperature area of the gas turbine combustor. Thermal NO_X increases exponentially with increases in flame temperature and linearly with increases in residence time. Flame temperature is dependent upon the ratio of fuel burned in a flame to the amount of fuel that consumes all of the available oxygen.

By maintaining a low fuel ratio (lean combustion), the flame temperature will be lower, thus reducing the potential for NO_X formation. Prompt NO_X is formed in the proximity of the flame front as intermediate combustion products. The contribution of Prompt to overall NO_X is relatively small in near-stoichiometric combustors and increases for leaner fuel mixtures. This provides a practical limit for NO_X control by lean combustion.

Fuel NO_X is formed when fuels containing bound nitrogen are burned. This phenomenon is not important when combusting natural gas. It is not a significant issue for the Shady Hills project because these units will not be continuously operated, but rather will be "peakers". Also, low sulfur fuel oil (which has more fuel-bound nitrogen than natural gas) is proposed to be used for no more than 1000 hours per year (per CT).

Uncontrolled emissions range from about 100 to over 600 parts per million by volume, dry, corrected to 15 percent oxygen (ppmvd @15% O_2). The Department estimates uncontrolled emissions at approximately 200 ppmvd @15% O_2 for each turbine of the Shady Hills Project. The proposed NO_X controls will reduce these emissions significantly.

NO_X Control Techniques

Wet Injection

Injection of either water or steam directly into the combustor lowers the flame temperature and thereby reduces thermal NO_X formation. Typical emissions achieved by wet injection are in the range of 15–25 ppmvd when firing gas and 42 ppmvd when firing fuel oil in large combustion turbines. These values often form the basis, particularly in combined cycle turbines, for further reduction to BACT limits by other techniques. Carbon monoxide (CO) and hydrocarbon (HC) emissions are relatively low for most gas turbines. However steam and (more so) water injection may increase emissions of both of these pollutants.

Combustion Controls

The excess air in lean combustion cools the flame and reduces the rate of thermal NO_X formation. Lean premixing of fuel and air prior to combustion can further reduce NO_X emissions. This is accomplished by minimizing localized fuel-rich pockets (and high temperatures) that can occur when trying to achieve lean mixing within the combustion zones.

The above principle is depicted in Figure 1 for a General Electric DLN-1 can-annular combustor operating on gas. For ignition, warm-up, and acceleration to approximately 20 percent load, the first stage serves as the complete combustor. Flame is present only in the first stage, which is operated as lean stable combustion will permit. With increasing load, fuel is introduced into the secondary stage, and combustion takes place in both stages. When the load reaches approximately 40 percent, fuel is cut off to the first stage and the flame in this stage is extinguished. The venturi ensures the flame in the second stage cannot propagate upstream to the first stage. When thc fuel in the first-stage flame is extinguished (as verified by internal flame detectors), fuel is again introduced into the first stage, which becomes a premixing zone to deliver a lean, unburned, uniform mixture to the second stage. The second stage acts as the complete combustor in this configuration.

To further reduce NO_X emissions, GE developed the DLN-2.0 (cross section shown in Figure 1) wherein air usage (other than for premixing) was minimized. The venturi and the centerbody assembly were eliminated and each combustor has a single burning zone. So-called "quaternary fuel" is introduced through pegs located on the circumference of the outward combustion casing.

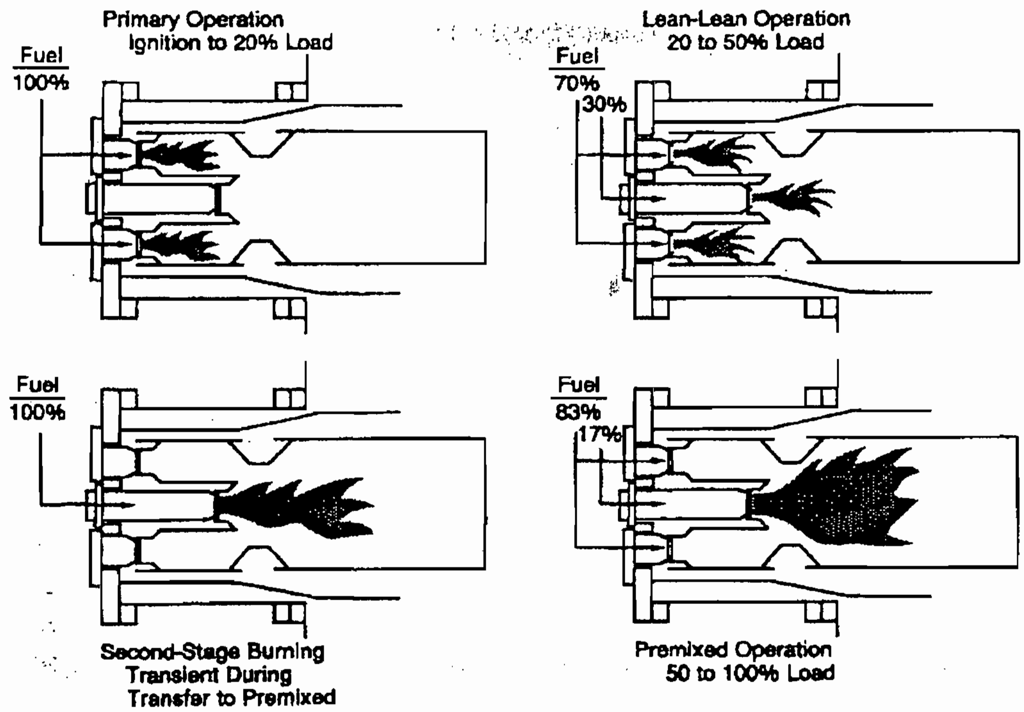
GE has made further improvements in the DLN design. The most recent version is the DLN-2.6 (proposed for the Shady Hills project). The combustor is similar to the DLN-2 with the addition of a sixth (center) fuel nozzle. The emission characteristics of the DLN-2.6 combustor while firing natural gas are given in Figure 2 for a unit tuned to meet a 15 ppmvd NO_X limit (by volume, dry corrected to at 15 percent oxygen) at JEA's Kennedy Station.

NO_X concentrations are higher in the exhaust at lower loads because the combustor does not operate in the lean pre-mix mode. Therefore such a combustor emits NO_X at concentrations of 15 ppmvd at loads between 50 and 100 percent of capacity, but concentrations as high as 100 ppmvd at less than 50 percent of capacity. Note that VOC comprises a very small amount of the "unburned hydrocarbons" which in turn is mostly non-VOC methane.

The combustor can be tuned differently to achieve emissions as low as 9 ppm of NO_X and 9 ppm of CO. Emissions characteristics by wet injection NO_X control while firing oil are expected to be similar for the DLN-2.6 as they are for those of the DLN-2.0 shown in Figure 3. Simplified cross sectional views of the totally premixed (while firing natural gas) DLN-2.6 combustor to be installed at the Shady Hills project are shown in Figure 4.

In all but the most recent gas turbine combustor designs, the high temperature combustion gases are cooled to an acceptable temperature with dilution air prior to entering the turbine (expansion) section. The sooner this cooling occurs, the lower the thermal NO_X formation. Cooling is also required to protect the first stage nozzle. When this is accomplished by air cooling, the air is injected into the component and is ejected into the combustion gas stream, causing a further drop in combustion gas temperature. This, in turn, lowers achievable thermal efficiency for the unit.

Larger units, such as the Westinghouse 501 G or the planned General Electric 7H, use steam in a closed loop system to provide much of the cooling. The fluid is circulated through the internal portion of the nozzle component or around the transition piece between the combustor and the nozzle and does not enter the exhaust stream. Instead it is normally sent back to a steam generator. The difference between flame temperature and firing temperature into the first stage is minimized and higher efficiency is attained.



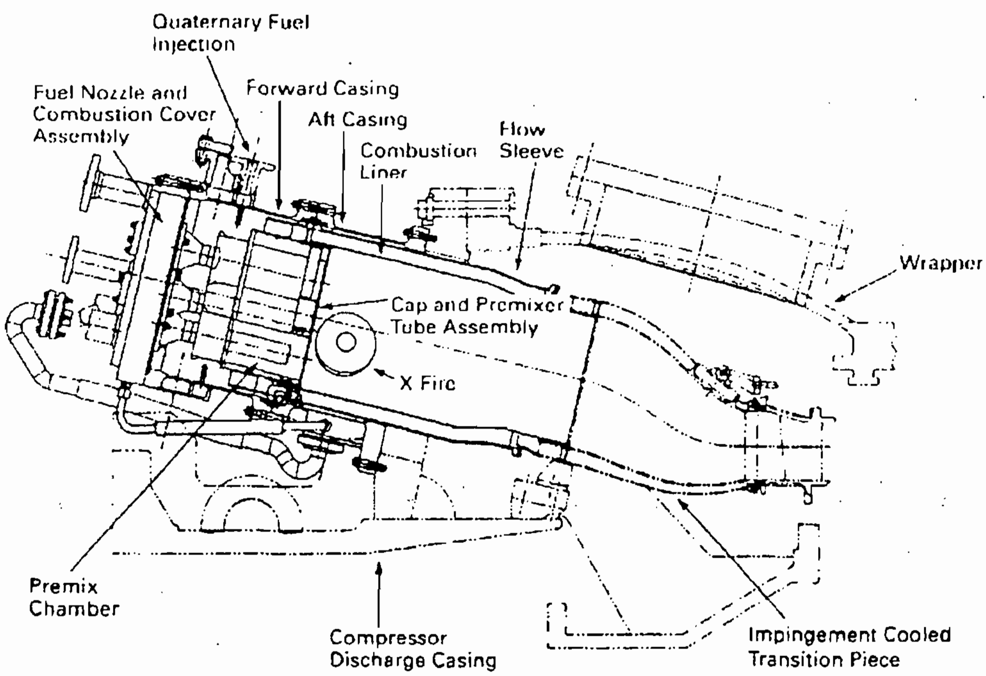


Figure 1 – Dry Low NO_X Operating Modes – DLN-1
Cross Section of GE DLN-2

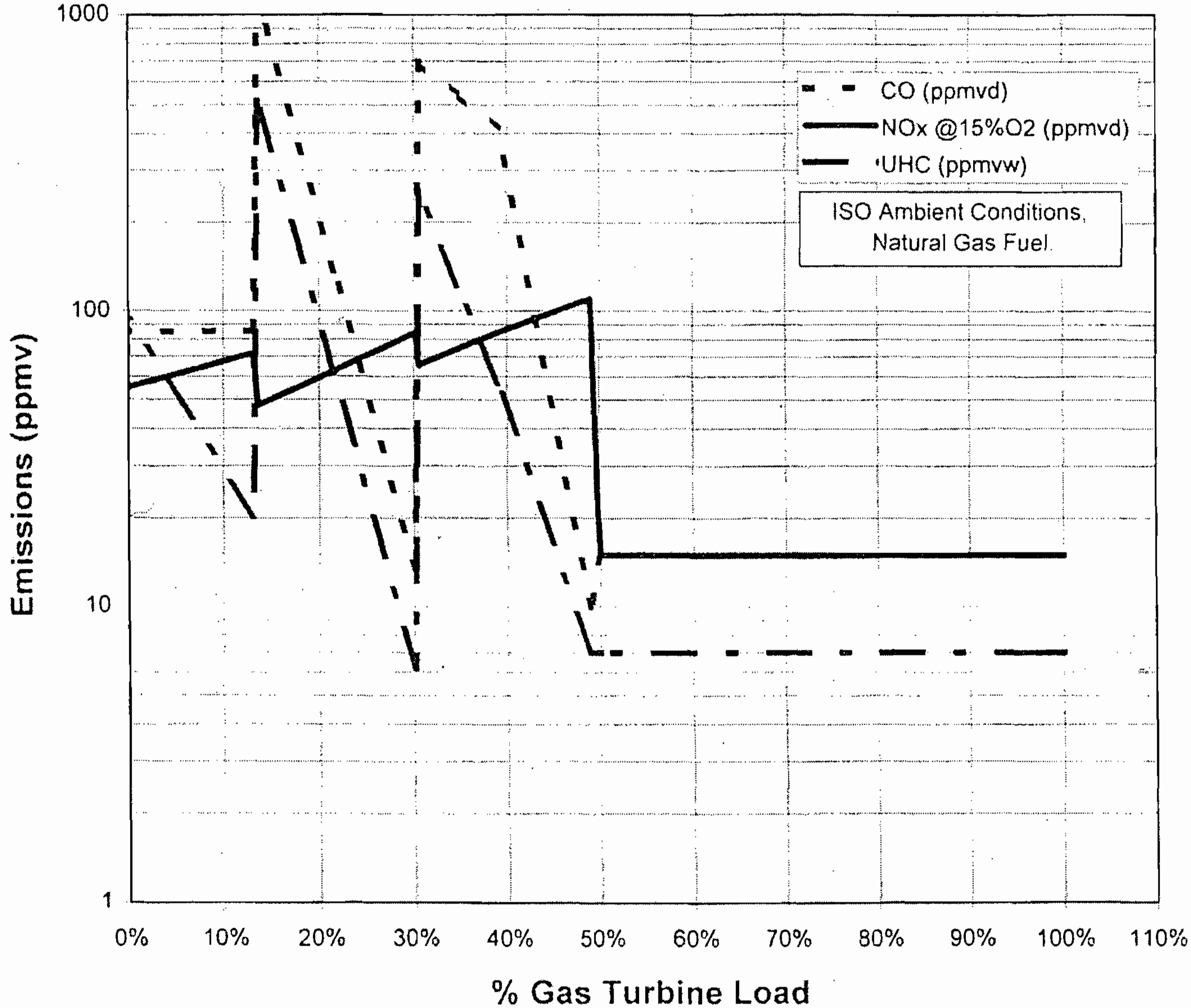


Figure 2 – Emissions Performance Curves for GE DLN-2.6 Combustor Firing Natural Gas in a Dual Fuel GE 7FA Combustion Turbine

(Simple Cycle Intermittent Duty – If Tuned to 15 ppmvd NO_X)

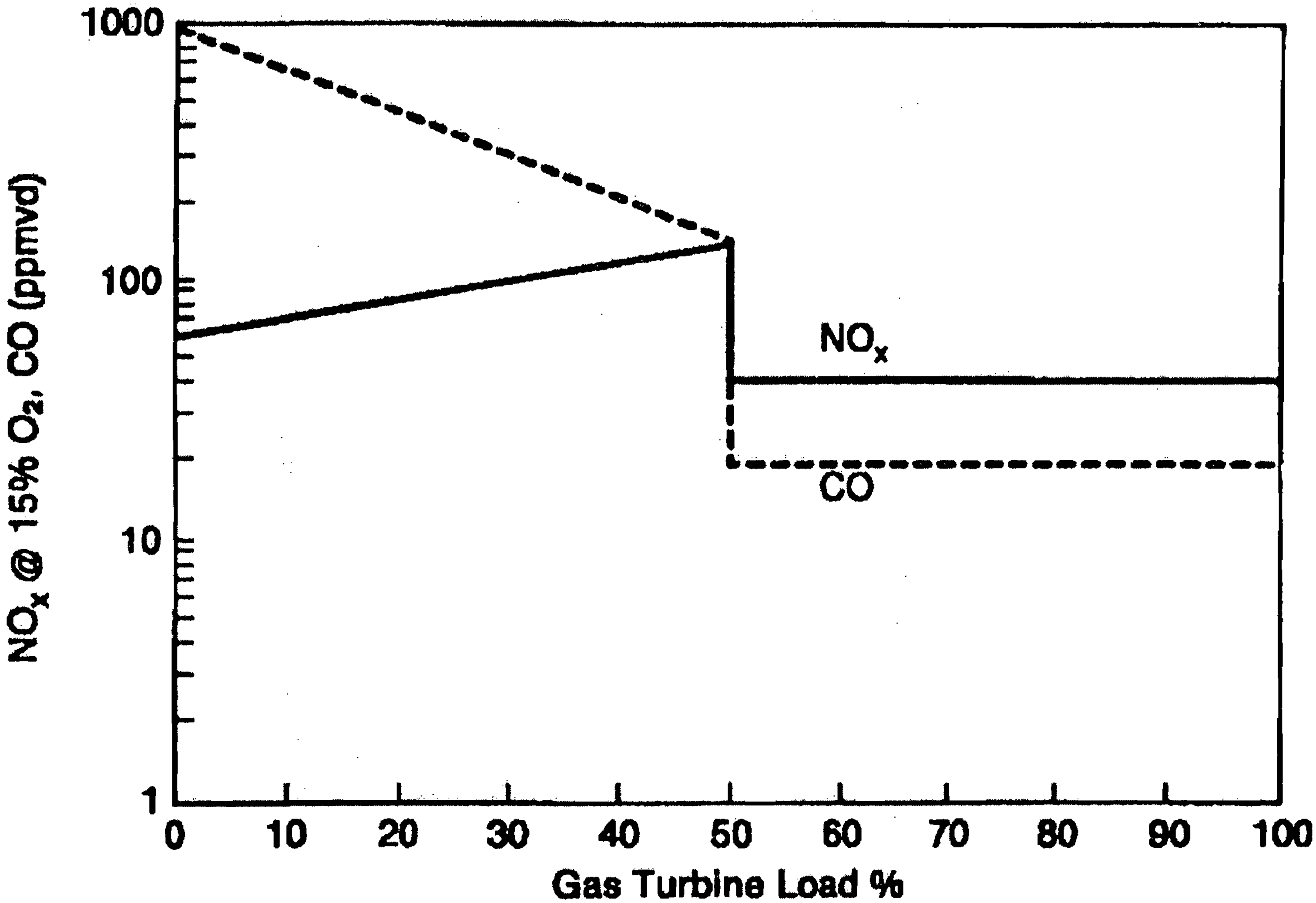


Figure 3 – Emissions Performance for DLN-2 Combustors
Firing Fuel Oil in Dual Fuel GE 7FA Turbine

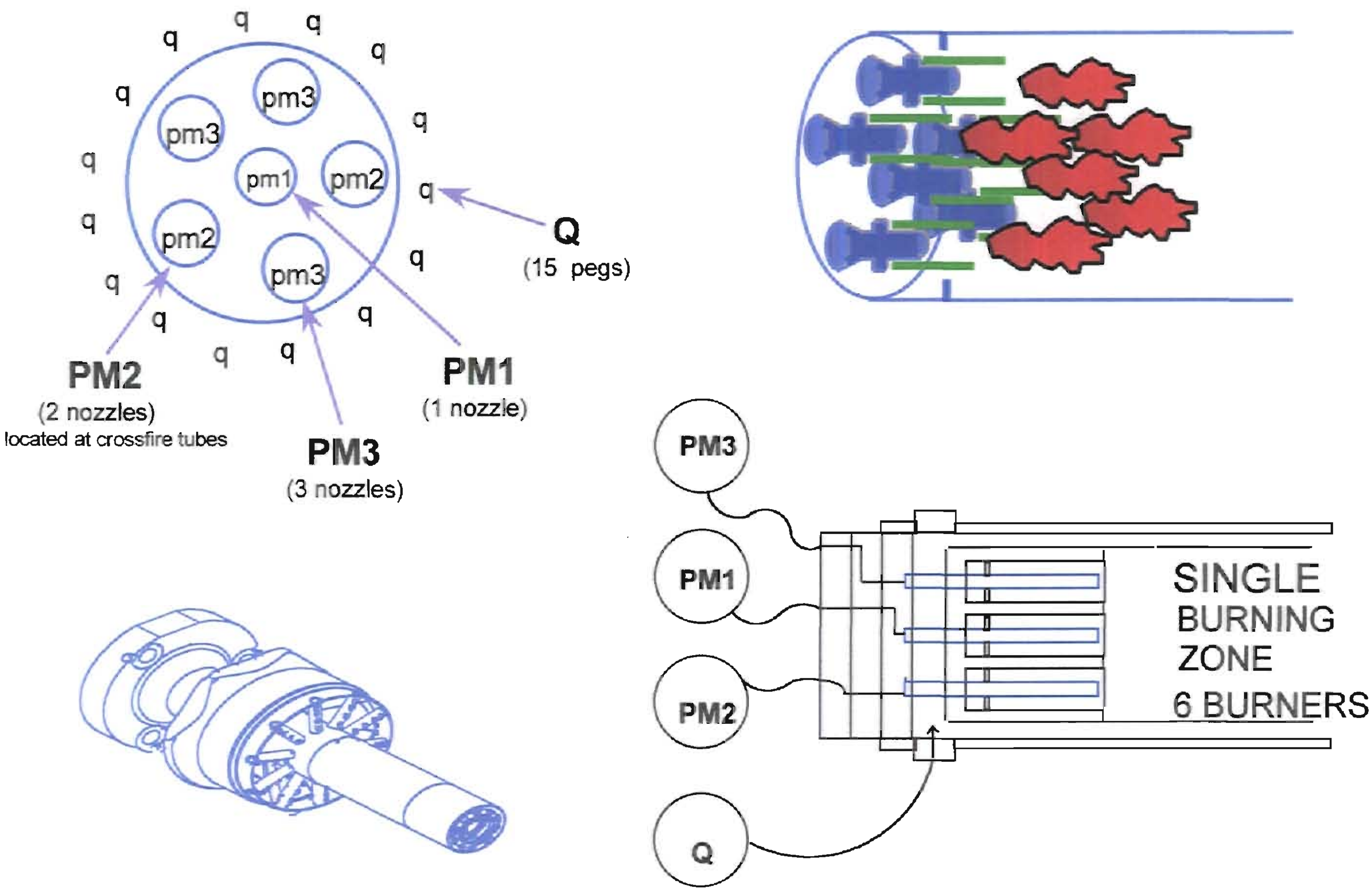


Figure 4 - DLN2.6 Fuel Nozzle Arrangement

Another important result of steam cooling is that a higher firing temperature can be attained with no increase in flame temperature. Flame temperatures and NO_X emissions can therefore be maintained at comparatively low levels even at high firing temperatures. At the same time, thermal efficiency should be greater when employing steam cooling. A similar analysis applies to steam cooling around the transition piece between the combustor and first stage nozzle.

The relationship between flame temperature, firing temperature, unit efficiency, and NO_X formation can be appreciated from Figure 5 which is from a General Electric discussion on these principles. In addition to employing pre-mixing and steam cooling, further reductions are accomplished through design optimization of the burners, testing, further evaluation, etc.

At the present time, emissions achieved by combustion controls are as low as 9 ppmvd from large gas turbines, such as the GE 7FA line. Specialized dual fuel DLN burners were installed in a project in Israel[1], but their performance on fuel oil is not known to the Department.

<u>Selective Catalytic Combustion</u>

Selective catalytic reduction (SCR) is an add-on NO_X control technology that is employed in the exhaust stream following the gas turbine. SCR reduces NO_X emissions by injecting ammonia into the flue gas in the presence of a catalyst. Ammonia reacts with NO_X in the presence of a catalyst and excess oxygen yielding molecular nitrogen and water. The catalysts used in combined cycle, low temperature applications (conventional SCR), are usually vanadium or titanium oxide and account for almost all installations. For high temperature applications (Hot SCR up to 1100 °F), such as simple cycle turbines, zeolite catalysts are available but used in few applications to-date. SCR units are typically used in combination with wet injection or DLN combustion controls.

In the past, sulfur was found to poison the catalyst material. Sulfur-resistant catalyst materials are now becoming more available. Catalyst formulation improvements have proven effective in resisting sulfur-induced performance degradation with fuel oil in Europe and Japan, where conventional SCR catalyst life in excess of 4 to 6 years has been achieved, while 8 to 10 years catalyst life has been reported with natural gas.

Excessive ammonia use tends to increase emissions of CO, ammonia (slip) and particulate matter (when sulfur-bearing fuels are used).

As of early 1992, over 100 gas turbine installations already used SCR in the United States. Only one combustion turbine project in Florida (FPC Hines Power Block 1) employs SCR. The equipment was installed on a temporary basis because Westinghouse had not yet demonstrated emissions as low as 12 ppmvd by DLN technology at the time the units were to start up in 1998. Seminole Electric will install SCR on a previously permitted 501F unit at the Hardee Unit 3 project. The reasons are similar to those for the FPC Hines Power Block I.

Permit limits as low as 2.0 to 3.5 ppmvd NO_X have been specified using SCR on combined cycle F Class projects throughout the country. The recently permitted Kissimmee Cane Island Unit 3 project is one example.[2]

Selective Non-Catalytic Combustion

Selective non-catalytic reduction (SNCR) reduction works on the same principle as SCR. The differences are that it is applicable to hotter streams than conventional or hot SCR, no catalyst is required, and urea can be used as a source of ammonia. No applications have been identified wherein SNCR was applied to a gas turbine because the exhaust temperature of 1100 °F is too low to support the NO_X removal mechanism.

The Department did, however, specify SNCR as one of the available options for the combined cycle Santa Rosa Energy Center. The project will incorporate a large 600 MMBtu/hr duct burner in the heat recovery steam generator (HRSG) and can provide the acceptable temperatures (between 1400 and 2000 °F) and residence times to support the reactions.

Emerging Technologies: $SCONO_X$™ and XONON™

$SCONO_X$™ is a catalytic technology that achieves NO_X control by oxidizing and then absorbing the pollutant onto a honeycomb structure coated with potassium carbonate. The pollutant is then released as harmless molecular nitrogen during a regeneration cycle that requires dilute hydrogen gas. The technology has been demonstrated on small units in California and has been purchased for a small source in Massachusetts.[3] California regulators and industry sources have stated that the first 250 MW block to install $SCONO_X$ ™ will be at PG&E's La Paloma Plant near Bakersfield.[4] The overall project includes several more 250 MW blocks with SCR for control.[5] USEPA has identified an "achieved in practice" BACT value of 2.0 ppmvd over a three-hour rolling average based upon the recent performance of a Vernon, California natural gas-fired 32 MW combined cycle turbine equipped with $SCONO_X$™.

$SCONO_X$™ technology (at 2.0 ppmvd) is considered to represent LAER in non-attainment areas where cost is not a factor in setting an emission limit. It competes with less-expensive SCR in those areas, but has the advantages that it does not cause ammonia emissions in exchange for NO_X reduction. Advantages of the $SCONO_X$ ™ process include in addition to the reduction of NO_X, the elimination of ammonia and the control of VOC and CO emissions. $SCONO_X$™ has not been applied on any major sources in ozone attainment areas.

In a letter dated March 23, 1998 to Goal Line Environmental Technologies, the $SCONO_X$™ process was deemed as technically feasible for maintaining NO_X emissions at 2 ppmvd on a combined cycle unit. ABB Environmental was announced on September 10, 1998 as the exclusive licensee for $SCONO_X$™ for United States turbine applications larger than 100 MW. ABB Power Generation has stated that scale up and engineering work will be required before $SCONO_X$™ can be offered with commercial guarantees for large turbines (based upon letter from Kreminski/Broemmelsiek of ABB Power Generation to the Massachusetts Department of Environmental Protection dated November 4, 1998). $SCONO_X$ requires a much lower temperature regime that is not available in simple cycle units and is therefore not feasible for this project. Therefore the $SCONO_X$ system cannot be considered as achievable or demonstrated in practice for this application.

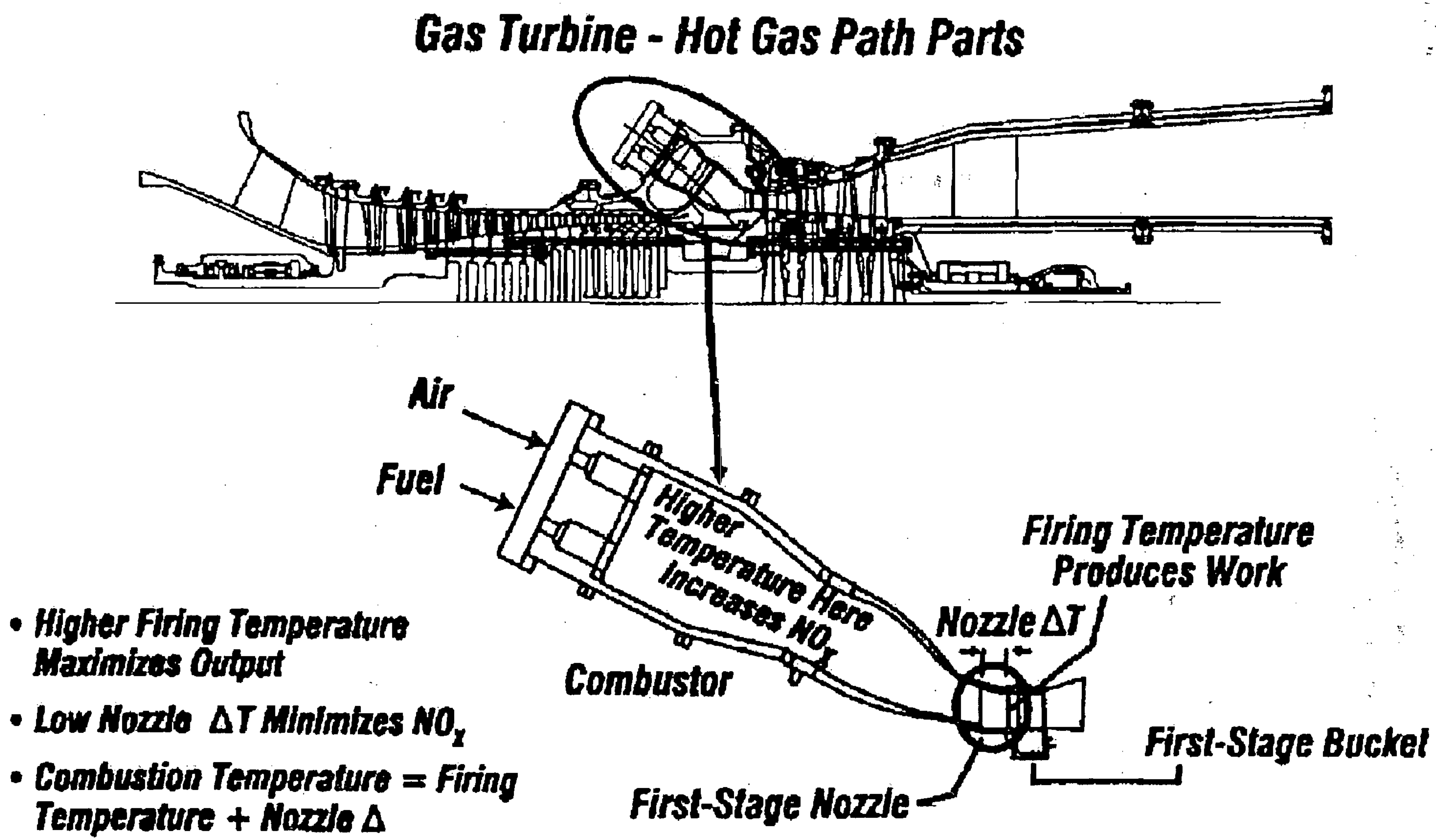


Figure 5 – Relation Between Flame Temperature and Firing Temperature

XONON™, which works by partially burning fuel in a low temperature pre-combustor and completing the combustion in a catalytic combustor. The overall result is low temperature partial combustion (and thus lower NO_X combustion) followed by flameless catalytic combustion to further attenuate NO_X formation. The technology has been demonstrated on combustors on the same order of size as $SCONO_X$™ has. XONON™ avoids the emissions of ammonia and the need to generate hydrogen. It is also extremely attractive from a mechanical point of view.

Catalytica Combustion Systems, Inc. develops, manufactures and markets the XONON™ Combustion System. In a press release on October 8, 1998 Catalytica announced the first installation of a gas turbine equipped with the XONON™ Combustion System in a municipally owned utility for the production of electricity. The turbine was started up on that day at the Gianera Generating Station of Silicon Valley Power, a municipally owned utility serving the City of Santa Clara, Calif. The XONON™ Combustion System, deployed for the first time in a commercial setting, is designed to enable turbines to produce environmentally sound power without the need for expensive cleanup solutions. Previously, this XONON™ system had successfully completed over 1,200 hours of extensive full-scale tests which documented its ability to limit emissions of nitrogen oxides, a primary air pollutant, to less than 3 parts per million.

In a definitive agreement signed on November 19, 1998, GE Power Systems and Catalytica agreed to cooperate in the design, application, and commercialization of XONON™ systems for both new and installed GE E and F-class turbines used in power generation and mechanical drive applications. This appears to be an up-and-coming technology, the development of which will be watched closely by the Department for future applications. It is not yet available for fuel oil and cycling operation.

REVIEW OF SULFUR DIOXIDE (SO_2) AND SULFURIC ACID MIST (SAM)

SO_2 control processes can be classified into five categories: fuel/material sulfur content limitation, absorption by a solution, adsorption on a solid bed, direct conversion to sulfur, or direct conversion to sulfuric acid. A review of the BACT determinations for combustion turbines contained in the BACT Clearinghouse shows that the exclusive use of low sulfur fuels constitutes the top control option for SO_2.

For this project, the applicant has proposed as BACT the use of 0.05% sulfur oil and pipeline natural gas. The applicant estimated total emissions for the project at 221 TPY of SO_2 and 34 TPY of SAM. The Department expects the emissions to be lower because of the limited oil consumption and the typical natural gas in Florida that contains less than 1 grain of sulfur per 100 standard cubic feet (gr S/100scf). This value is well below the "default" maximum value of 20 gr. S/100 scf, but high enough to require a BACT determination.

REVIEW OF PARTICULATE MATTER (PM/PM_{10}) CONTROL TECHNOLOGIES:

Particulate matter is generated by various physical and chemical processes during combustion and will be affected by the design and operation of the NO_X controls. The particulate matter emitted from this unit will mainly be less than 10 microns in diameter (PM_{10}).

Natural gas and 0.05 percent sulfur No. 2 (or superior grade) distillate fuel oil will be the only fuels fired and are efficiently combusted in gas turbines. Such fuels are necessary to avoid damaging turbine blades and other components already exposed to very high temperature and pressure. Natural gas is an inherently clean fuel and contains no ash. The fuel oil to be combusted contains a minimal amount of ash and its use is proposed for only 1000 hours per year making any conceivable add-on control technique for PM/PM_{10} either unnecessary or impractical.

A technology review indicated that the top control option for PM/PM_{10} is a combination of good combustion practices, fuel quality, and filtration of inlet air. Total annual emissions of PM_{10} for the project are expected to be approximately 82 tons per year.

REVIEW OF CARBON MONOXIDE (CO) CONTROL TECHNOLOGIES

CO is emitted from combustion turbines due to incomplete fuel combustion. Combustion design and catalytic oxidation are the control alternatives that are viable for the project. The most stringent control technology for CO emissions is the use of an oxidation catalyst.

All combustion turbines using catalytic oxidation appear to be combined cycle units. Among the most recently permitted ones are the 500 MW Wyandotte Energy project in Michigan, the El Dorado project in Nevada, Ironwood in Pennsylvania, Millenium in Massachusetts, and Sutter Calpine in California. The permitted CO values of these units are between 3 and 5 ppm. Catalytic oxidation was recently installed at a cogeneration plant at Reedy Creek (Walt Disney World), Florida to avoid PSD review which would have been required due to increased operation at low load. Seminole Electric recently proposed catalytic oxidation in order to meet the permitted CO limit at its planned 244 MW Westinghouse 501FD combined cycle unit in Hardee County, Florida.[6]

Most combustion turbines incorporate good combustion to minimize emissions of CO. So far this appears to be the only technology proposed at simple cycle turbine projects. These installations are typically permitted between 10 and 25 ppmvd at full load while firing gas. The values of 12 and 20 ppm for gas and oil respectively at baseload proposed in IPSAPC's original application are within the range of recent determinations for simple cycle CO BACT determinations. Values given in GE-based applications are representative of operations between 50 and 100 percent of full load.

REVIEW OF VOLATILE ORGANIC COMPOUND (VOC) CONTROL TECHNOLOGIES

Volatile organic compound (VOC) emissions, like CO emissions, are formed due to incomplete combustion of fuel. There are no viable add-on control techniques, particularly for simple cycle combustion turbines. The high flame temperature is very efficient at destroying VOC. The applicant has proposed good combustion practices to control VOC. The limits proposed by IPSAPC for this project are 1.4 ppmvd for gas and 7 ppmvw for oil firing at baseload. These limits are sufficient to keep annual emissions of VOC below the 40 TPY threshold and a BACT determination is not required. According to GE, VOC emissions less than 1.4 ppm were achieved during recent tests of the DLN-2.6 technology when firing natural gas.[7]

BACKGROUND ON PROPOSED GAS TURBINE

IPSAPC plans the purchase of three 170 MW (nominal) General Electric PG 7241FA simple cycle gas turbines. This is the most recent designation of GE's line of "F" Class units.

The first commercial GE 7F (or 7FA) unit was installed in a combined cycle project at the Virginia Power Chesterfield Station in 1990.[8] The initial units had a firing temperature of 2300 °F and a combined cycle efficiency exceeding 50 percent. By the mid-90s, the line was improved by higher combustor pressure, a firing temperature of 2400 °F, and a combined cycle efficiency of approximately 56 percent based on a 167 MW combustion turbine.

The first GE 7F/FA project in Florida was at the FPL Martin Plant in 1993 and entered commercial service in 1994.[9] The units were equipped with DLN-2 combustors with a permitted NO_X limit of 25 ppmvd. These actually achieved emissions of 13-25 ppmvd of NO_X, 0-3 ppm of CO, and 0-0.17 ppm of VOC.[10] The City of Tallahassee received a permit in 1998 to install a GE PG7231FA combustion turbine at its Purdom Plant.[11] Although permitted emissions are 12 ppmvd of NO_X, the City obtained a performance guarantee from GE of 9 ppmvd.[12]

FPL also obtained a guarantee and permit limit of 9 ppmvd NO_X for fourteen GE 7241FA turbines to be installed at the Fort Myers and Sanford Repowering Projects.[13, 14] The Santa Rosa Energy Center and the Lake Worth LLC projects in Florida also received a permit with a 9 ppmvd NO_X limit for a GE 7241FA turbine with DLN-2.6 burners.[15]

Most recently, the Department issued BACT determinations for the simple cycle Oleander project in Brevard County, the Vandolah Power Project in Hardee County, the TEC project in Polk County and the JEA Brady Branch Project in Duval County. These five permits also include "new and clean" NO_X limits of 9 ppmvd based on the DLN-2.6 technology installed on F Class units. The Oleander and Vandolah Projects will meet 9 ppmvd on a 24-hour basis and will be allowed to burn fuel oil for 1000 hr/yr/unit. The TEC and JEA projects will meet 10.5 ppmvd on a 24-hour basis, but will limited in oil firing to 750 hr/yr/unit.

General Electric has primarily relied on further advancement and refinement of DLN technology to provide sufficient NO_X control for their combustion turbines in Florida. When required by BACT determinations of most states, General Electric incorporates SCR in combined cycle projects.[16] In its recent permits, Florida has included separate and lower limits in the event that GE's DLN technology does not achieve 9 ppmvd or the applicant selects a manufacturer that does not provide combustors capable of meeting 9 ppmvd.

GE's approach of progressively refining such technology is a proven one, even on some relatively large units. Recently GE Frame 7FA units met performance guarantees of 9 ppmvd with "DLN-2.6" burners at Fort St. Vrain, Colorado and Clark County, Washington.[17] Although the permitted limit is 15 ppmvd, GE has already achieved emission levels of approximately 7-9 ppmvd on gas at a dual-fuel 7EA (120 MW combined cycle) KUA Cane Island Unit 2.[18] Unit 2 is equipped with DLN-1 combustors. Performance guarantees less than 9 ppmvd can be expected for DLN-2.6 combustors on units delivered in a couple of years.[19]

The 9-ppmvd NO_X limit on natural gas proposed by IPSAPC is very stringent for simple cycle 7FA combustion turbines. Typically, companies obtain a guarantee from GE to achieve 9 ppmvd during a test on a "new and clean unit." The test must be conducted at a steady-state load of 50 to 100 percent and completed within the first 100 fired hours of operation.

With the frequent start-ups and shutdowns of the unit, some applicants, such as TEC and JEA, are concerned about the ability to maintain the low NO_X values for long periods of time. As a result, TEC and JEA agreed to a "new and clean" limit of 9 ppmvd but a continuing limit of 10.5 ppmvd. Their permits reflect fewer hours on oil for the higher NO_X value on gas. Presumably, their concern would be lessened should these units be converted to baseload combined cycle operation. Although the Department is not fully aware of the details of the GE guarantee for Shady Hills (proposed 9 ppmvd on a simple cycle unit), the Department is aware from discussions with other applicants that a continuing guarantee may be available at a substantial cost.[20]

The GE Speedtronic™ Mark V Gas Control System will be used. This control system is designed to fulfill all gas turbine control requirements. These include control of liquid, gas, or both fuels in accordance with the requirements of the speed, load control under part-load conditions, temperature control under maximum capability conditions, or during start-up conditions. The Mark V also monitors the DLN process and controls fuel staging and combustion modes to maintain the programmed NO_X values.[21]

DEPARTMENT BACT DETERMINATION

Following are the BACT limits determined for the Shady Hills project assuming full load.. Values for NO_X are corrected to 15% O_2 on a dry volume basis. The emission limits or their equivalents in terms of pounds per hour and NSPS units, as well as the applicable averaging times, are given in the permit Specific Conditions Nos. 18 through 23.

POLLUTANT	CONTROL TECHNOLOGY	PROPOSED BACT LIMIT
PM/PM_{10}, VE	Pipeline Natural Gas Good Combustion	10 Percent Opacity 10/17 lb/hr – Gas/Fuel Oil
CO	As Above	12 ppmvd – Gas 20 ppmvd – Fuel Oil
SO_2/SAM	As Above	1 grain of sulfur per 100 ft^3 gas 0.05 Percent Sulfur in Fuel Oil
NO_X	Dry Low NO_X, WI for F.O., limited oil use	9 ppmvd – Gas 42 ppmvd – F.O. for 1000 of 3,390 hours

RATIONALE FOR DEPARTMENT'S DETERMINATION

- The Top technology and Lowest Achievable Emission Rate (LAER) for simple cycle combustion turbines are Hot SCR and an emission limit of 5 ppmvd and possibly less.
- An example of the above is the Carson Plant in Sacramento, California where there is an SCR system on a simple cycle LM6000PA combustion turbine. Emissions of ammonia are more than 10 ppmvd at the Carson Plant.

- Hot SCR is not commonly used on simple cycle combustion turbines. Although it was required on the fuel oil-fired PREPA project (to achieve 10 ppmvd), the requirement has been removed from the permit. This does not mean that it is not feasible for intermittent duty simple cycle combustion turbines firing natural gas.
- Hot SCR is required at the simple cycle continuous duty Lakeland McIntosh Unit 5 Project if the Westinghouse 501 G unit fails to achieve 9 ppmvd while firing natural gas. Hot SCR was considered cost-effective because the unit will operate continuously and the expected NO_X reduction is from 25^+ to 9 ppmvd). The ammonia slip guarantee is 10 ppmvd.
- The levelized costs of NO_X removal by Hot SCR for the Shady Hills project were estimated by Golder at $14,900 per ton assuming 3,390 hours of operation on natural gas and a reduction from 9 to 3.6 ppmvd on gas and 42 to 17 ppmvd on fuel oil. The estimate is based on an ammonia slip of 10 ppmvd.
- The Department believes that the cost of NO_X control estimated for the Shady Hills project is on the "high side." This is partly based on EPA Region IV comments on the Vandolah Power Project.[22] Also certain repetitive costs such as Engineering within Indirect Costs for three units are not likely to be three times as much as they are for a single units.
- In the face of a real requirement to install Hot SCR, a system could be engineered to cool the gases and use the heat in a recuperator of some kind. Additionally a once-through steam generator could accomplish the same end with the generated steam used for steam augmentation. This could increase revenues to pay for the additional equipment and possibly reduce the cost-effectiveness values.
- The Department believes, nevertheless, that the cost effectiveness of NO_X control by Hot SCR is still more than $10,000 per ton of NO_X removed.
- Hot SCR is not commonly used in PSD attainment areas. Although the Department does not have a "bright line" cost-effectiveness figure and does not necessarily adopt the precise cost calculations for the Shady Hills Station, Hot SCR is not cost-effective for this project. Therefore it is rejected as BACT.
- The Department will limit operation of the three units to 3,390 hours per year per unit. No single unit may operate more than 5,000 hours per year to insure that the conclusion regarding cost-effectiveness remains applicable.
- The units will be operated in intermittent duty and simple cycle mode. Therefore control options, which are feasible only for combined cycle units, are not applicable. This rules out Low Temperature (conventional) SCR, which achieves 3.5 ppmvd NO_X or lower. It also rules out the possibility of $SCONO_X$. XONON is not available for F Class dual fuel projects.
- General Electric has provided a "clean and new" guarantee of 9 ppmvd NO_X. This value is equal to that required at the Lakeland continuous duty combustion turbine.
- Typical permit limits nation-wide for these GE 7FA units while operating on natural gas and in simple cycle mode and intermittent duty are 9-15 ppmvd even though GE provides the same "new and clean" guarantees for them. Limits as high as 25 ppmvd have been recently proposed by some for similar units produced by other manufacturers.

- A level of 9 ppmvd NO_X by DLN has been demonstrated on GE 7FA combustion turbines at Fort St. Vrain, Colorado and Clark County, Washington. However the permitted limits are actually higher at these two facilities providing some level of operating margin.
- A long-term limit of 9 ppmvd is required for the for five GE7 FA units in the Oleander Project in Brevard County and for four identical units in the IPSAPC Vandolah Power Project in Hardee County. A BACT level of 9 ppmvd has been proposed by Virginia Power for a GE 7FA unit to avoid non-attainment New Source Review.
- The 9 ppmvd limit at Oleander, Vandolah, Shady Hills, and Virginia Power while firing natural gas is the lowest known BACT value for an "F" frame combustion turbine operating in simple cycle mode and intermittent duty. The 42 ppmvd limit while firing fuel oil is typical.
- The gas-based NO_X emission limit of 9 ppmvd will be difficult to maintain over short term averaging times. That is the main reason why some operators cannot provide reasonable assurance they can meet such a low limit by DLN. The Department believes a 24-hour averaging time is appropriate. Only periods during which the unit is operated will contribute to the 24 hour average. For example if the unit operates only 6 hours in 24 hours and averages 9 ppmvd during the 6 hours, the reported concentration will still be 9 ppmvd.
- The Department prefers not to set a 24-hour average limit that includes start-up emissions for a peaking unit. There will be a short period during start-up when emissions will actually exceed 100 ppmvd (see Figure 2). Such periods can probably be absorbed into an emissions limit with a long-term averaging time for a continuous duty. It would be much more difficult for an intermittent duty unit that might run only a few continuous hours on occasion.
- The fuel oil-based NO_X emissions limit of 42 ppmvd can be maintained over a short-term averaging period by varying the amount of water injected. The Department has determined that a 3-hour averaging time is appropriate.
- The Department issued permits for the TEC Polk Power, JEA Brandy Branch, and Reliant Osceola Projects with 10.5 ppmvd limit for the same simple cycle GE 7241FA units, but limited the hours of operation on fuel oil to only 750 hours compared with 1000 hours at Oleander, Vandolah and Shady Hills.
- The proposed BACT limit of 9 ppmvd is about less than one-tenth of the applicable NSPS limit per 40 CFR 60, Subpart GG for units as efficient as the 7FA.
- Comments from the National Park Service on the Oleander project suggested that a reduction from 42 to 25 ppmvd in NO_X emissions while burning fuel oil is possible. GE has advised that 42 ppmvd NO_X is the lowest guarantee on F Class units when firing oil. The Department has requested that GE work on developing wet or dry technologies to reduce NO_X emissions for units permitted to fire substantial amounts of fuel oil.[23]
- The Department is aware that ABB offers a DLN technology for fuel oil firing applicable to at least certain smaller combustion turbines (ABB-GTX). It is noted, however, that ABB does not offer a guarantee of 9 ppmvd on the same unit when firing natural gas.

- It is possible that the NO_X emissions while firing oil from may be reduced from 42 ppmvd by increasing the water injection rate. In order to address this possibility, a specific condition will be added to conduct appropriate testing and prepare an engineering report. The report will be submitted for the Department's review to ensure that the lowest reliable NO_X emission rates while firing oil have been achieved.
- The Department's overall BACT determination is equivalent to approximately 0.4 lb/MW-hr by Dry Low NO_X. For reference, the new NSPS promulgated on September 3, 1998 requires that new conventional power plants (based on boilers, etc.) meet a limit of 1.6 lb/MW-hr.
- VOC emissions of 1.4 ppmvd while firing gas and 7 ppmvw proposed by the applicant are achievable and will insure that PSD is not triggered for this pollutant.
- The Department will set CO limits achievable by good combustion at full load as 12 ppm (gas) and 20 ppm (oil). These values are equal to the lowest values from permitted or proposed simple cycle units. These limits are equal to those proposed by the Department for the Oleander, Vandolah, Reliant, JEA Brandy Branch, and TEC Polk Power projects.
- Golder evaluated the use of an oxidation catalyst for the Shady Hills project with an 80 percent control efficiency. The oxidation catalyst control system was estimated to increase the capital cost of the project by $1,700,000 per unit with an annualized cost of $466,000 per year per unit. Golder estimated levelized costs for CO catalyst control at $9,000 per ton. The Department does not necessarily adopt this estimate, but would agree that even much lower estimates would not be cost-effective for removal of CO.
- BACT for PM_{10} was determined to be good combustion practices consisting of: inlet air filtering; use of pipeline natural gas; use of clean, low ash, low sulfur fuels, and operation of the unit in accordance with the manufacturer-provided manuals. The emission limits for PM10 will be set at 10 pounds per hour during gas operation and 17 pounds per hour while operating on fuel oil.
- PM_{10} emissions will be very low and difficult to measure. Additionally, the higher emission mode will involve fuel oil firing which will occur only approximately 1000 hours per year. It is not practical to require running the turbine on oil, simply to conduct tests. Therefore, the Department will set a Visible Emission standard of 10 percent opacity as BACT for both natural gas and fuel oil firing, consistent with the definition of BACT. Examples of installations with similar VE limits include the City of Lakeland, JEA Brandy Branch, TEC Polk Power, Oleander Power and quite a number of combined cycle projects.

POLLUTANT	COMPLIANCE PROCEDURE
Visible Emissions	Method 9
Carbon Monoxide	Annual Method 10 (can use RATA if at capacity)
NO_X (performance)	Annual Method 20 (can use RATA if at capacity)
NO_X (gas - 24-hr block average) (oil – 3-hr block average)	NO_X CEMS, O_2 or CO_2 diluent monitor, and flow device as needed. During gas operation, a separate compliance determination is conducted at the end of each operating day and a new average emission rate is calculated from the arithmetic average of all valid hourly emission rates from the previous operating day. A valid hourly emission rate shall be calculated for each hour in which at least two NO_X concentrations are obtained at least 15 minutes apart. Valid hourly emission rates shall not include periods of start up, shutdown, or malfunction unless prohibited by 62-210.700 F.A.C.
SO_2 and SAM	Custom Fuel Monitoring Schedule

DETAILS OF THE ANALYSIS MAY BE OBTAINED BY CONTACTING:

A. A. Linero, P.E. Administrator
New Source Review Section
Department of Environmental Protection
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended By: Approved By:

C. H. Fancy, P.E., Chief
Bureau of Air Regulation

Howard L. Rhodes, Director
Division of Air Resources Management

Date:

Date:

REFERENCES

1 Telecom. Linero, A.A., FDEP and Chalfin, J., GE. NO_X control technology for fuel oil.

2 Permit. Florida DEP. Kissimmee Utility Authority Cane Island Unit 3. File PSD-FL-254. November, 1999.

3 News Release. Goaline Environmental. Genetics Institute Buys $SCONO_X$ Clean Air System. August 20, 1999.

4 "Control Maker Strives to Sway Utility Skeptics." Air Daily. Volume 5, No. 199. October 14, 1998.

5 Telecom. Linero, A.A., FDEP, and Beckham, D., U.S. Generating. Circa November 1998.

6 Letter. Opalinski, M.P., SECI to Linero, A.A., FDEP. Turbines and Related Equipment at Hardee Unit 3. December 9, 1998.

7 Telecon. Vandervort, C., GE, and Linero, A.A., DEP. "VOC Emissions from FA Gas Turbines with DLN-2.6 Combustors."

8 Brochure. General Electric. "GE Gas Turbines - MS7001FA." Circa 1993.

9 Davis, L.B., GE. "Dry Low NO_X Combustion Systems for GE Heavy Duty Gas Turbines." 1994.

10 Report. Florida Power & Light. "Final Dry Low NO_X Verification Testing at Martin Combine Cycle Plant." August 7, 1995.

11 Permit. Florida DEP. City of Tallahassee Purdom Unit 8. File PSD-FL-239. May, 1998.

12 Application. City of Tallahassee. PSD/Site Certification Application. April, 1997.

13 Permit. Florida DEP. FPL Fort Myers Repowering Project. File 0710002-004-AC. November, 1998.

14 Permit. Florida DEP. FPL Sanford Repowering Project. File 1270009-004-AC. September, 1998.

15 Permit. Florida DEP. Santa Rosa Energy Center. File 1130168-001-AC. December, 1998.

16 Permit. State of Alabama. Alabama Power Plant Barry. 1998.

17 Telecon. Schorr, M., GE, and Costello, M., Florida DEP. March 31, 1998. Status of DLN-2.6 Program

18 Monthly Report. Florida DEP Bureau of Air Regulation. June, 1998.

19 Telecon. Schorr, M., GE, and Linero, A.A., Florida DEP. August, 1998. Cost effectiveness of DLN versus SCR.

20 Telecon. Gianazza, N.B., JEA, and Linero, A.A., Florida DEP. Proposed NO_X limits at Brandy Branch Project.

21 Rowen, W.I. "General Electric Speedtronic™ Mark V Gas Turbine Control System. 1994."

22 Letter. Neeley, R.D., EPA Region IV to Linero, A.A., FDEP. Draft Permit for IPS Avon Park Vandolah Power Project. November 19, 1999.

23 Letter. Linero, A. A., FDEP to Forry, J. and Chalfin, J. General Electric. NO_X emissions control while firing fuel oil in Simple Cycle Units. October 12, 1999.

APPENDIX GC

G.1 The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

G.2 This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings or exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

G.3 As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

G.4 This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

G.5 This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

G.6 The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

G.7 The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

a) Have access to and copy and records that must be kept under the conditions of the permit;
b) Inspect the facility, equipment, practices, or operations regulated or required under this permit, and,
c) Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

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

G.8 If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

a) A description of and cause of non-compliance; and
b) The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

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

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

G.10 The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

G.11 This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

G.12 This permit or a copy thereof shall be kept at the work site of the permitted activity.

G.13 This permit also constitutes:

a) Determination of Best Available Control Technology (X)
b) Determination of Prevention of Significant Deterioration (X); and
c) Compliance with New Source Performance Standards (X).

G.14 The permittee shall comply with the following:

a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application or this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

c) Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements;
2. The person responsible for performing the sampling or measurements;
3. The dates analyses were performed;
4. The person responsible for performing the analyses;
5. The analytical techniques or methods used; and
6. The results of such analyses.

G.15 When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

Memorandum

Florida Department of Environmental Protection

TO: ~~Clair Fancy~~

FROM: Al Linero AL 11/30

DATE: November 30, 1999

SUBJECT: IPSAPC Shady Hills Generating Station
Three 170 MW Combustion Turbines
DEP File No. 1010373-001-AC (PSD-FL-280)

Attached is the public notice package for construction of three dual-fuel, intermittent duty, simple cycle, 170 MW combustion turbines and one 2.8 million gallon fuel oil storage tank at the planned Vandolah Power Project.

Nitrogen Oxides (NO_X) emissions from the gas turbine will be controlled by Dry Low NO_X (DLN-2.6). The applicant proposed an NO_X emission limit of 9 ppmvd @15% O_2. We are requiring compliance on a continuous (24-hour average) basis. The use of fuel oil will be allowed up to 1000 hours per year per unit in recognition of the very low simple cycle NO_X limit on gas. The NO_X and fuel oil hours are equal to the values in the Draft Oleander and IPSAPC Vandolah permits. For reference, JEA, TEC, and Reliant (proposed) were allowed 10.5 ppmvd NO_X on gas, but only 750 hours per year per unit of operation on fuel oil.

NO_X emissions will be controlled to 42 ppm during the limited fuel oil use. Emissions of carbon monoxide, volatile organic compounds, sulfur dioxide, sulfuric acid mist, and particulate matter (PM/PM_{10}) will be very low because of the inherently clean pipeline quality natural gas, limited fuel oil use and, especially, the design of the GE unit.

Recent simple cycle emission limits in Region IV (outside of Florida) have typically been at 15 ppm for simple cycle "F Class" units. In fact, North Carolina recently issued a draft BACT to Dynegy for six dual-fuel Westinghouse "F Class" units with limits of 25 ppm and well over 1000 hours of fuel oil usage. The Dynegy Westinghouse units must meet 15 ppm by early 2002.

Apparently IPSAPC and Oleander feel more confident that they can maintain the guaranteed "new and clean" emission limit of 9 ppmvd for the GE units whereas JEA and TEC do not have the same confidence (while Westinghouse customers do not have the option). The added risk to IPSAPC and Oleander comes at a cost. The extra allowable hours help to even things out between the different companies, NO_X limits, and hours of fuel oil operation.

I recommend your approval of the attached Intent to Issue.

AAL/al

Attachments

Department of Environmental Protection

Jeb Bush
Governor

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

David B. Struhs
Secretary

P.E. Certification Statement

Permittee: **DEP File No.** 1010373-001-AC (PSD-FL-280)

IPS Avon Park Corporation
Shady Hills Generating Station
Hardee County

Project type:

Project is construction of three 170-megawatt GE PG7241FA gas and oil-fired simple cycle combustion turbine-electrical generators with 60-foot stacks and one 2.8-million gallon storage tank. Units will operate maximum of 3,390 hours per year per unit of which 1000 hours per year per unit may be on No. 2 distillate fuel oil.

The units must meet the manufacturer's "new and clean" nitrogen oxides performance guarantee of 9 parts per million by volume, dry, at 15% oxygen (ppmvd) while burning natural gas. The continuous (24-hour) BACT NO_X limits are 9 ppmvd when operating on natural gas and 42 ppmvd by wet injection when burning fuel oil. Other pollutants, including particulate matter (PM/PM_{10}), carbon monoxide, volatile organic compounds, sulfur dioxide, and sulfuric acid mist will be controlled by good combustion and use of clean fuels.

Projected impacts from the proposed project emissions are all less than the applicable significant impact limits corresponding to the nearest PSD Class I (Chassahowitzka National Wilderness Area) and Class II areas.

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

11/30/99

A A. Linero, P.E. Date
Registration Number: 26032

Department of Environmental Protection
Bureau of Air Regulation
New Source Review Section
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301
Phone (850) 921-9523
Fax (850) 922-6979

A. A. LINERO
CERTIFICATE
NO. 26032 11/30
STATE OF
FLORIDA
REGISTERED ENGINEER

FLORIDA

Department of Environmental Protection

Jeb Bush
Governor

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

David B. Struhs
Secretary

October 28, 1999

Mr. Gregg Worley, Chief
Air, Radiation Technology Branch
Preconstruction/HAP Section
U.S. EPA – Region IV
61 Forsyth Street
Atlanta, Georgia 30303

Re: IPS 510 MW Simple Cycle Project
DEP File No. 1010373-001-AC (PSD-FL-280)

Dear Mr. Worley:

Enclosed for your review and comment is an application for the IPS Shady Hills Generating Station in Pasco County. This facility will be comprised of three nominal 170 MW GE PG7241FA combustion turbines operating in simple cycle mode, one fuel oil storage tank, and ancillary equipment. IPS proposes 3,390 hours of operation per unit. IPS requests up to 1000 hours of 0.05 percent sulfur No. 2 distillate fuel oil use per unit within the requested 3,390 hours.

The site is approximately 28 kilometers south of the Chassahowitzka National Wildlife Area. The applicant proposes NO_X emissions at 9 ppmvd on natural gas and 42 ppmvd on fuel oil with annual emissions as per the table below:

Pollutant	Proposed Facility Emissions (tons per year)
NO_X	756
SO_2	166
CO	259
PM/PM_{10}	61.4
VOC	34.4
SAM	25.4

The project is similar to the Oleander Project. Your comments can be forwarded to my attention at the letterhead address or faxed to me at (850) 922-6979. If you have any questions, please contact me at (850) 921-9523.

Sincerely,

Tori Tober for

A. A. Linero, P.E., Administrator
New Source Review Section

AAL/jk

Enclosure

FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Jeb Bush
Governor

Department of Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

David B. Struhs
Secretary

October 28, 1999

Mr. John Bunyak, Chief
Policy, Planning & Permit Review Branch
NPS-Air Quality Division
Post Office Box 25287
Denver, CO 80225

Re: IPS 510 MW Simple Cycle Project
DEP File No. 1010373-001-AC (PSD-FL-280)

Dear Mr. Bunyak:

Enclosed for your review and comment is an application for the IPS Shady Hills Generating Station in Pasco County. This facility will be comprised of three nominal 170 MW GE PG7241FA combustion turbines operating in simple cycle mode, one fuel oil storage tank, and ancillary equipment. IPS proposes 3,390 hours of operation per unit. IPS requests up to 1000 hours of 0.05 percent sulfur No. 2 distillate fuel oil use per unit within the requested 3,390 hours.

The site is approximately 28 kilometers south of the Chassahowitzka National Wildlife Area. The applicant proposes NO_X emissions at 9 ppmvd on natural gas and 42 ppmvd on fuel oil with annual emissions as per the table below:

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NO_X	756
SO_2	166
CO	259
PM/PM_{10}	61.4
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SAM	25.4

The project is similar to the Oleander Project. Your comments can be forwarded to my attention at the letterhead address or faxed to me at (850) 922-6979. If you have any questions, please contact me at (850) 921-9523.

Sincerely,

Teri Tober for

A. A. Linero, P.E., Administrator
New Source Review Section

AAL/jk

Enclosure

- Particulate matter (PM) as total suspended particulate matter (TSP),
- Particulate matter with aerodynamic diameter of 10 microns or less (PM_{10}),
- Nitrogen dioxide (NO_2),
- Sulfur dioxide (SO_2), and
- Carbon monoxide (CO).

Pasco County has been designated as an attainment or unclassifiable area for all criteria pollutants [i.e., attainment: ozone (O_3), PM_{10}, SO_2, CO, and NO_2; unclassifiable: lead] and is classified as a PSD Class II area for PM_{10}, SO_2, and NO_2; therefore, the PSD review will follow the regulations pertaining to such designations.

The air permit application is divided into seven major sections.

- Section 2.0 presents a description of the facility, including air emissions and stack parameters.
- Section 3.0 summarizes and reviews the PSD requirements applicable to the proposed project.
- Section 4.0 includes the control technology review with discussions on BACT.
- Section 5.0 discusses the ambient air monitoring analysis (pre-construction monitoring) required by PSD regulations.
- Section 6.0 presents a summary of the air modeling approach and results used in assessing compliance of the proposed project with ambient air quality standards (AAQS), PSD increments, and good engineering practice (GEP) stack height regulations.
- Section 7.0 provides the additional impact analyses for soils, vegetation, and visibility.

Figure 1-1. General Location of Pasco Site	Filename: 9939525Y/F1/WP/figure1-1 Date: 10/12/99	Golder Associates

2.0 PROJECT DESCRIPTION

2.1 SITE DESCRIPTION

The project site, shown in Figure 2-1, consists of about 20 acres that is currently undeveloped. There is minimal industrial and commercial development within a 3-kilometer (km) radius of the site. The plant elevation will be approximately 50 feet above sea level. The terrain surrounding the site is flat.

Natural gas will be supplied by a lateral pipeline connected to the Florida Gas Transmission (FGT) Company's natural gas pipeline located west of the site. The site has access to electrical transmission facilities from a 230-kilovolt (kV) transmission line and electrical substation that is located to the west of the site. Water for the evaporative cooler, and NO_x control when firing oil, will be supplied by Pasco County, but onsite groundwater wells will be available for backup or emergency purposes. Potable water and additional fire protection supply water will be provided from groundwater wells.

2.2 POWER PLANT

The proposed project will consist of three General Electric Frame 7FA CTs and associated facilities. The annual maximum capacity factor of the plant will be 39 percent, which is equivalent to operating 3,390 hours per year at full load. Natural gas will be used as the primary fuel, and fuel oil will be used as a backup fuel. Fuel oil usage will be limited to the equivalent of 1,000 hours per year at full load.

Plant performance with General Electric 7FA CTs was developed for natural gas and oil; at 50-, 75-, and 100-percent load; and at 32 degrees Fahrenheit (°F), 59°F, and 95°F turbine inlet temperatures. Combustion turbine performance is based on a performance envelope developed from General Electric data and has been adjusted to reflect degradation when the units operate over time and performance improvements beyond that provided by the manufacturer's guarantee. In particular, the combustion turbine emission estimates account for 5 percent higher power output and a 6 percent degradation (see Appendix A). This 11 percent was used to increase mass flow of the turbine.

The CTs will be capable of operating from 50 to 100 percent of baseload. The efficiency of the CTs decreases at part load. As a result, IPS Avon Park Corporation will have an economic incentive to dispatch the plant to keep the units operating as near baseload as possible.

Natural gas will be transported to the site via pipeline and fuel oil will be trucked to the site. The distillate fuel oil, which will have a maximum sulfur content of 0.05 percent, will be stored onsite in one aboveground storage tank, sized to hold approximately 67,000 barrels (2.8 million gallons).

Air emissions control will consist of using state-of-the-art DLN burners in the CTs when firing natural gas. The General Electric Frame 7FA will be equipped with the General Electric DLN-2.6 combustion system that regulates the distribution of fuel delivery to a multi-nozzle, total premix combustor arrangement. The fuel flow distribution to each combustion system fuel nozzle is regulated to maintain unit load and minimize turbine emissions. The DLN-2.6 combustion system consists of six fuel nozzles per combustion can, with each operating as a fully premixed combustor. Of the six nozzles, five are located radically and one is in the center. The fuel system is fully automated and sequences the DLN-2.6 combustion system through a number of staging modes prior to reaching full load. The General Electric Frame 7FA has 14 combustors per turbine. Water injection will be used for NO_x control when firing distillate fuel oil. The SO_2 emissions will be controlled by the use of low-sulfur fuels. Good combustion practices and clean fuels will also minimize potential emissions of PM, CO, volatile organic compound (VOC), and other pollutants (e.g., trace metals). These engineering and environmental designs maximize control of air emissions while minimizing economic, environmental, and energy impacts (see Section 4.0 for the BACT evaluation).

2.3 PROPOSED SOURCE EMISSIONS AND STACK PARAMETERS

The estimated maximum hourly emissions and exhaust information representative of the proposed CT operating at baseload conditions (100-percent load), 75-percent load and 50-percent load conditions are presented in Tables 2-1 through 2-6. The information is presented in these tables for one unit operating in simple cycle operation, based on natural gas combustion and fuel oil combustion. The data are presented for turbine inlet temperatures of 32°F, 59°F, and 95°F. These temperatures represent the range of ambient temperatures that the CTs are most likely to experience.

The performance calculations for the operating conditions are given in Appendix A.

The pollutant gaseous emission concentrations and PM_{10} emission rates for the proposed CTs are as follows:

Pollutant	Natural Gas	Distillate Oil
NO_x, ppmvd @ 15 percent O_2	9	42
CO, ppmvd	12	20
VOC as CH_4, ppmvd (gas), ppmvw (oil)	1.4	7
SO_x as SO_2	Calculated Based on Fuel (1.0 grains S/100 SCF)	Calculated Based on Fuel (0.05 percent sulfur)
PM_{10} lb/hr (dry filterable)	10	17

Note: lb/hr = pound per hour
ppmvd = parts per million volume dry
ppmvw = parts per million volume wet

The maximum short-term emission rates (lb/hr) generally occur at baseload, 32°F operation, where the CT has the greatest output and greatest fuel consumption.

Based on a turbine inlet temperature of 59°F, the emission rates used to calculate maximum potential annual emissions for the proposed facility for regulated air pollutants are presented in Table 2-7 for one and three CTs. To produce the maximum annual emissions, the CTs are assumed to operate at baseload for 3,390 hours (39 percent capacity factor) firing natural gas for 2,390 hours and fuel oil for 1,000 hours. The potential emissions are based on the 59°F turbine inlet air condition since it represents a nominal average between the higher emission levels at the 32°F turbine inlet condition (winter) and the relatively infrequent 95°F turbine inlet condition (summer).

Process flow diagrams of the turbine operating at turbine inlet temperature of 95°F, 59°F, and 32°F are presented in Figures 2-2 through 2-4, respectively for the "F" Class CT.

Based on a review of the emission rates for natural gas and fuel oil combustion, the highest emission rates for the regulated pollutants generally occur when firing fuel oil. Combustion of natural gas and fuel oil result in slightly different exhaust flow gas rates and stack exit temperatures; however, the differences are minor. As a result of the higher emissions when firing oil, the air modeling analyses were based on determining maximum ground-level impacts with fuel oil.

As discussed in Section 6.0, the air modeling analyses that addressed compliance with ambient standards were based on modeling the CTs for the operating load and ambient temperature which produced the maximum impacts from the load impact analysis that was performed. Although the highest emission rates occur with low turbine inlet temperatures (i.e., 32°F) and baseload conditions, the lowest exhaust gas flow rates occur with a turbine inlet temperature of 95°F and 50 percent operating load. Since this low exhaust flow condition can result in potentially higher impacts due to lower plume rise (i.e., due to lower exit velocity and temperature), the analysis included modeling the CTs for the following four scenarios which are designed to determine the maximum impacts for the project:

- Base operating load for the turbine at an inlet temperature of 32°F;
- Base operating load for the turbine at an inlet temperature of 95°F;
- A 50-percent operating load for the turbine at an inlet temperature of 32°F; and
- A 50-percent operating load for the turbine at an inlet temperature of 95°F.

2.4 SITE LAYOUT, STRUCTURES, AND STACK SAMPLING FACILITIES

A plot plan of the proposed facility is presented in Figure 2-5. The dimensions of the buildings and structures are presented in Section 6.0. Stack sampling facilities will be constructed in accordance with Rule 62-297.310(6) F.A.C.

Table 2-1. Stack, Operating, and Emission Data for the Proposed GE 7FA Combustion Turbine with DLN Combustors Firing Natural Gas-- Baseload for Simple Cycle Operation

Parameter		Operating and Emission Data[a] for Ambient Temperature 32°F	59°F	95°F
Stack Data (ft)				
Height		60	60	60
Diameter		22	22	22
Operating Data				
Temperature (°F)		1,097	1,113	1,135
Velocity (ft/sec)		118.7	116.0	111.1
Maximum Hourly Emission per Unit[b]				
SO_2	lb/hr	5.1	5.0	4.6
	Basis	1.0 grain S/100CF	1.0 grain S/100CF	1.0 grain S/100CF
PM/PM_{10}	lb/hr	10	10	10
	Basis	Dry filterables	Dry filterables	Dry filterables
NO_x	lb/hr	66.7	64.1	59.9
	Basis	9 ppmvd at 15% O_2	9 ppmvd at 15% O_2	9 ppmvd at 15% O_2
CO	lb/hr	44.2	42.5	39.3
	Basis	12 ppmvd	12 ppmvd	12 ppmvd
VOC (as methane)	lb/hr	2.95	2.83	2.62
	Basis	1.4 ppmvd	1.4 ppmvd	1.4 ppmvd
Sulfuric Acid Mist	lb/hr	0.79	0.76	0.71
	Basis	10% SO_2	10% SO_2	10% SO_2

Note: ppmvd = parts per million volume dry; O_2 = oxygen; S = sulfur; CF = cubic feet

[a] Refer to Appendix A for detailed information.

[b] Other regulated pollutants are assumed to have negligible emissions. These pollutants include lead, reduced sulfur compounds, hydrogen sulfide, fluorides, beryllium, mercury, arsenic, asbestos, vinyl chloride, and radionuclides.

Table 2-2. Stack, Operating, and Emission Data for the Proposed GE 7FA Combustion Turbine with DLN Combustors Firing Natural Gas-- 75 Percent Load for Simple Cycle Operation

Parameter		Operating and Emission Data[a] for Ambient Temperature		
		32°F	59°F	95°F
Stack Data (ft)				
Height		60	60	60
Diameter		22	22	22
Operating Data				
Temperature (°F)		1,170	1,179	1,193
Velocity (ft/sec)		100.5	98.2	95.0
Maximum Hourly Emission per Unit[b]				
SO_2	lb/hr	4.2	4.0	3.7
	Basis	1.0 grain S/100CF	1.0 grain S/100CF	1.0 grain S/100CF
PM/PM_{10}	lb/hr	10	10	10
	Basis	Dry filterables	Dry filterables	Dry filterables
NO_x	lb/hr	54.4	52.4	48.3
	Basis	9 ppmvd at 15% O_2	9 ppmvd at 15% O_2	9 ppmvd at 15% O_2
CO	lb/hr	35.7	34.6	32.7
	Basis	12 ppmvd	12 ppmvd	12 ppmvd
VOC (as methane)	lb/hr	2.38	2.31	2.18
	Basis	1.4 ppmvd	1.4 ppmvd	1.4 ppmvd
Sulfuric Acid Mist	lb/hr	0.65	0.62	0.57
	Basis	10% SO_2	10% SO_2	10% SO_2

Note: ppmvd = parts per million volume dry; O_2 = oxygen; S = sulfur; CF = cubic feet

[a] Refer to Appendix A for detailed information.

[b] Other regulated pollutants are assumed to have negligible emissions. These pollutants include lead, reduced sulfur compounds, hydrogen sulfide, fluorides, beryllium, mercury, arsenic, asbestos, vinyl chloride, and radionuclides.

Table 2-3. Stack, Operating, and Emission Data for the Proposed GE 7FA Combustion Turbine with DLN Combustors Firing Natural Gas-- 50 Percent Load for Simple Cycle Operation

		Operating and Emission Data[a] for Ambient Temperature		
Parameter		32°F	59°F	95°F
Stack Data (ft)				
Height		60	60	60
Diameter		22	22	22
Operating Data				
Temperature (°F)		1,171	1,186	1,200
Velocity (ft/sec)		84.2	82.0	80.5
Maximum Hourly Emission per Unit[b]				
SO_2	lb/hr	3.4	3.2	2.9
	Basis	1.0 grain S/100CF	1.0 grain S/100CF	1.0 grain S/100CF
PM/PM_{10}	lb/hr	10	10	10
	Basis	Dry filterables	Dry filterables	Dry filterables
NO_x	lb/hr	43.4	40.8	38.3
	Basis	9 ppmvd at 15% O_2	9 ppmvd at 15% O_2	9 ppmvd at 15% O_2
CO	lb/hr	30.0	28.9	27.8
	Basis	12 ppmvd	12 ppmvd	12 ppmvd
VOC (as methane)	lb/hr	2.00	1.93	1.85
	Basis	1.4 ppmvd	1.4 ppmvd	1.4 ppmvd
Sulfuric Acid Mist	lb/hr	0.52	0.49	0.45
	Basis	10% SO_2	10% SO_2	10% SO_2

Note: ppmvd = parts per million volume dry; O_2 = oxygen; S = sulfur; CF = cubic feet

[a] Refer to Appendix A for detailed information.

[b] Other regulated pollutants are assumed to have negligible emissions. These pollutants include lead, reduced sulfur compounds, hydrogen sulfide, fluorides, beryllium, mercury, arsenic, asbestos, vinyl chloride, and radionuclides.

Table 2-4. Stack, Operating, and Emission Data for the Proposed GE 7FA Combustion Turbine with Water Injection Firing Distillate Fuel Oil-- Baseload for Simple Cycle Operation

Parameter		Operating and Emission Data[a] for Ambient Temperature		
		32°F	59°F	95°F
Stack Data (ft)				
Height		60	60	60
Diameter		22	22	22
Operating Data				
Temperature (°F)		1,076	1,094	1,121
Velocity (ft/sec)		122.4	119.7	115.0
Maximum Hourly Emission per Unit[b]				
SO_2	lb/hr	101.5	98.7	93.4
	Basis	0.05 % S	0.05 % S	0.05 % S
PM/PM_{10}	lb/hr	17.0	17.0	17.0
	Basis	Dry filterables	Dry filterables	Dry filterables
NO_x	lb/hr	362.0	350.8	335.8
	Basis	42 ppmvd at 15% O_2	42 ppmvd at 15% O_2	42 ppmvd at 15% O_2
CO	lb/hr	74.4	71.4	66.2
	Basis	20 ppmvd	20 ppmvd	20 ppmvd
VOC (as methane)	lb/hr	16.7	16.2	15.3
	Basis	7 ppmvw	7 ppmvw	7 ppmvw
Sulfuric Acid Mist	lb/hr	15.6	15.1	14.3
	Basis	10% SO_2	10% SO_2	10% SO_2

Note: ppmvd = parts per million volume dry; O_2 = oxygen; S = sulfur; CF = cubic feet; ppmvw = parts per million volume wet

[a] Refer to Appendix A for detailed information.

[b] Other regulated pollutants are assumed to have negligible emissions. These pollutants include lead, reduced sulfur compounds, hydrogen sulfide, fluorides, beryllium, mercury, arsenic, asbestos, vinyl chloride, and radionuclides.

Table 2-5. Stack, Operating, and Emission Data for the Proposed GE 7FA Combustion Turbine with Water Injection Firing Distillate Fuel Oil-- 75 Percent Load for Simple Cycle Operation

Parameter		Operating and Emission Data[a] for Ambient Temperature 32°F	59°F	95°F
Stack Data (ft)				
Height		60	60	60
Diameter		22	22	22
Operating Data				
Temperature (°F)		1,170	1,176	1,186
Velocity (ft/sec)		101.0	99.6	97.0
Maximum Hourly Emission per Unit[b]				
SO_2	lb/hr	82.6	80.1	74.8
	Basis	0.05 % S	0.05 % S	0.05 % S
PM/PM_{10}	lb/hr	17	17	17
	Basis	Dry filterables	Dry filterables	Dry filterables
NO_x	lb/hr	296.7	285.0	267.8
	Basis	42 ppmvd at 15% O_2	42 ppmvd at 15% O_2	42 ppmvd at 15% O_2
CO	lb/hr	57.6	56.4	53.9
	Basis	20 ppmvd	20 ppmvd	20 ppmvd
VOC (as methane)	lb/hr	13.0	12.8	12.4
	Basis	7 ppmvw	7 ppmvw	7 ppmvw
Sulfuric Acid Mist	lb/hr	12.6	12.3	11.5
	Basis	10% SO_2	10% SO_2	10% SO_2

Note: ppmvd = parts per million volume dry; O_2 = oxygen; S = sulfur; CF = cubic feet; ppmvw = parts per million volume wet

[a] Refer to Appendix A for detailed information.

[b] Other regulated pollutants are assumed to have negligible emissions. These pollutants include lead, reduced sulfur compounds, hydrogen sulfide, fluorides, beryllium, mercury, arsenic, asbestos, vinyl chloride, and radionuclides.

Table 2-6. Stack, Operating, and Emission Data for the Proposed GE 7FA Combustion Turbine with Water Injection Firing Distillate Fuel Oil-- 50 Percent Load for Simple Cycle Operation

Parameter		Operating and Emission Data[a] for Ambient Temperature 32°F	59°F	95°F
Stack Data (ft)				
Height		60	60	60
Diameter		22	22	22
Operating Data				
Temperature (°F)		1,200	1,200	1,200
Velocity (ft/sec)		85.7	83.3	81.5
Maximum Hourly Emission per Unit[b]				
SO_2	lb/hr	65.6	62.8	58.9
	Basis	0.05 % S	0.05 % S	0.05 % S
PM/PM_{10}	lb/hr	17	17	17
	Basis	Dry filterables	Dry filterables	Dry filterables
NO_x	lb/hr	236.4	224.0	209.3
	Basis	42 ppmvd at 15% O_2	42 ppmvd at 15% O_2	42 ppmvd at 15% O_2
CO	lb/hr	72.2	69.8	67.5
	Basis	30 ppmvd	30 ppmvd	30 ppmvd
VOC (as methane)	lb/hr	10.8	10.5	10.3
	Basis	7 ppmvw	7 ppmvw	7 ppmvw
Sulfuric Acid Mist	lb/hr	10.0	9.6	9.0
	Basis	10% SO_2	10% SO_2	10% SO_2

Note: ppmvd = parts per million volume dry; O_2 = oxygen; S = sulfur; CF = cubic feet; ppmvw = parts per million volume wet

[a] Refer to Appendix A for detailed information.

[b] Other regulated pollutants are assumed to have negligible emissions. These pollutants include lead, reduced sulfur compounds, hydrogen sulfide, fluorides, beryllium, mercury, arsenic, asbestos, vinyl chloride, and radionuclides.

Table 2-7. Maximum Potential Annual Emissions for the Shady Hills Generating Station Project

	Annual Emissions (tons per years) (1)						
	Natural Gas Firing (2) for Operating Loads			Distillate Oil Firing (3) for Operating Loads			Maximum Emissions
Pollutant	100%	75%	50%	100%	75%	50%	with oil-firing (4)
<u>One Combustion Turbine</u>							
PM	17.0	17.0	17.0	8.5	8.5	8.5	20.5
SO_2	8.4	6.8	5.4	49.3	40.0	31.4	55.3
NO_x	109	88.8	69.2	175.4	142.6	112.0	252
CO	72.0	58.6	49.0	35.7	28.2	34.9	86.5
VOC	4.8	3.9	3.3	8.1	6.4	5.3	11.5
Sulfuric Acid Mist	1.3	1.0	0.8	7.6	6.1	4.8	8.5
<u>Three Combustion Turbines</u>							
PM	50.9	50.9	50.9	25.5	25.5	25.5	61.4
SO_2	25.2	20.5	16.2	148	120	94.2	166
NO_x	326	266	208	526	428	336	756
CO	216	176	147	107	84.5	105	259
VOC	14.4	11.7	9.8	24.3	19.2	15.8	34.4
Sulfuric Acid Mist	3.9	3.1	2.5	22.7	18.4	14.4	25.4

(1) Based on turbine inlet temperature of 59°F.
(2) 3,390 hours per year operation.
(3) 1,000 hours per year operation.
(4) 2,390 hours of gas firing and 1,000 hours of oil firing.

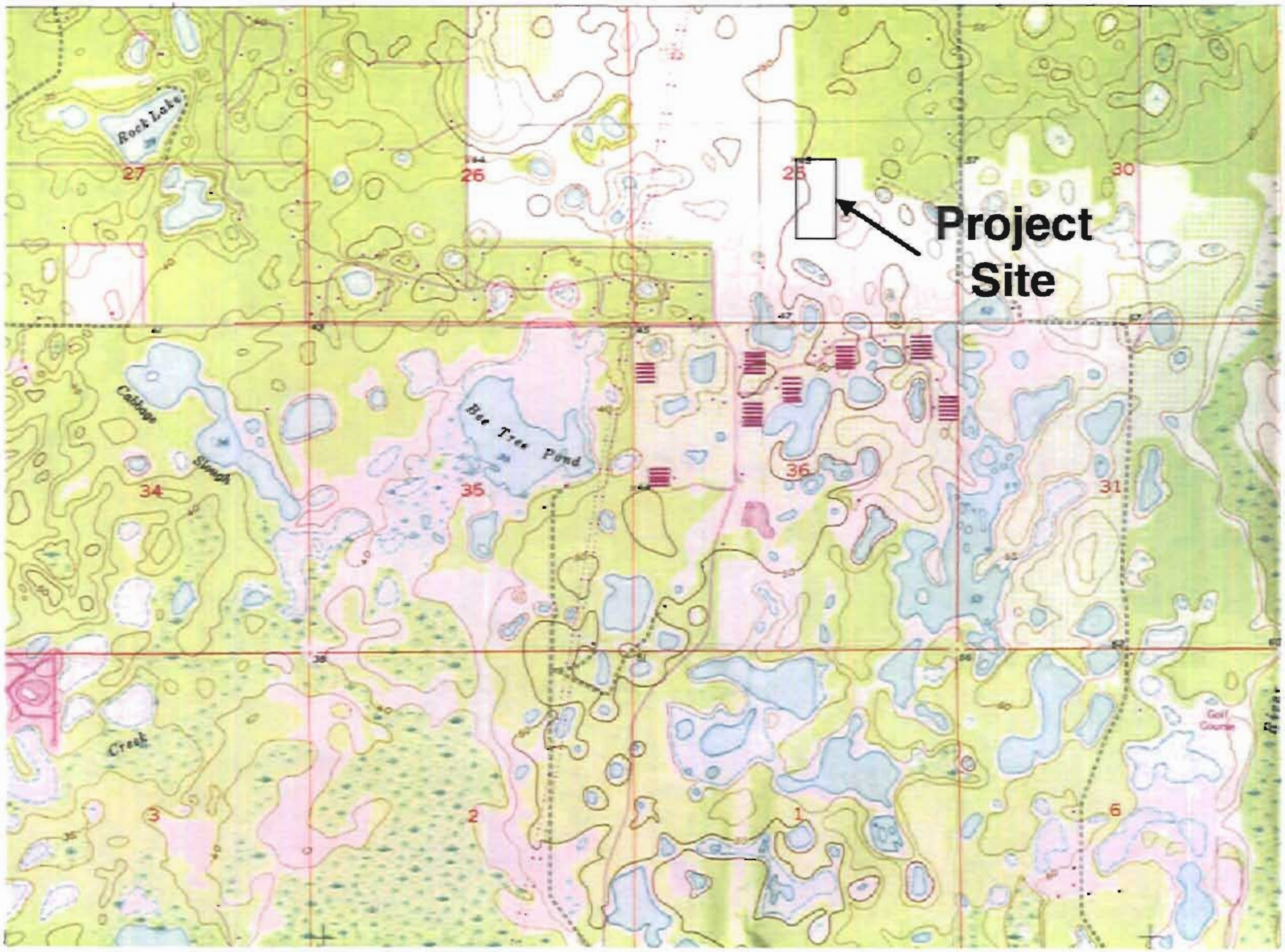
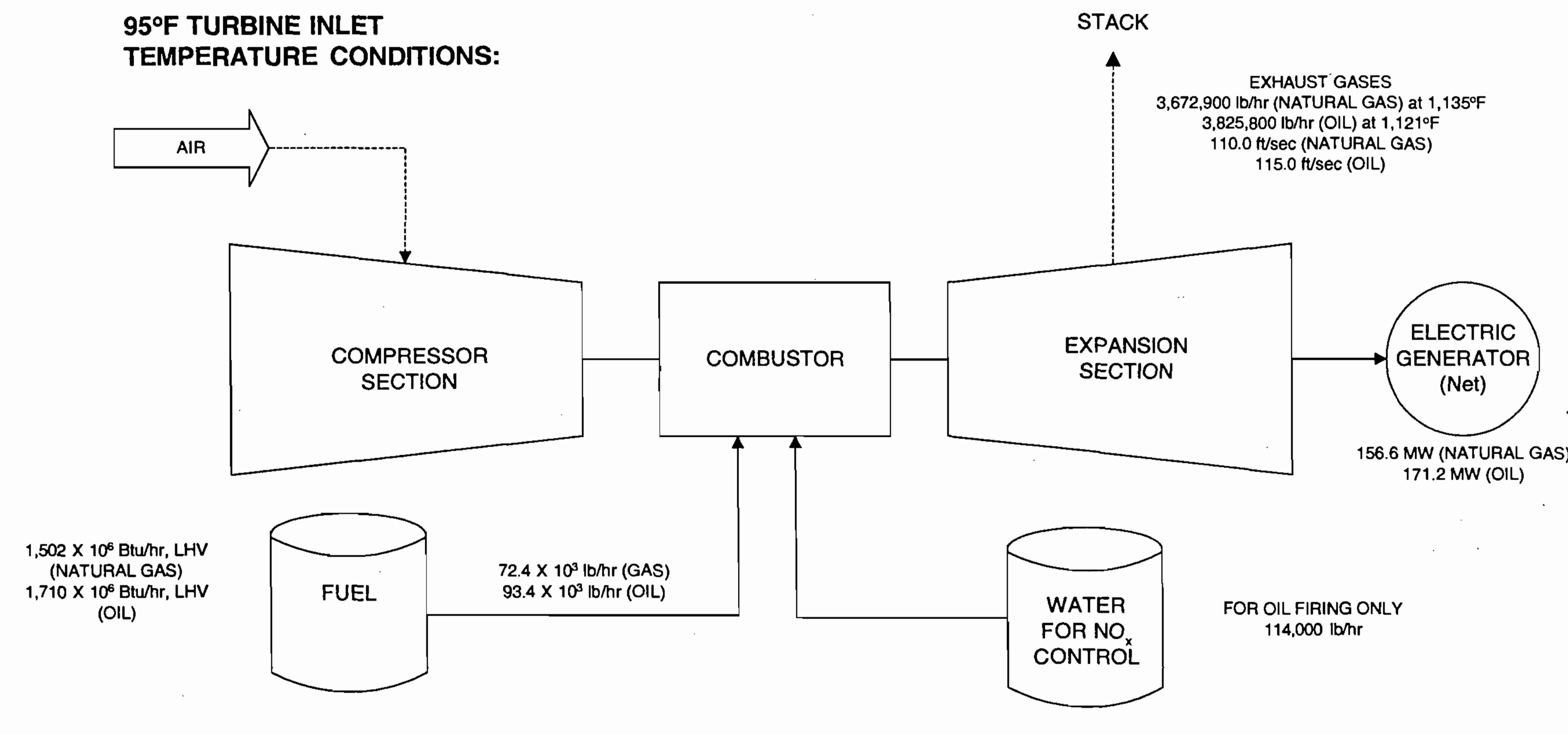


Figure 2-1. Location of Shady Hills Generating Station
IPS Avon Park Corporation

Golder Associates



NOTE: SEE APPENDIX A FOR DESIGN INFORMATION AND STACK PARAMETERS FOR EACH FUEL.

Figure 2-2
Simplified Flow Diagram of Proposed "F" Class Combustion Turbine
Baseload, Summer Design Conditions

Process Flow Legend

Solid/Liquid	———▶
Gas	- - - - ▶
Steam	········▶

Filename: 9939525Y/F1/WP/FIGURES.VSD

Date: 10/12/99

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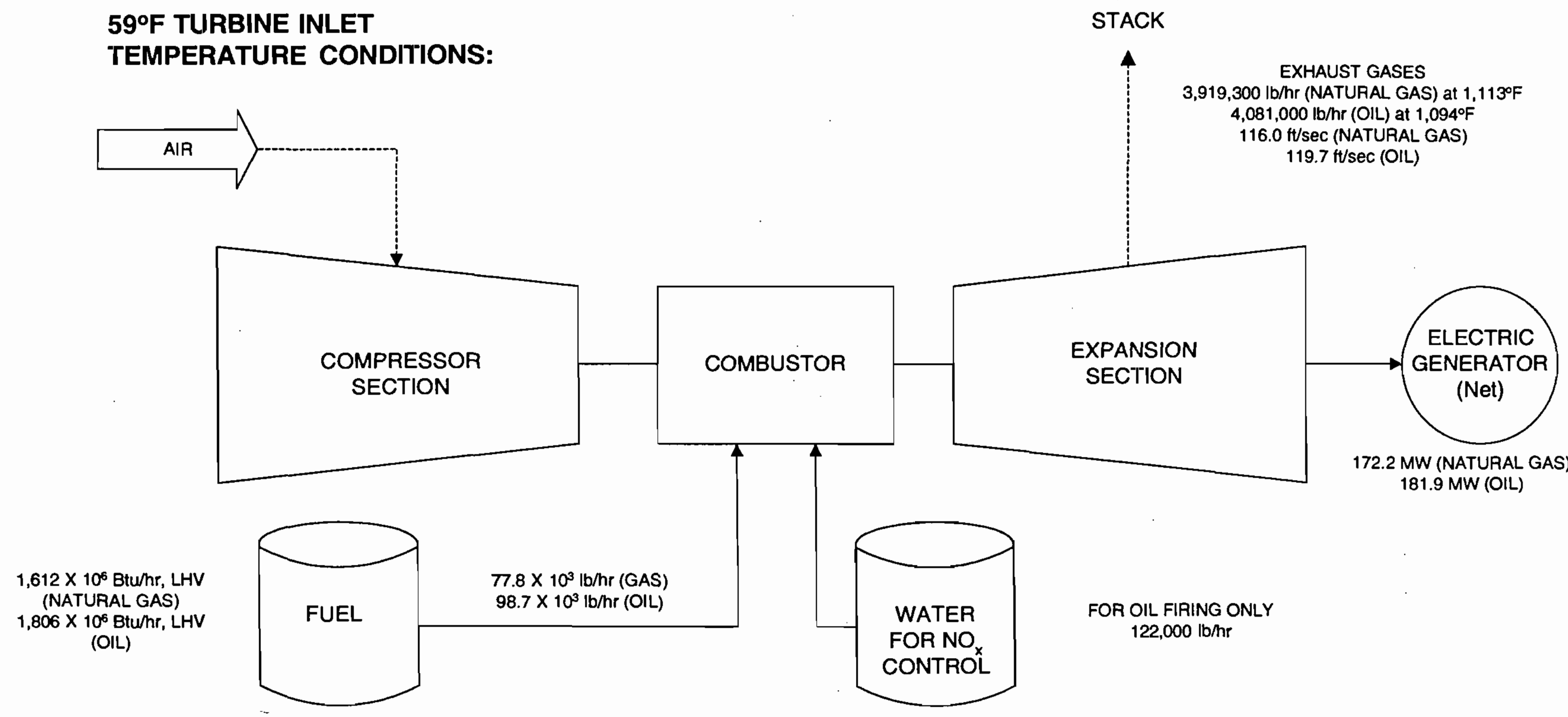

NOTE: SEE APPENDIX A FOR DESIGN INFORMATION AND STACK PARAMETERS FOR EACH FUEL.

Figure 2-3
Simplified Flow Diagram of Proposed "F" Class Combustion Turbine
Baseload, Annual Design Conditions

Process Flow Legend
Solid/Liquid
Gas
Steam

Filename: 9939525Y/F1/WP/FIGURES.VSD
Date: 10/12/99

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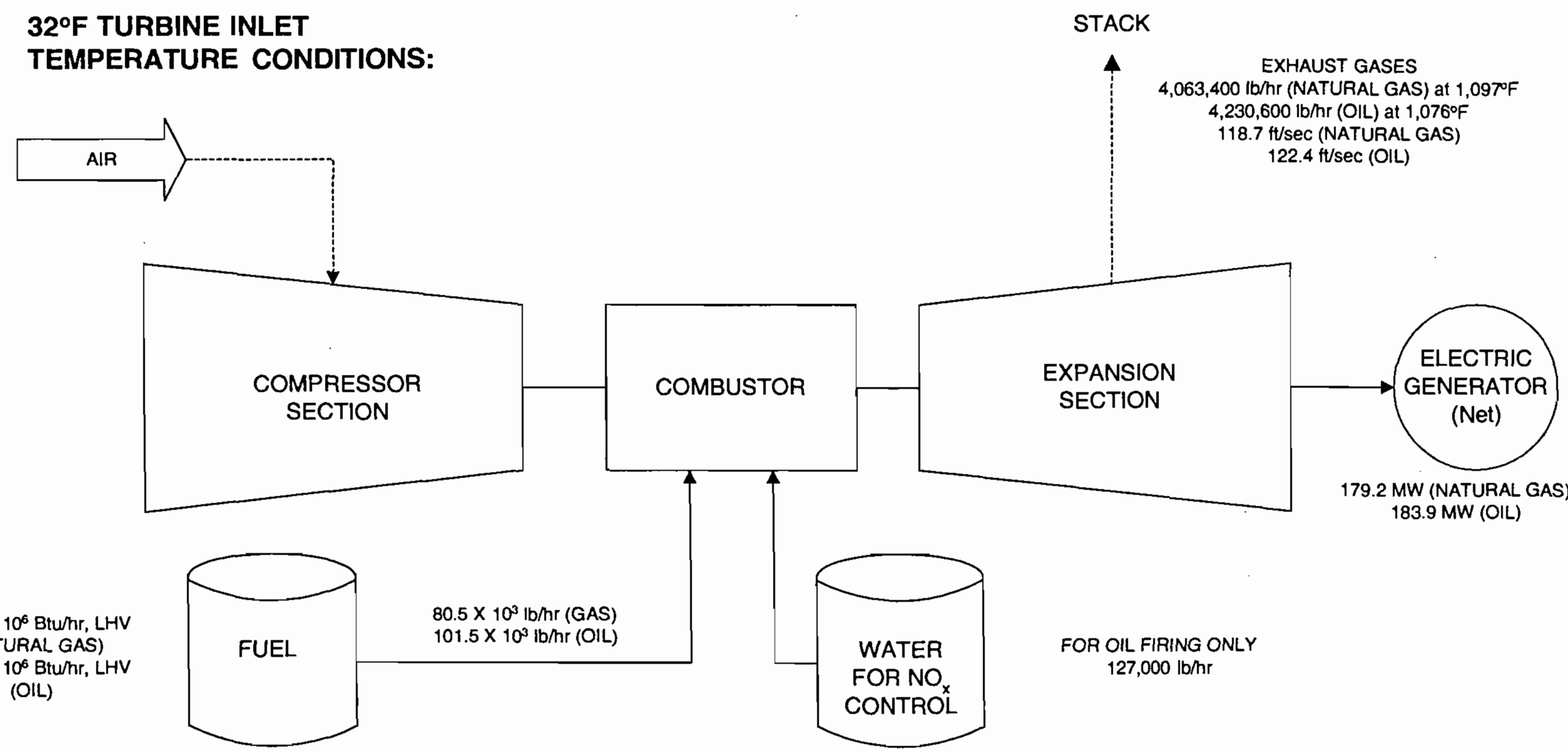


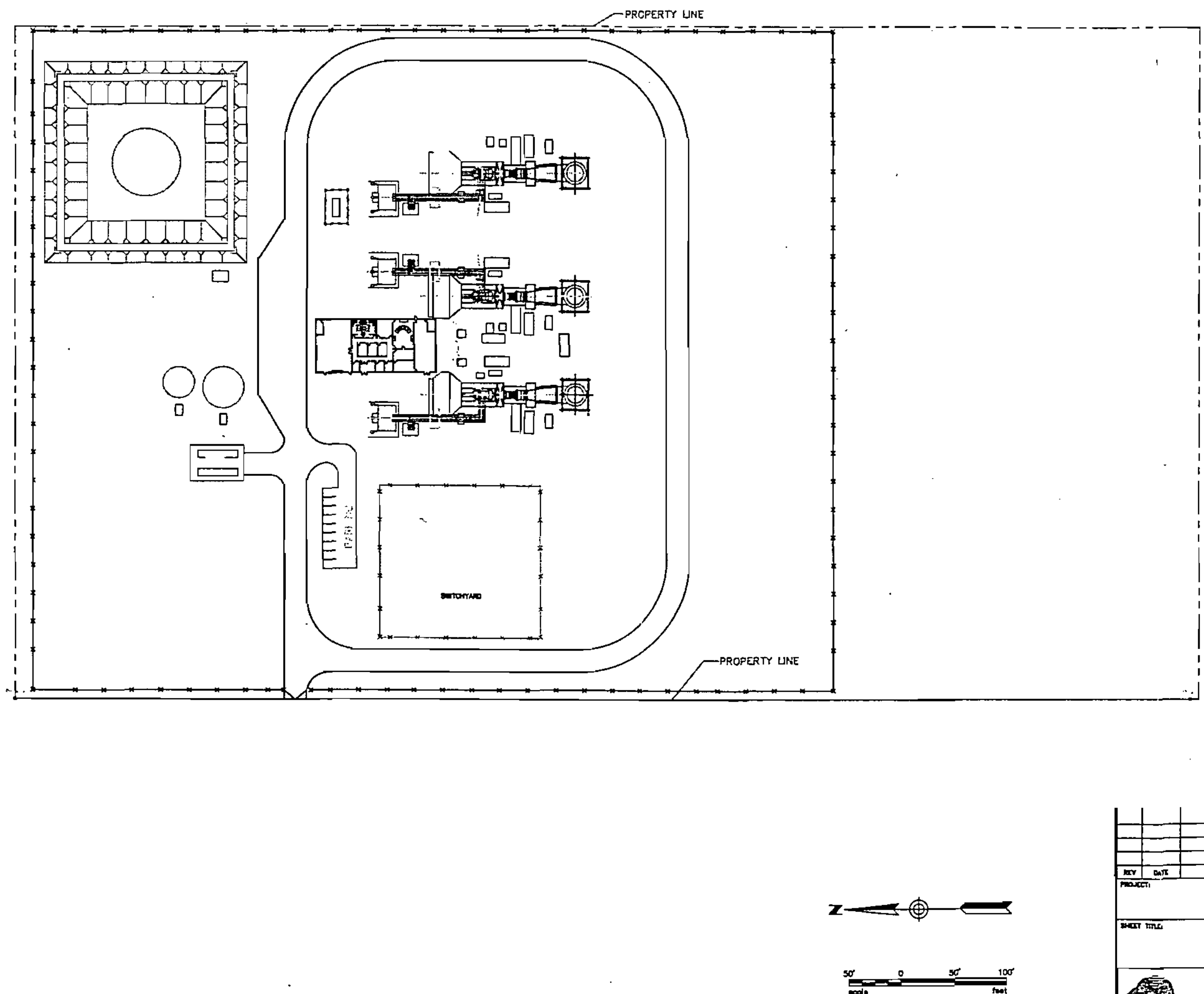
NOTE: SEE APPENDIX A FOR DESIGN INFORMATION AND STACK PARAMETERS FOR EACH FUEL.

Figure 2-4
Simplified Flow Diagram of Proposed "F" Class Combustion Turbine
Baseload, Winter Design Conditions

Process Flow Legend
Solid/Liquid
Gas
Steam

Filename: 9939525Y/F1/WP/FIGURES.VSD
Date: 10/25/99

Golder Associates



REV	DATE	DESCRIPTION	CAD BY	CHK BY	RVW BY

PROJECT: Sanat Power Incorporated – Pasco County

SHEET TITLE: Layout Plan

Golder Associates
Tampa, Florida

PROJECT No.	993-9525		FILE No.:	Pasco.dwg
CLIENT PROJ. No.	–		DRAFTING SUBTITLE:	–
DES BY	–	9/23/99	SCALE:	1"=50'
CAD BY	CDT	9/23/99		2-5
CHK BY				
RVW BY				

3.0 AIR QUALITY REVIEW REQUIREMENTS AND APPLICABILITY

The following discussion pertains to the federal and state air regulatory requirements and their applicability to the proposed Shady Hills Generating Station.

3.1 NATIONAL AND STATE AAQS

The existing national and Florida AAQS are presented in Table 3-1. Primary AAQS were promulgated to protect the public health with an adequate margin of safety [42 United States Code (USC) Section 7409(b)(1)]. The primary AAQS are designed to protect children, the elderly, and those with respiratory diseases. Secondary AAQS were promulgated to protect the public welfare from any known or anticipated adverse effects associated with the presence of pollutants in the ambient air [42 USC Section 7409(b)(2)]. Areas of the country in violation of AAQS are designated as nonattainment areas, and new sources to be located in or near these areas may be subject to more stringent air permitting requirements.

3.2 PSD REQUIREMENTS

3.2.1 GENERAL REQUIREMENTS

Under federal and State of Florida PSD review requirements, all new or modified major sources of air pollutants regulated under the Clean Air Act (CAA) must be reviewed and a permit issued before the commencement of construction. Florida's State Implementation Plan (SIP), which contains PSD regulations, has been approved by EPA; therefore, PSD approval authority has been granted to DEP.

A "major facility" is defined as any one of 28 named source categories that have the potential to emit 100 tons per year (TPY) or more, or any other stationary facility that has the potential to emit 250 TPY or more, of any pollutant regulated under CAA. "Potential to emit" means the capability, at maximum design capacity, to emit a pollutant after the application of control equipment.

Subject to certain exceptions, a "major modification" is defined under PSD regulations as a physical or operational change at an existing major facility that increases the facility's emissions by an amount that is greater than the defined significant emission rates. PSD significant emission rates are shown in Table 3-2.

EPA's regulations identify certain increases above an air quality baseline concentration level of SO_2, PM_{10}, and NO_2 concentrations that would constitute significant deterioration. The EPA class designations and allowable PSD increments are presented in Table 3-1. The State of Florida has adopted the EPA class designations and allowable PSD increments for SO_2, PM_{10}, and NO_2 increments.

PSD review is used to determine whether significant air quality deterioration will result from the new or modified facility. Federal PSD requirements are contained in 40 CFR 52.21, *Prevention of Significant Deterioration of Air Quality*. The State of Florida has adopted PSD regulations which have been approved by EPA [Rule 62-212.400 F.A.C.]. Major facilities and major modifications are required to undergo the following analysis related to PSD for each pollutant emitted in significant amounts:

1. Control technology review,
2. Source impact analysis,
3. Air quality analysis (monitoring),
4. Source information, and
5. Additional impact analyses.

In addition to these analyses, a new facility also must be reviewed with respect to GEP stack height regulations. Discussions concerning each of these requirements are presented in the following sections.

3.2.2 CONTROL TECHNOLOGY REVIEW

The control technology review requirements of the federal and state PSD regulations require that all applicable federal and state emission-limiting standards be met, and that BACT be applied to control emissions from the source (Rule 62-212.410, F.A.C.). The BACT requirements are applicable to all regulated pollutants for which the increase in emissions from the facility or modification exceeds the significant emission rate (see Table 3-2).

BACT is defined in 52.21 (b)(12) and Rule 62-210.200(40), F.A.C., as:

> An emissions limitation (including a visible emission standard) based on the maximum degree of reduction of each pollutant subject to regulation under the Act which would be emitted by any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts, and other costs, 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 such pollutant. 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 and 61. If the Administrator determines that technological or economic limitations on the application of measurement methodology to a particular part of a source 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 and shall provide for compliance by means which achieve equivalent results.

BACT was promulgated within the framework of the PSD requirements in the 1977 amendments of the CAA [Public Law 95-95; Part C, Section 165(a)(4)]. The primary purpose of BACT is to optimize consumption of PSD air quality increments and thereby enlarge the potential for future economic growth without significantly degrading air quality (EPA, 1978; 1980). Guidelines for the evaluation of BACT can be found in EPA's *Guidelines for Determining Best Available Control Technology (BACT)* (EPA, 1978) and in the *PSD Workshop Manual* (EPA, 1980). These guidelines were promulgated by EPA to provide a consistent approach to BACT and to ensure that the impacts of alternative emission control systems are measured by the same set of parameters. In addition, through implementation of these guidelines, BACT in one area may not be identical to BACT in another area. According to EPA (1980), "BACT analyses for the same types of emissions unit and the same pollutants in different locations or situations may determine that different control strategies should be applied to the different sites, depending on site-specific factors. Therefore, BACT analyses must be conducted on a case-by-case basis."

The BACT requirements are intended to ensure that the control systems incorporated in the design of a proposed facility reflect the latest in control technologies used in a particular industry and take into consideration existing and future air quality in the vicinity of the proposed facility. BACT must, as a minimum, demonstrate compliance with new source performance standards (NSPS) for a source (if applicable). An evaluation of the air pollution control techniques and systems, including a cost-benefit analysis of alternative control technologies capable of achieving a higher degree of emission reduction than the proposed control technology, is required. The cost-benefit analysis requires the documentation of the materials, energy, and economic penalties associated with the proposed and alternative control systems, as well as the environmental benefits derived from these systems. A decision on BACT is to be based on sound judgment, balancing environmental benefits with energy, economic, and other impacts (EPA, 1978).

Historically, a "bottom-up" approach consistent with the BACT Guidelines and PSD Workshop Manual has been used. With this approach, an initial control level, which is usually NSPS, is evaluated against successively more stringent controls until a BACT level is selected. However, EPA became concerned that the bottom-up approach was not providing the level of BACT decisions originally intended. As a result, in December 1987, the EPA Assistant Administrator for Air and Radiation mandated changes in the implementation of the PSD program, including the adoption of a new "top-down" approach to BACT decision making.

The top-down BACT approach essentially starts with the most stringent (or top) technology and emissions limit that have been applied elsewhere to the same or a similar source category. The applicant must next provide a basis for rejecting this technology in favor of the next most stringent technology or propose to use it. Rejection of control alternatives may be based on technical or economic infeasibility. Such decisions are made on the basis of physical differences (e.g., fuel type), locational differences (e.g., availability of water), or significant differences that may exist in the environmental, economic, or energy impacts. The differences between the proposed facility and the facility on which the control technique was applied previously must be justified. EPA has issued a draft guidance document on the top-down approach entitled *Top-Down Best Available Control Technology Guidance Document* (EPA, 1990).

3.2.3 SOURCE IMPACT ANALYSIS

A source impact analysis must be performed for a proposed major source subject to PSD review for each pollutant for which the increase in emissions exceeds the significant emission rate (Table 3-2). The PSD regulations specifically provide for the use of atmospheric dispersion models in performing impact analyses, estimating baseline and future air quality levels, and determining compliance with AAQS and allowable PSD increments. Designated EPA models normally must be used in performing the impact analysis. Specific applications for other than EPA-approved models require EPA's consultation and prior approval. Guidance for the use and application of dispersion models is presented in the EPA publication Guideline on Air Quality Models (Revised). The source impact analysis for criteria pollutants that addresses compliance with AAQS and PSD Class II increments may be limited to the new or modified source if the net increase in impacts as a result of the new or modified source is below the significance levels, as presented in Table 3-1.

The EPA has proposed significant impact levels (SILs) for Class I areas. The NPS, as the designated agency for oversight in air quality impacts to Class I areas, has also recommended significant impact levels for PSD Class I areas. The EPA proposed Class I SILs are as follows:

Pollutant	Averaging Time	Proposed EPA PSD Class I Significant Impact Levels (μg/m^3)
SO_2	3-hour	1
	24-hour	0.2
	Annual	0.1
PM_{10}	24-hour	0.3
	Annual	0.2
NO_2	Annual	0.1

[a] μg/m^3 = micrograms per cubic meter.

Although these levels have not been officially promulgated as part of the PSD review process and may not be binding for states in performing PSD review, the proposed levels serve as a guideline in assessing a source's impact in a Class I area. The EPA action to incorporate Class I significant impact levels in the PSD process is part of implementing NSR provisions of the 1990 CAA Amendments. Because the process of developing the regulations will be lengthy, EPA believes that the proposed rules concerning the significant impact levels is appropriate in order to assist states in implementing the PSD permit process.

Various lengths of record for meteorological data can be used for impact analysis. A 5-year period can be used with corresponding evaluation of highest, second-highest short-term concentrations for comparison to AAQS or PSD increments. The term "HSH" refers to the highest of the second-highest concentrations at all receptors (i.e., the highest concentration at each receptor is discarded). The second-highest concentration is significant because short-term AAQS specify that the standard should not be exceeded at any location more than once a year. If fewer than 5 years of meteorological data are used in the modeling analysis, the highest concentration at each receptor normally must be used for comparison to air quality standards.

The term "baseline concentration" evolves from federal and state PSD regulations and refers to a concentration level corresponding to a specified baseline date and certain additional baseline sources. By definition, in the PSD regulations as amended August 7, 1980, baseline concentration means the ambient concentration level that exists in the baseline area at the time of the applicable baseline date. A baseline concentration is determined for each pollutant for which a baseline date is established and includes:

1. The actual emissions representative of facilities in existence on the applicable baseline date; and
2. The allowable emissions of major stationary facilities that commenced construction before January 6, 1975, for SO_2 and PM (TSP) concentrations, or February 8, 1988, for NO_2 concentrations, but that were not in operation by the applicable baseline date.

The following emissions are not included in the baseline concentration and therefore affect PSD increment consumption:

1. Actual emissions from any major stationary facility on which construction commenced after January 6, 1975, for SO_2 and PM (TSP) concentrations, and after February 8, 1988, for NO_2 concentrations; and
2. Actual emission increases and decreases at any stationary facility occurring after the baseline date.

In reference to the baseline concentration, the term "baseline date" actually includes three different dates:

1. The major facility baseline date, which is January 6, 1975, in the cases of SO2 and PM (TSP), and February 8, 1988, in the case of NO_2.
2. The minor facility baseline date, which is the earliest date after the trigger date on which a major stationary facility or major modification subject to PSD regulations submits a complete PSD application.
3. The trigger date, which is August 7, 1977, for SO2 and PM (TSP), and February 8, 1988, for NO2.

The minor source baseline date for SO_2 and PM (TSP) has been set as December 27, 1977, for the entire State of Florida [Rule 62-204.360(1) and (2), F.A.C.]. The minor source baseline for NO_2 has been set as March 28, 1988 [Rule 62-204.360(3), F.A.C.]. It should be noted that references to PM (TSP) are also applicable to PM_{10}.

3.2.4 AIR QUALITY MONITORING REQUIREMENTS

In accordance with requirements of 40 CFR 52.21(m) and Rule 62-212.400(5)(f), F.A.C., any application for a PSD permit must contain an analysis of continuous ambient air quality data in the area affected by the proposed major stationary facility or major modification. For a new major facility, the affected pollutants are those that the facility potentially would emit in significant amounts. For a major modification, the pollutants are those for which the net emissions increase exceeds the significant emission rate (see Table 3-2).

Ambient air monitoring for a period of up to 1 year generally is appropriate to satisfy the PSD monitoring requirements. A minimum of 4 months of data is required. Existing data from the vicinity of the proposed source may be used if the data meet certain quality assurance requirements; otherwise, additional data may need to be gathered. Guidance in designing a PSD monitoring network is provided in EPA's *Ambient Monitoring Guidelines for Prevention of Significant Deterioration* (EPA, 1987a).

The regulations include an exemption that excludes or limits the pollutants for which an air quality analysis must be conducted. This exemption states that Florida DEP may exempt a proposed major stationary facility or major modification from the monitoring requirements with respect to a particular pollutant if the emissions increase of the pollutant from the facility or modification would cause, in any area, air quality impacts less than the *de minimis* levels presented in Table 3-2 (Rule 62-212.400-3, F.A.C.).

3.2.5 SOURCE INFORMATION/GOOD ENGINEERING PRACTICE STACK HEIGHT

Source information must be provided to adequately describe the proposed project. The general type of information required for this project is presented in Section 2.0.

The 1977 CAA Amendments require that the degree of emission limitation required for control of any pollutant not be affected by a stack height that exceeds GEP or any other dispersion technique. On July 8, 1985, EPA promulgated final stack height regulations (EPA, 1985a). Identical regulations have been adopted by Florida DEP (Rule 62-210.550, F.A.C.). GEP stack height is defined as the highest of:

1. 65 m; or
2. A height established by applying the formula:

   $Hg = H + 1.5L$

   where: Hg = GEP stack height,

   H = Height of the structure or nearby structure, and

   L = Lesser dimension (height or projected width) of nearby structure(s); or
3. A height demonstrated by a fluid model or field study.

"Nearby" is defined as a distance up to five times the lesser of the height or width dimensions of a structure or terrain feature, but not greater than 0.8 km. Although GEP stack height regulations require that the stack height used in modeling for determining compliance with AAQS and PSD increments not exceed the GEP stack height, the actual stack height may be greater.

The stack height regulations also allow increased GEP stack height beyond that resulting from the above formula in cases where plume impaction occurs. Plume impaction is defined as concentrations measured or predicted to occur when the plume interacts with elevated terrain. Elevated terrain is defined as terrain that exceeds the height calculated by the GEP stack height formula.

3.2.6 ADDITIONAL IMPACT ANALYSIS

In addition to air quality impact analyses, federal and State of Florida PSD regulations require analyses of the impairment to visibility and the impacts on soils and vegetation that would occur as a result of the proposed source [40 CFR 52.21(o); Rule 62-212.400(5)(e), F.A.C.]. These analyses are to be conducted primarily for PSD Class I areas. Impacts as a result of general commercial, residential, industrial, and other growth associated with the source also must be addressed. These analyses are required for each pollutant emitted in significant amounts (Table 3-2).

3.3 NONATTAINMENT RULES

Based on the current nonattainment provisions (Rule 62-212.500, F.A.C.), all major new facilities and modifications to existing major facilities located in a nonattainment area must undergo nonattainment review. A new major facility is required to undergo this review if the proposed pieces of equipment have the potential to emit 100 TPY or more of the nonattainment pollutant. A major modification at a major facility is required to undergo review if it results in a significant net emission increase of 40 TPY or more of the nonattainment pollutant or if the modification is major (i.e., 100 TPY or more).

For major facilities or major modifications that locate in an attainment or unclassifiable area, the nonattainment review procedures apply if the source or modification is located within the area of influence of a nonattainment area. The area of influence is defined as an area that is outside the boundary of a nonattainment area but within the locus of all points that are 50 km outside the boundary of the nonattainment area. Based on Rule 62-2.500(2)(c)2.a., F.A.C., all VOC sources that are located within an area of influence are exempt from the provisions of NSR for nonattainment areas. Sources that emit other nonattainment pollutants and are located within the area of influence are subject to nonattainment review unless the maximum allowable emissions from the proposed source do not have a significant impact within the nonattainment area.

3.4 EMISSION STANDARDS

3.4.1 NEW SOURCE PERFORMANCE STANDARDS

The NSPS are a set of national emission standards that apply to specific categories of new sources. As stated in the CAA Amendments of 1977, these standards "shall reflect the degree of emission limitation and the percentage reduction achievable through application of the best technological system of continuous emission reduction the Administrator determines has been adequately demonstrated."

The proposed project will be subject to one or more NSPS. The CTs will be subject to 40 CFR Part 60, Subpart GG, and the fuel oil storage tank (2.8 million gallon capacity) will be subject to 40 CFR Part 60, Subpart Kb.

3.4.1.1 Combustion Turbine

The CTs will be subject to emission limitations covered under Subpart GG, which limits NO_x and SO_2 emissions from all stationary CTs with a heat input at peak load equal to 10.7 gigajoules per hour [10 million British thermal units per hour (MMBtu/hr)], based on the lower heating value of the fuel fired.

NO_x emissions are limited to 75 ppmvd corrected to 15 percent oxygen and heat rate while sulfur dioxide emissions are limited to using a fuel with a sulfur content of 0.8 percent. In addition to emission limitations, there are requirements for notification, record keeping, reporting, performance testing and monitoring. These are summarized below:

40 CFR 60.7 Notification and Record Keeping

(a)(1) Notification of the date of construction - 30 days after such date.

(a)(2) Notification of the date of initial start-up - no more than 60 days or less than 30 days prior to date.

(a)(3) Notification of actual date of initial start-up - within 15 days after such date.

(a)(5) Notification of date which demonstrates continuous emission monitoring (CEM) - not less than 30 days prior to date.

60.7 (b) Maintain records of the start-up, shutdown, and malfunction quarterly.

(c) Excess emissions reports - by the 30th day following end of quarter. (required even if no excess emissions occur)

(d) Maintain file of all measurements for two years.

60.8 Performance Tests

(a) must be performed within 60 days after achieving maximum production rate but no later than 180 days after initial start-up.

(d) Notification of Performance tests at least 30 days prior to them occurring.

40 CFR Subpart GG

60.334 Monitoring of Operations

(a) continuous monitoring system required for water-to-fuel ratio to meet NSPS; system must be accurate within ±5 percent.

(b) Monitor sulfur and nitrogen content of fuel.

Oil - (1): each occasion that fuel is transferred to bulk storage tank.

Gas - (2): daily monitoring required

3.4.1.2 Fuel Oil Storage Tank

The applicable NSPS is 40 CFR Part 60, Subpart Kb--Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels for which Construction, Reconstruction, or Modification Commenced after July 23, 1984). The storage tank will contain distillate fuel oil, a volatile organic liquid as defined in Subpart Kb. There are no emission limiting or control requirements under Subpart Kb for the use of distillate fuel oil. The facility, however, must perform record keeping of the type of organic liquid in the tank.

3.4.2 FLORIDA RULES

The Florida DEP regulations for new stationary sources are covered in the F.A.C. The Florida DEP has adopted the EPA NSPS by reference in Rule 62-204.800(7); subsection (b)39 for stationary gas turbines and (b)16 for volatile organic liquid storage vessels. Therefore, the project is required to meet the same emissions, performance testings, monitoring, reporting, and record keeping as those described in Section 3.4.1. DEP has authority for implementing NSPS requirements in Florida.

3.4.3 FLORIDA AIR PERMITTING REQUIREMENTS

The Florida DEP regulations require any new source to obtain an air permit prior to construction. Major new sources must meet the appropriate PSD and nonattainment requirements as discussed previously. Required permits and approvals for air pollution sources include NSR for nonattainment areas, PSD, NSPS, National Emission Standards for Hazardous Air Pollutants (NESHAP), Permit to Construct, and Permit to Operate. The requirements for construction permits and approvals are contained in Rules 62-4.030, 62-4.050, 62-4.052, 62-4.210, and 62-210.300(1), F.A.C. Specific emission standards are set forth in Chapter 62-296, F.A.C.

3.4.4 HAZARDOUS POLLUTANT REVIEW

The Florida DEP has published guidelines (DEP, 1995) to determine whether any emission of a potentially hazardous or toxic pollutant can pose a possible health risk to the public. Maximum concentrations for all regulated pollutants for which an ambient standard does not exist and all nonregulated hazardous pollutants can be compared to ambient reference concentrations (ARCs) for each applicable pollutant. If the maximum predicted concentrations for any hazardous pollutant is less than the corresponding ARC for each applicable averaging time, that emission is considered not to pose a significant health risk. The ARCs are not environmental standards but, rather, evaluation tools to determine if an apparent threat to the public health may exist. These levels are not used in permitting new sources.

3.4.5 LOCAL AIR REGULATIONS

Pasco County has not adopted its own air regulations.

3.5 SOURCE APPLICABILITY

3.5.1 AREA CLASSIFICATION

The project site is located in Pasco County, which has been designated by EPA and DEP as an attainment area for all criteria pollutants. Pasco County and surrounding counties are designated as PSD Class II areas for SO_2, PM (TSP) , and NO_2. The nearest Class I areas to the site is the Chassahowitzka National Wilderness Area (NWA) which is about 28 km (17 miles) from the site.

3.5.2 PSD REVIEW

3.5.2.1 Pollutant Applicability

The proposed project is considered to be a major facility because the emissions of several regulated pollutants are estimated to exceed 250 TPY; therefore, PSD review is required for any pollutant for which the emissions are considered major or exceed the PSD significant emission rates. As shown in Table 3-3, potential emissions from the proposed project will be major for NO_x and CO and have potential emissions that are greater than the significant emission rates for PM (TSP), PM_{10}, SO_2, and sulfuric acid mist. Because the proposed project's impacts for these pollutants are predicted to be below the significant impact levels, a modeling analysis incorporating the impacts from other sources is not required. (Note: EPA has promulgated changes to the PSD Rules to eliminate hazardous air pollutants (HAPs) from PSD review. The pollutants, vinyl chloride, mercury, asbestos, and beryllium, are no longer evaluated in PSD review.)

As part of the PSD review, a PSD Class I increment analysis is required if the proposed project's impacts are greater than the proposed EPA Class I significant impact levels. The nearest Class I areas to the plant site is about 28 km from the site. A PSD Class I increment-consumption analysis is required because the project's impacts are greater than the proposed EPA Class I significant impact levels.

3.5.2.2 Emission Standards

The applicable NSPS for the CTs is 40 CFR Part 60, Subpart GG. The proposed emissions for the turbines will be well below the specified limits (see Section 4.0).

The fuel oil storage tank will have a maximum storage capacity of 2.8 million gallons of No. 2 fuel oil. Since the storage tank has a capacity greater than 40 cubic meters (m^3) (approximately 10,568 gallons), the applicable NSPS is 40 CFR Part 60, Subpart Kb. The storage tank will contain distillate fuel oil, a volatile organic liquid as defined in Subpart Kb, with a true vapor pressure of 0.022 pound per square inch (psi) at 100 F. Because the fuel oil is expected to have a maximum true vapor pressure of less than 3.5 kilopascals (kPa) or 0.51 psi, only the minor monitoring of operating requirements specified in 40 CFR 60 116b(a) and (b) will apply.

3.5.2.3 Ambient Monitoring

Based on the estimated pollutant emissions from the proposed plant (see Table 3-4), a pre-construction ambient air quality monitoring analysis is required for PM_{10}, SO_2, NO_2, CO, and O_3 (based on VOC emissions). If the net increase in impact of the pollutant is less than the applicable *de minimis* monitoring concentration (100 TPY in the case of VOC), then an exemption from the pre-construction ambient monitoring requirement may be obtained [52.21(i)(8)]. In addition, if an acceptable ambient monitoring method for the pollutant has not been established by EPA, monitoring is not required.

If pre-construction monitoring data are required to be submitted, data collected at or near the project site can be submitted, based on existing air quality data or the collection of onsite data.

As shown in Table 3-4, the proposed plant's impacts are predicted to be below the applicable *de minimis* monitoring concentration levels and criteria. Therefore, the project is exempt from the preconstruction ambient air quality monitoring requirements.

3.5.2.4 GEP Stack Height Impact Analysis

The GEP stack height regulations allow any stack to be at least 65 m [213 feet (ft)] high. The CT stacks for the project will be 60 ft. This stack height does not exceed the GEP stack height. However, as discussed in Section 6.0, Air Quality Modeling Approach, since the stack height is less than GEP, building downwash effects must be considered in the modeling analysis. As a result, the potential for downwash of the CTs' emissions caused by nearby structures are included in the modeling analysis.

3.5.3 NONATTAINMENT REVIEW

The project site is located in Pasco County, which is classified as an attainment area for all criteria pollutants. Therefore, nonattainment requirements are not applicable.

3.5.4 OTHER CAA REQUIREMENTS

The 1990 CAA Amendments established a program to reduce potential precursors of acidic deposition. The Acid Rain Program was delineated in Title IV of the CAA Amendments and required EPA to develop the program. EPA's final regulations were promulgated on January 11, 1993, and included permit provisions (40 CFR Part 72), an allowance system (Part 73), CEM (Part 75), excess emission procedures (Part 77), and appeal procedures (Part 78).

EPA's Acid Rain Program applies to all existing and new utility units except those serving a generator less than 25 MW, existing simple cycle CTs, and certain non-utility facilities; units which fall under the program are referred to as affected units. The EPA regulations would be applicable to the proposed project for the purposes for obtaining a permit and allowances, as well as emission monitoring. New units are required to obtain permits under the program by submitting a complete application 24 months before the later of

January 1, 2000, or the date on which the unit begins serving an electric generator (greater than 25 MW).

The permit would provide SO_2 and NO_x emission limitations and the requirement to hold emission allowances. Emission limitations established in the Acid Rain Program are presumed to be less stringent than BACT or lowest achievable emission rate (LAER) for new units. An allowance is a market-based financial instrument that is equivalent to 1 ton of SO_2 emissions. Allowances can be sold, purchased, or traded. For the proposed project, SO_2 allowances will be obtained from the market.

CEM for SO_2 and NO_x is required for gas-fired and oil-fired affected units. When an SO_2 CEM is selected to monitor SO_2 mass emissions, a flow monitor is also required. Alternately, SO_2 emissions may be determined using procedures established in Appendix D, 40 CFR Part 75 (flow proportional oil sampling or manual daily oil sampling). CO_2 emissions must also be determined either through a CEM (e.g., as a diluent for NO_X monitoring) or calculation. Alternate procedures, test methods, and quality assurance/quality control (QA/QC) procedures for CEM are specified (Part 75, Appendices A through I). The CEM requirements including QA/QC procedures are, in general, more stringent than those specified in the NSPS for Subpart GG. New units are required to meet the requirements by the later of January 1, 1995, or not later than 90 days after the unit commences commercial operation.

Table 3-1. National and State AAQS, Allowable PSD Increments, and Significant Impact Levels

Pollutant	Averaging Time	AAQS ($\mu g/m^3$) Primary Standard	AAQS ($\mu g/m^3$) Secondary Standard	AAQS ($\mu g/m^3$) Florida	PSD Increments ($\mu g/m^3$) Class I	PSD Increments ($\mu g/m^3$) Class II	Significant Impact Levels ($\mu g/m^3$) [b]
Particulate Matter[c] (PM_{10})	Annual Arithmetic Mean	50	50	50	4	17	1
	24-Hour Maximum	150	150	150	8	30	5
Sulfur Dioxide	Annual Arithmetic Mean	80	NA	60	2	20	1
	24-Hour Maximum[a]	365	NA	260	5	91	5
	3-Hour Maximum[a]	NA	1,300	1,300	25	512	25
Carbon Monoxide	8-Hour Maximum[a]	10,000	10,000	10,000	NA	NA	500
	1-Hour Maximum[a]	40,000	40,000	40,000	NA	NA	2,000
Nitrogen Dioxide	Annual Arithmetic Mean	100	100	100	2.5	25	1
Ozone[c]	8-Hour Maximum[d]	157	157	157	NA	NA	NA
Lead	Calendar Quarter Arithmetic Mean	1.5	1.5	1.5	NA	NA	NA

Note: Particulate matter (PM_{10}) = particulate matter with aerodynamic diameter less than or equal to 10 micrometers.
NA = Not applicable, i.e., no standard exists.

[a] Short-term maximum concentrations are not to be exceeded more than once per year.

[b] Maximum concentrations are not to be exceeded.

[c] On July 18, 1997, EPA promulgated revised AAQS for particulate matter and ozone. For particulate matter, $PM_{2.5}$ standards were introduced with a 24-hour standard of 65 g/m^3 (3-year average of 98th percentile) and an annual standard of 15 g/m^3 (3-year average at community monitors). These standards have been stayed by a court case against EPA; implementation of these standards appears to be years away.

[d] 0.08 parts per million (ppm); achieved when 3-year average of 99th percentile is 0.08 ppm or less. These have been stayed by a court case against EPA. EPA is appealing. The 1-hour standard of 0.12 ppm is still applicable. FDEP has not yet adopted the new standards.

Sources: Federal Register, Vol. 43, No. 118, June 19, 1978.; 40 CFR 50; 40 CFR 52.21.; Chapter 62-204, F.A.C.

Table 3-2. PSD Significant Emission Rates and *De Minimis* Monitoring Concentrations

Pollutant	Regulated Under	Significant Emission Rate (TPY)	*De Minimis* Monitoring Concentration[a] (μg/m3)
Sulfur Dioxide	NAAQS, NSPS	40	13, 24-hour
Particulate Matter [PM (TSP)]	NSPS	25	10, 24-hour
Particulate Matter (PM_{10})	NAAQS	15	10, 24-hour
Nitrogen Dioxide	NAAQS, NSPS	40	14, annual
Carbon Monoxide	NAAQS, NSPS	100	575, 8-hour
Volatile Organic Compounds (Ozone)	NAAQS, NSPS	40	100 TPY[b]
Lead	NAAQS	0.6	0.1, 3-month
Sulfuric Acid Mist	NSPS	7	NM
Total Fluorides	NSPS	3	0.25, 24-hour
Total Reduced Sulfur	NSPS	10	10, 1-hour
Reduced Sulfur Compounds	NSPS	10	10, 1-hour
Hydrogen Sulfide	NSPS	10	0.2, 1-hour
Mercury	NESHAP	0.1	0.25, 24-hour
MWC Organics	NSPS	$3.5x10^{-6}$	NM
MWC Metals	NSPS	15	NM
MWC Acid Gases	NSPS	40	NM
MSW Landfill Gases	NSPS	50	NM

Note: Ambient monitoring requirements for any pollutant may be exempted if the impact of the increase in emissions is below *de minimis* monitoring concentrations.

NAAQS = National Ambient Air Quality Standards.
NM = No ambient measurement method established; therefore, no *de minimis* concentration has been established.
NSPS = New Source Performance Standards.
NESHAP = National Emission Standards for Hazardous Air Pollutants.
g/m^3 = micrograms per cubic meter.
MWC = Municipal waste combustor
MSW = Municipal solid waste

[a] Short-term concentrations are not to be exceeded.
[b] No *de minimis* concentration; an increase in VOC emissions of 100 TPY or more will require monitoring analysis for ozone.
[c] Any emission rate of these pollutants.

Sources: 40 CFR 52.21.
Rule 62-212.400

Table 3-3. Maximum Emissions Due to the Proposed Shady Hills Generating Station Compared to the PSD Significant Emission Rates

Pollutant	Pollutant Emissions (TPY)		PSD Review
	Potential Emissions from Proposed Facility[a]	Significant Emission Rate	
Sulfur Dioxide	166	40	Yes
Particulate Matter [PM (TSP)]	61	25	Yes
Particulate Matter (PM_{10})	61	15	Yes
Nitrogen Dioxide	756	40	Yes
Carbon Monoxide	259	100	Yes
Volatile Organic Compounds	34	40	No
Lead	0.03	0.6	No
Sulfuric Acid Mist	25	7	Yes
Total Fluorides	0.093	3	No
Total Reduced Sulfur	NEG	10	No
Reduced Sulfur Compounds	NEG	10	No
Hydrogen Sulfide	NEG	10	No
Mercury	0.0018	0.1	No
MWC Organics (as 2,3,7,8-TCDD)	0.00000098	0.0000035	No
MWC Metals (as Be, Cd)	0.010	15	No
MWC Acid Gasser (as HCl)	0.61	40	No

Note: NEG = Negligible.

[a] Based on emissions from three CTs operating at baseload at 59°F; firing natural gas and distillate fuel oil for 2,390 and 1,000 hours per year per turbine, respectively (Refer to Table 2-7).

Table 3-4. Predicted Net Increase in Impacts Due to the Proposed Shady Hills Generating Station Compared to PSD *De Minimis* Monitoring Concentrations

	Concentration (µg/m3)	
Pollutant	Predicted Increase in Impacts[a]	*De Minimis* Monitoring Concentration; Averaging Period
Sulfur Dioxide	0.8	13; 24-hour
Particulate Matter (PM_{10})	0.19	10; 24-hour
Nitrogen Dioxide	0.21	14; annual
Carbon Monoxide	1.6	575; 8-hour

Note: NA = not applicable.
NM = no ambient measurement method.
TPY = tons per year.

[a] See Section 6.0 for air dispersion modeling results.

4.0 CONTROL TECHNOLOGY REVIEW

4.1 APPLICABILITY

The PSD regulations require new major stationary sources to undergo a control technology review for each pollutant that may potentially be emitted in amounts that are greater than the PSD significant emission rates shown in Table 3-2. In this case, the control technology review requirements of the PSD regulations are applicable to emissions of NO_x, SO_2, CO, PM/PM_{10}, and sulfuric acid mist (see Section 3.0). The maximum potential annual emissions of these pollutants from the proposed GE 7FA CTs are summarized below (see Table 2-7):

Pollutant Emissions (TPY)

Pollutant	3 GE 7FA CTs
NO_x	756
SO_2	166
CO	256
PM/PM_{10}	61
Sulfuric Acid Mist	25

[a] Maximum emissions based on firing natural gas for 2,390 hours and distillate fuel oil for 1,000 hours at baseload conditions and 59°F.

This section presents the applicable NSPS and the proposed BACT for these pollutants. The approach to the BACT analysis is based on the regulatory definitions of BACT, as well as EPA's current policy guidelines requiring a top-down approach. A BACT determination requires an analysis of the economic, environmental, and energy impacts of the proposed and alternative control technologies [see 40 CFR 52.21(b)(12); and Rule 62-210.200(42), and Rule 62-214.410, F.A.C.]. The analysis must, by definition, be specific to the project (i.e., case-by-case).

4.2 NEW SOURCE PERFORMANCE STANDARDS

The applicable NSPS for CTs are codified in 40 CFR 60, Subpart GG and summarized in Appendix B. The applicable NSPS emission limit for NO_x is 75 parts per million by volume dry (ppmvd) corrected for heat rate and 15 percent oxygen. For the CTs being considered for the project, the NSPS emission limit NO_x with the NSPS heat rate correction is 109.4 parts per million (ppm) on gas and 103.1 ppm (corrected to 15 percent oxygen) on oil at a fuel-bound nitrogen content of 0.015 percent. The proposed NO_x emission limits for the project will be much lower than the NSPS.

4.3 BEST AVAILABLE CONTROL TECHNOLOGY

4.3.1 PROPOSED BACT

In recent permitting actions, FDEP has established BACT for heavy-duty industrial gas turbines like the ones proposed for the Shady Hills Generating Station. DEP's decisions have been based on the use of advanced DLN combustors for limiting NO_x and CO emissions and clean fuels (natural gas and distillate oil) for control of other emissions, including SO_2. The BACT proposed for IPS Avon Park Corporation's CTs is consistent with these recent FDEP permits. The proposed project will have two modes of operation (see Section 2.3) for which a BACT analysis has been performed. The results of the analysis have concluded that the following controls are BACT for IPS Avon Park Corporation's project.

1. Natural Gas Fired. The CTs will utilize state-of-the-art DLN combustion technology which will achieve gas turbine exhaust NO_x levels of no greater than 9 ppmvd (corrected to 15 percent O_2). CO emissions will be limited to 12 ppmvd at baseload.
2. Fuel Oil Fired. The CT will utilize water injection to achieve gas turbine exhaust NO_x levels of no greater than 42 ppmvd (corrected to 15 percent O_2). CO emissions will be limited to 20 ppmvd at baseload.

4.3.2 NITROGEN OXIDES

4.3.2.1 Introduction

The BACT analysis was performed for the following alternatives:

1. Advanced DLN combustors at an emission rate of 9 ppmvd corrected to 15 percent O_2 when firing gas and 42 ppmvd (corrected) when firing oil.

2. Selective catalytic reduction (SCR) and advanced DLN combustors at an emission rate of approximately 3.6 ppmvd corrected to 15 percent O_2 when firing natural gas and 16.8 ppmvd when firing oil.

Appendix B presents a discussion of NO_x control technologies and their feasibility for the project.

DLN combustor technology has recently been offered and installed by manufacturers to reduce NO_x emissions by inhibiting thermal NO_x formation through premixing fuel and air prior to combustion and providing staged combustion to reduce flame temperatures. NO_x emissions of 25 ppmvd (corrected to 15-percent O_2) and less have been offered by manufacturers for advanced CTs. Advanced in this context are the larger (over 150 MW) and more efficient (higher initial firing temperatures and lower heat rate) CTs. This technology is truly pollution prevention because NO_x emissions are inhibited from forming.

SCR is a post-combustion process where NO_x in the gas stream is reacted with ammonia in the presence of a catalyst to form nitrogen and water. The reaction occurs typically between 600°F and 750°F, which has limited SCR application to combined cycle units where such temperatures occur in the heat-recovery steam generator (HRSG). Exhausts from simple cycle operation range up to 1,200°F, thus limiting SCR application for this mode of operation. If SCR is used, with the higher cost ceramic catalyst, temperatures up to 1,050°F are possible. Such SCR systems are referred to as "hot" SCR. To accommodate "hot" SCR in the "F" Class gas turbine, some gas cooling would be required to maintain temperatures below 1,050°F. In-duct cooling using about 110,000 actual cubic feet per minute (acfm) of ambient air would maintain temperatures at or below 1,050°F with turbine flow of about 2,600,000 acfm and up to 1,200°F temperatures in the exhaust gas. This approach could be accomplished with an electric powered fan rated at about 200 kW. While such modifications are theoretically possible, such gas cooling and its effectiveness have not been demonstrated on a "F" Class simple cycle gas turbine. SCR has been primarily installed and operated on combined cycle facilities using catalysts with temperature ranges from 600-750°F and generally achieving 9 ppmvd (corrected to 15-percent O_2) or less while burning only natural gas.

Applications of SCR with oil firing are limited. Where oil firing has been attempted, catalyst poisoning and ammonium salt formation has occurred. Ammonium salts (ammonium sulfate and ammonium bisulfate) are formed by the reaction of sulfur oxides in the gas stream and ammonia. These salts are highly acidic, and special precautions in materials and ammonia injection rates must be implemented to minimize their formation. Ammonia injected in the SCR system that does not react with NO_x is emitted directly into the atmosphere and referred to as ammonia slip. In general, SCR manufacturers guarantee ammonia slip to be no more than 10 ppmvd; however, permitted limits in some applications have exceeded 25 ppmvd. While SCR is technically feasible for the IPS Avon Park Corporation project, SCR has not been applied to a simple cycle advanced combustion turbine of the size proposed for this project or to a facility approved for the amount of oil firing that may occur in this case.

The recent permitting trend for advanced CTs, even with combined cycle configuration, is the use of DLN combustors. Indeed, most of the recent Florida projects have been permitted with this technology, including Florida Power & Light's Martin Units 3 and 4, Central Florida Cogeneration Project, Hardee Unit 3 Project, City of Tallahassee Project, FPL Fort Myers Repowering Project, Duke New Smyrna Beach, Oleander Power Project, and FPL Sanford Repowering Project.

As discussed in Section 2.1, the proposed CTs will be fired primarily with natural gas. Distillate oil will be used as backup fuel, but not to exceed 1,000 hours per year. Table 4-1 presents a summary of emissions with DLN combustors and with DLN combustors and SCR assuming 39 percent operating capacity at an ambient temperature of 59°F. The NO_x removed using SCR would be 151 TPY when firing oil and natural gas. The NO_x removed when firing oil is based on 1,000 hours per year. The NO_x removed when firing natural gas is based on 2,390 hours of operation.

4.3.2.2 Proposed BACT and Rationale

The proposed BACT for the project is advanced DLN combustion technology. The proposed NO_x emissions level using this technology is 9 ppmvd (corrected to 15 percent oxygen) when firing natural gas under baseload conditions. NO_x from oil firing will be controlled using water injection (42 ppmvd corrected to 15 percent oxygen). This combination of control technologies is proposed for the following reasons:

1. SCR was rejected based on technical, economic, environmental, and energy grounds. Table 4-2 summarizes these considerations which favor the DLN pollution prevention technology.
2. The estimated incremental cost of SCR is approximately $14,900 per ton of NO_x removed and is similar to the cost for other projects that have rejected SCR as being unreasonable. This is even more apparent if additional pollutant emissions due to SCR are considered.
3. Additional environmental impacts would result from SCR operation, including emissions of ammonia; from secondary emissions (to replace the lost generation); and from the generation of hazardous waste (i.e., spent catalyst). While NO_x emissions would be reduced by about 151 TPY per unit with SCR, the net emissions reduction would not be as great. There are three additional factors that must be considered:
    a. Ammonia slip would occur, and it may be as high as 40.4 TPY per unit.
    b. Additional particulate matter may be formed through the reaction of ammonia and sulfur oxides forming ammonium salts. As much as 17.1 TPY per unit additional particulate matter may be formed.
    c. SCR will require energy for system operation and reduce the efficiency of the combustion turbine. This lost energy would have to be replaced because the proposed project would be an efficient peaking power plant while operating. Any peaking power plants replacing this lost energy would be lower on the dispatch list and inevitably more polluting. Conservatively, this lost energy would result in the emissions of an additional 4.7 TPY of criteria pollutants. Additional emissions of carbon dioxide would also result.

d. The "net" cost effectiveness could be as high as $25,300 per ton of pollutant removed.

4. The energy impacts of SCR will reduce potential electrical power generation by more than 3.9 million kilowatt hours (kWh) per year. This amount of energy is sufficient to provide the monthly electrical needs of 326 residential customers.
5. The proposed BACT (i.e., DLN combustion) provides the most cost effective control alternative, is pollution preventing, and results in low environmental impacts (less than the significant impact levels). DLN combustion at the proposed emissions levels has been adopted previously in BACT determinations. Indeed, compared to conventional CTs, the use of IPS Avon Park Corporation's proposed CTs will result in 10 to 15 percent less NO_x emission while producing the same amount of electricity.

The analyses of economic, environmental, and energy impacts follow.

4.3.2.3 Impact Analysis

Economic--The total capital costs of SCR for the proposed plant are $5,263,200 per CT. The total annualized cost of applying SCR with DLN combustion is $2,250,700. Appendix B contains the detailed cost estimates for the capital and annualized costs. The incremental cost effectiveness of adding SCR to the DLN combustors and water injection (for oil firing) is estimated at $14,900 per ton of NO_x removed.

Environmental--The maximum predicted NO_x impacts using the DLN technology are all considerably below the NO_2 PSD Class II increment of 25 $\mu g/m^3$, annual average, and the AAQS of 100 $\mu g/m^3$, annual average. Indeed, the maximum annual impact for the project is 0.3 $\mu g/m^3$, which is only about 30 percent of the significant impact level. While additional controls beyond DLN combustors (i.e., SCR and SCR with water injection) would reduce emissions, the effect will not be significant and much less than 1 percent of the PSD increment and the AAQS for the project.

The use of DLN combustor technology is truly "pollution prevention". In contrast, use of SCR on the proposed project will cause emissions of ammonia and ammonium salts, such as ammonium sulfate and bisulfate. Ammonia emissions associated with SCR are expected to be up to 10 ppm based on reported experience; previous permit conditions have specified this level. Indeed, ammonia emissions could be as high as 40.4 TPY/per unit for the project. Potential emissions of ammonium sulfate and bisulfate will increase emissions of PM_{10}; up to 17.1 TPY/per unit could be emitted.

The electrical energy required to run the SCR system and the back pressure from the turbine will reduce the available power from the project. This power, which would otherwise be available to the electrical system, will have to be replaced by other less efficient units. The replacement power will cause air pollutant emissions that would not have occurred without SCR. These "secondary" emissions, coupled with potential emissions of ammonia and ammonium salts, are presented in Table 4-3. This table shows the emissions balance for the project with and without SCR. As shown, the net reduction in emissions with SCR when all criteria pollutants are considered will be 89 TPY. In addition to criteria pollutants, additional secondary emissions of carbon dioxide would be emitted and were included in Table 4-3. As noted from this table, the emissions including CO_2 would be greater with SCR than that proposed using DLN combustion technology.

The replacement of the SCR catalyst will create additional economic and environmental impacts since certain catalysts contain materials that are listed as hazardous chemical wastes under Resource Conservation and Recovery Act regulations (40 CFR 261). In addition, SCR will require the construction and maintenance of storage vessels of anhydrous or aqueous ammonia for use in the reaction. Ammonia has potential health effects, and the construction of ammonia storage facilities triggers the application of at least three major standards: CAA (Section 112), Occupational Safety and Health Administration (OSHA) 29 CFR 1910.1000, and OSHA 29 CFR 1910.119.

<u>Energy</u>--Significant energy penalties occur with SCR. With SCR, the output of the CT may be reduced by about 0.50 percent over that of advanced low-NO_x combustors. This penalty

is the result of the SCR pressure drop, which would be about 2.5 inches of water and would amount to about 2,967,290 kWh per year in potential lost generation. The energy required by the SCR equipment would be about 949,200 kWh per yr. Taken together, the total lost generation and energy requirements of SCR of 3,916,490 kWh per year could supply the monthly electrical needs of about 326 residential customers. To replace this lost energy, an additional 41 x 10^{10} British thermal units per year (Btu/yr) or about 41 million cubic feet per year (ft^3/yr) of natural gas would be required.

Technology Comparison--The proposed project will use an advanced heavy-duty industrial gas turbine with advanced DLN combustors. This type of machine advances the state-of-the-art for CTs by being more efficient and less polluting than previous CTs. Integral to the machine's design is DLN combustors that prevent the formation of air pollutants within the combustion process, thereby eliminating the need for add-on controls that can have detrimental effects on the environment. An analogy of this technology is a more efficient automotive engine that gives better mileage and reduces pollutant formation without the need of a catalytic converter.

An advanced gas turbine is unique from an engineering perspective in two ways. First, the advanced machine is larger and has higher initial firing (i.e., combustion) temperatures than conventional turbines. This results in a larger, more thermally efficient machine. For example, the electrical generating capability of the proposed GE Frame 7FA advanced machine is about 170 MW compared to the 70 MW to 120 MW conventional machines. The higher initial firing temperature (i.e., 2,600°F) results in about 20 percent more electrical energy produced for the same amount of fossil fuel used in conventional machines. This has the added advantage of producing lower air pollutant emissions (e.g., NO_x, PM, and CO) for each MW generated. While the increased firing temperature increases the thermal NO_x generated, this NO_x increase is controlled through combustor design.

The second unique attribute of the advanced machine is the use of DLN combustors that will reduce NO_x emissions to 9 ppmvd when firing natural gas. Thermal NO_x formation is inhibited by using staged combustion techniques where the natural gas and combustion air are premixed prior to ignition. This level of control will result in NO_x emissions of about 0.04 lb/10^6 Btu, which is less than half of the emissions generated from conventional fossil fuel-fired steam generators.

Since the purpose of the project is to produce electrical energy, and CT technology is rapidly advancing, it is appropriate to compare the proposed emissions on an equivalent generation basis to that of a conventional CT. The heat rate of the GE 7FA machines will be about 9,360 Btu/kWh (LHV, 59°F, natural gas). In contrast, the heat rate for a new conventional CT is about 11,000 Btu/kWh. Therefore, the amount of total NO_x from the advanced CT will be more than 10-percent lower than a conventional turbine for the same amount of generation.

Also, the amount of NO_x control achieved by the DLN combustor on an advanced CT is considerably higher than that achieved by a conventional CT. Because of the higher firing initial temperatures, the advanced CT results in greater NO_x emission formation. Since the advanced machine has higher firing temperatures, the NO_x emissions without the use of DLN combustion technology are much higher than a conventional CT (greater than 180 ppmvd vs. 150 ppmvd). This results in an overall greater NO_x reduction on the advanced CT.

4.3.3 CARBON MONOXIDE

4.3.3.1 Introduction

Emissions of CO are dependent upon the combustion design, which is a result of the manufacturer's operating specifications, including the air-to-fuel ratio, staging of combustion, and the amount of water injected (i.e., for oil firing). The CTs proposed for the project have designs to optimize combustion efficiency and minimize CO as well as NO_x emissions.

For the project, the following alternatives were evaluated as BACT:

1. Combustion controls at 12 ppmvd when firing natural gas (at baseload) and 20 ppmvd when firing oil (at baseload); and

2. Oxidation catalyst at 80 percent removal; maximum annual CO emissions are 17 TPY per unit.

4.3.3.2 Proposed BACT and Rationale

Combustion design is proposed as BACT, as there are adverse technical and economic consequences of using catalytic oxidation on CTs. The proposed BACT emission rates for CO will not exceed 12 ppmvd when firing natural gas and 20 ppmvd when firing distillate oil at baseload conditions. Catalytic oxidation is considered unreasonable for the following reasons:

1. Catalytic oxidation will not produce measurable reduction in the air quality impacts;
2. The economic impacts are significant (i.e., the capital cost is about $1.7 million per unit, with an analyzed cost of $466,000 per year per unit); and
3. Recent projects in Florida have been authorized with BACT emission limits of 25 ppmvd on gas and 90 ppmvd on oil.

Combustion design is proposed as BACT as a result of the technical and economic consequences of using catalytic oxidation on CTs. Catalytic oxidation is considered unreasonable since it will not produce a measurable reduction in the air quality impacts. Indeed, recent BACT decisions for similar advanced CTs have set limits in the 30 ppmvd range and higher. Even the Northeast States for Coordinated Air Use Management (NESCAUM) has recognized a BACT level of 50 ppmvd for CO emissions. The cost of an oxidation catalyst would be significant and not be cost effective given the maximum proposed emission limits.

4.3.3.3 Impact Analysis

<u>Economic</u>--The estimated annualized cost of a CO oxidation catalyst is $466,000 per unit, resulting in a cost effectiveness of greater than $9,000 per ton of CO removed. The cost effectiveness is based on 2,390 hours per year on natural gas and 1,000 hours per year of operation on oil. No costs are associated with combustion techniques since they are inherent in the design.

Environmental--The air quality impacts of both oxidation catalyst control and combustion design control techniques are below the significant impact levels for CO. Therefore, no significant environmental benefit would be realized by the installation of a CO catalyst. Moreover, the air quality impacts at the proposed CT emission rate are predicted to be much less than the PSD significant impact levels. The maximum CO impacts are less than 0.1 percent of the applicable AAQS. There would also be no secondary benefits, such as reductions in acidic deposition, to reducing CO.

Energy--An energy penalty would result from the pressure drop across the catalyst bed. A pressure drop of about 2 inches water gauge would be expected. At a catalyst back pressure of about 2 inches, an energy penalty of about 1,186,900 kWh/yr would result at 100 percent load. This energy penalty is sufficient to supply the electrical needs of about 99 residential customers for a year. To replace this lost energy, about 1.2×10^{10} Btu/yr or about 12 million ft^3/yr of natural gas would be required.

4.3.4 VOLATILE ORGANIC COMPOUNDS

VOCs will be emitted by the CT as a result of incomplete combustion. The proposed BACT for VOC emissions will be the use of combustion technology and the use of clean fuels so that emissions will not exceed 1.4 ppmvd when firing natural gas and 7.0 ppmvw when firing distillate oil. These emission levels are similar to the BACT emission levels established for other similar sources. Combustion controls and the use of clean fuels have been overwhelmingly approved as BACT for CTs. The environmental effect of further reducing emissions would not be significant.

4.3.5 PM/PM_{10}, SO_2 AND OTHER REGULATED AND NONREGULATED POLLUTANT EMISSIONS

The PM/PM_{10} emissions from the CTs are a result of incomplete combustion and trace elements in the fuel. The design of the CT ensures that particulate emissions will be minimized by combustion controls and the use of clean fuels. A review of EPA's BACT/LAER Clearinghouse Documents did not reveal any post-combustion particulate control technologies being used on gas- or oil-fired CTs.

The maximum particulate emissions from the CT will be lower in concentration than that normally specified for fabric filter designs {i.e., the grain loading associated with the maximum particulate emissions [about 10 pounds per hour (lb/hr) when firing natural gas]} is less than 0.01 grain per standard cubic foot, which is a typical design specification for a baghouse. This further demonstrates that no further particulate controls are necessary for the proposed project.

There are no technically feasible methods for controlling the emissions of these pollutants from CTs, other than the inherent quality of the fuel. Clean fuels, natural gas and distillate oil, represent BACT for these pollutants. The use of natural gas and very low sulfur (0.05 percent) fuel oil will limit emissions of SO_2 and sulfuric acid mist.

For the nonregulated pollutants, none of the control technologies evaluated for other pollutants (i.e., SCR) would reduce such emissions; thus, natural gas and distillate oil represent BACT because of their inherently low contaminant content.

Table 4-1. NO_x Emission Estimates (TPY) of BACT Alternative Technologies (per Unit)

	Operating Mode[a]		
Alternative BACT Control Technologies	Oil	Gas	Total
NO_x Emission (TPY)			
DLN only	175.4	76.6	252.0
DLN with SCR[b]	70.2	30.6	100.8
Reduction	(105.2)	(46.0)	(151.2)
Basis of Emissions (ppmvd)			
DLN only	42	9	
DLN with SCR	16.8	3.6	
Hours of Operation	1,000	2,390	3,390

Note: DLN = Dry low-NO_x.
SCR = selective catalytic reduction.
TPY = tons per year.

a Emission rates were based on a "F" class combustion turbine operating at 100-percent capacity and firing natural gas for 2,390 hours and distillate fuel oil for 1,000 hours. Emission data are based on an ambient temperature of 50°F at maximum emission rates.

b Based on primary emissions with SCR; no account is made for additional emissions (secondary) due to lost energy from heat rate penalty and electrical usage for SCR operation (see Table 4-3).

Table 4-2. Comparison of Alternative BACT Control Technologies for NO_x (per Unit)

	Alternative BACT Control Technologies	
	DLN Only	SCR
Technical Feasibility	Feasible	Feasible for gas
Economic Impact[a]		
Capital Costs	included	$5,263,200
Annualized Costs	included	$2,250,700
Cost Effectiveness		
NO_x Removed (per ton of NO_x)	NA	$14,886
NO_x Removed (per ton of total pollutants)	NA	25,267
Environmental Impact[b]		
Total NO_x (TPY)	252	101
NO_x Reduction (TPY)	NA	(151.2)
Ammonia Emissions (TPY)	0	40.4
PM Emissions (TPY)	0	17.1
Secondary Emissions (TPY)	0	4.7
Net Emission Reduction (TPY)	NA	(89.1)
Energy Impacts[c]		
Energy Use (kWh/yr)	0	3,916,490
Energy Use (mmBtu/yr) at 10,000 Btu/kWh	0	40,696
Energy Use (mmcf/yr) at 1,000 Btu/cf for natural gas	0	41
Energy Use (residential customers)	0	326

[a] See Appendix B for detailed development of capital costs (including recurring costs) and annualized costs.

[b] See emission data presented in Table 4-3.

[c] Energy impacts are estimated due to the lost energy from heat rate penalty and electrical usage for the SCR operation at 3,390 hours per year. Lost energy is based on 0.5 percent of 175.06 MW. SCR electrical usage is based on 0.080 MWh per SCR system and 0.20 MWh for cooling fan.

Table 4-3. Maximum Potential Incremental Emissions (TPY) with Selective Catalytic Reduction

Pollutants		Incremental Emissions (tons/year) of SCR		Total
		Primary	Secondary	
Particulate		17.10	0.15	17.25
Sulfur Dioxide			0.06	0.06
Nitrogen Oxides		-151.20	2.71	-148.49
Carbon Monoxide			1.63	1.63
Volatile Organic Compounds			0.11	0.11
Ammonia		40.37		
	Total:	-93.73	4.65	-89.08
Carbon Dioxide (additional from gas firing)			2,577.43	2,577.43

Basis:

Lost Energy (mmBtu/year)	40,696
Secondary Emissions (lb/mmBtu): Assumes natural gas firing in NOx controlled steam unit.	
Particulate	0.0072
Sulfur Dioxide	0.0027
Nitrogen Oxides w/LNB	0.1333
Carbon Monoxide	0.0800
Volatile Organic Compounds	0.0052

Reference: Table 1.4-1 and 1.4-2, AP-42, Version 2/98

5.0 AMBIENT MONITORING ANALYSIS

The CAA requires that an air quality analysis be conducted for each criteria and noncriteria pollutant subject to regulation under the Act before a major stationary source is constructed. Criteria pollutants are those pollutants for which AAQS have been established. Noncriteria pollutants are those pollutants that may be regulated by emission standards, but no AAQS have been established. This analysis may be performed by the use of modeling and/or by monitoring the air quality.

A major source may waive the ambient monitoring analysis requirement if it can be demonstrated that the proposed source's maximum air quality impacts will not exceed the PSD *de minimis* concentration levels. The maximum impacts of the proposed source are compared with the PSD *de minimis* concentrations in Table 3-4. As can be seen from Table 3-4, the proposed plant's maximum air quality impacts will be well below the *de minimis* concentrations for all applicable pollutants.

6.0 AIR QUALITY IMPACT ANALYSIS

6.1 SIGNIFICANT IMPACT ANALYSIS APPROACH

The general modeling approach in this case followed EPA and Florida DEP modeling guidelines for determining compliance with AAQS and PSD increments. For all applicable pollutants that have emission increases that will exceed the PSD significant emission rate due to a proposed project, a significant impact analysis is performed to determine whether the project alone will result in predicted impacts that will exceed the EPA significant impact levels at any off-plant property areas in the vicinity of the plant.

If the project's impacts are above the significant impact levels, then a more detailed air modeling analysis that includes background sources is performed. Current Florida DEP policies stipulate that the highest annual average and highest short-term (i.e., 24 hours or less) concentrations are to be compared to the applicable significant impact levels. Based on the screening modeling analysis results, additional modeling refinements with a denser receptor grid are performed, as necessary, to obtain the maximum concentration. Modeling refinements are performed with a receptor grid spacing of 100 meters (m) or less.

For this project, the significant impacts levels were calculated in the vicinity of the plant following Florida DEP policies.

Generally, if a new project also is within 150 km of a PSD Class I area, then a significant impact analysis is also performed for the PSD Class I area. Currently, the National Park Service (NPS) has recommended significant impact levels for PSD Class I areas. The recommended levels have not been promulgated as rules. EPA also has proposed PSD Class I significant impact levels that have not been finalized as of this report.

Because the proposed project site is approximately 28 km from the Chassahowitzka NWA PSD Class I area, a significant impact modeling analysis has been performed.

6.2 PRECONSTRUCTION MONITORING ANALYSIS APPROACH

The general modeling approach in this case followed EPA and Florida DEP modeling guidelines. The project's impacts were compared to the *de minimis* monitoring levels to determine whether it would be necessary to submit continuous monitoring data to DEP prior to construction. For all applicable pollutants that have emission increases that will exceed the PSD significant emission rate due to a proposed project, a *de minimis* impact analysis is performed to determine whether the project alone will result in predicted impacts that will exceed the EPA *de minimis* levels at any off-plant property areas in the vicinity of the plant. Current Florida DEP policies stipulate that the highest annual average and highest short-term concentrations are to be compared to the applicable *de minimis* monitoring levels.

A proposed major stationary facility or major modification may be exempt from the monitoring requirements with respect to a particular pollutant if the emissions increase of the pollutant from the facility or modification would cause, in any area, air quality impacts less than the *de minimis* levels.

For this project, the project's impacts were calculated in the vicinity of the plant for comparison to *de minimis* levels following Florida DEP policies. As presented in Section 5.0, since the project's VOC emissions are lower than the *de minimis* VOC emission level, the project is exempt from preconstruction ambient monitoring requirements.

6.3 AIR MODELING ANALYSIS APPROACH

6.3.1 GENERAL PROCEDURES

As stated in the previous sections, for each pollutant which is emitted above the significant emission rate, air modeling analyses are required to determine if the project's impacts are predicted to be greater than the significant impact levels and *de minimis* monitoring levels. These analyses consider the project's impacts alone. Air quality impacts are predicted using 5 years of meteorological data and selecting the highest annual and the highest short-term concentrations for comparison to the significant impact levels and *de minimis* levels.

If the project's impacts are greater than the significant impact levels, the air modeling analyses must consider other nearby sources and background concentrations, and calculate the cumulative impact of these sources for comparison to ambient standards. In general, when 5 years of meteorological data are used in the analysis, the highest annual and the HSH concentrations are compared to the applicable AAQS and allowable PSD increments. The HSH concentration is calculated for a receptor field by:

1. Eliminating the highest concentration predicted at each receptor,
2. Identifying the second-highest concentration at each receptor, and
3. Selecting the highest concentration among these second-highest concentrations.

This approach is consistent with air quality standards and allowable PSD increments, which permit a short-term average concentration to be exceeded once per year at each receptor.

To develop the maximum short-term concentrations for the proposed project, the modeling approach was divided into screening and refined phases to reduce the computation time required to perform the modeling analysis. For this study, the only difference between the two modeling phases is the density of the receptor grid spacing employed when predicting concentrations. Concentrations are predicted for the screening phase using a coarse receptor grid and a 5-year meteorological data record.

Refinements of the maximum predicted concentrations are typically performed for the receptors of the screening receptor grid at which the highest and/or HSH concentrations occurred over the 5-year period. Generally, if the maximum concentration from other years in the screening analysis are within 10 percent of the overall maximum concentration, then those other concentrations are refined as well. Typically, if the highest and HSH concentrations are in different locations, concentrations in both areas are refined.

Modeling refinements are performed for short-term averaging times by using a denser receptor grid, centered on the screening receptor at which the maximum concentration was predicted. The angular spacing between radials is 2 degrees and the radial distance interval between receptors is 100 m. Annual modeling refinements employ an angular spacing between radials of 2 degrees and a distance interval from 100 to 300 m, depending on the concentration gradient in the vicinity of the screening receptor to be refined. If the maximum screening concentration is located on the plant property boundary, additional plant boundary receptors are input, spaced at a 2-degree angular interval and centered on the screening receptor. The domain of the refinement grid will extend to all adjacent screening receptors. The air dispersion model is then executed with the refined grid for the entire year of meteorology during which the screening concentration occurred. This approach is used to ensure that a valid highest concentration is obtained. A more detailed description of the model, along with the emission inventory, meteorological data, and screening receptor grids are presented in the following sections.

6.3.2 MODEL SELECTION

The Industrial Source Complex Short-term (ISCST3, Version 99155) dispersion model (EPA, 1997) was used to evaluate the pollutant impacts due to the proposed CTs. This model is maintained by the EPA on its Internet website, Support Center for Regulatory Air Models (SCRAM), within the Technical Transfer Network (TTN). A listing of ISCST3 model features is presented in Table 6-1. The ISCST3 model is designed to calculate hourly concentrations based on hourly meteorological data (i.e., wind direction, wind speed, atmospheric stability, ambient temperature, and mixing heights). The ISCST3 model is applicable to sources located in either flat or rolling terrain where terrain heights do not exceed stack heights. These areas are referred to as simple terrain. The model can also be applied in areas where the terrain exceeds the stack heights. These areas are referred to as complex terrain.

In this analysis, the EPA regulatory default options were used to predict all maximum impacts. The ISCST3 model can run in the rural or urban land use mode which affects stability dispersion coefficients, wind speed profiles, and mixing heights. Land use can be characterized based on a scheme recommended by EPA (Auer, 1978). If more than 50 percent of the land use within a 3-km radius around a project is classified as industrial or commercial, or high-density residential, then the urban option should be selected. Otherwise, the rural option is appropriate. Based on the land-use within a 3-km radius of the proposed plant site (see Figure 2-1), the rural dispersion coefficients were used in the modeling analysis.

The ISCST3 model was used to provide maximum concentrations for the annual and 24-, 8-, 3-, and 1-hour averaging times. When evaluating the project's impacts only for comparison to the significant impact and *de minimis* monitoring levels, a generic emission rate of 10 grams per second (g/s) was used as emissions for the proposed source. Maximum pollutant-specific air impacts for the project were then determined by multiplying the maximum pollutant-specific emission rate, in pounds per hour, by the maximum predicted generic impact divided by 79.365 lb/hr (10 g/s).

6.3.3 METEOROLOGICAL DATA

Meteorological data used in the ISCST3 model to determine air quality impacts consisted of a concurrent 5-year period of hourly surface weather observations and twice-daily upper air soundings from the National Weather Service (NWS) stations at the Tampa International Airport in Tampa, Florida, and at Ruskin, Florida, respectively. The 5-year period of meteorological data was from 1987 through 1991. These data are the most recent 5-year period of meteorological data that have been approved by DEP for use in the modeling. The NWS station at Tampa is located approximately 40 km (24 miles) to the south of the proposed plant site while the NWS station at Ruskin is located approximately 70 km (42 miles) south of the proposed plant site. The surface meteorological data from Tampa are assumed to be representative of the project site because both the project site and the weather station are located in similar topographical areas and are situated in central Florida to experience similar weather conditions, such as frontal passages.

6.3.4 EMISSION INVENTORY

A summary of the criteria pollutant emission rates, physical stack and stack operating parameters for the proposed CTs used in the air modeling analysis is presented in Tables 2-1 through 2-6. The emission and stack operating parameters presented for 32°F and 95°F ambient temperatures for both natural gas and distillate fuel oil were used in the modeling to determine the maximum air quality impacts for a range of possible operating conditions.

Six modeling scenarios per fuel type were considered:

1. Base operating load at an inlet temperature of 32°F;
2. Base operating load at an inlet temperature of 95°F;
3. 75 percent operating load at an inlet temperature of 32°F;
4. 75 percent operating load at an inlet temperature of 95°F;
5. 50 percent operating load at an inlet temperature of 32°F; and
6. 50 percent operating load at an inlet temperature of 95°F.

The proposed CTs will have a stack height of 60 ft and an inner stack diameter of 22 ft.

6.3.5 RECEPTOR LOCATIONS

For predicting maximum concentrations in the vicinity of the plant, a polar receptor grid comprised of 693 grid receptors was used. These receptors included 36 receptors located on radials extending out from the proposed CTs' stack locations. Along each radial, receptors were located at the plant property and distances of 0.1, 0.2, 0.3, 0.5, 0.7, 1.0, 1.5, 2.0, 2.5, 3.0, 4.0, 5.0, 7.0, 10.0, 12.0, 15.0, 20.0, 25.0, and 30.0 km from the proposed CT No 2 stack location. The closest property boundary to the stack is 85 m.

Modeling refinements were performed, as needed, by employing a polar receptor grid with a maximum spacing of 100 m along each radial and an angular spacing between radials of 2 degrees.

Since the terrain surrounding the proposed plant site varies little from the stack base elevation of 50 ft above MSL, the terrain was assumed to be flat and receptor elevations were set equal to the stack base elevation.

6.3.6 BUILDING DOWNWASH EFFECTS

The only significant structures in the vicinity of the proposed CT stacks are the proposed CT air filter inlets, CT structure, fuel oil storage tank, and demineralizer water tanks. The height and widths of these structures are as follows:

Structure	Height (ft)	Width (ft)	Length (ft)
CT air inlet	47	24	36
CT structure	22	30	42
Fuel oil tank	50	100 (diameter)	Not applicable
Demin. water tank	50	100 (diameter)	Not applicable

Building dimensions for the project's structures were entered into the EPA's Building Profile Input Program (BPIP, Version 95086) for the purpose of obtaining direction-specific building heights and widths for all downwash-affected sources. The direction-specific building dimensions were then input to the ISCST3 model as the building height and width for each of 36 ten-degree wind sectors. A summary of the direction-specific building dimensions used in the modeling is presented in Appendix C.

6.4 AIR MODELING RESULTS

The modeling analysis results for the proposed CTs alone in the vicinity of the plant are summarized in Tables 6-2 through 6-4. The maximum pollutant concentrations predicted in the screening analysis for a single CT and three CTs firing natural gas and distillate fuel oil are presented in Tables 6-2 and 6-3, respectively. A summary of the maximum pollutant concentrations predicted for the project compared to the Class II significant impact levels, PSD Class II increments, and AAQS is shown in Table 6-5.

As shown in the tables, the maximum predicted PM, SO_2, NO_x, and CO impacts due to the proposed CTs are all below the significant impact levels. Because the proposed source will not have a significant impact upon the air quality in the vicinity of the plant site, more detailed modeling analyses for determining compliance with the AAQS and PSD Class II increments are not required.

The maximum predicted PM, SO_2, NO_x, and CO impacts due to the proposed CTs are also below the *de minimis* monitoring levels. Because the proposed source will not have predicted impacts greater than *de minimis* levels, preconstruction monitoring data are not required to be submitted as part of the PSD review.

The modeling analysis results for the proposed CTs alone at the Chassahowitzka NWA are summarized in Tables 6-5 through 6-7. The maximum pollutant concentrations predicted in the screening analysis for a single CT and three CTs firing natural gas and distillate fuel oil are presented in Tables 6-6 and 6-7, respectively. A summary of maximum pollutant concentrations predicted for the project compared to the Class I significant impact levels and PSD Class I increments are presented in Table 6-7.

As shown in the tables, the maximum predicted PM and NO_2 impacts due to the proposed CTs are all below EPA's proposed PSD Class I significant impact levels. Therefore, more detailed modeling analyses for determining compliance with the AAQS and PSD Class II increments are not required for these pollutants. For SO_2, the maximum annual average impacts from the CTs are predicted to be below the proposed EPA significant impact levels while the maximum 3-hour and 24-hour average impacts from the CTs are predicted to be above the significant impact levels. As a result, more detailed modeling for the 3-hour and 24-hour average SO_2 concentrations was performed to assess PSD Class I increment consumption at the Chassahowitzka NWA.

Summaries of the ISCST3 model results for each year are presented in Appendix D. Examples of the model input file are also provided in Appendix D.

The detailed modeling involved assessing air quality impacts 3-hour and 24-hour average SO_2 from PSD sources located within about 150 km from the Chassahowitzka NWA. Based on discussions with the Florida DEP and National Park Service, these analyses should be performed using a long-range transport model that can assess impacts for sources located more than 50 km from the Class I area and is acceptable to the Florida DEP, EPA, and National Park Service. From these discussions, the California PUFF (CALPUFF) long-range transport model was recommended and determined to be acceptable by the reviewing agencies. As a result, the CALPUFF model was used to assess the 3-hour and 24-hour average SO_2 concentration for PSD sources, including the project, located within 150 km of the Class I area. A description of the CALPUFF model, including methods and assumptions used in the analysis, is presented in Appendix E. A detailed listing of the PSD sources used in the modeling is presented in Appendix F. This inventory was used in a recent PSD permit application that addressed SO_2 increment consumption in the Class I area.

A summary of maximum 3-hour and 24-hour average SO_2 concentrations predicted for PSD sources at the Class I area is presented in Table 6-8. As shown in Table 6-8, there were one and three violations of the 3-hour and 24-hour average PSD Class I increments, respectively, predicted in the Class I area. For these locations and periods for which the violations were predicted, the project's impacts were less than the proposed EPA significant impact levels. In fact, the project's impacts were zero or essentially zero with a predicted impact of 0.0004 $\mu g/m^3$ for one of the 24-hour violations.

Based on these analyses, the project's impacts are predicted to comply with the PSD Class I increments and not have a significant impact at the Class I area when violations of the 3-hour and 24-hour average PSD Class I increments are predicted.

Copies of the CALPUFF model input and output files, including those from CALPOST that summarize the CALPUFF results, are provided in Appendix G.

Table 6-1. Major Features of the ISCST3 Model, Version 99155

ISCST3 Model Features
• Polar or Cartesian coordinate systems for receptor locations
• Rural or one of three urban options which affect wind speed profile exponent, dispersion rates, and mixing height calculations
• Plume rise due to momentum and buoyancy as a function of downwind distance for stack emissions (Briggs, 1969, 1971, 1972, and 1975; Bowers, et al., 1979).
• Procedures suggested by Huber and Snyder (1976); Huber (1977); and Schulman and Scire (1980) for evaluating building wake effects
• Procedures suggested by Briggs (1974) for evaluating stack-tip downwash
• Separation of multiple emission sources
• Consideration of the effects of gravitational settling and dry deposition on ambient particulate concentrations
• Capability of simulating point, line, volume, area, and open pit sources
• Capability to calculate dry and wet deposition, including both gaseous and particulate precipitation scavenging for wet deposition
• Variation of wind speed with height (wind speed-profile exponent law)
• Concentration estimates for 1-hour to annual average times
• Terrain-adjustment procedures for elevated terrain including a terrain truncation algorithm for ISCST3; a built-in algorithm for predicting concentrations in complex terrain
• Consideration of time-dependent exponential decay of pollutants
• The method of Pasquill (1976) to account for buoyancy-induced dispersion
• A regulatory default option to set various model options and parameters to EPA recommended values (see text for regulatory options used)
• Procedure for calm-wind processing including setting wind speeds less than 1 meters per second(m/s) to 1 m/s.

Note: ISCST3 = Industrial Source Complex Short-Term.
Source: EPA, 1999.

Table 6-2. Maximum Pollutant Concentrations Predicted for One Combustion Turbine Firing Natural Fuel and Distillate Fuel Oil in Simple-Cycle Operation in the Project Vicinity

	Maximum Emission Rates (lb/hr) by Operating Load and Air Temperature							Maximum Predicted Concentrations (ug/m^3) by Operating Load and Air Temperature (1)					
	Base Load		75% Load		50% Load		Averaging	Base Load		75% Load		50% Load	
Pollutant	32°F	95°F	32°F	95°F	32°F	95°F	Time	32°F	95°F	32°F	95°F	32°F	95°F
Natural Gas													
Generic	79.37	79.37	79.37	79.37	79.37	79.37	Annual	0.0155	0.0165	0.0183	0.0193	0.0219	0.0229
(10 g/s)							24-Hour	0.2006	0.2103	0.2282	0.2426	0.2714	0.2817
							8-Hour	0.4347	0.4572	0.4977	0.5194	0.5810	0.6041
							3-Hour	0.8216	0.9642	0.9772	0.9837	1.1910	1.2004
							1-Hour	1.7590	1.8765	2.1112	2.1693	2.5525	2.5669
SO_2	5.1	4.6	4.2	3.7	3.4	2.9	Annual	0.00099	0.00095	0.00097	0.00090	0.00094	0.00084
							24-Hour	0.0129	0.0122	0.0121	0.0113	0.0116	0.0103
							3-Hour	0.053	0.056	0.052	0.046	0.051	0.044
PM10	10.0	10.0	10.0	10.0	10.0	10.0	Annual	0.0020	0.0021	0.0023	0.0024	0.0028	0.0029
							24-Hour	0.0253	0.0265	0.0287	0.0306	0.0342	0.0355
NO_x	66.7	59.9	54.4	48.3	43.4	38.3	Annual	0.013	0.012	0.013	0.012	0.012	0.011
CO	44.2	39.3	35.7	32.7	30.0	27.8	8-Hour	0.24	0.23	0.22	0.21	0.22	0.21
							1-Hour	0.98	0.93	0.95	0.89	0.96	0.90
Distillate Fuel Oil													
Generic	79.37	79.37	79.37	79.37	79.37	79.37	Annual	0.0151	0.0159	0.0182	0.0189	0.0214	0.0225
(10 g/s)							24-Hour	0.1965	0.2050	0.2269	0.2391	0.2654	0.2781
							8-Hour	0.4253	0.4450	0.4950	0.5112	0.5689	0.5960
							3-Hour	0.8184	0.9601	0.9763	0.9813	1.1854	1.1970
							1-Hour	1.7080	1.8169	2.1093	2.1572	2.5071	2.5617
SO_2	101.5	93.4	82.6	74.8	65.6	58.9	Annual	0.019	0.019	0.019	0.018	0.018	0.017
							24-Hour	0.25	0.24	0.24	0.23	0.22	0.21
							3-Hour	1.05	1.13	1.02	0.92	0.98	0.89
PM10	17.0	17.0	17.0	17.0	17.0	17.0	Annual	0.0032	0.0034	0.0039	0.0041	0.0046	0.0048
							24-Hour	0.042	0.044	0.049	0.051	0.057	0.060
NO_x	362.0	335.8	296.7	267.8	236.4	209.3	Annual	0.069	0.067	0.068	0.064	0.064	0.059
CO	74.4	66.2	57.6	53.9	72.2	67.5	8-Hour	0.40	0.37	0.36	0.35	0.52	0.51
							1-Hour	1.60	1.52	1.53	1.47	2.28	2.18

(1) Concentrations are based on highest predicted concentrations using five years of meteorological for 1987 to 1991 of surface and upper air data from the National Weather Service stations at Tampa International Airport and Ruskin, respectively.

Pollutant concentrations were based on a modeled or generic concentration predicted using a modeled emission rate of 79.37 lb/hr (10 g/s). Specific pollutant concentrations were estimated by multiplying the modeled concentration (at 10 g/s) by the ratio of the specific pollutant emission rate to the modeled emission rate of 10 g/s.

Table 6-3. Maximum Pollutant Concentrations Predicted for Three Simple-Cycle Combustion Turbines Firing Natural Gas and Distillate Fuel Oil Compared to the EPA PSD Class II Significant Impact Levels

Pollutant	Averaging Time	Maximum Predicted Concentrations (ug/m^3) by Operating Load and Air Temperature (1): Base Load 32°F	Base Load 95°F	75% Load 32°F	75% Load 95°F	50% Load 32°F	50% Load 95°F	EPA Class II Significant Impact Levels (ug/m^3)
Natural Gas								
SO_2	Annual	0.0030	0.0029	0.0029	0.0027	0.0028	0.0025	1
	24-Hour	0.039	0.037	0.036	0.034	0.035	0.031	5
	3-Hour	0.158	0.168	0.155	0.138	0.153	0.132	25
PM10	Annual	0.0059	0.0062	0.0069	0.0073	0.0083	0.0087	1
	24-Hour	0.076	0.079	0.086	0.092	0.103	0.106	5
NO_x	Annual	0.039	0.037	0.038	0.035	0.036	0.033	1
CO	8-Hour	0.73	0.68	0.67	0.64	0.66	0.63	500
	1-Hour	2.9	2.8	2.8	2.7	2.9	2.7	2,000
Distillate Fuel Oil								
SO_2	Annual	0.058	0.056	0.057	0.053	0.053	0.050	1
	24-Hour	0.75	0.72	0.71	0.68	0.66	0.62	5
	3-Hour	3.1	3.4	3.0	2.8	2.9	2.7	25
PM10	Annual	0.0097	0.0102	0.0117	0.0122	0.0137	0.0145	1
	24-Hour	0.126	0.132	0.146	0.154	0.171	0.179	5
NO_x	Annual	0.21	0.20	0.20	0.19	0.19	0.18	1
CO	8-Hour	1.20	1.11	1.08	1.04	1.55	1.52	500
	1-Hour	4.8	4.5	4.6	4.4	6.8	6.5	2,000

(1) Concentrations are based on highest predicted concentrations using five years of meteorological for 1987 to 1991 of surface and upper air data from the National Weather Service stations at Tampa International Airport and Ruskin, respectively.

Table 6-4. Summary of Maximum Pollutant Concentrations Predicted for Three Simple-Cycle Combustion Turbines Compared to the EPA Class II Significant Impact Levels, PSD Class II Increments, and AAQS

Pollutant	Averaging Time	Maximum Concentration (ug/m^3) Natural Gas	Maximum Concentration (ug/m^3) Distillate Fuel Oil	EPA Class II Significant Impact Levels (ug/m^3)	PSD Class II Increments (ug/m^3)	AAQS (ug/m^3)
SO_2	Annual	0.0030	0.060	1	25	60
	24-Hour	0.039	0.82	5	91	260
	3-Hour	0.17	3.6	25	512	1,300
PM_{10}	Annual	0.0087	0.015	1	17	50
	24-Hour	0.106	0.19	5	30	150
NO_x	Annual	0.039	0.21	1	25	100
CO	8-Hour	0.73	1.6	500	NA	10,000
	1-Hour	2.9	6.8	2,000	NA	40,000

NA= not applicable

Table 6-5. Maximum Pollutant Concentrations Predicted for One Combustion Turbine Firing Natural Fuel and Distillate Fuel Oil in Simple-Cycle Operation at the PSD Class I Area of the Chassahowitzka NWA

	Maximum Emission Rates (lb/hr) by Operating Load and Air Temperature							Maximum Predicted Concentrations (ug/m^3) by Operating Load and Air Temperature (1)					
	Base Load		75% Load		50% Load		Averaging	Base Load		75% Load		50% Load	
Pollutant	32°F	95°F	32°F	95°F	32°F	95°F	Time	32°F	95°F	32°F	95°F	32°F	95°F
Natural Gas													
Generic	79.37	79.37	79.37	79.37	79.37	79.37	Annual	0.0066	0.0070	0.0076	0.0080	0.0090	0.0094
(10 g/s)							24-Hour	0.1083	0.1148	0.1255	0.1312	0.1478	0.1533
							8-Hour	0.2799	0.2943	0.3202	0.3341	0.3739	0.3870
							3-Hour	0.6412	0.6669	0.7125	0.7361	0.8022	0.8230
							1-Hour	0.8707	0.9176	1.0019	1.0469	1.1738	1.2169
SO_2	5.1	4.6	4.2	3.7	3.4	2.9	Annual	0.00042	0.00041	0.00040	0.00037	0.00039	0.00034
							24-Hour	0.0070	0.0067	0.0066	0.0061	0.0063	0.0056
							3-Hour	0.041	0.039	0.038	0.034	0.034	0.030
PM10	10.0	10.0	10.0	10.0	10.0	10.0	Annual	0.0008	0.0009	0.0010	0.0010	0.0011	0.0012
							24-Hour	0.0136	0.0145	0.0158	0.0165	0.0186	0.0193
NO_x	66.7	59.9	54.4	48.3	43.4	38.3	Annual	0.006	0.005	0.005	0.005	0.005	0.005
Distillate Fuel Oil													
Generic	79.37	79.37	79.37	79.37	79.37	79.37	Annual	0.0065	0.0068	0.0076	0.0079	0.0089	0.0092
(10 g/s)							24-Hour	0.1058	0.1116	0.1247	0.1291	0.1445	0.1514
							8-Hour	0.2739	0.2865	0.3185	0.3289	0.3660	0.3824
							3-Hour	0.6303	0.6529	0.7094	0.7272	0.7892	0.8157
							1-Hour	0.8509	0.8922	0.9962	1.0299	1.1491	1.2013
SO_2	101.5	93.4	82.6	74.8	65.6	58.9	Annual	0.008	0.008	0.008	0.007	0.007	0.007
							24-Hour	0.14	0.13	0.13	0.12	0.12	0.11
							3-Hour	0.81	0.77	0.74	0.69	0.65	0.61
PM10	17.0	17.0	17.0	17.0	17.0	17.0	Annual	0.0014	0.0015	0.0016	0.0017	0.0019	0.0020
							24-Hour	0.023	0.024	0.027	0.028	0.031	0.032
NO_x	362.0	335.8	296.7	267.8	236.4	209.3	Annual	0.030	0.029	0.028	0.027	0.026	0.024

(1) Concentrations are based on highest predicted concentrations using five years of meteorological for 1987 to 1991 of surface and upper air data from the National Weather Service stations at Tampa International Airport and Ruskin, respectively.

Table 6-6. Maximum Pollutant Concentrations Predicted for Three Simple-Cycle Combustion Turbines Firing Natural Gas and Distillate Fuel Oil Compared to the EPA PSD Class I Significant Impact Levels

Pollutant	Averaging Time	Maximum Predicted Concentrations (ug/m^3) by Operating Load and Air Temperature (1)						EPA Class I Significant Impact Levels (ug/m^3)
		Base Load		75% Load		50% Load		
		32°F	95°F	32°F	95°F	32°F	95°F	
Natural Gas								
SO_2	Annual	0.00127	0.00122	0.00121	0.00112	0.00116	0.00103	0.1
	24-Hour	0.021	0.020	0.020	0.018	0.019	0.017	0.2
	3-Hour	0.124	0.116	0.113	0.103	0.103	0.090	1.0
PM10	Annual	0.0025	0.0027	0.0029	0.0030	0.0034	0.0035	0.2
	24-Hour	0.041	0.043	0.047	0.050	0.056	0.058	0.3
NO_x	Annual	0.017	0.016	0.016	0.015	0.015	0.014	0.1
Distillate Fuel Oil								
SO_2	Annual	0.025	0.024	0.024	0.022	0.022	0.021	0.1
	24-Hour	0.406	0.394	0.389	0.365	0.358	0.337	0.2
	3-Hour	2.42	2.31	2.21	2.06	1.96	1.82	1.0
PM10	Annual	0.004	0.004	0.005	0.005	0.006	0.006	0.2
	24-Hour	0.068	0.072	0.080	0.083	0.093	0.097	0.3
NO_x	Annual	0.089	0.086	0.085	0.080	0.079	0.073	0.1

(1) Concentrations are based on highest predicted concentrations using five years of meteorological for 1987 to 1991 of surface and upper air data from the National Weather Service stations at Tampa International Airport and Ruskin, respectively.

Table 6-7. Summary of Maximum Pollutant Concentrations Predicted for Three Simple-Cycle Combustion Turbines Compared to the EPA Class I Significant Impact Levels and PSD Class I Increments

Pollutant	Averaging Time	Maximum Concentration (ug/m^3)		EPA Class I Significant Impact Levels (ug/m^3)	PSD Class I Increments (ug/m^3)
		Natural Gas	Distillate Fuel Oil		
SO_2	Annual	0.00127	0.025	0.1	2
	24-Hour	0.021	0.41	0.2	5
	3-Hour	0.124	2.4	1.0	25
PM10	Annual	0.0035	0.0059	0.2	4
	24-Hour	0.058	0.097	0.3	8
NO_x	Annual	0.017	0.089	0.1	2.5

Table 6-8. Summary of Maximum 3-hour and 24-hour Average SO_2 Concentrations Predicted for PSD Sources at the Chassahowitzka NWA Compared to the PSD Class I Increments (CALPUFF Model)

Averaging Time	Maximum Concentration [a] (ug/m^3)	Project's Contribution (ug/m^3)	Receptor Location (m)		Period Ending (Julian day/ hour/year)	PSD Class I Increments (ug/m^3)	EPA Class I Significant Impact Levels (ug/m^3)
			UTM East	UTM North			
24-Hour	5.33	0.0	340,700	3,171,900	253/24/90	5	0.2
	5.09	0.0004	340,300	3,167,700	135/24/90		
	5.01	0.0	340,300	3,165,700	336/24/90		
3-Hour	29.6	0.0	334,000	3,183,400	143/12/90	25	1.0

[a] Maximum concentration is the highest, second highest or lower value predicted at the Class I area (i.e., concentration that exceeds the Class I increment).

7.0 ADDITIONAL IMPACT ANALYSIS

7.1 INTRODUCTION

The additional impact analysis addresses the potential impacts of the new power facility on vegetation, soils, and wildlife of the surrounding area and the nearest Class I area. The nearest Class I area is the Chassahowitzka NWA, located approximately 28 km northwest of the proposed project. Because the facility is subject to the PSD NSR requirements for SO_2, PM_{10}, NO_2, CO, and sulfuric acid emissions, the additional impact analysis were performed for these pollutants. The analyses also addressed impacts associated with the project firing natural gas and backup distillate fuel oil.

According to the modeling results presented in Section 6.0, the maximum air quality impacts predicted for the project are well below the EPA's Class II significant impact levels, the PSD Class II increments, and the AAQS. The maximum air quality impacts predicted for the project are also below the EPA's Class I significant impact levels and the PSD Class I increments, except for the 3-hour and 24-hour average SO_2 concentrations. However, the project's impacts are predicted to be less than the Class I significant impact levels when exceedances of the Class I increment are predicted. As a result, regardless of the existing conditions in the vicinity of the site or in the Class I areas, the proposed project will not result in any significant adverse effects upon these areas.

7.2 SOIL, VEGETATION, AND AQRV ANALYSIS METHODOLOGY

As shown in Section 6.0, the maximum air quality impacts for the project were predicted in the vicinity of the project and in the Class I area. The analysis involved predicting worst-case maximum short- and long-term concentrations of pollutants and comparing them to the lowest observed effect levels for AQRVs or analogous organisms. In conducting the assessment, several assumptions were made to assess the pollutant interaction with the different matrices (i.e., vegetation, soils, wildlife, and aquatic environment).

A screening approach was used to evaluate potential effects that compared the maximum predicted ambient concentrations of air pollutants of concern with effect threshold limits for both vegetation and wildlife as reported in the scientific literature. A literature search was conducted which specifically addressed the effects of air contaminants on plant species reported to occur in the vicinity of the plant and the Class I area. It was recognized that effects threshold information is not available for all species found in the Chassahowitzka NWA, although studies have been performed on a few of the common species and on other similar species which can be used as models.

7.3 IMPACTS TO PLANT VICINITY SOILS AND VEGETATION

According to the USDA Pasco County Soil Survey, soils in the vicinity of the project are classified as Candler fine sand, an excessively drained, sloping soil found in the sandhill areas of Pasco County. Excessively drained, sandy soils are by nature acidic, therefore agricultural uses require amendment of soil with lime to increase alkalinity.

Vegetative communities in the vicinity of the project site are primarily pine plantation, improved pasture, xeric oak hammock, and maintained lawns associated with the wastewater treatment plant and access road right-of-ways.

Maximum predicted concentrations of SO_2, PM_{10}, NO_2, and CO in the vicinity of the project site are at least an order of magnitude lower than the EPA Class II significant impact levels (see Table 6-4); therefore, no significant impacts associated with facility operations are expected. The predicted concentrations are less than 1 percent of the AAQS. Since the AAQS are designed to protect the public welfare, including effects on soils and vegetation, no detrimental effects on soils or vegetation should occur in this area.

7.4 CLASS I AREA IMPACT ANALYSIS

7.4.1 IDENTIFICATION OF AQRV AND METHODOLOGY

An AQRV analysis was conducted to assess the potential risk to AQRVs of the Chassahowitzka NWA due to the proposed increase from the proposed facility. The U.S. Department of the Interior in 1978 administratively defined AQRVs to be:

All those values possessed by an area except those that are not affected by changes in air quality and include all those assets of an area whose vitality, significance, or integrity is dependent in some way upon the air environment. These values include visibility and those scenic, cultural, biological, and recreational resources of an area that are affected by air quality.

Important attributes of an area are those values or assets that make an area significant as a national monument, preserve, or primitive area. They are the assets that are to be preserved if the area is to achieve the purposes for which it was set aside (Federal Register 1978).

Except for visibility, AQRVs were not specifically defined. However, odor, soil, flora, fauna, cultural resources, geological features, water, and climate generally have been identified by land managers as AQRVs. Since specific AQRVs have not been identified for the Chassahowitzka NWA, this AQRV analysis evaluates the effects of air quality on general vegetation types and wildlife found in the Chassahowitzka NWA.

Vegetation type AQRVs and their representative species types have been defined as:

- Marshlands - black needlerush, saw grass, salt grass, and salt marsh cordgrass
- Marsh Islands - cabbage palm and eastern red cedar
- Estuarine Habitat - black needlerush, salt marsh cordgrass, and wax myrtle
- Hardwood Swamp - red maple, red bay, sweet bay, and cabbage palm
- Upland Forests - live oak, scrub oak, longleaf pine, slash pine, wax myrtle, and saw palmetto
- Mangrove Swamp - red, white, and black mangrove

Wildlife AQRVs have been identified as endangered species, waterfowl, marsh and waterbirds, shorebirds, reptiles, and mammals.

A screening approach was used that compared the maximum predicted ambient concentration of air pollutants of concern in the Chassahowitzka NWA with effect threshold limits for both vegetation and wildlife as reported in the scientific literature. A literature search was conducted that specifically addressed the effects of air contaminants on plant species reported to occur in the NWA. While the literature search focused on such species as cabbage palm, eastern red cedar, lichens, and species of the hardwood swamplands and mangrove forest, no specific citations that addressed these species were found. It is recognized that effect threshold information is not available for all species found in the Chassahowitzka NWA, although studies have been performed on a few of the common species and on other similar species that can be used as indicators of effects.

7.4.2 IMPACTS TO SOILS

For soils, the potential and hypothesized effects of atmospheric deposition include:

- Increased soil acidification,
- Alteration in cation exchange,
- Loss of base cations, and
- Mobilization of trace metals.

The potential sensitivity of specific soils to atmospheric inputs is related to two factors. First, the physical ability of a soil to conduct water vertically through the soil profile is important in influencing the interaction with deposition. Second, the ability of the soil to resist chemical changes, as measured in terms of pH and soil cation exchange capacity (CEC), is important in determining how a soil responds to atmospheric inputs.

According to the USDA Soil Surveys of Citrus and Hernando Counties, nine soil complexes are found in the Chassahowitzka NWA. These include Aripeka fine sand, Aripeka-Okeelanta-Lauderhill, Hallendale-Rock outcrop, Homosassa mucky fine sandy loam, Lacooche, Okeelanta mucks, Okeelanta-Lauderdale-Terra Ceia mucks, Rock outcrop-Homosassa-Lacoochee, and Weekiwachee-Durbin mucks (Porter, 1996). The majority of the soil complexes found in the NWA are inundated by tidal waters, contain a relatively high organic matter content, and have high buffering capacities based on their CEC, base saturation, and bulk density. The regular flooding of these soils by the Gulf of Mexico regulates the pH and any change in acidity in the soil would be buffered by this activity. Therefore, they would be relatively insensitive to atmospheric inputs. However, Terra Ceia, Okeelanta, and Lauderdale freshwater mucks are present along the eastern border of the NWA, and may be more sensitive to atmospheric sulfur deposition (Porter, 1996). Although not tidally influenced, these freshwater mucks are highly organic and therefore have a relatively high intrinsic buffering capacity.

The relatively low sensitivity of the soils to atmospheric inputs coupled with the extremely low ground-level concentrations of contaminants projected for the Chassahowitzka NWA from the proposed plant emissions precludes any significant impact on soils.

7.4.3 VEGETATION

7.4.3.1 General

In general, the effects of air pollutants on vegetation occur primarily from SO_2, NO_2, O_3, and PM. Effects from minor air contaminants such as fluoride, chlorine, hydrogen chloride, ethylene, ammonia, hydrogen sulfide, CO, and pesticides have also been reported in the literature. The effects of air pollutants are dependent both on the concentration of the contaminant and the duration of the exposure. The term "injury," as opposed to damage, is commonly used to describe all plant responses to air contaminants and will be used in the context of this analysis. Air contaminants are thought to interact primarily with plant foliage, which is considered to be the major pathway of exposure. For purposes of this analysis, it was assumed that 100 percent of each air contaminant of concern is accessible to the plants.

Injury to vegetation from exposure to various levels or air contaminants can be termed acute, physiological, or chronic. Acute injury occurs as a result of a short-term exposure to a high contaminant concentration and is typically manifested by visible injury symptoms ranging from chlorosis (discoloration) to necrosis (dead areas). Physiological or latent injury occurs as the result of a long-term exposure to contaminant concentrations below that which results in acute injury symptoms. Chronic injury results from repeated exposure to low concentrations over extended periods of time, often without any visible symptoms, but with some effect on the overall growth and productivity of the plant. In this assessment, 100 percent of the particular air pollutant in the ambient air was assumed to interact with the vegetation. This is a conservative approach.

The response of vegetation and wildlife to atmospheric pollutants is influenced by the concentration of the pollutant, duration of exposure, and frequency of exposures. The pattern of pollutant exposure expected from the facility is that of a few episodes of relatively high ground-level concentration which occur during certain meteorological conditions interspersed with long periods of extremely low ground-level concentrations. If there are any effects of stack emissions on plants and animals they will be from the short-term, higher doses. A dose is the product of the concentration of the pollutant and duration of the exposure.

7.4.3.2 SO_2

Sulfur is an essential plant nutrient usually taken up as sulfate ions by the roots from the soil solution. When sulfur dioxide in the atmosphere enters the foliage through pores in the leaves, it reacts with water in the leaf interior to form sulfite ions. Sulfite ions are highly toxic. They interact with enzymes, compete with normal metabolites, and interfere with a variety of cellular functions (Horsman and Wellburn, 1976). However, within the leaf, sulfite is oxidized to sulfate ions, which can then be used by the plant as a nutrient. Small amounts of sulfite may be oxidized before they prove harmful.

SO_2 gas at elevated levels has long been known to cause injury to plants. Acute SO_2 injury usually develops within a few hours or days of exposure, and symptoms include marginal, flecked, and/or intercostal necrotic areas that appear water-soaked and dullish green initially. This injury

generally occurs to younger leaves. Chronic injury usually is evident by signs of chlorosis, bronzing, premature senescence, reduced growth, and possible tissue necrosis (EPA, 1982). Background levels of SO_2 in the Chassahowitzka NWA average 1.29 $\mu g/m^3$, with a 24-hour maximum concentration of 14.5 $\mu g/m^3$. Observed SO_2 effect levels for several plant species and plant sensitivity groupings are presented in Tables 7-2 and 7-3, respectively.

Many studies have been conducted to determine the effects of high-concentration, short-term SO_2 exposure on natural community vegetation. Sensitive plants include ragweed, legumes, blackberry, southern pine, and red and black oak. These species are injured by exposure to 3-hour SO_2 concentrations of 790 to 1,570 μg/m³. Intermediate plants include locust and sweetgum. These species are injured by exposure to 3-hour SO_2 concentrations of 1,570 to 2,100 μg/m³. Resistant species (injured at concentrations above 2,100 μg/m³ for 3 hours) include white oak and dogwood (EPA, 1982).

A study of native Floridian species (Woltz and Howe, 1981) demonstrated that cypress, slash pine, live oak, and mangrove exposed to 1,300 μg/m³ SO_2 for 8 hours were not visibly damaged. This finding support the levels cited by other researchers on the effects of SO_2 on vegetation. A corroborative study (McLaughlin and Lee, 1974) demonstrated that approximately 20 percent of a cross-section of plants ranging from sensitive to tolerant was visibly injured at 3-hour SO_2 concentrations of 920 μg/m³.

Two lichen species indigenous to Florida exhibited signs of SO_2 damage in the form of decreased biomass gain and photosynthetic rate as well as membrane leakage when exposed to concentrations of 200 to 400 μg/m³ for 6 hours/week for 10 weeks (Hart et al., 1988).

The maximum 24-hour SO_2 concentrations predicted within the Class I area due to the project only are 0.021 μg/m³ when operating with natural gas and 0.50 μg/m³ when firing distillate fuel oil. When added to the average background concentration of 1.29 μg/m³, total SO_2 impacts are 1.31 and 1.79 μg/m³, for natural gas and distillate fuel oil, respectively. When added to the maximum 24-hour background concentrations for the NWA (14.5 μg/m³), the resultant worst-case scenario concentrations are 14.52 and 15 μg/m³ for natural gas and distillate fuel oil, respectively. This level is much lower than those known to cause damage to test species. Jack pine seedlings exposed to SO_2 concentrations of 470 to 520 μg/m³ for 24 hours demonstrated inhibition of foliar lipid synthesis; however, this inhibition was reversible (Malhotra and Kahn, 1978). Black oak exposed to 1,310 μg/m³ SO_2 for 24 hours a day for 1 week demonstrated a 48 percent reduction in photosynthesis (Carlson, 1979). Under worst-case scenarios when the plant is operating on backup fuel, the maximum 24-hour SO_2 concentrations predicted within the Class I area are only 3.8 to 7.5 percent of those that caused damage to the most sensitive lichens. The modeled annual incremental increase in SO_2 adds slightly to background levels of this gas and poses only a minimal threat to area vegetation.

7.4.3.3 PM_{10}

Although information pertaining to the effects of particulate matter on plants is scarce, some concentrations are available (Mandoli and Dubey, 1988). Ten species of native Indian plants were exposed to levels of particulate matter that ranged from 210 to 366 μg/m^3 for an 8-hour averaging

period. Damage in the form of a higher leaf area/dry weight ratio was observed at varying degrees for most plants tested. Concentrations of particulate matter lower than 163 μg/m^3 did not appear to be injurious to the tested plants.

By comparison of these published toxicity values for particulate matter exposure (i.e., concentrations for an 8-hour averaging time), the possibility of plant damage in the Chassahowitzka NWA can be determined. The maximum predicted cumulative 8-hour PM_{10} concentration in the NWA due to the project only is 0.146 μg/m^3 when firing natural gas, and 0.246 μg/m^3 when firing distillate fuel oil (see Table 7-1). When added to the average background concentrations recorded for the NWA (21.1 μg/m^3, 24-hour averaging time), the resultant concentrations are 21.2 and 21.3 μg/m^3, respectively. This concentration is well below the lower threshold value that reportedly affects plant foliage. When added to the maximum PM10 concentrations recorded in the NWA (83.6 μg/m^3, 24 hour averaging time), the worst case scenario concentrations are 83.7 and 83.8 μg/m^3 when firing natural gas or fuel oil, respectively. In any event, since the project contributes only 0.146 μg/m^3, 8-hour average impact, to the total predicted impacts, no effects to vegetative AQRVs are expected from the project.

7.4.3.4 NO_2

Nitrogen dioxide (NO_2) is another emission of concern for the proposed plant. This compound can injure plant tissue with symptoms usually appearing as irregular white to brown collapsed lesions between the leaf veins and near the margins. Conversely, noninjurious levels of NO_2 can be absorbed by plants, enzymatically transformed into ammonia, and incorporated into plant constituents such as amino acids (Matsumaru et al., 1979).

Plant damage can occur through either acute (short-term, high concentration) or chronic (long-term, relatively low concentration) exposure. For plants that have been determined to be more sensitive to NO_2 exposure than others, acute (1, 4, 8 hours) exposure caused 5 percent predicted foliar injury at concentrations ranging from 3,800 to 15,000 $\mu g/m^3$ (Heck and Tingey, 1979). Chronic exposure of selected plants (some considered NO_2-sensitive) to NO_2 concentrations of 2,000 to 4,000 $\mu g/m^3$ for 213 to 1,900 hours caused reductions in yield of up to 37 percent and some chlorosis (Zahn, 1975).

Short term (8 hour averaging time) predicted NO_x emissions in the Class I area due to the project only are 0.706 and 3.75 $\mu g/m^3$ for natural gas and fuel oil, respectively. These concentrations are less than 0.1 percent of the levels that cause foliar injury in acute exposure scenarios. By comparison of published toxicity values for NO_2 exposure to long-term (annual averaging time) modeled concentrations, the possibility of plant damage in the Class I areas can be examined for chronic exposure situations. For a chronic exposure, the annual estimated NO_2 concentrations due to the project only at the point of maximum impact in the Class I areas are 0.017 and 0.089 $\mu g/m^3$.

when the project is firing natural gas and fuel oil, respectively. These values are less than 0.01 percent of the levels that caused minimal yield loss and chlorosis in plant tissue. The average and maximum background NO_2 concentrations reported in the Chassahowitzka NWA are 0.006 and 0.104 $\mu g/m^3$, respectively.

Although it has been shown that simultaneous exposure to SO_2 and NO_2 results in synergistic plant injury (Ashenden and Williams, 1980), the magnitude of this response is generally only 3 to 4 times greater than either gas alone and usually occurs at unnaturally high levels of each gas. Therefore, the concentrations within the wilderness areas are still far below the levels that potentially cause plant injury for either acute or chronic exposure.

7.4.3.5 CO

As with PM, information pertaining to the effects of CO on plants is scarce. The main effect of high concentrations of CO is the inhibition of cytochrome *c* oxidase, the terminal oxidase in the mitochondrial electron transfer chain. Inhibition of cytochrome *c* oxidase depletes the supply of ATP, the principal donor of free energy required for cell functions. However, this inhibition only occurs at extremely high concentrations of CO. Pollok et al. (1989) reported that exposure to $CO:O_2$ ratio of 25 (equivalent to an ambient CO concentration of 6.85 x 10^6 $\mu g/m^3$) resulted in stomatal closure in the leaves of the sunflower (*Helianthus annuus*). Naik et al. (1992) reported cytochrome *c* oxidase inhibition in corn, sorghum, millet, and Guinea grass at $CO:O_2$ ratios of 2.5 (equivalent to an ambient CO concentration of 6.85 x 10^5 $\mu g/m^3$). These plants were considered the species most sensitive to CO-induced inhibition of cytochrome *c* oxidase.

By comparison of published effect values for CO exposure, the possibility of plant damage in the Class I areas can be determined. The predicted maximum annual concentrations due to the project only in the Class I area are 0.011 and 0.024 $\mu g/m^3$ for natural gas and fuel oil, respectively. These concentrations are <0.00001 percent of the minimum value that caused inhibition in laboratory studies.

7.4.3.6 SUMMARY

In summary, the phytotoxic effects from the proposed plant emissions are minimal. It is important to note that the elements were conservatively modeled with the assumption that 100 percent was available for plant uptake. This is rarely the case in a natural ecosystem.

7.4.4 WILDLIFE

The major air quality risk to wildlife in the United States is from continuous exposure to pollutants above the National AAQS. This occurs in non-attainment areas, e.g., Los Angeles Basin. Risks to wildlife also may occur for wildlife living in the vicinity of an emission source that experiences frequent upsets or episodic conditions resulting from malfunctioning equipment, unique meteorological conditions, or startup operations (Newman and Schreiber, 1988). Under these conditions, chronic effects (e.g., particulate contamination) and acute effects (e.g., injury to health) have been observed (Newman, 1981).

A wide range of physiological and ecological effects to fauna has been reported for gaseous and particulate pollutants (Newman, 1981; Newman and Schreiber, 1988). The most severe of these effects have been observed at concentrations above the secondary AAQS. Physiological and behavioral effects have been observed in experimental animals at or below these standards. For impacts on wildlife, the lowest threshold values of SO_2, NO_2, and particulates which are reported to cause physiological changes are shown in Table 7-4. These values are up to orders of magnitude larger than maximum predicted concentrations for the Class I area. No effects on wildlife AQRVs from SO_2, NO_2, and particulates are expected. The proposed project's contribution to cumulative impacts is negligible.

7.4.5 IMPACTS UPON VISIBILITY

The Clean Air Act Amendments of 1977 provide for implementation of guidelines to prevent visibility impairment in mandatory Class I areas. The guidelines are intended to protect the aesthetic quality of these pristine areas from reduction in visual range and atmospheric discoloration due to various pollutants. Sources of air pollution can cause visible plumes if emissions of PM_{10} and NO_x are sufficiently large. A plume will be visible if its constituents scatter or absorb sufficient light so that the plume is brighter or darker than its viewing background (e.g., the sky or a terrain feature, such as a mountain). PSD Class I areas, such as national parks and wilderness areas, are afforded special visibility protection designed to prevent plume visual impacts to observers within a Class I area.

The analysis to determine the potential adverse plume visibility effects in the Chassahowitzka NWA was based on using the screening approach suggested in the Workbook for Plume Visual Impact Screening and Analysis (EPA, 1992), which has been computerized by EPA in a program called the VISCREEN model. The VISCREEN model is currently recommended for use by the EPA to assess visual plume impacts in regulatory applications. The VISCREEN model can be used to calculate potential plume impact of specific pollutant emissions for specific transport and meteorological dispersion conditions.

The model can be applied in two successive levels of screening (i.e., referred to as Levels 1 and 2) without the need for extensive source, meteorological, or pollutant input. If the screening calculations demonstrate that, during worst-case meteorological conditions a plume is imperceptible or, if perceptible, is not likely to be considered objectionable ("adverse" or "significant" in the language of the EPA PSD and visibility regulations), further analysis of plume visual impact would not be required as part of the air quality review of the source. However, if the screening analyses demonstrate that the criteria are exceeded, plume visual impacts cannot be ruled out, and more detailed analyses to ascertain the magnitude, frequency, location, and timing of plume visual impacts would be required.

The Level 1 screening analysis is designed to provide a conservative estimate of plume visual impacts (i.e., impacts that would be larger than those calculated with more realistic input and modeling assumptions). This analysis assumes worst-case meteorological conditions of stable stability (Pasquill-Gifford stability class F) and a 1 m/s wind speed persisting for 12 hours in one direction towards a PSD Class I area. The input required for the Level 1 analysis is limited to the following parameters:

- Emission rates of PM_{10} and NO_x;
- Distance between the emission source and (a) the observer; (b) the closest Class I area boundary; and (c) the most distant Class I area boundary;
- Background visual range appropriate for the region in which the Class I area is located; and
- If available, emission rates of NO2, soot, and primary sulfate.

Visibility impacts are then determined for two parameters:

- Contrast of a plume against a viewing background such as the sky or a terrain feature, and
- Perceptibility of a plume on the basis of the color difference between the plume and the viewing background (Delta E).

Results are provided by the model for several scenarios based on the background view, the viewing angle, visibility improvement due to plumes located both inside and outside the

Class I area, and the sun angle. The critical values for contrast and Delta E are 0.05 and 2.00, respectively. If these levels are not exceeded by the proposed source, the source is considered to pass the Level 1 visibility analysis, and the source will not have a significant impact on the Class I area.

The only PSD Class I area located within 150 km of the project site is the Chassahowitzka NWA. The terrain between the project site and PSD Class I area and within the Class I area can be considered as generally flat. With no terrain feature that can be used as a viewing background, the visibility impacts were determined using the sky as the only viewing background.

The visibility impact analysis for the project was performed for the project firing natural gas, the primary fuel, and distillate fuel oil that, which the backup fuel. It should be note that the proposed CTs will operate up to a maximum of 3,390 hours in a year with the backup fuel oil limited to 1,000 hours per year. In reality, because the CTs are peaker units operating in simple-cycle mode, the CTs will operate for fewer hours than those proposed. Also, because of the economic difference in cost between firing natural gas and fuel oil, the CTs will fire fuel oil on an infrequent basis. It should also be noted that the CTs, as peaking units, will operate during the daytime from about 7 a.m. to 7 p.m. when electrical demand is highest.

The input parameters and results of the Level 1 analysis for the project firing natural gas and fuel oil are presented in Figures 7-1 and 7-2. As shown, the project will emit PM_{10}, NO_x, and primary SO_4 (as sulfuric acid mist). The maximum short-term average emission rates used in the analysis, which are presented in Section 2.0 and Appendix A, are based on the CTs operating at baseload conditions with an air inlet temperature of 32°F. These rates are higher for fuel oil-firing than those for natural gas-firing. Primary NO_2 and soot are not emitted in significant quantities by natural gas- and oil-fired combustion sources; therefore, these emissions were set to zero.

The background visual range was assumed to be 65 km based on information provided by the U.S. Fish and Wildlife Service. This background visual range was derived from particle data measured from April 1993 to May 1994 at the Interagency Monitoring of Protected Visual Environments (IMPROVE) network in the Chassahowitzka NWA. The background visual range of 65 km is based on the 10th percentile of values from the monitoring period having the best visibility.

Other parameters input to the model were based upon default values given in the Workbook and incorporated into the computer model.

As shown in Figures 7-1 and 7-2, the project's emissions due to natural gas- and oil-firing are calculated to exceed the Level 1 visibility screening criteria at the Class I area. Because results from the Level 1 screening analysis exceed the visibility criteria, a Level 2 screening analysis was performed. One of the main differences in input between the Level 1 and Level 2 analyses is the meteorology assumed for plume transport and dispersion patterns.

The Level 2 screening analysis is designed to account for more realistic occurrences of meteorological conditions that would transport the plumes of the proposed units towards the Class I area. In this analysis, an assessment of the frequency of the wind direction, wind speed, and atmospheric stability classes is made to determine the frequency of conditions that are most likely to cause a potentially adverse plume visual impact. If the Level 1 default parameters are selected for addressing visual plume impacts, the VISCREEN model assigns an appropriate estimate of particle size and density for the emitted and background atmosphere particulate and worst-case plume dispersion conditions. For this analysis, the particle size and density for the emission sources were not changed.

The first step in the analysis is to construct a table that shows worst-case dispersion conditions ranked in order of decreasing severity and the frequency of occurrence of these conditions associated with the wind direction that could transport emissions toward the Class I area. Dispersion conditions are ranked by evaluating the product of the horizontal dispersion parameter (called sigma y) times the vertical dispersion parameter (called sigma z) times the wind speed. Sigma y and sigma z account for the amount of plume spreading or dispersion that will occur as a plume travels away from a source for a given stability class. The dispersion conditions are then ranked in ascending order of the value of the dispersion product term (i.e., sigma y times sigma z times the wind speed).

For the Level 2 analysis, it is assumed that steady-state plume conditions are unlikely to persist for more than 12 hours. Thus, if a transit time of more than 12 hours is required to transport a plume parcel from the emission source to a Class I area for a given dispersion condition, it is assumed that the plume material is more dispersed than a standard Gaussian plume model would predict. This enhanced dilution would result from daytime convective mixing and wind direction and speed changes.

To obtain the worst-case meteorological conditions, it is necessary to determine the dispersion conditions (i.e., a given wind speed and stability class associated with the wind direction that would transport emissions toward the Class I area) that has a dispersion product term with a cumulative probability of 1 percent. Thus, the dispersion condition is selected to address potential plume visual impacts such that the sum of all frequencies of occurrence worse than this condition totals 1 percent (i.e., about 4 days per year). The 1-percentile meteorology is assumed to be worst-case plume visual impacts when the probability of worst-case meteorology conditions is coupled with the probability of other factors being ideal for maximizing plume visual impacts. Dispersion conditions associated with transport times of more than 12 hours are not considered in this cumulative frequency.

For this study, the surface meteorological data from the NWS station in Tampa from 1987 to 1991 were used to generate a frequency distribution of wind direction, wind speed, and stability occurrences based on the standardized stability array (STAR) program used for many air dispersion model applications. The STAR program generates frequencies using 16 wind direction classes with each class covering a 22.5-degree sector, 6 wind speed classes, and 6 stability classes. It should be noted that these data were used to address air quality impacts from the project as presented in Section 6.0.

The PSD Class I area of the Chassahowitzka NWA is located to the north and north-northwest of the project site at distances that vary from approximately 28 km to 47 km. Therefore, the frequencies associated with these two wind directions were included in the analysis (i.e., south and south-southeast) with the highest frequency from any of those directions used in the cumulative frequency to determine the worst-case meteorology. Since the CTs are most likely to operate during the daytime, the weather frequencies for these wind directions were determined for the daytime and nighttime periods. The daytime period corresponded to the 12-hour period from 7 a.m. to 7 p.m. while the nighttime period corresponded to the 12-hour period from 7 p.m. to 7 a.m.

This analysis is presented in Table 7-5, which shows the dispersion product term, transport time to the nearest part of the Class I area (i.e., distance of 27.8 km), and the frequency associated with each wind direction. As indicated in Table 7-5, the meteorological conditions considered in the analysis could be transported to the Class I area in less than 12 hours. As a result, all of these conditions would be included in determining the worst-case meteorology using the cumulative probability of 1 percent.

As shown in Table 7-5, during the nighttime period, two weather conditions for both wind directions produce a cumulative frequency of 1 percent or more (moderately stable stability and wind speeds of 0.8 and 2.6 m/s. However, the CTs are not likely to operate during the nighttime. By considering the daytime period when the CTs are likely to operate, the weather condition of neutral (D class) stability and wind speed of 4.4 m/s is associated with a cumulative frequency of 1 percent. This weather condition was used to assess the potential visual plume impacts from the project.

The results of the visual plume impact analysis for the CTs firing natural gas and fuel oil using a worst-case meteorological condition of neutral stability and 4.4 m/s wind speed are shown in Figures 7-3 and 7-4, respectively. For natural gas-firing, all values of Delta E and contrast are less than the screening criteria of 2.00 and 0.05, respectively. As a result, it is highly unlikely that the pollutant emissions from the project firing natural gas will cause adverse visibility impairment in the Chassahowitzka NWA.

For oil-firing, all values of Delta E and contrast are less than the screening criteria of 2.00 and 0.05, respectively, except for maximum visual impacts outside of the Class I area when the plume is viewed against a sky background. The Delta E for the project is estimated to be 2.25 compared to a criterion of 2.0. This scenario assumes that the plume is between the observer and the sun that is located at an angle of 10 degrees above the horizon in a direction to the southeast or southwest of the observer. In reality, such a sun angle and direction are not likely to occur for any given line of sight from the Class I area to the project. The furthest southward extent of the sun's location at these latitudes is to the east-southeast or west-southwest. By limiting the southward extent of sun's location to these directions and to a 10-degree angle above the horizon, the Delta E for the project is estimated to be less than the criterion of 2.0.

It should also be noted that these critical visual impacts are estimated for locations outside of the Class I area. This evaluation is important if there were integral vistas located outside the Class I area. However, no integral vistas have been identified for the Chassahowitzka NWA.

Given that the CTs will be firing natural gas as a primary fuel and are proposed to operate for 39 percent of the time or less during the year (including 11 percent or less with fuel oil), it is highly unlikely that the pollutant emissions from the project firing natural gas or fuel oil will cause adverse visibility impairment in the Chassahowitzka NWA.

7.5 ADDITIONAL GROWTH

Construction of the new plant will result in an increase in jobs, payroll, and taxes in the area. However, no significant growth-related impacts are expected due to the proposed project.

Table 7-1. Maximum Predicted Concentrations due to the Project Only at the Class I Area of the Chassahowitzka National Wilderness Area

Natural Gas	Concentrations[a] ($\mu g/m^3$) for Averaging Times				
Pollutant	Annual	24-Hour	8-Hour	3-Hour	1-Hour
Sulfur Dioxide (SO_2)	0.0013	0.021	0.054	0.124	0.168
Nitrogen Dioxide (NO_2)	0.017	0.273	0.706	1.62	2.20
Particulates (PM_{10})	0.0035	0.058	0.146	0.311	0.460
Carbon Monoxide (CO)	0.011	0.181	0.468	1.07	1.45
Distillate Fuel Oil					
Sulfur Dioxide (SO_2)	0.025	0.406	1.05	2.42	3.26
Nitrogen Dioxide (NO_2)	0.089	1.45	3.75	8.63	11.6
Particulates (PM_{10})	0.0059	0.097	0.246	0.524	0.772
Carbon Monoxide (CO)	0.024	0.394	0.999	2.15	3.14

[a] From the ISCST model and 5-years of hourly meteorological data from the NWS station at the Tampa International Airport, 1987-91.

Table 7-2. SO_2 Effects Levels for Various Plant Species

Plant Species	Observed Effect Level ($\mu g/m^3$)	Exposure (Time)	Reference
Sensitive to tolerant	920 (20 percent displayed visible injury)	3 hours	McLaughlin and Lee, 1974
Lichens	200-400	6 hr/wk for 10 weeks	Hart *et al.*, 1988
Cypress, slash pine, live oak, mangrove	1,300	8 hours	Woltz and Howe, 1981
Jack pine seedlings	470-520	24 hours	Malhotra and Kahn, 1978
Black oak	1,310	Continuously for 1 week	Carlson, 1979

Table 7-3. Sensitivity Groupings of Vegetation Based on Visible Injury at Different SO_2 Exposures[a]

Sensitivity Grouping	SO_2 Concentration 1-Hour	3-Hour	Plants
Sensitive	1,310 - 2,620 $\mu g/m^3$ (0.5 - 1.0 ppm)	790 - 1,570 $\mu g/m^3$ (0.3 - 0.6 ppm)	Ragweeds Legumes Blackberry Southern pines Red and black oaks White ash Sumacs
Intermediate	2,620 - 5,240 $\mu g/m^3$ (1.0 - 2.0 ppm)	1,570 - 2,100 $\mu g/m^3$ (0.6 - 0.8 ppm)	Maples Locust Sweetgum Cherry Elms Tuliptree Many crop and garden species
Resistant	>5,240 $\mu g/m^3$ (>2.0 ppm)	>2,100 $\mu g/m^3$ (>0.8 ppm)	White oaks Potato Upland cotton Corn Dogwood Peach

[a] Based on observations over a 20-year period of visible injury occurring on over 120 species growing in the vicinities of coal-fired power plants in the southeastern United States.

Source: EPA, 1982a.

Table 7-4. Examples of Reported Effects of Air Pollutants at Concentrations Below National Secondary AAQS

Pollutant	Reported Effect	Concentration ($\mu g/m^3$)	Exposure
Sulfur Dioxide[1]	Respiratory stress in guinea pigs	427 to 854	1 hour
	Respiratory stress in rats	267	7 hours/day; 5 day/week for 10 weeks
	Decreased abundance in deer mice	13 to 157	continually for 5 months
Nitrogen Dioxide[2,3]	Respiratory stress in mice	1,917	3 hours in mice
	Respiratory stress in guinea pigs	96 to 958	8 hours/day for 122 days
Particulates[1]	Respiratory stress, reduced respiratory disease defenses	120 PbO_3	continually for 2 months
	Decreased respiratory disease defenses in rats, same with hamsters	100 $NiCl_2$	2 hours

Source: [1]Newman and Schreiber, 1988.
[2]Gardner and Graham, 1976.
[3]Trzeciak et al., 1977.

Table 7-5. Plume Visual Impact Analysis- Screening Level 2
Identification of Worst-Case Meteorological Conditions

Dispersion Conditions						Transport	Frequency of Occurrence (percent) of Dispersion Conditions [c]			
Stability		Wind Speed	Dispersion Parameter		Sigma Y x Sigma Z x Wind Speed	Time to Class I Area	Hours 7 p.m. to 7 a.m.		Hours 7 a.m. to 7 p.m.	
Category	Name	(m/s)	Horizontal (Sigma Y (m))	Vertical (Sigma Z (m))	(m^3/s)	(hours) [a]	f [b]	cf [b]	f	cf
							South Wind Direction			
F	Moderately Stable	0.8	663.0	66.9	35,488	9.7	0.49	0.49	0.04	0.04
E	Slightly Stable	0.8	995.6	123.2	98,137	9.7	0.00	0.49	0.00	0.04
F	Moderately Stable	2.6	663.0	66.9	115,336	3.0	1.38	$\boxed{1.87}$	0.11	0.15
F	Moderately Stable	4.4	663.0	66.9	195,184	1.8	0.00	1.87	0.00	0.15
D	Neutral	0.8	1329.5	239.1	254,304	9.7	0.06	1.93	0.03	0.18
E	Slightly Stable	2.6	995.6	123.2	318,944	3.0	1.20	3.13	0.18	0.36
E	Slightly Stable	4.4	995.6	123.2	539,751	1.8	0.40	3.53	0.13	0.49
D	Neutral	2.6	1329.5	239.1	826,488	3.0	0.31	3.84	0.47	0.95
D	Neutral	4.4	1329.5	239.1	1,398,672	1.8	0.85	4.70	1.00	$\boxed{1.95}$
							South- southeast Wind Direction			
F	Moderately Stable	0.8	663.0	66.9	35,488	9.7	0.34	0.34	0.01	0.01
E	Slightly Stable	0.8	995.6	123.2	98,137	9.7	0.00	0.34	0.00	0.01
F	Moderately Stable	2.6	663.0	66.9	115,336	3.0	1.09	$\boxed{1.43}$	0.05	0.06
F	Moderately Stable	4.4	663.0	66.9	195,184	1.8	0.00	1.43	0.00	0.06
D	Neutral	0.8	1329.5	239.1	254,304	9.7	0.01	1.44	0.02	0.08
E	Slightly Stable	2.6	995.6	123.2	318,944	3.0	1.04	2.47	0.09	0.17
E	Slightly Stable	4.4	995.6	123.2	539,751	1.8	0.56	3.03	0.04	0.21
D	Neutral	2.6	1329.5	239.1	826,488	3.0	0.21	3.24	0.37	0.58
D	Neutral	4.4	1329.5	239.1	1,398,672	1.8	0.72	3.96	0.55	$\boxed{1.13}$

[a] Based on proposed source located approximately 27.8 km from closest boundary of Class I area.
[b] f= frequencyfor given meteorological condition; cf= cumulative frequency up to and including condition.
[c] Based on surface meteorological data for 1987 to 1991 from the National Weather Service (NWS) station at the Tampa International Airport.

Figure 7-1 Level 1 Screening Analysis of Visual Effects due to the Project Firing Natural Gas Predicted at the Chassahowitzka NWA

```
                    ***   Level-1 Screening   ***
Input Emissions for

   Particulates     30.00  LB /HR
   NOx (as NO2)    200.10  LB /HR
   Primary NO2        .00  LB /HR
   Soot               .00  LB /HR
   Primary SO4       2.40  LB /HR

    **** Default Particle Characteristics Assumed

            Transport Scenario Specifications:

    Background Ozone:                  .06 ppm
    Background Visual Range:         65.00 km
    Source-Observer Distance:        27.80 km
    Min. Source-Class I Distance:    27.80 km
    Max. Source-Class I Distance:    47.80 km
    Plume-Source-Observer Angle:     11.25 degrees
    Stability:   6
    Wind Speed:   1.00 m/s

                          R E S U L T S

Asterisks (*) indicate plume impacts that exceed screening criteria

         Maximum Visual Impacts INSIDE  Class I Area
            Screening Criteria ARE Exceeded
                                          Delta E      Contrast
                                        ===========  ============
Backgrnd Theta Azi Distance Alpha Crit  Plume   Crit  Plume
======== ===== === ======== ===== ====  =====   ====  =====
 SKY       10. 135.   35.4    34.  2.00  4.420*   .05   .005
 SKY      140. 135.   35.4    34.  2.00  2.021*   .05  -.035

         Maximum Visual Impacts OUTSIDE Class I Area
            Screening Criteria ARE Exceeded
                                          Delta E      Contrast
                                        ===========  ============
Backgrnd Theta Azi Distance Alpha Crit  Plume   Crit  Plume
======== ===== === ======== ===== ====  =====   ====  =====
 SKY       10.   0.    1.0   168.  2.00  6.530*   .05   .078*
 SKY      140.   0.    1.0   168.  2.00  1.522    .05  -.068*
```

Figure 7-2 Level 1 Screening Analysis of Visual Effects due to the Project Firing Fuel Oil Predicted at the Chassahowitzka NWA

```
                  ***   Level-1 Screening   ***
  Input Emissions for

    Particulates     51.00  LB /HR
    NOx (as NO2)   1086.00  LB /HR
    Primary NO2        .00  LB /HR
    Soot               .00  LB /HR
    Primary SO4      28.20  LB /HR

     **** Default Particle Characteristics Assumed

               Transport Scenario Specifications:

     Background Ozone:                    .06 ppm
     Background Visual Range:           65.00 km
     Source-Observer Distance:          27.80 km
     Min. Source-Class I Distance:      27.80 km
     Max. Source-Class I Distance:      47.80 km
     Plume-Source-Observer Angle:       11.25 degrees
     Stability:   6
     Wind Speed:   1.00 m/s

                         R E S U L T S

Asterisks (*) indicate plume impacts that exceed screening criteria

         Maximum Visual Impacts INSIDE  Class I Area
            Screening Criteria ARE Exceeded
                                      Delta E       Contrast
                                    ===========   ============
Backgrnd Theta Azi Distance Alpha Crit  Plume     Crit  Plume
======== ===== === ======== ===== ====  =====     ====  =====
  SKY     10.  84.   27.8    84.  2.00 16.108*    .05  -.028
  SKY    140.  84.   27.8    84.  2.00  8.393*    .05  -.121*

         Maximum Visual Impacts OUTSIDE Class I Area
            Screening Criteria ARE Exceeded
                                      Delta E       Contrast
                                    ===========   ============
Backgrnd Theta Azi Distance Alpha Crit  Plume     Crit  Plume
======== ===== === ======== ===== ====  =====     ====  =====
  SKY     10.  40.   22.9   129.  2.00 17.020*    .05  -.033
  SKY    140.  40.   22.9   129.  2.00  8.686*    .05  -.144*
```

Figure 7-3 Level 2 Screening Analysis of Visual Effects due to the Project Firing Natural Gas Predicted at the Chassahowitzka NWA

*** User-selected Screening Scenario Results ***

Input Emissions for

Particulates	30.00	LB /HR
NOx (as NO2)	200.10	LB /HR
Primary NO2	.00	LB /HR
Soot	.00	LB /HR
Primary SO4	2.40	LB /HR

**** Default Particle Characteristics Assumed

Transport Scenario Specifications:

Background Ozone:	.06 ppm
Background Visual Range:	65.00 km
Source-Observer Distance:	27.80 km
Min. Source-Class I Distance:	27.80 km
Max. Source-Class I Distance:	47.80 km
Plume-Source-Observer Angle:	11.25 degrees
Stability:	4
Wind Speed:	4.40 m/s

R E S U L T S

Asterisks (*) indicate plume impacts that exceed screening criteria

Maximum Visual Impacts INSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	145.	39.6	24.	2.00	.280	.05	.000
SKY	140.	145.	39.6	24.	2.00	.123	.05	-.002

Maximum Visual Impacts OUTSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	0.	1.0	168.	2.00	1.281	.05	.006
SKY	140.	0.	1.0	168.	2.00	.406	.05	-.015

Figure 7-4 Level 2 Screening Analysis of Visual Effects due to the Project Firing Fuel Oil Predicted at the Chassahowitzka NWA

*** User-selected Screening Scenario Results ***

Input Emissions for

Particulates	51.00	LB /HR
NOx (as NO2)	1086.00	LB /HR
Primary NO2	.00	LB /HR
Soot	.00	LB /HR
Primary SO4	28.20	LB /HR

**** Default Particle Characteristics Assumed

Transport Scenario Specifications:

Background Ozone:	.06 ppm
Background Visual Range:	65.00 km
Source-Observer Distance:	27.80 km
Min. Source-Class I Distance:	27.80 km
Max. Source-Class I Distance:	47.80 km
Plume-Source-Observer Angle:	11.25 degrees
Stability:	4
Wind Speed:	4.40 m/s

R E S U L T S

Asterisks (*) indicate plume impacts that exceed screening criteria

Maximum Visual Impacts INSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	145.	39.6	24.	2.00	1.310	.05	-.003
SKY	140.	145.	39.6	24.	2.00	.640	.05	-.011

Maximum Visual Impacts OUTSIDE Class I Area
Screening Criteria ARE Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	5.	8.7	164.	2.00	2.251*	.05	-.006
SKY	140.	5.	8.7	164.	2.00	1.048	.05	-.024

Note: The results with Theta equal to 10 degrees are unrealistic because the plume is assumed to be between the observer and the sun which is located at an angle of 10 degrees above the horizon in a direction to the southeast or southwest of the observer. In reality, such a sun angle and direction are not likely to occur for any given line of sight from the Class I area to the project. By limiting the southward extent of sun's location to the east-southeast or west-southwest directions and to a 10-degree angle above the horizon, the Delta E for the project is estimated to be less than the criterion of 2.0.

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APPENDIX A

EXPECTED PERFORMANCE AND EMISSION INFORMATION
ON "F" CLASS COMBUSTION TURBINE

(Note: SO_2 based on 0.2 gr/100 cf of H_2S. Actual total sulfur based on 1 gr/100 cf to account for odorant (mercaptans) in pipeline gas.)

Table A-1. Design Information and Stack Parameters for the Shady Hills Generating Station Project
GE Frame 7FA, Dry Low NOx Combustor, Natural Gas, Base Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Combustion Turbine Performance			
Net power output (MW)	179.2	172.2	156.6
Net heat rate (Btu/kWh, LHV)	9,319	9,361	9,591
(Btu/kWh, HHV)	10,344	10,391	10,646
Heat Input (MMBtu/hr, LHV)	1,670	1,612	1,502
(MMBtu/hr, HHV)	1,854	1,789	1,667
Fuel heating value (Btu/lb, LHV)	20,751	20,751	20,751
(Btu/lb, HHV)	23,006	23,006	23,006
(HHV/LHV)	1.110	1.110	1.110
CT Exhaust Flow			
Mass Flow (lb/hr)- with margin of 10%	4,063,400	3,919,300	3,672,900
- provided	3,694,000	3,563,000	3,339,000
Temperature (°F)	1,097	1,113	1,135
Moisture (% Vol.)	7.9	8.6	10.3
Oxygen (% Vol.)	12.60	12.50	12.20
Molecular Weight	28.44	28.34	28.16
Fuel Usage			
Fuel usage (lb/hr) = Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))			
Heat input (MMBtu/hr, LHV)	1,670	1,612	1,502
Heat content (Btu/lb, LHV)	20,751	20,751	20,751
Fuel usage (lb/hr)- calculated	80,478	77,683	72,382
CT Stack			
Stack height (ft)	60	60	60
Diameter (ft)	22	22	22
Turbine Flow Conditions			
Turbine Flow (acfm) = [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F)+ 460°F)] / [Molecular weight x 2116.8] / 60 min/hr			
Mass flow (lb/hr)	4,063,400	3,919,300	3,672,900
Temperature (°F)	1,097	1,113	1,135
Molecular weight	28.44	28.34	28.16
Volume flow (acfm)- calculated	2,706,395	2,645,986	2,530,918
(ft3/s)- calculated	45,107	44,100	42,182
Velocity (ft/sec)	118.7	116.0	111.0

Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft^2; 14.7 lb/ft^3

Source: GE, 1998.

Table A-2. Maximum Emissions for Criteria Pollutants for the Shady Hills Generating Station Project
GE Frame 7FA, Dry Low NOx Combustor, Natural Gas, Base Load

Parameter	Gas 32 °F	Ambient Temperature 59 °F	95 °F
Hours of Operation	3,390	3,390	3,390
Particulate (lb/hr) = Emission rate (lb/hr) from manufacturer			
Basis (excludes H_2SO_4), lb/hr	10	10	10
Emission rate (lb/hr)- provided	10.0	10.0	10.0
(TPY)	17.0	17.0	17.0
Sulfur Dioxide (lb/hr) = Natural gas (cf/hr) x sulfur content(gr/100 cf) x 1 lb/7000 gr x (lb SO_2/lb S) /100			
Fuel density (lb/ft^3)	0.0448	0.0448	0.0448
Fuel use (cf/hr)	1,797,031	1,734,619	1,616,252
Sulfur content (grains/ 100 cf)	1	1	1
lb SO_2/lb S (64/32)	2	2	2
Emission rate (lb/hr)	5.1	5.0	4.6
(TPY)	8.70	8.40	7.83
Nitrogen Oxides (lb/hr) = NOx(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 x Volume flow (acfm) x 46 (mole. wgt NOx) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 5.9 x 1,000,000 (adj. for ppm)]			
Basis, ppmvd @15% O_2	9	9	9
Moisture (%)	7.9	8.6	10.3
Oxygen (%)	12.6	12.5	12.2
Turbine Flow (acfm)	2,706,395	2,645,986	2,530,918
Turbine Exhaust Temperature (°F)	1,097	1,113	1,135
Emission rate (lb/hr)	66.7	64.1	59.9
(TPY)	113.0	108.6	101.6
Carbon Monoxide (lb/hr) = CO(ppm) x [1 - Moisture(%)/100] x 2116.8 lb/ft2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]			
Basis, ppmvd	12	12	12
Moisture (%)	7.9	8.6	10.3
Turbine Flow (acfm)	2,706,395	2,645,986	2,530,918
Turbine Exhaust Temperature (°F)	1,097	1,113	1,135
Emission rate (lb/hr)	44.2	42.5	39.3
(TPY)	75.0	72.0	66.6
VOCs (lb/hr) = VOC(ppmvd) x [1-Moisture(%)/100] x 2116.8 lb/ft2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]			
Basis, ppmvd	1.4	1.4	1.4
Moisture (%)	7.9	8.6	10.3
Turbine Flow (acfm)	2,706,395	2,645,986	2,530,918
Turbine Exhaust Temperature (°F)	1,097	1,113	1,135
Emission rate (lb/hr)	2.95	2.83	2.62
(TPY)	5.0	4.8	4.4
Lead (lb/hr) = NA			
Emission Rate Basis	NA	NA	NA
Emission rate (lb/hr)	NA	NA	NA
(TPY)	NA	NA	NA

Note: ppmvd = parts per million, volume dry; O_2 = oxygen.

Source: GE, 1998; Golder Associates, 1998; EPA, 1996

Table A-3. Maximum Emissions for Other Regulated PSD Pollutants for the Shady Hills Generating Station Project
GE Frame 7FA, Dry Low NOx Combustor, Natural Gas, Base Load

Parameter	Gas Ambient Temperatu 32 °F	59 °F	95 °F
Hours of Operation	3,390	3,390	3,390
2,3,7,8 TCDD Equivalents (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	1.20E-06	1.20E-06	0.00E+00
Heat Input Rate (MMBtu/hr)	1.85E+03	1.79E+03	1.67E+03
Emission Rate (lb/hr)	2.22E-09	2.15E-09	0.00E+00
(TPY)	3.77E-09	3.64E-09	0.00E+00
Beryllium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Fluoride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b) , lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Mercury (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	7.48E-04	7.48E-04	7.48E-04
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	1.39E-06	1.34E-06	1.25E-06
(TPY)	2.35E-06	2.27E-06	2.11E-06
Sulfuric Acid Mist = Fuel Use (lb/hr) x sulfur (S) content (fraction) x conversion of S to H_2SO_4 (%) x MW H_2SO_4 /MW S (98/32)			
Fuel Usage (cf/hr)	1,797,031	1,734,619	1,616,252
Sulfur (lb/hr)	2.57	2.48	2.31
lb H_2SO_4 /lb S (98/32)	3.0625	3.0625	3.0625
Conversion to H_2SO_4 (%) (c)	10	10	10
Emission Rate (lb/hr)	0.79	0.76	0.71
(TPY)	1.33	1.29	1.20

Sources: (a) Golder Associates, 1998; (b) EPA, 1981; (c) Assumed.

Note: No Emission Factors for Hydrogen chloride (HCl) from natural gas firing.

Table A-4. Maximum Emissions for Hazardous Air Pollutants for the Shady Hills Generating Station Project
GE Frame 7FA, Dry Low NOx Combustor, Natural Gas, Base Load

Parameter	Ambient Temperat 32 °F	59 °F	95 °F
Hours of Operation	3,390	3,390	3,390
Antimony (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0.00E+00	0.00E+00	0.00E+00
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Benzene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0.8	0.8	0.8
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	1.48E-03	1.43E-03	1.33E-03
(TPY)	2.51E-03	2.43E-03	2.26E-03
Cadmium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	0	0	0
(TPY)	0.00E+00	0.00E+00	0.00E+00
Chromium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Formaldehyde (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	34	34	34
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	6.30E-02	6.08E-02	5.67E-02
(TPY)	1.07E-01	1.03E-01	9.61E-02
Cobalt (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1.85E+03	1.79E+03	1.67E+03
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00
(TPY)	0	0	0
Manganese (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Nickel (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Phosphorous (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b), lb/10^{12} Btu	0.00E+00	0.00E+00	0.00E+00
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Selenium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Toluene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	10	10	10
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	1.85E-02	1.79E-02	1.67E-02
(TPY)	3.14E-02	3.03E-02	2.83E-02

Sources: (a) Golder Associates, 1998; (b) EPA,1996 (AP-42,Table 3.1-4)

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **CO**

2. Total Percent Efficiency of Control:

3. Potential Emissions: **74.4** lb/hour **86.5** tons/year

4. Synthetically Limited? [X]

5. Range of Estimated Fugitive Emissions:
[ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year

6. Emission Factor:
Reference: **GE, 1998; Golder**

7. Emissions Method Code: **2**

8. Calculation of Emissions (limit to 600 characters):

See Attachment PSD-SPC; Section 2.0; Appendix A.

9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):

Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**

2. Future Effective Date of Allowable Emissions:

3. Requested Allowable Emissions and Units: **20 ppmvd**

4. Equivalent Allowable Emissions: **74.4** lb/hour **34.7** tons/year

5. Method of Compliance (limit to 60 characters):

EPA Method 10; high and low load

6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):

Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 1,000 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: CO	2. Total Percent Efficiency of Control:
3. Potential Emissions: 74.4 lb/hour 86.5 tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: GE, 1998; Golder	7. Emissions Method Code: 2
8. Calculation of Emissions (limit to 600 characters): See Attachment PSD-SPC; Section 2.0; Appendix A.	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: OTHER	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: 12 ppmvd	4. Equivalent Allowable Emissions: 44.2 lb/hour 72.0 tons/year
5. Method of Compliance (limit to 60 characters): EPA Method 10; high and low load	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC**
2. Total Percent Efficiency of Control:
3. Potential Emissions: **16.7** lb/hour **11.5** tons/year
4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year
6. Emission Factor:
   Reference: **GE, 1998; Golder**
7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters):

   See Attachment PSD-SPC; Section 2.0; Appendix A.
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):

   Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**
2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **7 ppmvw**
4. Equivalent Allowable Emissions: **16.7** lb/hour **8.1** tons/year
5. Method of Compliance (limit to 60 characters):

   EPA Method 25A; high and low load
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):

   Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 1,000 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **16.7** lb/hour **11.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-SPC; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **1.4 ppmvd**	4. Equivalent Allowable Emissions: **3** lb/hour **4.8** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 25A; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Additional requested allowable emissions and units: Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: PM_{10}	2. Total Percent Efficiency of Control:
3. Potential Emissions: 17 lb/hour 20.5 tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: GE, 1998; Golder	7. Emissions Method Code: 2
8. Calculation of Emissions (limit to 600 characters): See Attachment PSD-SPC; Section 2.0; Appendix A.	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Lb/hr based on oil firing; 100% load; 59°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: OTHER	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: 17 lb/hr	4. Equivalent Allowable Emissions: 17 lb/hour 8.5 tons/year
5. Method of Compliance (limit to 60 characters): Annual stack test; EPA Method 5 or 17 if <400 hours	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): Oil firing - all loads; 1,000 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **17** lb/hour **20.5** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-SPC; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 59°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **10 lb/hr**	4. Equivalent Allowable Emissions: **10** lb/hour **17.0** tons/year
5. Method of Compliance (limit to 60 characters): **VE Test < 20% opacity**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing; all loads; 3,390 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 1 of 2

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **Annual VE Test EPA Method 9**	
5. Visible Emissions Comment (limit to 200 characters): **Maximum for oil firing.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 1 of 2

1. Parameter Code: **EM**	2. Pollutant(s): **NO_x**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: **Not yet determined** Manufacturer: Model Number:	Serial Number:
5. Installation Date: **01 Jan 2002**	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **NO_x CEM proposed to meet requirements of 40 CFR Part 75.**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 2 of 2

1. Visible Emissions Subtype: **VE99**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: % Exceptional Conditions: **100** % Maximum Period of Excess Opacity Allowed: **6** min/hour	
4. Method of Compliance: **None**	
5. Visible Emissions Comment (limit to 200 characters): **FDEP Rule 62-201.700(1), Allowed for 2 hours (120 minutes) per 24 hours for start up, shutdown and malfunction.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 2 of 2

1. Parameter Code: **EM**	2. Pollutant(s): **NO_x**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: **Not yet determined** Manufacturer: Model Number: Serial Number:	
5. Installation Date: **01 Jan 2002**	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Parameter Code: WTF. Required by 40 CFR Part 60; subpart GG; 60.334.**	

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements

1. Process Flow Diagram [X] Attached, Document ID: PSD-SPC [ ] Not Applicable [ ] Waiver Requested
2. Fuel Analysis or Specification [X] Attached, Document ID: PSD-SPC [ ] Not Applicable [ ] Waiver Requested
3. Detailed Description of Control Equipment [X] Attached, Document ID: PSD-SPC [ ] Not Applicable [ ] Waiver Requested
4. Description of Stack Sampling Facilities [X] Attached, Document ID: PSD-SPC [ ] Not Applicable [ ] Waiver Requested
5. Compliance Test Report [ ] Attached, Document ID:________ [ ] Previously submitted, Date:______________ [X] Not Applicable
6. Procedures for Startup and Shutdown [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested
7. Operation and Maintenance Plan [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested
8. Supplemental Information for Construction Permit Application [X] Attached, Document ID: PSD-SPC [ ] Not Applicable
9. Other Information Required by Rule or Statute [X] Attached, Document ID: PSD-SPC [ ] Not Applicable
10. Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation [ ] Attached, Document ID:________ [ ] Not Applicable
12. Alternative Modes of Operation (Emissions Trading) [ ] Attached, Document ID:________ [ ] Not Applicable
13. Identification of Additional Applicable Requirements [ ] Attached, Document ID:________ [ ] Not Applicable
14. Compliance Assurance Monitoring Plan [ ] Attached, Document ID:________ [ ] Not Applicable
15. Acid Rain Part Application (Hard-copy Required) [ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID:________ [ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID:________ [ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID:________ [ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID:________ [ ] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) Attached, Document ID:________ [ ] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) Attached, Document ID:________ [ ] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)

Emissions Unit Description and Status

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

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

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

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

2. Regulated or Unregulated Emissions Unit? (Check one)

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

[X] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):

Unreg. Emissions Activities - 1 Tank 2.8 M gallons each

4. Emissions Unit Identification Number: [ ] No ID
ID: [X] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
C		**49**	[ ]

9. Emissions Unit Comment: (Limit to 500 Characters)

This emission unit information section addresses one 2.8 million gallon tank as unregulated emission unit. NSPS Subpart Kb recordkeeping requirements are applicable; there is no emission limiting or work practice standards. See Attachment PSD-SPC.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method):
2. Control Device or Method Code(s):

Emissions Unit Details

1. Package Unit: Manufacturer:	Model Number:	
2. Generator Nameplate Rating:	MW	
3. Incinerator Information: Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:		 °F seconds °F

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **No. 2 Distillate Oil/Diesel**		
2. Source Classification Code (SCC): **A2505030090**	3. SCC Units: **1,000 gallons used**	
4. Maximum Hourly Rate:	5. Maximum Annual Rate: **41,100**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **131.8**
10. Segment Comment (limit to 200 characters): **Annual rate combined for both tanks based on inputs to CTs; 18,560 Btu/lb (LHV); and 7.1 lb/gal at 59°F.**		

Segment Description and Rate: Segment ____ of ____

1. Segment Description (Process/Fuel Type) (limit to 500 characters):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

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

PART B

ATTACHMENT PSD-SPC

PSD ANALYSIS

1.0 INTRODUCTION

IPS Avon Park Corporation proposes to license, construct, and operate a nominal 540-megawatt (MW) power production facility, referred to as the Shady Hills Generating Station, in an unincorporated area of Pasco County, Florida (Figure 1-1). The site will be located on approximately a 20-acre tract of land near Pasco County's resource recovery facility and Shady Hills wastewater treatment plant. The project consists of three 170-MW dual-fuel, General Electric Frame 7FA combustion turbines (CTs) that will use dry low-nitrogen oxide (NO_x) [dry-low NO_x (DLN)] combustion technology when operating on natural gas and water injection (for NO_x control) when operating on distillate fuel oil. The facility is designed for peaking service. The primary fuel of the CTs will be natural gas with distillate fuel oil used as backup fuel. The fuel oil in this case will contain a maximum sulfur content of 0.05 percent.

The project requires an air construction permit and prevention of significant deterioration (PSD) review. To assist in performing the necessary licensing activities, IPS Avon Park Corporation hired Golder Associates Inc. (Golder) to perform the necessary air quality assessments for determining the project's compliance with state and federal new source review (NSR) regulation. The critical aspects of these assessments include the air quality impact analyses performed using an air dispersion model and the best available control technology (BACT) analyses performed to evaluate the selected emission control technology.

The proposed project will be a new air pollution source that will result in increases in air emissions in Pasco County. The U.S. Environmental Protection Agency (EPA) has implemented regulations for facilities requiring a PSD review. The PSD regulations are promulgated under 10 Code of Federal Regulations (CFR) Part 52.21 and implemented through delegation to the Florida Department of Environmental Protection (DEP). Florida's PSD regulations are codified in Rules 62-212.400, Florida Administrative Code (F.A.C.). Florida's regulations incorporate the EPA PSD regulations.

Based on the emissions from the proposed project, a PSD review is required for each of the following regulated pollutants:

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **101.5** lb/hour **55.3** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-SPC; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Emission Factor: 1 grain S per 100 CF gas; 0.05% S oil; lb/hr based on oil firing at 100% and load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.05% Sulfur Oil**	4. Equivalent Allowable Emissions: **101.5** lb/hour **49.3** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel Sampling**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing - 32°F; 100% load; 1,000 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: SO_2	2. Total Percent Efficiency of Control:
3. Potential Emissions: 101.5 lb/hour 55.3 tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: GE, 1998; Golder	7. Emissions Method Code: 2
8. Calculation of Emissions (limit to 600 characters): See Attachment PSD-SPC; Section 2.0; Appendix A.	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Emission Factor: 1 grain S per 100 CF gas; 0.05% S oil; lb/hr based on oil firing at 100% load and 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: OTHER	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: See Comment	4. Equivalent Allowable Emissions: 5.1 lb/hour 8.4 tons/year
5. Method of Compliance (limit to 60 characters): Fuel Sampling	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): Requested allowable emissions and units: Pipeline Natural Gas. Gas firing, 1 gram/100 cf - 32°F, 100% load; 3,390 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: NO_x	2. Total Percent Efficiency of Control:
3. Potential Emissions: 362 lb/hour 252 tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: GE, 1998; Golder	7. Emissions Method Code: 2
8. Calculation of Emissions (limit to 600 characters): See Attachment PSD-SPC; Section 2.0; Appendix A.	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: OTHER	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: 42 ppmvd	4. Equivalent Allowable Emissions: 362.0 lb/hour 175.4 tons/year
5. Method of Compliance (limit to 60 characters): CEM - 30 Day Rolling Average	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): Requested Allowable Emissions is at 15% O_2-100% load. Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 1,000 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: NO_x

2. Total Percent Efficiency of Control:

3. Potential Emissions: **362** lb/hour **252** tons/year

4. Synthetically Limited? [X]

5. Range of Estimated Fugitive Emissions:
[ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year

6. Emission Factor:
Reference: **GE, 1998; Golder**

7. Emissions Method Code: **2**

8. Calculation of Emissions (limit to 600 characters):

See Attachment PSD-SPC; Section 2.0; Appendix A.

9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):

Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions

Allowable Emissions
Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**

2. Future Effective Date of Allowable Emissions:

3. Requested Allowable Emissions and Units: **9 ppmvd**

4. Equivalent Allowable Emissions: **66.7** lb/hour **108.6** tons/year

5. Method of Compliance (limit to 60 characters):

CEM - 30 Day Rolling Average

6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):

Requested Allowable Emissions and Units is at 15% O_2-100% load. Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **74.4** lb/hour **86.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-SPC; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **20 ppmvd**	4. Equivalent Allowable Emissions: **74.4** lb/hour **34.7** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 1,000 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **74.4** lb/hour **86.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-SPC; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **12 ppmvd**	4. Equivalent Allowable Emissions: **44.2** lb/hour **72.0** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: VOC	2. Total Percent Efficiency of Control:
3. Potential Emissions: 16.7 lb/hour 11.5 tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: GE, 1998; Golder	7. Emissions Method Code: 2
8. Calculation of Emissions (limit to 600 characters): See Attachment PSD-SPC; Section 2.0; Appendix A.	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: OTHER	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: 7 ppmvw	4. Equivalent Allowable Emissions: 16.7 lb/hour 8.1 tons/year
5. Method of Compliance (limit to 60 characters): EPA Method 25A; high and low load	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 1,000 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **16.7** lb/hour **11.5** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-SPC; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **1.4 ppmvd**	4. Equivalent Allowable Emissions: **3** lb/hour **4.8** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 25A; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Additional requested allowable emissions and units: Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **17** lb/hour **20.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-SPC; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 59°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **17 lb/hr**	4. Equivalent Allowable Emissions: **17** lb/hour **8.5** tons/year
5. Method of Compliance (limit to 60 characters): **Annual stack test; EPA Method 5 or 17 if <400 hours**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing - all loads; 1,000 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: PM_{10}	2. Total Percent Efficiency of Control:
3. Potential Emissions: 17 lb/hour 20.5 tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: GE, 1998; Golder	7. Emissions Method Code: 2
8. Calculation of Emissions (limit to 600 characters): See Attachment PSD-SPC; Section 2.0; Appendix A.	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Lb/hr based on oil firing; 100% load; 59°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: OTHER	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: 10 lb/hr	4. Equivalent Allowable Emissions: 10 lb/hour 17.0 tons/year
5. Method of Compliance (limit to 60 characters): VE Test < 20% opacity	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): Gas firing; all loads; 3,390 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 1 of 2

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **Annual VE Test EPA Method 9**	
5. Visible Emissions Comment (limit to 200 characters): **Maximum for oil firing.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 1 of 2

1. Parameter Code: **EM**	2. Pollutant(s): **NO_x**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: **Not yet determined** Manufacturer: Model Number:	Serial Number:
5. Installation Date: **01 Jan 2002**	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **NO_x CEM proposed to meet requirements of 40 CFR Part 75.**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 2 of 2

1. Visible Emissions Subtype: **VE99**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: % Exceptional Conditions: **100** % Maximum Period of Excess Opacity Allowed: **6** min/hour	
4. Method of Compliance: **None**	
5. Visible Emissions Comment (limit to 200 characters): **FDEP Rule 62-201.700(1), Allowed for 2 hours (120 minutes) per 24 hours for start up, shutdown and malfunction.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 2 of 2

1. Parameter Code: **EM**	2. Pollutant(s): **NO_x**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: **Not yet determined** Manufacturer: Model Number:	Serial Number:
5. Installation Date: **01 Jan 2002**	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Parameter Code: WTF. Required by 40 CFR Part 60; subpart GG; 60.334.**	

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements

1. Process Flow Diagram [X] Attached, Document ID: PSD-SPC [ ] Not Applicable [ ] Waiver Requested	
2. Fuel Analysis or Specification [X] Attached, Document ID: PSD-SPC [ ] Not Applicable [ ] Waiver Requested	
3. Detailed Description of Control Equipment [X] Attached, Document ID: PSD-SPC [ ] Not Applicable [ ] Waiver Requested	
4. Description of Stack Sampling Facilities [X] Attached, Document ID: PSD-SPC [ ] Not Applicable [ ] Waiver Requested	
5. Compliance Test Report [ ] Attached, Document ID:________ [ ] Previously submitted, Date:_______________ [X] Not Applicable	
6. Procedures for Startup and Shutdown [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested	
7. Operation and Maintenance Plan [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested	
8. Supplemental Information for Construction Permit Application [X] Attached, Document ID: PSD-SPC [ ] Not Applicable	
9. Other Information Required by Rule or Statute [X] Attached, Document ID: PSD-SPC [ ] Not Applicable	
10. Supplemental Requirements Comment:	

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation
    [ ] Attached, Document ID:________ [ ] Not Applicable

12. Alternative Modes of Operation (Emissions Trading)
    [ ] Attached, Document ID:________ [ ] Not Applicable

13. Identification of Additional Applicable Requirements
    [ ] Attached, Document ID:________ [ ] Not Applicable

14. Compliance Assurance Monitoring Plan
    [ ] Attached, Document ID:________ [ ] Not Applicable

15. Acid Rain Part Application (Hard-copy Required)

    [ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a))
    Attached, Document ID:________

    [ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)
    Attached, Document ID:________

    [ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.)
    Attached, Document ID:________

    [ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)
    Attached, Document ID:________

    [ ] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.)
    Attached, Document ID:________

    [ ] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.)
    Attached, Document ID:________

    [ ] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)

Emissions Unit Description and Status

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

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

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

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

2. Regulated or Unregulated Emissions Unit? (Check one)

[X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

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

3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):
GE Frame 7FA Combustion Turbine

4. Emissions Unit Identification Number:
ID:

[ ] No ID
[X] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
C		49	[X]

9. Emissions Unit Comment: (Limit to 500 Characters)
This emission unit is a GE Frame 7FA combustion turbine operating in simple cycle mode. See Attachment PSD-SPC.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Dry Low NO_X combustion - Natural gas firing**
2. Control Device or Method Code(s): **25**

Emissions Unit Details

1. Package Unit: Manufacturer: **General Electric**	Model Number: **7FA**	
2. Generator Nameplate Rating:	**172** MW	
3. Incinerator Information: Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:		°F seconds °F

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Water injection - distillate oil firing**	
2. Control Device or Method Code(s): **28**	

Emissions Unit Details

1. Package Unit: Manufacturer: **General Electric**	Model Number: **7FA**	
2. Generator Nameplate Rating:	**172** MW	
3. Incinerator Information: Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:		 °F seconds °F

B. EMISSIONS UNIT CAPACITY INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:		1,612	mmBtu/hr
2. Maximum Incineration Rate:	lb/hr		tons/day
3. Maximum Process or Throughput Rate:			
4. Maximum Production Rate:			
5. Requested Maximum Operating Schedule:			
	hours/day		days/week
	weeks/year	3,390	hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters):			
Maximum heat input at ISO conditions and natural gas firing (LHV); maximum for oil firing is 1,806 MMBtu/hr (ISO-LHV) and 182 MW.			

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

See Attachment IPS-EU1-D for operational requirements	
See Attachment PSD-SPC for permitting requirements	

D. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? **See Att. PSD-SPC**	2. Emission Point Type Code: **1**

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point):

Exhausts through a single stack.

4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:

5. Discharge Type Code: **V**	6. Stack Height: **60** feet	7. Exit Diameter: **22** feet
8. Exit Temperature: **1,113** °F	9. Actual Volumetric Flow Rate: **2,645,000** acfm	10. Water Vapor: **8.6** %

11. Maximum Dry Standard Flow Rate: **800,000** dscfm	12. Nonstack Emission Point Height: feet

13. Emission Point UTM Coordinates:

Zone: **17** East (km): **347.0** North (km): **3139.0**

14. Emission Point Comment (limit to 200 characters):

Stack parameters for ISO operating condition firing natural gas; for oil 1,094°F and 2,731,000 ACFM.

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Distillate (No. 2) Fuel Oil**		
2. Source Classification Code (SCC): **20100101**	3. SCC Units: **1,000 gallons used**	
4. Maximum Hourly Rate: **13.7**	5. Maximum Annual Rate: **13,700**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.05**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **132**
10. Segment Comment (limit to 200 characters): **Million Btu per SCC Unit = 131.8 (rounded to 132). Based on 7.1 lb/gal; LHV of 18,560 Btu/lb, - ISO conditions, 1,000 hrs/yr operation.**		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Natural Gas**		
2. Source Classification Code (SCC): **20100201**	3. SCC Units: **Million Cubic Feet**	
4. Maximum Hourly Rate: **1.70**	5. Maximum Annual Rate: **5,752**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **950**
10. Segment Comment (limit to 200 characters): **Based on 950 Btu/cf (LHV); ISO conditions and 3,390 hrs/yr operation.**		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM			EL
SO_2			EL
NO_x	026	028	EL
CO			EL
VOC			EL
PM_{10}			EL

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **17** lb/hour **20.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-SPC; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing, all loads. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **17 lb/hr**	4. Equivalent Allowable Emissions: **17** lb/hour **8.5** tons/year
5. Method of Compliance (limit to 60 characters): **Annual stack test; EPA Methods 5 or 17; if < 400 hours**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing - all loads; 1,000 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **17** lb/hour **20.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-SPC; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; all loads. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **10 lb/hr**	4. Equivalent Allowable Emissions: **10** lb/hour **17** tons/year
5. Method of Compliance (limit to 60 characters): **VE Test < 20% opacity**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing - all loads; 3,390 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **101.5** lb/hour **55.3** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-SPC; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Emission Factor: 1 grain S per 100 CF gas; 0.05% S oil; lb/hr based on oil firing at 100% load and 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.05% Sulfur Oil**	4. Equivalent Allowable Emissions: **101.5** lb/hour **49.3** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel Sampling**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing - 32°F; 100% load; 1,000 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **101.5** lb/hour **55.3** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-SPC; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Emission Factor: 1 grain S per 100 CF gas; 0.05% S oil; lb/hr based on oil firing at 100% load and 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **See Comment**	4. Equivalent Allowable Emissions: **5.1** lb/hour **8.4** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel Sampling**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested allowable emissions and units: Pipeline Natural Gas. Gas firing, 1 gram/100 cf - 32°F, 100% load; 3,390 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **NO_x**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **362** lb/hour **252** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-SPC; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **42 ppmvd**	4. Equivalent Allowable Emissions: **362.0** lb/hour **175.4** tons/year
5. Method of Compliance (limit to 60 characters): **CEM - 30 Day Rolling Average**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested Allowable Emissions is at 15% O_2-100% load. Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 1,000 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **NO_x**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **362** lb/hour **252** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-SPC; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **9 ppmvd**	4. Equivalent Allowable Emissions: **66.7** lb/hour **108.6** tons/year
5. Method of Compliance (limit to 60 characters): **CEM - 30 Day Rolling Average**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested Allowable Emissions and Units is at 15% O_2-100% load. Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **101.5** lb/hour **55.3** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-SPC; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Emission Factor: 1 grain S per 100 CF gas; 0.05% S oil; lb/hr based on oil firing at 100% load and 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **See Comment**	4. Equivalent Allowable Emissions: **5.1** lb/hour **8.4** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel Sampling**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested allowable emissions and units: Pipeline Natural Gas. Gas firing, 1 gram/100 cf - 32°F, 100% load; 3,390 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **NO_x**
2. Total Percent Efficiency of Control:
3. Potential Emissions: **362** lb/hour **252** tons/year
4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year
6. Emission Factor:
   Reference: **GE, 1998; Golder**
7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters):

   See Attachment PSD-SPC; Section 2.0; Appendix A.
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):

   Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**
2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **42 ppmvd**
4. Equivalent Allowable Emissions: **362.0** lb/hour **175.4** tons/year
5. Method of Compliance (limit to 60 characters):

   CEM - 30 Day Rolling Average
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):

   Requested Allowable Emissions is at 15% O_2-100% load. Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 1,000 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units -
Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **NO_x**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **362** lb/hour **252** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-SPC; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **9 ppmvd**	4. Equivalent Allowable Emissions: **66.7** lb/hour **108.6** tons/year
5. Method of Compliance (limit to 60 characters): **CEM - 30 Day Rolling Average**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested Allowable Emissions and Units is at 15% O_2-100% load. Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units -
Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **74.4** lb/hour **86.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-SPC; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **20 ppmvd**	4. Equivalent Allowable Emissions: **74.4** lb/hour **34.7** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 1,000 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units -
Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **CO**

2. Total Percent Efficiency of Control:

3. Potential Emissions: **74.4** lb/hour **86.5** tons/year

4. Synthetically Limited? [X]

5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year

6. Emission Factor:
   Reference: **GE, 1998; Golder**

7. Emissions Method Code: **2**

8. Calculation of Emissions (limit to 600 characters):

See Attachment PSD-SPC; Section 2.0; Appendix A.

9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):

Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**

2. Future Effective Date of Allowable Emissions:

3. Requested Allowable Emissions and Units: **12 ppmvd**

4. Equivalent Allowable Emissions: **44.2** lb/hour **72.0** tons/year

5. Method of Compliance (limit to 60 characters):

EPA Method 10; high and low load

6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):

Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: VOC	2. Total Percent Efficiency of Control:
3. Potential Emissions: 16.7 lb/hour 11.5 tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: GE, 1998; Golder	7. Emissions Method Code: 2
8. Calculation of Emissions (limit to 600 characters): See Attachment PSD-SPC; Section 2.0; Appendix A.	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: OTHER	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: 7 ppmvw	4. Equivalent Allowable Emissions: 16.7 lb/hour 8.1 tons/year
5. Method of Compliance (limit to 60 characters): EPA Method 25A; high and low load	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 1,000 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

<u>Potential/Fugitive Emissions</u>

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **16.7** lb/hour **11.5** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-SPC; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

<u>Allowable Emissions</u> Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **1.4 ppmvd**	4. Equivalent Allowable Emissions: **3** lb/hour **4.8** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 25A; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Additional requested allowable emissions and units: Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: PM_{10}	2. Total Percent Efficiency of Control:
3. Potential Emissions: **17** lb/hour **20.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-SPC; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 59°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions **1** of **2**

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **17 lb/hr**	4. Equivalent Allowable Emissions: **17** lb/hour **8.5** tons/year
5. Method of Compliance (limit to 60 characters): **Annual stack test; EPA Method 5 or 17 if <400 hours**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing - all loads; 1,000 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **17** lb/hour **20.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-SPC; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 59°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **10 lb/hr**	4. Equivalent Allowable Emissions: **10** lb/hour **17.0** tons/year
5. Method of Compliance (limit to 60 characters): **VE Test < 20% opacity**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing; all loads; 3,390 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 1 of 2

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **Annual VE Test EPA Method 9**	
5. Visible Emissions Comment (limit to 200 characters): **Maximum for oil firing.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 1 of 2

1. Parameter Code: **EM**	2. Pollutant(s): **NO_x**
3. CMS Requirement: [X] Rule [ ] Other	
4. Monitor Information: **Not yet determined** Manufacturer: Model Number: Serial Number:	
5. Installation Date: **01 Jan 2002**	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **NO_x CEM proposed to meet requirements of 40 CFR Part 75.**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 2 of 2

1. Visible Emissions Subtype: **VE99**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: % Exceptional Conditions: **100** % Maximum Period of Excess Opacity Allowed: **6** min/hour	
4. Method of Compliance: **None**	
5. Visible Emissions Comment (limit to 200 characters): **FDEP Rule 62-201.700(1), Allowed for 2 hours (120 minutes) per 24 hours for start up, shutdown and malfunction.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 2 of 2

1. Parameter Code: **EM**	2. Pollutant(s): **NO_x**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: **Not yet determined** Manufacturer: Model Number:	Serial Number:
5. Installation Date: **01 Jan 2002**	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Parameter Code: WTF. Required by 40 CFR Part 60; subpart GG; 60.334.**	

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements

1. Process Flow Diagram
   [X] Attached, Document ID: PSD-SPC [ ] Not Applicable [ ] Waiver Requested

2. Fuel Analysis or Specification
   [X] Attached, Document ID: PSD-SPC [ ] Not Applicable [ ] Waiver Requested

3. Detailed Description of Control Equipment
   [X] Attached, Document ID: PSD-SPC [ ] Not Applicable [ ] Waiver Requested

4. Description of Stack Sampling Facilities
   [X] Attached, Document ID: PSD-SPC [ ] Not Applicable [ ] Waiver Requested

5. Compliance Test Report
   [ ] Attached, Document ID:________
   [ ] Previously submitted, Date:________________
   [X] Not Applicable

6. Procedures for Startup and Shutdown
   [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested

7. Operation and Maintenance Plan
   [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested

8. Supplemental Information for Construction Permit Application
   [X] Attached, Document ID: PSD-SPC [ ] Not Applicable

9. Other Information Required by Rule or Statute
   [X] Attached, Document ID: PSD-SPC [ ] Not Applicable

10. Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation [ ] Attached, Document ID:________ [ ] Not Applicable
12. Alternative Modes of Operation (Emissions Trading) [ ] Attached, Document ID:________ [ ] Not Applicable
13. Identification of Additional Applicable Requirements [ ] Attached, Document ID:________ [ ] Not Applicable
14. Compliance Assurance Monitoring Plan [ ] Attached, Document ID:________ [ ] Not Applicable
15. Acid Rain Part Application (Hard-copy Required) [ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID:________ [ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID:________ [ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID:________ [ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID:________ [ ] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) Attached, Document ID:________ [ ] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) Attached, Document ID:________ [ ] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)

Emissions Unit Description and Status

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

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

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

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

2. Regulated or Unregulated Emissions Unit? (Check one)

[X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

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

3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):
GE Frame 7FA Combustion Turbine

4. Emissions Unit Identification Number:
ID:
[ ] No ID
[X] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
C		**49**	[X]

9. Emissions Unit Comment: (Limit to 500 Characters)
This emission unit is a GE Frame 7FA combustion turbine operating in simple cycle mode. See Attachment PSD-SPC.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Dry Low NO_x combustion - Natural gas firing**
2. Control Device or Method Code(s): **25**

Emissions Unit Details

1. Package Unit: Manufacturer: **General Electric**	Model Number: **7FA**	
2. Generator Nameplate Rating:	**172** MW	
3. Incinerator Information: Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:		°F seconds °F

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): Water injection - distillate oil firing
2. Control Device or Method Code(s): 28

Emissions Unit Details

1. Package Unit: Manufacturer: General Electric	Model Number: 7FA
2. Generator Nameplate Rating: 172 MW	
3. Incinerator Information: Dwell Temperature: °F Dwell Time: seconds Incinerator Afterburner Temperature: °F	

B. EMISSIONS UNIT CAPACITY INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:		1,612	mmBtu/hr
2. Maximum Incineration Rate:	lb/hr		tons/day
3. Maximum Process or Throughput Rate:			
4. Maximum Production Rate:			
5. Requested Maximum Operating Schedule:			
	hours/day		days/week
	weeks/year	3,390	hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters): **Maximum heat input at ISO conditions and natural gas firing (LHV); maximum for oil firing is 1,806 MMBtu/hr (ISO-LHV) and 182 MW.**			

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

See Attachment IPS-EU1-D for operational requirements	
See Attachment PSD-SPC for permitting requirements	

D. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? **See Att. PSD-SPC**	2. Emission Point Type Code: **1**

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point):

Exhausts through a single stack.

4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:

5. Discharge Type Code: **V**	6. Stack Height: **60** feet	7. Exit Diameter: **22** feet
8. Exit Temperature: **1,113** °F	9. Actual Volumetric Flow Rate: **2,645,000** acfm	10. Water Vapor: **8.6** %

11. Maximum Dry Standard Flow Rate: **800,000** dscfm	12. Nonstack Emission Point Height: feet

13. Emission Point UTM Coordinates:

Zone: **17** East (km): **347.0** North (km): **3139.0**

14. Emission Point Comment (limit to 200 characters):

Stack parameters for ISO operating condition firing natural gas; for oil 1,094°F and 2,731,000 ACFM.

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Distillate (No. 2) Fuel Oil**		
2. Source Classification Code (SCC): **20100101**	3. SCC Units: **1,000 gallons used**	
4. Maximum Hourly Rate: **13.7**	5. Maximum Annual Rate: **13,700**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.05**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **132**
10. Segment Comment (limit to 200 characters): **Million Btu per SCC Unit = 131.8 (rounded to 132). Based on 7.1 lb/gal; LHV of 18,560 Btu/lb, - ISO conditions, 1,000 hrs/yr operation.**		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Natural Gas**		
2. Source Classification Code (SCC): **20100201**	3. SCC Units: **Million Cubic Feet**	
4. Maximum Hourly Rate: **1.70**	5. Maximum Annual Rate: **5,752**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **950**
10. Segment Comment (limit to 200 characters): **Based on 950 Btu/cf (LHV); ISO conditions and 3,390 hrs/yr operation.**		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM			EL
SO_2			EL
NO_x	026	028	EL
CO			EL
VOC			EL
PM_{10}			EL

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **17** lb/hour **20.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-SPC; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing, all loads. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **17 lb/hr**	4. Equivalent Allowable Emissions: **17** lb/hour **8.5** tons/year
5. Method of Compliance (limit to 60 characters): **Annual stack test; EPA Methods 5 or 17; if < 400 hours**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing - all loads; 1,000 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**

2. Total Percent Efficiency of Control:

3. Potential Emissions: **17** lb/hour **20.5** tons/year

4. Synthetically Limited? [X]

5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year

6. Emission Factor:
   Reference: **GE, 1998; Golder**

7. Emissions Method Code: **2**

8. Calculation of Emissions (limit to 600 characters):

See Attachment PSD-SPC; Section 2.0; Appendix A.

9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):

Lb/hr based on oil firing; all loads. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**

2. Future Effective Date of Allowable Emissions:

3. Requested Allowable Emissions and Units: **10 lb/hr**

4. Equivalent Allowable Emissions: **10** lb/hour **17** tons/year

5. Method of Compliance (limit to 60 characters):

VE Test < 20% opacity

6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):

Gas firing - all loads; 3,390 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.

Golder Associates Inc.

6241 NW 23rd Street, Suite 500
Gainesville, FL 32653-1500
Telephone (352) 336-5600
Fax (352) 336-6603

Golder Associates

October 25, 1999

9939525

RECEIVED
OCT 26 1999
BUREAU OF AIR REGULATION

Florida Department of Environmental Protection
New Source Review Section; Bureau of Air Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Attention: Mr. A. A. Linero, P.E. Administrator

RE: IPS-Shady Hills Generating Station
Air Permit Application

1010373-001-AC
PSD-FL-280

Dear Al:

Please find enclosed 7 copies of the air permit application for the Shady Hills Generating Station. Also enclosed is a check for $7,500 to cover the permit fee applicable for Prevention of Significant Deterioration review. As described in the permit application, the project consists of three General Electric Frame 7FA combustion turbines operating in simple cycle mode. The primary fuel will be natural gas with low sulfur distillate oil as backup.

Please call if you have any questions.

Sincerely,

GOLDER ASSOCIATES INC.

Kennard F. Kosky, P.E.
Principal

KFK/arz

Enclosures

cc: Richard Zwolak w/o enclosures
John Ellis, IPS Avon Park Corporation

P:\Projects\99\9939\9939525Y\F1\WP\#01-lot.doc

CC: SWD
EPA
NPS

Prudential Securities COMMAND℠ Account

IPS AVON PARK CORP
1560 GULF BLVD UNIT 701
CLEARWATER, FL 33767

258

25-80/440

Date 10-13-99

Pay to the order of FLORIDA DEPT OF ENVIRONMENTAL Protection $ 7,500.00

Seven thousand Five hundred no/100 Dollars

Security features included. Details on back.

1	2	3	4	5	6	7	8	9	0

CHECK ONE BOX

Prudential
Bank
PAYABLE THROUGH BANK ONE, COLUMBUS, NA
COLUMBUS, OHIO 43271

For PASCO County Air Permit fee

MP

[redacted]

property of
DEP, DARM

AIR PERMIT APPLICATION AND PREVENTION OF SIGNIFICANT DETERIORATION ANALYSIS FOR THE IPS AVON PARK CORPORATION'S SHADY HILLS GENERATING STATION

Prepared For:

IPS Avon Park Corporation
1560 Gulf Blvd., #701
Clearwater, Florida 32767

Prepared By:

Golder Associates Inc.
6241 NW 23rd Street, Suite 500
Gainesville, Florida 32653-1500

RECEIVED
OCT 26 1999
BUREAU OF AIR REGULATION

October 1999
9939525Y/F1

DISTRIBUTION:
7 Copies - Florida Department of Environmental Protection
2 Copies – IPS Avon Park Corporation
2 Copies – Golder Associates Inc.

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LIST OF ACROYNMS AND ABBREVIATIONS

AAQS	ambient air quality standards
acfm	actual cubic feet per minute
ARC	ambient reference concentrations
BACT	best available control technology
BPIP	Building Profile Input Program
Btu/yr	British thermal units per year
CAA	Clean Air Act
CEM	continuous emission monitoring
CFR	Code of Federal Regulations
CO	carbon monoxide
CT	combustion turbine
DEP	Department of Environmental Protection
DLN	dry-low NO_x
EPA	U.S. Environmental Protection Agency
°F	degrees Fahrenheit
F.A.C.	Florida Administrative Code
FGT	Florida Gas Transmission
ft	foot
g/s	grams per second
GEP	good engineering practice
Golder	Golder Associates Inc.

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LIST OF ACROYNMS AND ABBREVIATIONS

HAP	hazardous air pollutant
HRSG	heat-recovery steam generator
HSH	highest, second-highest
ISCST3	Industrial Source Complex Short-term
km	kilometer
kPa	kilopascal
kWh	kilowatt hours
kV	kilovolt
LAER	lowest achievable emission rate
lb/hr	pounds per hour
m	meter
m^3	cubic meters
MMBtu/hr	million British thermal units per hour
m/s	meters per second
MW	megawatt
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_x	nitrogen oxide
NPS	National Park Service
NSPS	new source performance standards
NSR	new source review

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LIST OF ACROYNMS AND ABBREVIATIONS

NWA	National Wilderness Area
NWS	National Weather Service
O_3	ozone
OSHA	Occupational Safety and Health Administration
PM	particulate matter
PM_{10}	particulate matter with aerodynamic diameter of 10 microns or less
ppmvd	parts per million volume dry
ppmvw	parts per million volume wet
PSD	prevention of significant deterioration
psi	pound per square inch
QA/QC	quality assurance/quality control
SCRAM	Support Center for Regulatory Air Models
SO_2	sulfur dioxide
TPY	tons per year
TSP	total suspended particulate matter
TTN	Technical Transfer Network
$\mu g/m^3$	micrograms per cubic meter
USC	United States Code
VOC	volatile organic compound

PART A

AIR PERMIT APPLICATION

Department of Environmental Protection

Division of Air Resources Management

APPLICATION FOR AIR PERMIT - TITLE V SOURCE

See Instructions for Form No. 62-210.900(1)

I. APPLICATION INFORMATION

Identification of Facility

1. Facility Owner/Company Name: **IPS Avon Park Corporation**	
2. Site Name: **Shady Hills Generating Station**	
3. Facility Identification Number:	[X] Unknown
4. Facility Location: Street Address or Other Locator: City: **Unincorporated** County: **Pasco** Zip Code:	
5. Relocatable Facility? [ ] Yes [X] No	6. Existing Permitted Facility? [ ] Yes [X] No

Application Contact

1. Name and Title of Application Contact: **John S. Ellis, President**
2. Application Contact Mailing Address: Organization/Firm: **IPS Avon Park Corporation** Street Address: **1560 Gulf Blvd., #701** City: **Clearwater** State: **FL** Zip Code: **32767**
3. Application Contact Telephone Numbers: Telephone: (**727**) **517 - 7140** Fax: (**727**) **517 - 1255**

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	October 26, 1999
2. Permit Number:	1010373-001-AC
3. PSD Number (if applicable):	PSD-FL-280
4. Siting Number (if applicable):	

Purpose of Application

Air Operation Permit Application

This Application for Air Permit is submitted to obtain: (Check one)

[ ] Initial Title V air operation permit for an existing facility which is classified as a Title V source.

[ ] Initial Title V air operation permit for a facility which, upon start up of one or more newly constructed or modified emissions units addressed in this application, would become classified as a Title V source.

Current construction permit number:____________________

[ ] Title V air operation permit revision to address one or more newly constructed or modified emissions units addressed in this application.

Current construction permit number:____________________

Operation permit number to be revised:____________________

[ ] Title V air operation permit revision or administrative correction to address one or more proposed new or modified emissions units and to be processed concurrently with the air construction permit application. (Also check Air Construction Permit Application below.)

Operation permit number to be revised/corrected:____________________

[ ] Title V air operation permit revision for reasons other than construction or modification of an emissions unit. Give reason for the revision; e.g., to comply with a new applicable requirement or to request approval of an "Early Reductions" proposal.

Operation permit number to be revised:____________________

Reason for revision:____________________

Air Construction Permit Application

This Application for Air Permit is submitted to obtain: (Check one)

[X] Air construction permit to construct or modify one or more emissions units.

[ ] Air construction permit to make federally enforceable an assumed restriction on the potential emissions of one or more existing, permitted emissions units.

[ ] Air construction permit for one or more existing, but unpermitted, emissions units.

Owner/Authorized Representative or Responsible Official

1.	Name and Title of Owner/Authorized Representative or Responsible Official: **John S. Ellis, President**
2.	Owner/Authorized Representative or Responsible Official Mailing Address: Organization/Firm: **IPS Avon Park Corporation** Street Address: **1560 Gulf Blvd., #701** City: **Clearwater** State: **FL** Zip Code: **33767**
3.	Owner/Authorized Representative or Responsible Official Telephone Numbers: Telephone: **(727) 517 - 7140** Fax: **(727) 517 - 1255**
4.	Owner/Authorized Representative or Responsible Official Statement: *I, the undersigned, am the owner or authorized representative*(check here [ ], if so) or the responsible official (check here [ ], if so) of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions unit.* John S Ellis 10-13-99 Signature Date

* Attach letter of authorization if not currently on file.

Professional Engineer Certification

1.	Professional Engineer Name: **Kennard F. Kosky** Registration Number: **14996**
2.	Professional Engineer Mailing Address: Organization/Firm: **Golder Associates Inc.** Street Address: **6241 NW 23rd Street, Suite 500** City: **Gainesville** State: **FL** Zip Code: **32653-1500**
3.	Professional Engineer Telephone Numbers: Telephone: **(352) 336 - 5600** Fax: **(352) 336 - 6603**

4. Professional Engineer Statement:

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

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

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

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

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

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

Bernard F. Kosky — 10/25/99

Signature — Date

(seal)

* Attach any exception to certification statement.

Scope of Application

Emissions Unit ID	Description of Emissions Unit	Permit Type	Processing Fee
1R	GE Frame 7FA Combustion Turbine	AC1A	
2R	GE Frame 7FA Combustion Turbine	AC1A	
3R	GE Frame 7FA Combustion Turbine	AC1A	
4	Unregulated Emissions	AC1A	

Application Processing Fee

Check one: [X] Attached - Amount: $: 7,500 [ ] Not Applicable

Construction/Modification Information

1. Description of Proposed Project or Alterations: **Construction of 3 170-MW 'F' Class combustion turbines. See Attachment PSD-SPC.**
2. Projected or Actual Date of Commencement of Construction: **1 Jan 2001**
3. Projected Date of Completion of Construction: **1 Jul 2002**

Application Comment

See Attachment PSD-SPC

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates: Zone: **17** East (km): **347.0** North (km): **3139.0**			
2. Facility Latitude/Longitude: Latitude (DD/MM/SS): **28 / 22 / 00** Longitude (DD/MM/SS): **82 / 30 / 00**			
3. Governmental Facility Code: **0**	4. Facility Status Code: **C**	5. Facility Major Group SIC Code: **49**	6. Facility SIC(s): **4911**
7. Facility Comment (limit to 500 characters): **Project consists of three 170-MW dual-fuel, General Electric Frame 7FA combustion turbines(CT) that will use dry low-nitrogen oxide combustion technology when firing natural gas and water injection when firing distillate fuel oil. Each CT will operate up to 3,390 hours per year. The fuel oil tank will hold approximately 2.8 million gallons of very low sulfur content fuel oil.**			

Facility Contact

1. Name and Title of Facility Contact: **John S. Ellis, President**
2. Facility Contact Mailing Address: Organization/Firm: **IPS Avon Park Corporation** Street Address: **1560 Gulf Blvd., #701** City: **Clearwater** State: **FL** Zip Code: **33767**
3. Facility Contact Telephone Numbers: Telephone: **(727) 517 - 7140** Fax: **(727) 517 - 1255**

Facility Regulatory Classifications

Check all that apply:

1. [ ] Small Business Stationary Source?	[ ] Unknown
2. [X] Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)?	
3. [ ] Synthetic Minor Source of Pollutants Other than HAPs?	
4. [ ] Major Source of Hazardous Air Pollutants (HAPs)?	
5. [ ] Synthetic Minor Source of HAPs?	
6. [X] One or More Emissions Units Subject to NSPS?	
7. [ ] One or More Emission Units Subject to NESHAP?	
8. [ ] Title V Source by EPA Designation?	
9. Facility Regulatory Classifications Comment (limit to 200 characters): **CT is subject to NSPS Subpart GG. The fuel oil tank is subject to Subpart Kb.**	

List of Applicable Regulations

Not Applicable	

B. FACILITY POLLUTANTS

List of Pollutants Emitted

1. Pollutant Emitted	2. Pollutant Classif.	3. Requested Emissions Cap lb/hour	tons/year	4. Basis for Emissions Cap	5. Pollutant Comment
PM	A				Particulate Matter-Total
VOC	B				Volatile Organic Compounds
SO_2	A				Sulfur Dioxide
NO_x	A				Nitrogen Oxides
CO	A				Carbon Monoxides
PM_{10}	A				Particulate Matter-PM_{10}

C. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements

1. Area Map Showing Facility Location: [X] Attached, Document ID: PSD-SPC [ ] Not Applicable [ ] Waiver Requested	
2. Facility Plot Plan: [X] Attached, Document ID: PSD-SPC [ ] Not Applicable [ ] Waiver Requested	
3. Process Flow Diagram(s): [X] Attached, Document ID: PSD-SPC [ ] Not Applicable [ ] Waiver Requested	
4. Precautions to Prevent Emissions of Unconfined Particulate Matter: [ ] Attached, Document ID: ______ [X] Not Applicable [ ] Waiver Requested	
5. Fugitive Emissions Identification: [ ] Attached, Document ID: ______ [X] Not Applicable [ ] Waiver Requested	
6. Supplemental Information for Construction Permit Application: [X] Attached, Document ID: PSD-SPC [ ] Not Applicable	
7. Supplemental Requirements Comment:	

Additional Supplemental Requirements for Title V Air Operation Permit Applications

8. List of Proposed Insignificant Activities: [ ] Attached, Document ID:________ [ ] Not Applicable
9. List of Equipment/Activities Regulated under Title VI: [ ] Attached, Document ID:________ [ ] Equipment/Activities On site but Not Required to be Individually Listed [ ] Not Applicable
10. Alternative Methods of Operation: [ ] Attached, Document ID:________ [ ] Not Applicable
11. Alternative Modes of Operation (Emissions Trading): [ ] Attached, Document ID:________ [ ] Not Applicable
12. Identification of Additional Applicable Requirements: [ ] Attached, Document ID:________ [ ] Not Applicable
13. Risk Management Plan Verification: [ ] Plan previously submitted to Chemical Emergency Preparedness and Prevention Office (CEPPO). Verification of submittal attached (Document ID:________) or previously submitted to DEP (Date and DEP Office:________________________) [ ] Plan to be submitted to CEPPO (Date required:________________________) [ ] Not Applicable
14. Compliance Report and Plan: [ ] Attached, Document ID:________ [ ] Not Applicable
15. Compliance Certification (Hard-copy Required): [ ] Attached, Document ID:________ [ ] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)

Emissions Unit Description and Status

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

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

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

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

2. Regulated or Unregulated Emissions Unit? (Check one)

[X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

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

3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):
GE Frame 7FA Combustion Turbine

4. Emissions Unit Identification Number: [ ] No ID
ID: [X] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
C		**49**	[X]

9. Emissions Unit Comment: (Limit to 500 Characters)
This emission unit is a GE Frame 7FA combustion turbine operating in simple cycle mode. See Attachment PSD-SPC.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): Dry Low NO_X combustion - Natural gas firing
2. Control Device or Method Code(s): 25

Emissions Unit Details

1. Package Unit: Manufacturer: General Electric	Model Number: 7FA
2. Generator Nameplate Rating: 172 MW	
3. Incinerator Information: Dwell Temperature: °F Dwell Time: seconds Incinerator Afterburner Temperature: °F	

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Water injection - distillate oil firing**
2. Control Device or Method Code(s): **28**

Emissions Unit Details

1. Package Unit: Manufacturer: **General Electric**	Model Number: **7FA**	
2. Generator Nameplate Rating:	**172** MW	
3. Incinerator Information: Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:		 °F seconds °F

B. EMISSIONS UNIT CAPACITY INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:		1,612	mmBtu/hr
2. Maximum Incineration Rate:	lb/hr		tons/day
3. Maximum Process or Throughput Rate:			
4. Maximum Production Rate:			
5. Requested Maximum Operating Schedule:			
	hours/day		days/week
	weeks/year	3,390	hours/year

6. Operating Capacity/Schedule Comment (limit to 200 characters):

Maximum heat input at ISO conditions and natural gas firing (LHV); maximum for oil firing is 1,806 MMBtu/hr (ISO-LHV) and 182 MW.

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

See Attachment IPS-EU1-D for operational requirements	
See Attachment PSD-SPC for permitting requirements	

ATTACHMENT IPS-EU1-D

Applicable Requirements Listing

EMISSION UNIT ID: EU1

FDEP Rules:

Air Pollution Control-General Provisions:

62-204.800(7)(b)37. (State Only)	NSPS Subpart GG
62-204.800(7)(c) (State Only)	NSPS authority
62-204.800(7)(d)(State Only)	NSPS General Provisions
62-204.800(12) (State Only)	Acid Rain Program
62-204.800(13) (State Only)	Allowances
62-204.800(14) (State Only)	Acid Rain Program Monitoring
62-204.800(16) (State Only)	Excess Emissions (Potentially applicable over term of permit)

Stationary Sources-General:

62-210.650	Circumvention; EUs with control device
62-210.700(1)	Excess Emissions;
62-210.700(4)	Excess Emissions; poor maintenance
62-210.700(6)	Excess Emissions; notification

Acid Rain:

62-214.300	All Acid Rain Units (Applicability)
62-214.320(1)(a),(2)	All Acid Rain Units (Application Shield)
62-214.330(1)(a)1.	Compliance Options (if 214.430)
62-214.340	Exemptions (new units, retired units)
62-214.350(2);(3);(6)	All Acid Rain Units (Certification)
62-214.370	All Acid Rain Units (Revisions; correction; potentially applicable if a need arises)
62-214.430	All Acid Rain Units (Compliance Options-if required)

Stationary Sources-Emission Standards:

62-296.320(4)(b)(State Only)	CTs/Diesel Units

Stationary Sources-Emission Monitoring (where stack test is required):

62-297.310(1)	All Units (Test Runs-Mass Emission)
62-297.310(2)(b)	All Units (Operating Rate; other than CTs;no CT)
62-297.310(3)	All Units (Calculation of Emission)
62-297.310(4)(a)	All Units (Applicable Test Procedures;Sampling time)
62-297.310(4)(b)	All Units (Sample Volume)
62-297.310(4)(c)	All Units (Required Flow Rate Range-PM/H2SO4/F)
62-297.310(4)(d)	All Units (Calibration)
62-297.310(4)(e)	All Units (EPA Method 5-only)
62-297.310(5)	All Units (Determination of Process Variables)

62-297.310(6)(a)	All Units (Permanent Test Facilities-general)
62-297.310(6)(c)	All Units (Sampling Ports)
62-297.310(6)(d)	All Units (Work Platforms)
62-297.310(6)(e)	All Units (Access)
62-297.310(6)(f)	All Units (Electrical Power)
62-297.310(6)(g)	All Units (Equipment Support)
62-297.310(7)(a)1.	Applies mainly to CTs/Diesels
62-297.310(7)(a)2.	FFSG excess emissions
62-297.310(7)(a)3.	Permit Renewal Test Required
62-297.310(7)(a)4.a	Annual Test
62-297.310(7)(a)5.	PM exemption if <400 hrs/yr
62-297.310(7)(a)6.	PM FFSG semi annual test required if >200 hrs/yr
62-297.310(7)(a)7.	PM quarterly monitoring if >100 hrs/yr
62-297.310(7)(a)9.	FDEP Notification - 15 days
62-297.310(7)(c)	Waiver of Compliance Tests (Fuel Sampling)
62-297.310(8)	Test Reports

Federal Rules:

NSPS Subpart GG:

40 CFR 60.332(a)(1)	NO_x for Electric Utility CTs
40 CFR 60.332(a)(3)	NO_x for Electric Utility CTs
40 CFR 60.333	SO_2 limits
40 CFR 60.334	Monitoring of Operations (Custom Monitoring for Gas)
40 CFR 60.335	Test Methods

NSPS General Requirements:

40 CFR 60.7(a)(1)	Notification of Construction
40 CFR 60.7(a)(2)	Notification of Initial Start-Up
40 CFR 60.7(a)(3)	Notification of Actual Start-Up
40 CFR 60.7(a)(4)	Notification and Recordkeeping (Physical/Operational Cycle)
40 CFR 60.7(a)(5)	Notification of CEM Demonstration
40 CFR 60.7(b)	Notification and Recordkeeping (startup/shutdown/malfunction)
40 CFR 60.7(c)	Notification and Recordkeeping (startup/shutdown/malfunction)
40 CFR 60.7(d)	Notification and Recordkeeping (startup/shutdown/malfunction)
40 CFR 60.7(f)	Notification and Recordkeeping (maintain records-2 yrs)
40 CFR 60.8(a)	Performance Test Requirements
40 CFR 60.8(b)	Performance Test Notification
40 CFR 60.8(c)	Performance Tests (representative conditions)
40 CFR 60.8(e)	Provide Stack Sampling Facilities
40 CFR 60.8(f)	Test Runs
40 CFR 60.11(a)	Compliance (ref. S. 60.8 or Subpart; other than opacity)
40 CFR 60.11(b)	Compliance (opacity determined EPA Method 9)
40 CFR 60.11(c)	Compliance (opacity; excludes startup/shutdown/malfunction)
40 CFR 60.11(d)	Compliance (maintain air pollution control equip.)
40 CFR 60.11(e)(2)	Compliance (opacity; ref. S. 60.8)
40 CFR 60.12	Circumvention

40 CFR 60.13(a)	Monitoring (Appendix B; Appendix F)
40 CFR 60.13(c)	Monitoring (Opacity COMS)
40 CFR 60.13(d)(1)	Monitoring (CEMS; span, drift, etc.)
40 CFR 60.13(d)(2)	Monitoring (COMS; span, system check)
40 CFR 60.13(e)	Monitoring (frequency of operation)
40 CFR 60.13(f)	Monitoring (frequency of operation)
40 CFR 60.13(h)	Monitoring (COMS; data requirements)
Acid Rain-Permits:	
40 CFR 72.9(a)	Permit Requirements
40 CFR 72.9(b)	Monitoring Requirements
40 CFR 72.9(c)(1)	SO_2 Allowances-hold allowances
40 CFR 72.9(c)(2)	SO_2 Allowances-violation
40 CFR 72.9(c)(3)(iii)	SO_2 Allowances-Phase II Units (listed)
40 CFR 72.9(c)(4)	SO_2 Allowances-allowances held in ATS
40 CFR 72.9(c)(5)	SO_2 Allowances-no deduction for 72.9(c)(1)(i)
40 CFR 72.9(d)	NO_x Requirements
40 CFR 72.9(e)	Excess Emission Requirements
40 CFR 72.9(f)	Recordkeeping and Reporting
40 CFR 72.9(g)	Liability
40 CFR 72.20(a)	Designated Representative; required
40 CFR 72.20(b)	Designated Representative; legally binding
40 CFR 72.20(c)	Designated Representative; certification requirements
40 CFR 72.21	Submissions
40 CFR 72.22	Alternate Designated Representative
40 CFR 72.23	Changing representatives; owners
40 CFR 72.24	Certificate of representation
40 CFR 72.30(a)	Requirements to Apply (operate)
40 CFR 72.30(b)(2)	Requirements to Apply (Phase II-Complete)
40 CFR 72.30(c)	Requirements to Apply (reapply before expiration)
40 CFR 72.30(d)	Requirements to Apply (submittal requirements)
40 CFR 72.31	Information Requirements; Acid Rain Applications
40 CFR 72.32	Permit Application Shield
40 CFR 72.33(b)	Dispatch System ID;unit/system ID
40 CFR 72.33(c)	Dispatch System ID;ID requirements
40 CFR 72.33(d)	Dispatch System ID;ID change
40 CFR 72.40(a)	General; compliance plan
40 CFR 72.40(b)	General; multi-unit compliance options
40 CFR 72.40(c)	General; conditional approval
40 CFR 72.40(d)	General; termination of compliance options
40 CFR 72.51	Permit Shield
40 CFR 72.90	Annual Compliance Certification
Allowances:	
40 CFR 73.33(a),(c)	Authorized account representative
40 CFR 73.35(c)(1)	Compliance: ID of allowances by serial number

Monitoring Part 75:

40 CFR 75.4	Compliance Dates;
40 CFR 75.5	Prohibitions
40 CFR 75.10(a)(1)	Primary Measurement; SO_2;
40 CFR 75.10(a)(2)	Primary Measurement; NO_x;
40 CFR 75.10(a)(3)(iii)	Primary Measurement; CO_2; O_2 monitor
40 CFR 75.10(b)	Primary Measurement; Performance Requirements
40 CFR 75.10(c)	Primary Measurement; Heat Input; Appendix F
40 CFR 75.10(e)	Primary Measurement; Optional Backup Monitor
40 CFR 75.10(f)	Primary Measurement; Minimum Measurement
40 CFR 75.10(g)	Primary Measurement; Minimum Recording
40 CFR 75.11(d)	SO_2 Monitoring; Gas- and Oil-fired units
40 CFR 75.11(e)	SO_2 Monitoring; Gaseous firing
40 CFR 75.12(a)	NO_x Monitoring; Coal; Non-peaking oil/gas units
40 CFR 75.12(b)	NO_x Monitoring; Determination of NO_x emission rate; Appendix F
40 CFR 75.13(b)	CO_2 Monitoring; Appendix G
40 CFR 75.13(c)	CO_2 Monitoring; Appendix F
40 CFR 75.14(c)	Opacity Monitoring; Gas units; exemption
40 CFR 75.20(a)	Initial Certification Approval Process; Loss of Certification
40 CFR 75.20(b)	Recertification Procedures (if recertification necessary)
40 CFR 75.20(c)	Certification Procedures (if recertification necessary)
40 CFR 75.20(d)	Recertification Backup/portable monitor
40 CFR 75.20(f)	Alternate Monitoring system
40 CFR 75.21(a)	QA/QC; CEMS; Appendix B (Suspended 7/17/95-12/31/96)
40 CFR 75.21(c)	QA/QC; Calibration Gases
40 CFR 75.21(d)	QA/QC; Notification of RATA
40 CFR 75.21(e)	QA/QC; Audits
40 CFR 75.21(f)	QA/QC; CEMS (Effective 7/17/96-12/31/96)
40 CFR 75.22	Reference Methods
40 CFR 75.24	Out-of-Control Periods; CEMS
40 CFR 75.30(a)(3)	General Missing Data Procedures; NO_x
40 CFR 75.30(a)(4)	General Missing Data Procedures; SO_2
40 CFR 75.30(b)	General Missing Data Procedures; certified backup monitor
40 CFR 75.30(c)	General Missing Data Procedures; certified backup monitor
40 CFR 75.30(d)	General Missing Data Procedures; SO_2 (optional before 1/1/97)
40 CFR 75.30(e)	General Missing Data Procedures; bypass/multiple stacks
40 CFR 75.31	Initial Missing Data Procedures (new/re-certified CMS)
40 CFR 75.32	Monitoring Data Availability for Missing Data
40 CFR 75.33	Standard Missing Data Procedures
40 CFR 75.36	Missing Data for Heat Input
40 CFR 75.40	Alternate Monitoring Systems-General
40 CFR 75.41	Alternate Monitoring Systems-Precision Criteria
40 CFR 75.42	Alternate Monitoring Systems-Reliability Criteria
40 CFR 75.43	Alternate Monitoring Systems-Accessability Criteria
40 CFR 75.44	Alternate Monitoring Systems-Timeliness Criteria
40 CFR 75.45	Alternate Monitoring Systems-Daily QA
40 CFR 75.46	Alternate Monitoring Systems-Missing data
40 CFR 75.47	Alternate Monitoring Systems-Criteria for Class

40 CFR 75.48	Alternate Monitoring Systems-Petition
40 CFR 75.53	Monitoring Plan; revisions
40 CFR 75.54(a)	Recordkeeping-general
40 CFR 75.54(b)	Recordkeeping-operating parameter
40 CFR 75.54(c)	Recordkeeping-SO_2
40 CFR 75.54(d)	Recordkeeping- NO_x
40 CFR 75.54(e)	Recordkeeping-CO_2
40 CFR 75.54(f)	Recordkeeping-Opacity
40 CFR 75.55(c)	General Recordkeeping (Specific Situations)
40 CFR 75.55(e)	General Recordkeeping (Specific Situations)
40 CFR 75.56	Certification; QA/QC Provisions
40 CFR 75.60	Reporting Requirements-General
40 CFR 75.61	Reporting Requirements-Notification cert/recertification
40 CFR 75.62	Reporting Requirements-Monitoring Plan
40 CFR 75.63	Reporting Requirements-Certification/Recertification
40 CFR 75.64(a)	Reporting Requirements-Quarterly reports; submission
40 CFR 75.64(b)	Reporting Requirements-Quarterly reports; DR statement
40 CFR 75.64(c)	Rep. Req.; Quarterly reports; Compliance Certification
40 CFR 75.64(d)	Rep. Req.; Quarterly reports; Electronic format
40 CFR 75.66	Petitions to the Administrator (if required)
Appendix A-1	Installation and Measurement Locations
Appendix A-2.	Equipment Specifications
Appendix A-3.	Performance Specifications
Appendix A-4.	Data Handling and Acquisition Systems
Appendix A-5.	Calibration Gases
Appendix A-6.	Certification Tests and Procedures
Appendix A-7.	Calculations
Appendix B	QA/QC Procedures
Appendix C-1.	Missing Data; SO_2/ NO_x for controlled sources
Appendix C-2.	Missing Data; Load-Based Procedure; NO_x & flow
Appendix D	Optional SO_2; Oil-/gas-fired units
Appendix F	Conversion Procedures
Appendix H	Traceability Protocol

Acid Rain Program-Excess Emissions (these are future requirements):

40 CFR 77.3	Offset Plans (future)
40 CFR 77.5(b)	Deductions of Allowances (future)
40 CFR 77.6	Excess Emissions Penalties (SO_2 and NO_x;future)

D. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? **See Att. PSD-SPC**	2. Emission Point Type Code: **1**

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point):

Exhausts through a single stack.

4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:

5. Discharge Type Code: **V**	6. Stack Height: **60** feet	7. Exit Diameter: **22** feet
8. Exit Temperature: **1,113** °F	9. Actual Volumetric Flow Rate: **2,645,000** acfm	10. Water Vapor: **8.6** %

11. Maximum Dry Standard Flow Rate: **800,000** dscfm	12. Nonstack Emission Point Height: feet

13. Emission Point UTM Coordinates:

Zone: **17** East (km): **347.0** North (km): **3139.0**

14. Emission Point Comment (limit to 200 characters):

Stack parameters for ISO operating condition firing natural gas; for oil 1,094°F and 2,731,000 ACFM.

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Distillate (No. 2) Fuel Oil**		
2. Source Classification Code (SCC): **20100101**	3. SCC Units: **1,000 gallons used**	
4. Maximum Hourly Rate: **13.7**	5. Maximum Annual Rate: **13,700**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.05**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **132**
10. Segment Comment (limit to 200 characters): **Million Btu per SCC Unit = 131.8 (rounded to 132). Based on 7.1 lb/gal; LHV of 18,560 Btu/lb, - ISO conditions, 1,000 hrs/yr operation.**		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Natural Gas**		
2. Source Classification Code (SCC): **20100201**	3. SCC Units: **Million Cubic Feet**	
4. Maximum Hourly Rate: **1.70**	5. Maximum Annual Rate: **5,752**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **950**
10. Segment Comment (limit to 200 characters): **Based on 950 Btu/cf (LHV); ISO conditions and 3,390 hrs/yr operation.**		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM			EL
SO_2			EL
NO_x	026	028	EL
CO			EL
VOC			EL
PM_{10}			EL

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**

2. Total Percent Efficiency of Control:

3. Potential Emissions: **17** lb/hour **20.5** tons/year

4. Synthetically Limited? [X]

5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year

6. Emission Factor:
   Reference: **GE, 1998; Golder**

7. Emissions Method Code: **2**

8. Calculation of Emissions (limit to 600 characters):

See Attachment PSD-SPC; Section 2.0; Appendix A.

9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):

Lb/hr based on oil firing, all loads. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**

2. Future Effective Date of Allowable Emissions:

3. Requested Allowable Emissions and Units: **17 lb/hr**

4. Equivalent Allowable Emissions: **17** lb/hour **8.5** tons/year

5. Method of Compliance (limit to 60 characters):

Annual stack test; EPA Methods 5 or 17; if < 400 hours

6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):

Oil firing - all loads; 1,000 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **17** lb/hour **20.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-SPC; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; all loads. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **10 lb/hr**	4. Equivalent Allowable Emissions: **10** lb/hour **17** tons/year
5. Method of Compliance (limit to 60 characters): **VE Test < 20% opacity**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing - all loads; 3,390 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **101.5** lb/hour **55.3** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-SPC; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Emission Factor: 1 grain S per 100 CF gas; 0.05% S oil; lb/hr based on oil firing at 100% load and 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.05% Sulfur Oil**	4. Equivalent Allowable Emissions: **101.5** lb/hour **49.3** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel Sampling**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing - 32°F; 100% load; 1,000 hrs/yr. See Attachment PSD-SPC; Section 2.0; Appendix A.**	

Table A-5. Design Information and Stack Parameters for the Shady Hills Generating Station Project
GE Frame 7FA, Dry Low NOx Combustor, Natural Gas, 75% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Combustion Turbine Performance			
Net power output (MW)	134.2	126.4	111.1
Net heat rate (Btu/kWh, LHV)	10,261	10,396	10,882
(Btu/kWh, HHV)	11,045	11,289	11,765
Heat Input (MMBtu/hr, LHV)	1,377	1,314	1,209
(MMBtu/hr, HHV)	1,482	1,427	1,307
Fuel heating value (Btu/lb, LHV)	20,751	20,751	20,751
(Btu/lb, HHV)	23,006	23,006	23,006
(HHV/LHV)	1.110	1.110	1.110
CT Exhaust Flow			
Mass Flow (lb/hr)- with margin of 10%	3,285,700	3,190,000	3,039,300
- provided	2,987,000	2,900,000	2,763,000
Temperature (°F)	1,170	1,179	1,193
Moisture (% Vol.)	8.1	8.4	9.6
Oxygen (% Vol.)	12.50	12.50	12.50
Molecular Weight	28.41	28.38	28.21
Fuel Usage			
Fuel usage (lb/hr) = Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))			
Heat input (MMBtu/hr, LHV)	1,377	1,314	1,209
Heat content (Btu/lb, LHV)	20,751	20,751	20,751
Fuel usage (lb/hr)- calculated	66,358	63,322	58,262
CT Stack			
Stack height (ft)	60	60	60
Diameter (ft)	22	22	22
Turbine Flow Conditions			
Turbine Flow (acfm) = [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F)+ 460°F)] / [Molecular weight x 2116.8] / 60 min/hr			
Mass flow (lb/hr)	3,285,700	3,190,000	3,039,300
Temperature (°F)	1,170	1,179	1,193
Molecular weight	28.41	28.38	28.21
Volume flow (acfm)- calculated	2,292,951	2,240,823	2,166,041
(ft3/s)- calculated	38,216	37,347	36,101
Velocity (ft/sec)	100.5	98.2	95.0

Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft^2; 14.7 lb/ft^3

Source: GE, 1998.

Table A-6. Maximum Emissions for Criteria Pollutants for the Shady Hills Generating Station Project
GE Frame 7FA, Dry Low NOx Combustor, Natural Gas, 75% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	3,390	3,390	3,390
Particulate (lb/hr) = Emission rate (lb/hr) from manufacturer			
Basis (excludes H_2SO_4), lb/hr	10	10	10
Emission rate (lb/hr)- provided	10.0	10.0	10.0
(TPY)	17.0	17.0	17.0
Sulfur Dioxide (lb/hr) = Natural gas (cf/hr) x sulfur content(gr/100 cf) x 1 lb/7000 gr x (lb SO_2/lb S) /100			
Fuel density (lb/ft^3)	0.0448	0.0448	0.0448
Fuel use (cf/hr)	1,481,744	1,413,951	1,300,964
Sulfur content (grains/ 100 cf)	1	1	1
lb SO_2/lb S (64/32)	2	2	2
Emission rate (lb/hr)	4.2	4.0	3.7
(TPY)	7.18	6.85	6.30
Nitrogen Oxides (lb/hr) = NOx(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 x Volume flow (acfm) x 46 (mole. wgt NOx) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 5.9 x 1,000,000 (adj. for ppm)]			
Basis, ppmvd @15% O_2	9	9	9
Moisture (%)	8.1	8.4	9.6
Oxygen (%)	12.5	12.5	12.5
Turbine Flow (acfm)	2,292,951	2,240,823	2,166,041
Turbine Exhaust Temperature (°F)	1,170	1,179	1,193
Emission rate (lb/hr)	54.4	52.4	48.3
(TPY)	92.2	88.8	81.9
Carbon Monoxide (lb/hr) = CO(ppm) x [1 - Moisture(%)/100] x 2116.8 lb/ft2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]			
Basis, ppmvd	12	12	12
Moisture (%)	8.1	8.4	9.6
Turbine Flow (acfm)	2,292,951	2,240,823	2,166,041
Turbine Exhaust Temperature (°F)	1,170	1,179	1,193
Emission rate (lb/hr)	35.7	34.6	32.7
(TPY)	60.5	58.6	55.5
VOCs (lb/hr) = VOC(ppmvd) x [1-Moisture(%)/100] x 2116.8 lb/ft2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]			
Basis, ppmvd	1.4	1.4	1.4
Moisture (%)	8.1	8.4	9.6
Turbine Flow (acfm)	2,292,951	2,240,823	2,166,041
Turbine Exhaust Temperature (°F)	1,170	1,179	1,193
Emission rate (lb/hr)	2.38	2.31	2.18
(TPY)	4.0	3.9	3.7
Lead (lb/hr)= NA			
Emission Rate Basis	NA	NA	NA
Emission rate (lb/hr)	NA	NA	NA
(TPY)	NA	NA	NA

Note: ppmvd= parts per million, volume dry; O_2= oxygen.

Source: GE, 1998; Golder Associates, 1998; EPA, 1996

Table A-7. Maximum Emissions for Other Regulated PSD Pollutants for the Shady Hills Generating Station Project
GE Frame 7FA, Dry Low NOx Combustor, Natural Gas, 75% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	3,390	3,390	3,390
2,3,7,8-TCDD Equivalents (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	1.20E-06	1.20E-06	1.20E-06
Heat Input Rate (MMBtu/hr)	1.48E+03	1.43E+03	1.31E+03
Emission Rate (lb/hr)	1.78E-09	1.71E-09	1.57E-09
(TPY)	3.01E-09	2.90E-09	2.66E-09
Beryllium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Fluoride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b) , lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Mercury (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	7.48E-04	7.48E-04	7.48E-04
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	1.11E-06	1.07E-06	9.78E-07
(TPY)	1.88E-06	1.81E-06	1.66E-06
Sulfuric Acid Mist = Fuel Use (lb/hr) x sulfur (S) content (fraction) x conversion of S to H_2SO_4 (%) x MW H_2SO_4 /MW S (98/32)			
Fuel Usage (cf/hr)	1,481,744	1,413,951	1,300,964
Sulfur (lb/hr)	2.12	2.02	1.86
lb H_2SO_4 /lb S (98/32)	3.0625	3.0625	3.0625
Conversion to H_2SO_4 (%) (c)	10	10	10
Emission Rate (lb/hr)	0.65	0.62	0.57
(TPY)	1.10	1.05	0.96

Sources: (a) Golder Associates, 1998; (b) EPA, 1981; (c) Assumed.

Note: No Emission Factors for Hydrogen chloride (HCl) from natural gas firing.

Table A-8. Maximum Emissions for Hazardous Air Pollutants for the Shady Hills Generating Station Project
GE Frame 7FA, Dry Low NOx Combustor, Natural Gas, 75% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	3,390	3,390	3,390
Antimony (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0.00E+00	0.00E+00	0.00E+00
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Benzene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0.8	0.8	0.8
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	1.19E-03	1.14E-03	1.05E-03
(TPY)	2.01E-03	1.93E-03	1.77E-03
Cadmium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	0	0	0
(TPY)	0.00E+00	0.00E+00	0.00E+00
Chromium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Formaldehyde (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	34	34	34
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	5.04E-02	4.85E-02	4.44E-02
(TPY)	8.54E-02	8.22E-02	7.53E-02
Cobalt (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1.48E+03	1.43E+03	1.31E+03
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00
(TPY)	0	0	0
Manganese (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Nickel (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Phosphorous (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b), lb/10^{12} Btu	0.00E+00	0.00E+00	0.00E+00
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Selenium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Toluene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	10	10	10
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	1.48E-02	1.43E-02	1.31E-02
(TPY)	2.51E-02	2.42E-02	2.22E-02

Sources: (a) Golder Associates, 1998; (b) EPA,1996 (AP-42,Table 3.1-4)

Table A-9. Design Information and Stack Parameters for the Shady Hills Generating Station Project
GE Frame 7FA, Dry Low NOx Combustor, Natural Gas, 50% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Combustion Turbine Performance			
Net power output (MW)	90.76	85.55	74.6
Net heat rate (Btu/kWh, LHV)	12,054	12,086	12,842
(Btu/kWh, HHV)	13,380	13,416	14,254
Heat Input (MMBtu/hr, LHV)	1,094	1,034	958
(MMBtu/hr, HHV)	1,214	1,148	1,063
Fuel heating value (Btu/lb, LHV)	20,751	20,751	20,751
(Btu/lb, HHV)	23,006	23,006	23,006
(HHV/LHV)	1.110	1.110	1.110
CT Exhaust Flow			
Mass Flow (lb/hr)- with margin of 10%	2,754,400	2,654,300	2,570,700
- provided	2,504,000	2,413,000	2,337,000
Temperature (°F)	1,171	1,186	1,200
Moisture (% Vol.)	7.7	8	9.1
Oxygen (% Vol.)	12.90	13.00	13.00
Molecular Weight	28.44	28.41	28.26
Fuel Usage			
Fuel usage (lb/hr) = Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))			
Heat input (MMBtu/hr, LHV)	1,094	1,034	958
Heat content (Btu/lb, LHV)	20,751	20,751	20,751
Fuel usage (lb/hr)- calculated	52,720	49,829	46,166
CT Stack			
Stack height (ft)	60	60	60
Diameter (ft)	22	22	22
Turbine Flow Conditions			
Turbine Flow (acfm) = [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F) + 460°F)] / [Molecular weight x 2116.8] / 60 min/hr			
Mass flow (lb/hr)	2,754,400	2,654,300	2,570,700
Temperature (°F)	1,171	1,186	1,200
Molecular weight	28.44	28.41	28.26
Volume flow (acfm)- calculated	1,921,470	1,870,642	1,836,829
(ft3/s)- calculated	32,024	31,177	30,614
Velocity (ft/sec)	84.2	82.0	80.5

Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft^2; 14.7 lb/ft^3

Source: GE, 1998.

Table A-10. Maximum Emissions for Criteria Pollutants for the Shady Hills Generatng Station Project
GE Frame 7FA, Dry Low NOx Combustor, Natural Gas, 50% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	3,390	3,390	3,390
Particulate (lb/hr) = Emission rate (lb/hr) from manufacturer			
Basis (excludes H_2SO_4), lb/hr	10	10	10
Emission rate (lb/hr)- provided	10.0	10.0	10.0
(TPY)	17.0	17.0	17.0
Sulfur Dioxide (lb/hr) = Natural gas (cf/hr) x sulfur content(gr/100 cf) x 1 lb/7000 gr x (lb SO_2 /lb S) /100			
Fuel density (lb/ft^3)	0.0448	0.0448	0.0448
Fuel use (cf/hr)	1,177,217	1,112,653	1,030,872
Sulfur content (grains/ 100 cf)	1	1	1
lb SO_2 /lb S (64/32)	2	2	2
Emission rate (lb/hr)	3.4	3.2	2.9
(TPY)	5.70	5.39	4.99
Nitrogen Oxides (lb/hr) = NOx(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 x Volume flow (acfm) x 46 (mole. wgt NOx) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 5.9 x 1,000,000 (adj. for ppm)]			
Basis, ppmvd @15% O_2	9	9	9
Moisture (%)	7.7	8	9.1
Oxygen (%)	12.9	13	13
Turbine Flow (acfm)	1,921,470	1,870,642	1,836,829
Turbine Exhaust Temperature (°F)	1,171	1,186	1,200
Emission rate (lb/hr)	43.4	40.8	38.3
(TPY)	73.6	69.2	64.9
Carbon Monoxide (lb/hr) = CO(ppm) x [1 - Moisture(%)/100] x 2116.8 lb/ft2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]			
Basis, ppmvd	12	12	12
Moisture (%)	7.7	8	9.1
Turbine Flow (acfm)	1,921,470	1,870,642	1,836,829
Turbine Exhaust Temperature (°F)	1,171	1,186	1,200
Emission rate (lb/hr)	30.0	28.9	27.8
(TPY)	50.9	49.0	47.1
VOCs (lb/hr) = VOC(ppmvd) x [1-Moisture(%)/100] x 2116.8 lb/ft2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]			
Basis, ppmvd	1.4	1.4	1.4
Moisture (%)	7.7	8	9.1
Turbine Flow (acfm)	1,921,470	1,870,642	1,836,829
Turbine Exhaust Temperature (°F)	1,171	1,186	1,200
Emission rate (lb/hr)	2.00	1.93	1.85
(TPY)	3.4	3.3	3.1
Lead (lb/hr)= NA			
Emission Rate Basis	NA	NA	NA
Emission rate (lb/hr)	NA	NA	NA
(TPY)	NA	NA	NA

Note: ppmvd= parts per million, volume dry; O_2= oxygen.

Source: GE, 1998; Golder Associates, 1998; EPA, 1996

Table A-11. Maximum Emissions for Other Regulated PSD Pollutants for the Shady Hills Generatng Station Project
GE Frame 7FA, Dry Low NOx Combustor, Natural Gas, 50% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	3,390	3,390	3,390
2,3,7,8-TCDD Equivalents (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	1.20E-06	1.20E-06	1.20E-06
Heat Input Rate (MMBtu/hr)	1.21E+03	1.15E+03	1.06E+03
Emission Rate (lb/hr)	1.46E-09	1.38E-09	1.28E-09
(TPY)	2.47E-09	2.33E-09	2.16E-09
Beryllium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Fluoride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b) , lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Mercury (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	7.48E-04	7.48E-04	7.48E-04
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	9.08E-07	8.59E-07	7.95E-07
(TPY)	1.54E-06	1.46E-06	1.35E-06
Sulfuric Acid Mist = Fuel Use (lb/hr) x sulfur (S) content (fraction) x conversion of S to H_2SO_4 (%) x MW H_2SO_4 /MW S (98/32)			
Fuel Usage (cf/hr)	1,177,217	1,112,653	1,030,872
Sulfur (lb/hr)	1.68	1.59	1.47
lb H_2SO_4 /lb S (98/32)	3.0625	3.0625	3.0625
Conversion to H_2SO_4 (%) (c)	10	10	10
Emission Rate (lb/hr)	0.52	0.49	0.45
(TPY)	0.87	0.83	0.76

Sources: (a) Golder Associates, 1998; (b) EPA, 1981; (c) Assumed.

Note: No Emission Factors for Hydrogen chloride (HCl) from natural gas firing.

Table A-12. Maximum Emissions for Hazardous Air Pollutants for the Shady Hills Generatng Station Project
GE Frame 7FA, Dry Low NOx Combustor, Natural Gas, 50% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	3,390	3,390	3,390
Antimony (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0.00E+00	0.00E+00	0.00E+00
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Benzene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0.8	0.8	0.8
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	9.71E-04	9.18E-04	8.51E-04
(TPY)	1.65E-03	1.56E-03	1.44E-03
Cadmium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	0	0	0
(TPY)	0.00E+00	0.00E+00	0.00E+00
Chromium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Formaldehyde (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	34	34	34
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	4.13E-02	3.90E-02	3.62E-02
(TPY)	7.00E-02	6.61E-02	6.13E-02
Cobalt (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1.21E+03	1.15E+03	1.06E+03
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00
(TPY)	0	0	0
Manganese (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Nickel (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Phosphorous (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b), lb/10^{12} Btu	0.00E+00	0.00E+00	0.00E+00
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Selenium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Toluene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	10	10	10
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	1.21E-02	1.15E-02	1.06E-02
(TPY)	2.06E-02	1.95E-02	1.80E-02

Sources: (a) Golder Associates, 1998; (b) EPA,1996 (AP-42,Table 3.1-4)

Table A-13. Design Information and Stack Parameters for the Shady Hills Generatng Station Project
GE Frame 7FA, Dry Low NOx Combustor, Distillate Oil, Base Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Combustion Turbine Performance			
Net power output (MW)	183.9	181.9	171.2
Net heat rate (Btu/kWh, LHV)	10,103	9,929	9,988
(Btu/kWh, HHV)	10,710	10,524	10,588
Heat Input (MMBtu/hr, LHV)	1,858	1,806	1,710
(MMBtu/hr, HHV)	1,969	1,914	1,813
Fuel heating value (Btu/lb, LHV)	18,300	18,300	18,300
(Btu/lb, HHV)	19,398	19,398	19,398
(HHV/LHV)	1.060	1.060	1.060
CT Exhaust Flow			
Mass Flow (lb/hr)- with margin of 10%	4,230,600	4,081,000	3,825,800
- provided	3,846,000	3,710,000	3,478,000
Temperature (°F)	1,076	1,094	1,121
Moisture (% Vol.)	11	11.7	13.3
Oxygen (% Vol.)	11.20	11.04	10.60
Molecular Weight	28.33	28.25	28.06
Fuel Usage			
Fuel usage (lb/hr) = Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))			
Heat input (MMBtu/hr, LHV)	1,858	1,806	1,710
Heat content (Btu/lb, LHV)	18,300	18,300	18,300
Fuel usage (lb/hr)- calculated	101,530	98,689	93,443
CT Stack			
Stack height (ft)	60	60	60
Diameter (ft)	22	22	22
Turbine Flow Conditions			
Turbine Flow (acfm) = [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F)+ 460°F)] / [Molecular weight x 2116.8] / 60 min/hr			
Mass flow (lb/hr)	4,230,600	4,081,000	3,825,800
Temperature (°F)	1,076	1,094	1,121
Molecular weight	28.33	28.25	28.06
Volume flow (acfm)- calculated	2,790,601	2,731,215	2,622,427
(ft3/s)- calculated	46,510	45,520	43,707
Velocity (ft/sec)	122.4	119.7	115.0

Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft^2; 14.7 lb/ft^3

Source: GE, 1999; Golder Associates, 1999

Table A-14. Maximum Emissions for Criteria Pollutants for the Shady Hills Generatng Station Project
GE Frame 7FA, Dry Low NOx Combustor, Distillate Oil, Base Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	1,000	1,000	1,000
Particulate (lb/hr) = Emission rate (lb/hr) from manufacturer			
Basis (excludes H_2SO_4), lb/hr	17	17	17
Emission rate (lb/hr)- provided	17.0	17.0	17.0
(TPY)	8.5	8.5	8.5
Sulfur Dioxide (lb/hr) = Natural gas (lb/hr) x sulfur content (%/100) x (lb SO_2 /lb S)			
Fuel Sulfur Content	0.05%	0.05%	0.05%
Fuel use (lb/hr)	101,530	98,689	93,443
lb SO_2 /lb S (64/32)	2	2	2
Emission rate (lb/hr)	101.5	98.7	93.4
(TPY)	50.77	49.34	46.72
Nitrogen Oxides (lb/hr) = NOx(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 x Volume flow (acfm) x 46 (mole. wgt NOx) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 5.9 x 1,000,000 (adj. for ppm)]			
Basis, ppmvd @15% O_2	42	42	42
Moisture (%)	11	11.7	13.3
Oxygen (%)	11.2	11.04	10.6
Turbine Flow (acfm)	2,790,601	2,731,215	2,622,427
Turbine Exhaust Temperature (°F)	1,076	1,094	1,121
Emission rate (lb/hr)	362.0	350.8	335.8
(TPY)	181.0	175.4	167.9
Carbon Monoxide (lb/hr) = CO(ppm) x [1 - Moisture(%)/100] x 2116.8 lb/ft2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]			
Basis, ppmvd	20	20	20
Moisture (%)	11	11.7	13.3
Turbine Flow (acfm)	2,790,601	2,731,215	2,622,427
Turbine Exhaust Temperature (°F)	1,076	1,094	1,121
Emission rate (lb/hr)	74.4	71.4	66.2
(TPY)	37.2	35.7	33.1
VOCs (lb/hr) = VOC(ppmvw) x 2116.8 lb/ft2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]			
Basis, ppmvw	7	7	7
Turbine Flow (acfm)	2,790,601	2,731,215	2,622,427
Turbine Exhaust Temperature (°F)	1,076	1,094	1,121
Emission rate (lb/hr)	16.73	16.18	15.27
(TPY)	8.4	8.1	7.6
Lead (lb/hr)= NA			
Emission Rate Basis (lb/10^{12} Btu)	10.8	10.8	10.8
Emission rate (lb/hr)	0.0213	0.0207	0.0196
(TPY)	0.0106	0.0103	0.0098

Note: ppmvd= parts per million, volume dry; O_2= oxygen.
Source: GE, 1998; Golder Associates, 1998; EPA, 1996 (AP-42 draft revisions)

Table A-15. Maximum Emissions for Other Regulated PSD Pollutants for the Shady Hills Generatng Station Project
GE Frame 7FA, Dry Low NOx Combustor, Distillate Oil, Base Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	1,000	1,000	1,000
2,3,7,8 TCDD Equivalents (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	3.38E-04	3.38E-04	3.38E-04
Heat Input Rate (MMBtu/hr)	1.97E+03	1.91E+03	1.81E+03
Emission Rate (lb/hr)	6.66E-07	6.47E-07	6.13E-07
(TPY)	3.33E-07	3.24E-07	3.06E-07
Beryllium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0.331	0.331	0.331
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	6.52E-04	6.34E-04	6.00E-04
(TPY)	3.26E-04	3.17E-04	3.00E-04
Fluoride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b), lb/10^{12} Btu	32.54	32.54	32.54
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	6.41E-02	6.23E-02	5.90E-02
(TPY)	3.20E-02	3.11E-02	2.95E-02
Hydrogen Chloride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (c), lb/10^{12} Btu	2.12E+02	2.12E+02	2.12E+02
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	4.18E-01	4.06E-01	3.84E-01
(TPY)	2.09E-01	2.03E-01	1.92E-01
Mercury (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	6.26E-01	6.26E-01	6.26E-01
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	1.23E-03	1.20E-03	1.13E-03
(TPY)	6.16E-04	5.99E-04	5.67E-04
Sulfuric Acid Mist = Fuel Use (lb/hr) x sulfur (S) content (fraction) x conversion of S to H_2SO_4 (%) x MW H_2SO_4 /MW S (98/32)			
Fuel Usage (cf/hr)	101,530	98,689	93,443
Sulfur (lb/hr)	50.77	49.34	46.72
lb H_2SO_4 /lb S (98/32)	3.0625	3.0625	3.0625
Conversion to H_2SO_4 (%) (d)	10	10	10
Emission Rate (lb/hr)	15.55	15.11	14.31
(TPY)	7.77	7.56	7.15

Sources: (a) EPA, 1998 (AP-42 draft revisions); (b) EPA, 1981; (c) 4 ppm assumed based on ASTM D2880
(d) assumed based on combustion and HRSG effects.

Table A-16. Maximum Emissions for Hazardous Air Pollutants for the Shady Hills Generatng Station Project
GE Frame 7FA, Dry Low NOx Combustor, Distillate Oil, Base Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	1,000	1,000	1,000
Arsenic (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	7.91E+00	7.91E+00	7.91E+00
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	1.56E-02	1.51E-02	1.43E-02
(TPY)	7.79E-03	7.57E-03	7.17E-03
Benzene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	1.1	1.1	1.1
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	2.17E-03	2.11E-03	1.99E-03
(TPY)	1.08E-03	1.05E-03	9.97E-04
Cadmium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	3.24	3.24	3.24
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	6.38E-03	6.20E-03	5.87E-03
(TPY)	3.19E-03	3.10E-03	2.94E-03
Chromium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	6.76	6.76	6.76
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	1.33E-02	1.29E-02	1.23E-02
(TPY)	6.66E-03	6.47E-03	6.13E-03
Formaldehyde (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	2	2	2
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	3.94E-03	3.83E-03	3.63E-03
(TPY)	1.97E-03	1.91E-03	1.81E-03
Cobalt (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b) , lb/10^{12} Btu	37	37	37
Heat Input Rate (MMBtu/hr)	1.97E+03	1.91E+03	1.81E+03
Emission Rate (lb/hr)	7.29E-02	7.08E-02	6.71E-02
(TPY)	3.64E-02	3.54E-02	3.35E-02
Manganese (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	432	432	432
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	8.51E-01	8.27E-01	7.83E-01
(TPY)	4.25E-01	4.14E-01	3.92E-01
Nickel (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	86.3	86.3	86.3
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	1.70E-01	1.65E-01	1.56E-01
(TPY)	8.50E-02	8.26E-02	7.82E-02
Phosphorous (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b) , lb/10^{12} Btu	3.00E+02	3.00E+02	3.00E+02
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	0.590844	0.574308	0.54378
(TPY)	0.295422	0.287154	0.27189
Selenium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	23	23	23
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	4.53E-02	4.40E-02	4.17E-02
(TPY)	2.26E-02	2.20E-02	2.08E-02
Toluene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	237	237	237
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	4.67E-01	4.54E-01	4.30E-01
(TPY)	2.33E-01	2.27E-01	2.15E-01

Sources: (a) EPA, 1998 (AP-42 draft revisions); (b) EPA,1996 (AP-42,Table 3.1-4)

Table A-17. Design Information and Stack Parameters for the Shady Hills Generatng Station Project
GE Frame 7FA, Dry Low NOx Combustor, Distillate Oil, 75% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Combustion Turbine Performance			
Net power output (MW)	136.6	132.3	118.5
Net heat rate (Btu/kWh, LHV)	11,069	11,073	11,553
(Btu/kWh, HHV)	11,733	11,738	12,246
Heat Input (MMBtu/hr, LHV)	1,512	1,465	1,369
(MMBtu/hr, HHV)	1,603	1,553	1,451
Fuel heating value (Btu/lb, LHV)	18,300	18,300	18,300
(Btu/lb, HHV)	19,398	19,398	19,398
(HHV/LHV)	1.060	1.060	1.060
CT Exhaust Flow			
Mass Flow (lb/hr)- with margin of 10%	3,287,900	3,225,200	3,106,400
- provided	2,989,000	2,932,000	2,824,000
Temperature (°F)	1,170	1,176	1,186
Moisture (% Vol.)	11.5	11.8	12.9
Oxygen (% Vol.)	10.70	10.80	10.80
Molecular Weight	28.29	28.26	28.12
Fuel Usage			
Fuel usage (lb/hr) = Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))			
Heat input (MMBtu/hr, LHV)	1,512	1,465	1,369
Heat content (Btu/lb, LHV)	18,300	18,300	18,300
Fuel usage (lb/hr)- calculated	82,623	80,055	74,809
CT Stack			
Stack height (ft)	60	60	60
Diameter (ft)	22	22	22
Turbine Flow Conditions			
Turbine Flow (acfm) = [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F)+ 460°F)] / [Molecular weight x 2116.8] / 60 min/hr			
Mass flow (lb/hr)	3,287,900	3,225,200	3,106,400
Temperature (°F)	1,170	1,176	1,186
Molecular weight	28.29	28.26	28.12
Volume flow (acfm)- calculated	2,304,584	2,271,141	2,212,060
(ft3/s)- calculated	38,410	37,852	36,868
Velocity (ft/sec)	101.0	99.6	97.0

Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft^2; 14.7 lb/ft^3

Source: GE, 1999; Golder Associates, 1999

Table A-18. Maximum Emissions for Criteria Pollutants for the Shady Hills Generatng Station Project
GE Frame 7FA, Dry Low NOx Combustor, Distillate Oil, 75% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	1,000	1,000	1,000
Particulate (lb/hr) = Emission rate (lb/hr) from manufacturer			
Basis (excludes H_2SO_4), lb/hr	17	17	17
Emission rate (lb/hr)- provided	17.0	17.0	17.0
(TPY)	8.5	8.5	8.5
Sulfur Dioxide (lb/hr) = Natural gas (lb/hr) x sulfur content (%/100) x (lb SO_2 /lb S)			
Fuel Sulfur Content	0.05%	0.05%	0.05%
Fuel use (lb/hr)	82,623	80,055	74,809
lb SO_2 /lb S (64/32)	2	2	2
Emission rate (lb/hr)	82.6	80.1	74.8
(TPY)	41.31	40.03	37.40
Nitrogen Oxides (lb/hr) = NOx(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 x Volume flow (acfm) x 46 (mole. wgt NOx) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 5.9 x 1,000,000 (adj. for ppm)]			
Basis, ppmvd @15% O_2	42	42	42
Moisture (%)	11.5	11.8	12.9
Oxygen (%)	10.7	10.8	10.8
Turbine Flow (acfm)	2,304,584	2,271,141	2,212,060
Turbine Exhaust Temperature (°F)	1,170	1,176	1,186
Emission rate (lb/hr)	296.7	285.3	267.8
(TPY)	148.4	142.6	133.9
Carbon Monoxide (lb/hr) = CO(ppm) x [1 - Moisture(%)/100] x 2116.8 lb/ft2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]			
Basis, ppmvd	20	20	20
Moisture (%)	11.5	11.8	12.9
Turbine Flow (acfm)	2,304,584	2,271,141	2,212,060
Turbine Exhaust Temperature (°F)	1,170	1,176	1,186
Emission rate (lb/hr)	57.6	56.4	53.9
(TPY)	28.8	28.2	26.9
VOCs (lb/hr) = VOC(ppmvw) x 2116.8 lb/ft2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]			
Basis, ppmvw	7	7	7
Turbine Flow (acfm)	2,304,584	2,271,141	2,212,060
Turbine Exhaust Temperature (°F)	1,170	1,176	1,186
Emission rate (lb/hr)	13.02	12.78	12.37
(TPY)	6.5	6.4	6.2
Lead (lb/hr)= NA			
Emission Rate Basis (lb/10^{12} Btu)	10.8	10.8	10.8
Emission rate (lb/hr)	0.0173	0.0168	0.0157
(TPY)	0.0087	0.0084	0.0078

Note: ppmvd= parts per million, volume dry; O_2= oxygen.

Source: GE, 1998; Golder Associates, 1998; EPA, 1996 (AP-42 draft revisions)

Table A-19. Maximum Emissions for Other Regulated PSD Pollutants for the Shady Hills Generatng Station Project
GE Frame 7FA, Dry Low NOx Combustor, Distillate Oil, 75% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	1,000	1,000	1,000
2,3,7,8 TCDD Equivalents (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	3.80E-04	3.80E-04	3.80E-04
Heat Input Rate (MMBtu/hr)	1.60E+03	1.55E+03	1.45E+03
Emission Rate (lb/hr)	6.09E-07	5.90E-07	5.51E-07
(TPY)	3.05E-07	2.95E-07	2.76E-07
Beryllium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	0.331	0.331	0.331
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	5.31E-04	5.14E-04	4.80E-04
(TPY)	2.65E-04	2.57E-04	2.40E-04
Fluoride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b) , lb/10^{12} Btu	32.54	32.54	32.54
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	5.22E-02	5.05E-02	4.72E-02
(TPY)	2.61E-02	2.53E-02	2.36E-02
Hydrogen Chloride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (c) , lb/10^{12} Btu	2.12E+02	2.12E+02	2.12E+02
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	3.40E-01	3.29E-01	3.08E-01
(TPY)	1.70E-01	1.65E-01	1.54E-01
Mercury (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	6.26E-01	6.26E-01	6.26E-01
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	1.00E-03	9.72E-04	9.08E-04
(TPY)	5.02E-04	4.86E-04	4.54E-04
Sulfuric Acid Mist = Fuel Use (lb/hr) x sulfur (S) content (fraction) x conversion of S to H_2SO_4 (%) x MW H_2SO_4 /MW S (98/32)			
Fuel Usage (cf/hr)	82,623	80,055	74,809
Sulfur (lb/hr)	41.31	40.03	37.40
lb H_2SO_4 /lb S (98/32)	3.0625	3.0625	3.0625
Conversion to H_2SO_4 (%) (d)	10	10	10
Emission Rate (lb/hr)	12.65	12.26	11.46
(TPY)	6.33	6.13	5.73

Sources: (a) EPA, 1998 (AP-42 draft revisions); (b) EPA, 1981; (c) 4 ppm assumed based on ASTM D2880
(d) assumed based on combustion and HRSG effects.

Table A-20. Maximum Emissions for Hazardous Air Pollutants for the Shady Hills Generatng Station Project
GE Frame 7FA, Dry Low NOx Combustor, Distillate Oil, 75% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	1,000	1,000	1,000
Arsenic (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	7.91E+00	7.91E+00	7.91E+00
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	1.27E-02	1.23E-02	1.15E-02
(TPY)	6.34E-03	6.14E-03	5.74E-03
Benzene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	1.1	1.1	1.1
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	1.76E-03	1.71E-03	1.60E-03
(TPY)	8.81E-04	8.54E-04	7.98E-04
Cadmium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	3.24	3.24	3.24
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	5.19E-03	5.03E-03	4.70E-03
(TPY)	2.60E-03	2.52E-03	2.35E-03
Chromium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	6.76	6.76	6.76
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	1.08E-02	1.05E-02	9.81E-03
(TPY)	5.42E-03	5.25E-03	4.90E-03
Formaldehyde (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	2	2	2
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	3.21E-03	3.11E-03	2.90E-03
(TPY)	1.60E-03	1.55E-03	1.45E-03
Cobalt (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b), lb/10^{12} Btu	37	37	37
Heat Input Rate (MMBtu/hr)	1.60E+03	1.55E+03	1.45E+03
Emission Rate (lb/hr)	5.93E-02	5.75E-02	5.37E-02
(TPY)	2.97E-02	2.87E-02	2.68E-02
Manganese (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	432	432	432
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	6.92E-01	6.71E-01	6.27E-01
(TPY)	3.46E-01	3.35E-01	3.13E-01
Nickel (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	86.3	86.3	86.3
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	1.38E-01	1.34E-01	1.25E-01
(TPY)	6.92E-02	6.70E-02	6.26E-02
Phosphorous (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b), lb/10^{12} Btu	3.00E+02	3.00E+02	3.00E+02
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	0.480816	0.46587	0.435342
(TPY)	0.240408	0.232935	0.217671
Selenium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	23	23	23
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	3.69E-02	3.57E-02	3.34E-02
(TPY)	1.84E-02	1.79E-02	1.67E-02
Toluene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	237	237	237
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	3.80E-01	3.68E-01	3.44E-01
(TPY)	1.90E-01	1.84E-01	1.72E-01

Sources: (a) EPA, 1998 (AP-42 draft revisions); (b) EPA,1996 (AP-42,Table 3.1-4)

Table A-21. Design Information and Stack Parameters for the Shady Hills Generatng Station Project
GE Frame 7FA, Dry Low NOx Combustor, Distillate Oil, 50% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Combustion Turbine Performance			
Net power output (MW)	90.2	87.3	77.6
Net heat rate (Btu/kWh, LHV)	13,304	13,162	13,892
(Btu/kWh, HHV)	14,102	13,951	14,725
Heat Input (MMBtu/hr, LHV)	1,200	1,149	1,078
(MMBtu/hr, HHV)	1,272	1,218	1,143
Fuel heating value (Btu/lb, LHV)	18,300	18,300	18,300
(Btu/lb, HHV)	19,398	19,398	19,398
(HHV/LHV)	1.060	1.060	1.060
CT Exhaust Flow			
Mass Flow (lb/hr)- with margin of 10%	2,737,900	2,655,400	2,586,100
- provided	2,489,000	2,414,000	2,351,000
Temperature (°F)	1,200	1,200	1,200
Moisture (% Vol.)	11.2	11.6	12.7
Oxygen (% Vol.)	11.10	11.20	11.30
Molecular Weight	28.29	28.24	28.10
Fuel Usage			
Fuel usage (lb/hr) = Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))			
Heat input (MMBtu/hr, LHV)	1,200	1,149	1,078
Heat content (Btu/lb, LHV)	18,300	18,300	18,300
Fuel usage (lb/hr)- calculated	65,574	62,787	58,907
CT Stack			
Stack height (ft)	60	60	60
Diameter (ft)	22	22	22
Turbine Flow Conditions			
Turbine Flow (acfm) = [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F)+ 460°F)] / [Molecular weight x 2116.8] / 60 min/hr			
Mass flow (lb/hr)	2,737,900	2,655,400	2,586,100
Temperature (°F)	1,200	1,200	1,200
Molecular weight	28.29	28.24	28.10
Volume flow (acfm)- calculated	1,954,205	1,898,809	1,858,599
(ft3/s)- calculated	32,570	31,647	30,977
Velocity (ft/sec)	85.7	83.3	81.5

Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft^2; 14.7 lb/ft^3

Source: GE, 1999; Golder Associates, 1999

Table A-22. Maximum Emissions for Criteria Pollutants for the Shady Hills Generatng Station Project
GE Frame 7FA, Dry Low NOx Combustor, Distillate Oil, 50% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	1,000	1,000	1,000
Particulate (lb/hr) = Emission rate (lb/hr) from manufacturer			
Basis (excludes H_2SO_4), lb/hr	17	17	17
Emission rate (lb/hr)- provided	17.0	17.0	17.0
(TPY)	8.5	8.5	8.5
Sulfur Dioxide (lb/hr) = Natural gas (lb/hr) x sulfur content (%/100) x (lb SO_2 /lb S)			
Fuel Sulfur Content	0.05%	0.05%	0.05%
Fuel use (lb/hr)	65,574	62,787	58,907
lb SO_2 /lb S (64/32)	2	2	2
Emission rate (lb/hr)	65.6	62.8	58.9
(TPY)	32.79	31.39	29.45
Nitrogen Oxides (lb/hr) = NOx(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 x Volume flow (acfm) x 46 (mole. wgt NOx) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 5.9 x 1,000,000 (adj. for ppm)]			
Basis, ppmvd @15% O_2	42	42	42
Moisture (%)	11.2	11.6	12.7
Oxygen (%)	11.1	11.2	11.3
Turbine Flow (acfm)	1,954,205	1,898,809	1,858,599
Turbine Exhaust Temperature (°F)	1,200	1,200	1,200
Emission rate (lb/hr)	236.4	224.0	209.3
(TPY)	118.2	112.0	104.7
Carbon Monoxide (lb/hr) = CO(ppm) x [1 - Moisture(%)/100] x 2116.8 lb/ft2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]			
Basis, ppmvd	30	30	30
Moisture (%)	11.2	11.6	12.7
Turbine Flow (acfm)	1,954,205	1,898,809	1,858,599
Turbine Exhaust Temperature (°F)	1,200	1,200	1,200
Emission rate (lb/hr)	72.2	69.8	67.5
(TPY)	36.1	34.9	33.7
VOCs (lb/hr) = VOC(ppmvw) x 2116.8 lb/ft2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]			
Basis, ppmvw	7	7	7
Turbine Flow (acfm)	1,954,205	1,898,809	1,858,599
Turbine Exhaust Temperature (°F)	1,200	1,200	1,200
Emission rate (lb/hr)	10.84	10.53	10.31
(TPY)	5.4	5.3	5.2
Lead (lb/hr)= NA			
Emission Rate Basis (lb/10^{12} Btu)	10.8	10.8	10.8
Emission rate (lb/hr)	0.0137	0.0132	0.0123
(TPY)	0.0069	0.0066	0.0062

Note: ppmvd= parts per million, volume dry; O_2= oxygen.

Source: GE, 1998; Golder Associates, 1998; EPA, 1996 (AP-42 draft revisions)

Table A-23. Maximum Emissions for Other Regulated PSD Pollutants for the Shady Hills Generatng Station Project
GE Frame 7FA, Dry Low NOx Combustor, Distillate Oil, 50% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	1,000	1,000	1,000
2,3,7,8 TCDD Equivalents (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	3.80E-04	3.80E-04	3.80E-04
Heat Input Rate (MMBtu/hr)	1.27E+03	1.22E+03	1.14E+03
Emission Rate (lb/hr)	4.83E-07	4.63E-07	4.34E-07
(TPY)	2.42E-07	2.31E-07	2.17E-07
Beryllium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0.331	0.331	0.331
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	4.21E-04	4.03E-04	3.78E-04
(TPY)	2.11E-04	2.02E-04	1.89E-04
Fluoride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b), lb/10^{12} Btu	32.54	32.54	32.54
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	4.14E-02	3.96E-02	3.72E-02
(TPY)	2.07E-02	1.98E-02	1.86E-02
Hydrogen Chloride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (c), lb/10^{12} Btu	2.12E+02	2.12E+02	2.12E+02
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	2.70E-01	2.58E-01	2.42E-01
(TPY)	1.35E-01	1.29E-01	1.21E-01
Mercury (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	6.26E-01	6.26E-01	6.26E-01
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	7.96E-04	7.62E-04	7.15E-04
(TPY)	3.98E-04	3.81E-04	3.58E-04
Sulfuric Acid Mist = Fuel Use (lb/hr) x sulfur (S) content (fraction) x conversion of S to H_2SO_4 (%) x MW H_2SO_4 /MW S (98/32)			
Fuel Usage (cf/hr)	65,574	62,787	58,907
Sulfur (lb/hr)	32.79	31.39	29.45
lb H_2SO_4 /lb S (98/32)	3.0625	3.0625	3.0625
Conversion to H_2SO_4 (%) (d)	10	10	10
Emission Rate (lb/hr)	10.04	9.61	9.02
(TPY)	5.02	4.81	4.51

Sources: (a) EPA, 1998 (AP-42 draft revisions); (b) EPA, 1981; (c) 4 ppm assumed based on ASTM D2880
(d) assumed based on combustion and HRSG effects.

Table A-24. Maximum Emissions for Hazardous Air Pollutants for the Shady Hills Generatng Station Project
GE Frame 7FA, Dry Low NOx Combustor, Distillate Oil, 50% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	1,000	1,000	1,000
Arsenic (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	7.91E+00	7.91E+00	7.91E+00
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	1.01E-02	9.63E-03	9.04E-03
(TPY)	5.03E-03	4.82E-03	4.52E-03
Benzene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	1.1	1.1	1.1
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	1.40E-03	1.34E-03	1.26E-03
(TPY)	7.00E-04	6.70E-04	6.28E-04
Cadmium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	3.24	3.24	3.24
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	4.12E-03	3.95E-03	3.70E-03
(TPY)	2.06E-03	1.97E-03	1.85E-03
Chromium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	6.76	6.76	6.76
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	8.60E-03	8.23E-03	7.72E-03
(TPY)	4.30E-03	4.12E-03	3.86E-03
Formaldehyde (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	2	2	2
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	2.54E-03	2.44E-03	2.29E-03
(TPY)	1.27E-03	1.22E-03	1.14E-03
Cobalt (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b), lb/10^{12} Btu	37	37	37
Heat Input Rate (MMBtu/hr)	1.27E+03	1.22E+03	1.14E+03
Emission Rate (lb/hr)	4.71E-02	4.51E-02	4.23E-02
(TPY)	2.35E-02	2.25E-02	2.11E-02
Manganese (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	432	432	432
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	5.50E-01	5.26E-01	4.94E-01
(TPY)	2.75E-01	2.63E-01	2.47E-01
Nickel (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	86.3	86.3	86.3
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	1.10E-01	1.05E-01	9.86E-02
(TPY)	5.49E-02	5.26E-02	4.93E-02
Phosphorous (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b), lb/10^{12} Btu	3.00E+02	3.00E+02	3.00E+02
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	0.3816	0.365382	0.342804
(TPY)	0.1908	0.182691	0.171402
Selenium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	23	23	23
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	2.93E-02	2.80E-02	2.63E-02
(TPY)	1.46E-02	1.40E-02	1.31E-02
Toluene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	237	237	237
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	3.01E-01	2.89E-01	2.71E-01
(TPY)	1.51E-01	1.44E-01	1.35E-01

Sources: (a) EPA, 1998 (AP-42 draft revisions); (b) EPA,1996 (AP-42,Table 3.1-4)

APPENDIX B

BEST AVAILABLE CONTROL TECHNOLOGY FOR THE PROPOSED COMBUSTION TURBINES

B.1 NEW SOURCE PERFORMANCE STANDARDS

The NSPS regulations (40 CFR, Subpart GG) applicable to gas turbines apply to:

1. Electric utility stationary gas turbines with a heat input at peak load of greater than 100 x 10^6 Btu/hr [40 CFR 60.332 (b)];
2. Stationary gas turbines with a heat input at peak load between 10 and 100 x 10^6 Btu/hr [40 CFR 60.332 (c)]; or
3. Stationary gas turbines with a manufacturer's rate base load at ISO conditions of 30 MW or less [40 CFR 60.332 (d)].

The electric utility stationary gas turbine provisions apply to stationary gas turbines constructed for the purpose of supplying more than one-third of their potential electric output capacity for sale to any utility power distribution system [40 CFR 60.331 (q)]. The requirements for electric utility stationary gas turbines are applicable to the 501F turbines proposed for the project and are the most stringent provision of the NSPS. These requirements are summarized in Table B-1 and were considered in the BACT analysis.

As noted from Table B-1, the NSPS NO_x emission limit can be adjusted upward to allow for fuel-bound nitrogen (FBN). For a fuel-bound nitrogen concentration of 0.015 percent or less, no increase in the NSPS is provided; for a fuel-bound nitrogen concentration of 0.03 percent, the NSPS is increased by 0.0012 percent or 12 parts per million (ppm). The NSPS NO_x emission limit adjustment is not affected by natural gas combustion.

B.2 BEST AVAILABLE CONTROL TECHNOLOGY

B.2.1 NITROGEN OXIDES

Advanced dry low-NO_x combustion alone has increasingly been approved by regulatory agencies as BACT and is technically feasible for the proposed project. Available information suggests that "hot" SCR with dry low-NO_x combustor technology or with wet injection is also available.

Identification of NO_x Control Technologies

NO_x emissions from combustion of fossil fuels consist of thermal NO_x and fuel-bound NO_x. Thermal NO_x is formed from the reaction of oxygen and nitrogen in the combustion air at combustion temperatures. Formation of thermal NO_x depends on the flame temperature, residence time, combustion pressure, and air-to-fuel ratios in the primary combustion zone. The design and operation of the combustion chamber dictates these conditions. Fuel-bound NO_x is created by the oxidation of volatilized nitrogen in the fuel. Nitrogen content in the fuel is the primary factor in its formation.

Table B-2 presents a listing of the lowest achievable emission rates/best available control technology (LAER/BACT) decisions made by state environmental agencies and EPA regional offices for gas turbines. This table was developed from the information obtained from BACT/LAER Information System (BLIS) database maintained at EPA's National Computer Center located at Research Triangle Park, North Carolina.

Historically, the most stringent NO_x controls for CTs established as LAER/BACT by state agencies were selective catalytic reduction (SCR) with wet injection and wet injection alone. When SCR has been employed, wet injection is used initially to reduce NO_x emissions. However, advanced dry low-NO_x technology has only recently been developed and made available for gas turbines. SCR is a post-combustion control, while advanced dry low-NO_x combustors minimize the formation of NO_x in the combustion process.

SCR has been installed or permitted in over 100 projects. The majority of these projects (more than 90 percent) were initially cogeneration facilities with capacities of 50 MW or less. Most of these projects have been in California. Many of these projects have installed SCR have been in the Southern California NO_2 nonattainment area where SCR was required not as BACT but as LAER, a more stringent requirement. LAER is distinctly different from BACT in that there is no consideration of economic, energy, or environmental impacts; if a control technology has previously been installed, it must be required as LAER. LAER is defined as follows:

> Lowest achievable emission rate means, for any source, the more stringent rate of emissions based on the following: (i) The most stringent emissions limitation which is contained in the implementation plan of any State of such class or category of stationary source, unless the owner or operator of the proposed stationary source demonstrates that such limitations are not achievable; or (ii) The most stringent emissions limitation which is achieved in practice by such class or category of stationary source. This limitation, when applied to a modification, means the lowest achievable emissions rate for the new or modified emissions units within the stationary source. In no event shall the application of this term permit a proposed new modified stationary source to emit any pollutant in excess of the amount allowable under applicable new source standards of performance (40 CFR 51, Appendix S.II, A.18).

As noted previously, there are distinct regulatory and policy differences between LAER and BACT.

As discussed in Section 3.0, BACT involves an evaluation of the economic, environmental, and energy impacts of alternative control technologies. In contrast, LAER only considers the technical aspects of control.

All the projects in California have natural gas as the primary fuel, and less than 15 percent of the SCR applications in California have distillate fuel as backup.

There are also projects with SCR located in Vermont, Massachusetts, Connecticut, New Jersey, New York, Rhode Island, and Virginia. A majority of these projects are also cogenerators or independent power producers. The size of these projects ranges from 22 MW to 450 MW, with a majority less than 100 MW in size. While almost all of the facilities have distillate oil as backup fuel, distillate oil generally is restricted by permit to 1,000 hours or less per CT.

Reported and permitted NO_x removal efficiencies of SCR range from 40 to 80 percent of NO_x in the exhaust gas stream. The most common emission limiting standards associated with SCR are approximately 9 ppm for natural gas firing. However, a few facilities have reported emission limits of 3.5 ppm and less.

Wet injection historically (pre-1990's) has been the primary method of reducing NO_x emissions from CTs. Indeed, this method of control was first mandated by the NSPS to reduce NO_x levels to 75 parts per million by volume, dry (ppmvd) (corrected to 15 percent O_2 and heat rate). Development of improved wet injection combustors reduced NO_x concentrations to 25 ppmvd (corrected to 15 percent O_2) when burning natural gas. More recently, however, CT manufacturers have developed dry low-NO_x combustors that can reduce NO_x concentrations to 15 ppmvd (corrected to 15 percent O_2) or less when firing natural gas.

Technology Description and Feasibility

Wet Injection

The injection of water or steam in the combustion zone of CTs reduces the flame temperature with a corresponding decrease of NO_x emissions. The amount of NO_x reduction possible depends on the combustor design and the water-to-fuel ratio employed. An increase in the water-to-fuel ratio will cause a concomitant decrease in NO_x emissions until flame instability occurs. At this point, operation of the CT becomes inefficient and unreliable, and significant increases in products of incomplete combustion results (i.e., CO and VOC emissions). In "F" Class turbines using wet injection with gas firing, the NO_x emission rates in the 30 ppm have been demonstrated. However, wet injection is no longer offered for gas firing in "F" Class turbine. Wet injection is the only current feasible means of reducing NO_x emissions in the combustion process when firing oil.

Dry Low-NO_x Combustor

In the past several years, CT manufacturers have offered and installed machines with dry low-NO_x combustors. These combustors, which are offered on conventional machines manufactured by Westinghouse, GE, Kraftwork Union, and ABB, can achieve NO_x concentrations of 25 ppmvd or less when firing natural gas. Westinghouse and GE have offered dry low-NO_x combustors on advanced heavy-duty industrial machines. Thermal NO_x formation is inhibited by using combustion techniques where the natural gas and combustion air are premixed before ignition. For the CT being considered for the project, the combustion chamber design includes the use of dry low-NO_x combustor technology. The NO_x emission level when firing natural gas at baseload conditions is 9 ppmvd (corrected to 15 percent O_2), a level which is guaranteed by the selected vendor (Westinghouse or equivalent) for the project.

Selective Catalytic Reduction

Selective Catalytic Reduction (SCR) uses ammonia (NH_3) to react with NO_x in the gas stream in the presence of a catalyst. NH_3, which is diluted with air to about 5 percent by volume, is introduced into the gas stream at reaction temperatures between 600°F and 750°F. The reactions are as follows:

$$4NH_3 + 4NO + O_2 = 4N_2 + 6H_2O$$

$$4NH_3 + 2NO_2 + O_2 = 3N_2 + 6H_2O$$

SCR operating experience, as applied to gas turbines, consists primarily of baseload natural-gas-fired installations either of cogeneration or combined cycle configuration; no simple cycle facilities have SCR. Exhaust gas temperatures of simple cycle CTs generally are in the range of 1,000°F, which exceeds the optimum range for SCR with base metal catalysts. All current SCR applications have the catalyst placed in the HRSG to achieve proper reaction conditions. This allows a relatively constant temperature for the reaction of NH_3 and NO_x on the catalyst surface.

The use of SCR has been primarily limited to combined-cycle facilities that burn natural gas with small amounts of fuel oil, since SCR catalysts are contaminated by sulfur-containing fuels . For most fuel-oil-burning facilities, catalyst operation is discontinued, or the exhaust bypasses the SCR system. While the operating experience with SCR has not been extensive, certain cost, technical, and environmental considerations have surfaced for units firing both natural gas and oil while using SCR.

Ammonium salts (ammonium sulfate and bisulfate) are formed by the reaction of NH_3 and sulfur combustion products. Ammonium bisulfate can be corrosive and could cause damage to the HRSG surfaces that follow the catalyst, as well as to the stack. Corrosion protection for these areas would be required with concomitant cost and technical requirements. Ammonium sulfate is emitted as particulate matter. While the formation of ammonium salts is primarily associated with oil firing, sulfur combustion products from natural gas also could form small amounts of ammonium salts.

Zeolite and specially designed high temperature catalysts, which are reported to be capable of withstanding temperature ranges up to 1,100°F, have become available commercially only recently. Their application with SCR primarily has been limited to internal combustion engines. Optimum performance of an SCR system using a zeolite catalyst is reported to range from about 800°F to 900°F. At temperatures of 1,100°F and above, the high-temperature catalyst will be irreparably damaged.

In the 1990s there are four simple cycle combustion turbine projects that have installed SCR with operating experience. These projects are:

- Redding Municipal Power – 3 GE Frame 5 CTs fired with natural gas. The CTs are operated as a peaking facility.
- SoCal Gas Company – 4 Solar Centaur CTs (4MW equivalent each) fired with natural gas. The CTs are operated in intermediate cycling duty.
- UnoCal Brea Research Center – a single 4 MW CT firing natural gas. The CT operates in intermediate to base load duty.
- Puerto Rico Electric Power Authority (Cambalache Facility) – 3 ABB Type 11 N (83 MW each) firing No. 2 distillate oil.

The SCRs for all these CTs were designed to operate at temperatures less than 1,000 °F. Many of the smaller CTs have exhaust temperatures less than 1,000 °F. The Cambalache Facility had a once through steam generator in the ductwork leading to SCR used for power augmentation that reduced the catalyst temperature to less than 1,000 °F. Experience on these systems has shown significant catalyst deactivation occurs with peaking and intermediate cycling duty while firing natural gas. Under these conditions catalyst deactivation has occurred after operating from 350 to 4,000 hours. For intermediate-base load duty and firing natural gas, catalyst deactivation improved but still occurred after 8,000 hour of operation and well less the catalyst guarantee. When firing distillate oil, catalyst deactivation occurred after 600 hours. Due to the problems with oil firing, the SCR system for the Cambalache Facility has been removed. This experience suggests that SCR for simple cycle CTs while available from vendors has not been demonstrated as feasible.

SCONO$_x$™ Process

SCONO$_x$™ is a NO_x and CO control system exclusively offered by Goal Line Environmental Technologies (GLET). GLET is a partnership formed by Sunlaw Energy Corporation and Advanced Catalyst Systems, Inc.

The SCONO$_x$™ system employs a single catalyst to simultaneously oxidize CO to CO_2 and NO to NO_2. NO_2 formed by the oxidation of NO is subsequently absorbed onto the catalyst surface through the use of a potassium carbonate absorber coating. The SCONO$_x$™ oxidation/absorption cycle reactions are:

$$CO + \tfrac{1}{2} O_2 \Rightarrow CO_2 \quad (1)$$
$$NO + \tfrac{1}{2} O_2 \Rightarrow NO_2 \quad (2)$$
$$2NO_2 + K_2CO_3 \Rightarrow CO_2 + KNO_2 + KNO_3 \quad (3)$$

CO_2 produced by reaction (1) and (2) is released to the atmosphere as part of the CT/HRSG exhaust gas stream.

As shown in Reaction (3), the potassium carbonate catalyst coating reacts with NO_2 to form potassium nitrites and nitrates. Prior to saturation of the potassium carbonate coating, the catalyst must be regenerated. This regeneration is accomplished by passing a dilute hydrogen-reducing gas across the surface of the catalyst in the absence of O_2. Hydrogen in the reducing gas reacts with the nitrites and nitrates to form water and elemental nitrogen. CO_2 in the regeneration gas reacts with potassium nitrites and nitrates to form potassium carbonate; this compound is the catalyst absorber coating present on the surface of the catalyst at the start of the oxidation/absorption cycle. The SCONO$_x$™ regeneration cycle reaction is:

$$KNO_2 + KNO_3 + 4\,H_2 + CO_2 \Rightarrow K_2CO_3 + 4\,H_2O_{(g)}) + N_2 \quad (4)$$

Water vapor and elemental nitrogen are released to the atmosphere as part of the CT/HRSG exhaust stream. Following regeneration, the SCONO$_x$™ catalyst has a fresh coating of potassium carbonate, allowing the oxidation/absorption cycle to begin again. There is no net gain or loss of potassium carbonate after both the oxidation/absorption and regeneration cycles have been completed.

Since the regeneration cycle must take place in an oxygen-free environment, the section of catalyst undergoing regeneration is isolated from the exhaust gas stream using a set of louvers. Each catalyst section is equipped with a set of upstream and downstream louvers. During the regeneration cycle, these louvers close and valves open allowing fresh regeneration gas to enter and spent regeneration gas to exit the catalyst section being re-generated. At any given time, 75 percent of the catalyst sections will be in the oxida-tion/absorption cycle, while 25 percent will be in regeneration mode. A regeneration cycle is typically set to last for 3 to 5 minutes.

Regeneration gas is produced by reacting natural gas with O_2 present in ambient air. The SCONO$_x$™ system uses a gas generator produced by Surface Combustion. This unit uses a two-stage process to produce hydrogen and carbon dioxide. In the first stage, natural gas and ambient air are reacted across a partial oxidation catalyst at 1,900°F to form CO and hydrogen. Steam is added and the gas mixture is then passed across a low temperature shift catalyst, forming CO_2 and additional hydrogen. The resulting gas stream is diluted to less than 4 percent hydrogen using steam or another inert gas. The regeneration gas reactions are:

$$CH_4 + \tfrac{1}{2}O_2 + 1.88\,N_2 \Rightarrow CO + 2\,H_2 + 1.88\,N_2 \tag{5}$$

$$CO + 2\,H_2 + H_2O + 1.88\,N2_2 \Rightarrow CO_2 + 3\,H_2 + 1.88\,N_2 \tag{6}$$

The SCONO$_x$™ operates at a temperature range of 300 to 700°F and, therefore, must be installed in the appropriate temperature section of a HRSG. For SCONO$_x$™ systems installed in locations of the HRSG above 500°F, a separate regeneration gas generator is not required. Instead, regeneration gas is produced by introducing natural gas directly across the SCONO$_x$™ catalyst that reforms the natural gas.

The SCONO$_x$™ system catalyst is subject to reduced performance and deactivation due to exposure to sulfur oxides. For this reason, an additional catalytic oxidation/absorption system (SCONO$_x$™) to remove sulfur compounds is installed upstream of the SCONO$_x$™ catalyst. During regeneration of the SCONO$_x$™ catalyst, either hydrogen sulfide or SO_2 is released to the atmosphere as part of the CT/HRSG exhaust gas stream. The absorption portion of the SCONO$_x$™ process is proprietary. SCONO$_x$™ oxidation/absorption and regeneration reactions are:

$$CO + \frac{1}{2} O_2 \Rightarrow CO_2 \quad (7)$$

$$SO_2 + \frac{1}{2} O_2 \Rightarrow SO_3 \quad (8)$$

$$SO_3 + SORBER \Rightarrow [SO_3 + SORBER] \quad (9)$$

$$[SO_3 + SORBER] + 4\,H_2 \Rightarrow H_2S + 3\,H_2O \quad (10)$$

Utility materials needed for the operation of the SCONO$_x$™ control system include ambient air, natural gas, water, steam, and electricity. The primary utility material is natural gas used for regeneration gas production. Steam is used as the carrier/dilution gas for the regeneration gas. Electricity is required to operate the computer control system, control valves, and louver actuators.

Commercial experience to date with the SCONO$_x$™ control system is limited to one small combined cycle (CC) power plant located in Los Angeles. This power plant, owned by GLET partner Sunlaw Energy Corporation, utilizes a GE LM2500 turbine (30 MW size) equipped with water injection to control NO_x emissions to approximately 25 ppmvd. The SCONO$_x$™ control system was installed at the Sunlaw Energy facility in December 1996 and has achieved a NO_x exhaust concentration of 3.5 ppmv resulting in an approximate 85 percent NO_x removal efficiency.

The SCONO$_x$™ control technology is not considered to be technically feasible because it has not been commercially demonstrated on large CTs. The CTs planned for the project, Westinghouse 501 F units, each have a nominal generating capacity of 170 MW which are approximately six times larger than the nominal 25-MW GE LM2500 utilized at the Sunlaw Energy Corporation Los Angeles facility. Technical problems associated with scale-up of the SCONO$_x$™ technology given the large differences in machine flow rates are unknown. Additional concerns with the SCONO$_x$™ control technology include process complexity (multiple catalytic oxidation / absorption / regeneration systems), reliance on only one supplier, and the relatively brief (approximately 18 months) operating history of the technology.

NO_xOUT Process

The NO_xOUT process originated from the initial research by the Electric Power Research Institute (EPRI) in 1976 on the use of urea to reduce NO_x. EPRI licensed the proprietary process to Fuel Tech, Inc., for commercialization. In the NO_xOUT process, aqueous urea is injected into the flue gas stream ideally within a temperature range of 1,600°F to 1,900°F. In the presence of oxygen, the following reaction results:

$$CO(NH_2)_2 + 2NO + \frac{1}{2} O_2 \Rightarrow 2N_2 + CO_2 + 2H_2O$$

The amount of urea required is most cost-effective when the treatment rate is 0.5 to 2 moles of urea per mole of NO_x. In addition to the original EPRI urea patents, Fuel Tech claims to have a number of proprietary catalysts capable of expanding the effective temperature range of the reaction to between 1,600°F and 1,950°F. Advantages of the system are as follows:

1. Low capital and operating costs as a result of use of urea injection, and
2. The proprietary catalysts used are nontoxic and nonhazardous, thus eliminating potential disposal problems.

Disadvantages of the system are as follows:

1. Formation of ammonia from excess urea treatment rates and/or improper use of reagent catalysts, and
2. Sulfur trioxide (SO_3), if present, will react with ammonia created from the urea to form ammonium bisulfate, potentially plugging the cold end equipment downstream.

Commercial application of the NO_xOUT system is limited and the NO_xOUT system has not been demonstrated on any combustion turbine/HRSG unit.

The NO_xOUT process is not technically feasible for the proposed project because of the high application temperature of 1,600°F to 1,950°F. The maximum exhaust gas temperature of the 501F CT is about 1,000°F. Raising the exhaust temperature the required amount essentially would require installation of a heater. This would be economically prohibitive and would result in an increase in fuel consumption, an increase in the volume of gases that must be treated by the control system, and an increase in uncontrolled air emissions, including NO_x.

Thermal $DeNO_x$

Thermal $DeNO_x$ is Exxon Research and Engineering Company's patented process for NO_x reduction. The process is a high temperature selective noncatalytic reduction (SNCR) of NO_x using ammonia as the reducing agent. Thermal $DeNO_x$ requires the exhaust gas temperature to be above 1,800°F. However, use of ammonia plus hydrogen lowers the temperature requirement to about 1,000°F. For some applications, this must be achieved by additional firing in the exhaust stream before ammonia injection.

The only known commercial applications of Thermal $DeNO_x$ are on heavy industrial boilers, large furnaces, and incinerators that consistently produce exhaust gas temperatures above 1,800°F. There are no known applications on or experience with CTs. Temperatures of 1,800°F require alloy materials constructed with very large piping and components since the exhaust gas volume would be increased by several times. As with the NO_xOUT process, high capital, operating, and maintenance costs are expected because of material requirements, an additional duct burner system, and fuel consumption. Uncontrolled emissions would increase because of the additional fuel burning.

Thus, the Thermal $DeNO_x$ process will not be considered for the proposed project since its high application temperature makes it technically infeasible. The maximum exhaust gas temperature of a 501 F combustion turbine is typically 1,100°F; the cost to raise the exhaust gas to such a high temperature is prohibitively expensive.

Nonselective Catalytic Reduction

Certain manufacturers, such as Engelhard, market a nonselective catalytic reduction system (NSCR) for NO_x control on reciprocating engines. The NSCR process requires a low oxygen content in the exhaust gas stream and high temperature (700°F to 1,400°F) in order to be effective. CTs have the required temperature but also have high oxygen levels (greater than 12 percent) and, therefore, cannot use the NSCR process. As a result, NSCR is not a technically feasible add-on NO_x control device for CTs.

Technology Demonstration and Feasibility

The technical evaluation of post-combustion gas controls that include NO_xOUT, Thermal $DeNO_x$, NSCR, and SCONO™ indicate that these processes have not been applied to simple-cycle turbines and are technically infeasible for the project because of process constraints (e.g., temperature). While high-temperature SCR is feasible, it has not been demonstrated on simple-cycle "F" class turbines in peaking service. Wet injection cannot achieve emission rates lower than 25 ppm when firing natural gas in an "F" Class machine and is not offered by the preferred vendor.

For the BACT analysis, dry low-NO_x combustion technology is technically feasible when firing natural gas and SCR in combination with combustion controls is a potentially feasible alternative that can achieve a maximum degree of emission reduction. The advanced dry low-NO_x combustor alone can achieve 9 ppm (corrected) and the SCR with dry low-NO_x combustor is capable of achieving a NO_x emission level of 3.6 ppm when firing natural gas (corrected to 15 percent O_2 dry conditions).

Below is a summary of the technical demonstration and feasibility for the proposed project.

Technology	Simple Cycle
Dry Low-NO_x Combustors	Demonstrated and Feasible – Gas Firing
Wet Injection	Not Feasible/Available – Gas Firing
Wet Injection	Feasible/Available – Oil Firing
Selective Catalytic Reduction	Not Demonstrated on "F" Class turbines in peaking service
Thermal De NO_x	Not Feasible
NO_x Out	Not Feasible
SCO NO_x	Not Feasible
NSCR	Not Feasible

SCR Cost Estimates

Tables B-3 and B-4 present the total capital and annualized cost for SCR applied to simple cycle operation, respectively. The costs were developed using EPA Cost Control Manual (EPA, 1990 & 1993). Vendor based estimates were used for the SCR system. Standard EPA recommended cost factors were used. A capital recovery period of 15 years was used for the capital costs and 3 years for the reoccurring capital costs (i.e., catalyst). SCR system in simple-cycle operation would be subjected to temperatures exceeding 1,000°F where considerable wear can take place resulting in lower life of equipment. Capital recovery periods in this case may be much lower.

B.2.2 Carbon Monoxide

Identification of CO Control Technologies

CO emissions are a result of incomplete or partial combustion of fossil fuel. Combustion design and catalytic oxidation are the control alternatives that are viable for the project. Table B-5 presents a listing of LAER/BACT decisions for CO emissions from combustion turbines. Combustion design is the more common control technique used in CTs. Sufficient time, temperature, and turbulence is required within the combustion zone to maximize combustion efficiency and minimize the emissions of CO. Combustion efficiency is dependent upon combustor design. For the CTs being evaluated, CO emissions will not exceed 12 ppmvd, corrected to 15 percent O_2, dry conditions when firing natural gas under full load conditions.

Catalytic oxidation is a post-combustion control that has been employed in CO nonattainment areas where regulations have required CO emission levels to be less than those associated with wet injection. These installations have been required to use LAER technology and typically have CO limits in the 10 ppm range (corrected to dry conditions).

Technology Description

In an oxidation catalyst control system, CO emissions are reduced by allowing unburned CO to react with oxygen at the surface of a precious metal catalyst, such as platinum. Combustion of CO starts at about 300°F, with efficiencies above 90 percent occurring at temperatures above 600°F. Catalytic oxidation occurs at temperatures 50 percent lower than that of thermal oxidation, which reduces the amount of thermal energy required.

For CTs, the oxidation catalyst can be located directly after the CT. Catalyst size depends upon the exhaust flow, temperature, and desired efficiency. The existing oxidation catalyst applications primarily have been limited to smaller cogeneration facilities burning natural gas. Oxidation catalysts have not been used on fuel-oil-fired CTs or combined cycle facilities. The use of sulfur-containing fuels in an oxidation catalyst system would result in an increase of SO_3 emissions and concomitant corrosive effects to the stack. In addition, trace metals in the fuel could result in catalyst poisoning during prolonged periods of operation.

Since the units likely will require numerous startups, during simple-cycle operation, variations in exhaust conditions will influence catalyst life and performance. Very little technical data exist to demonstrate the effect of such cycling.

Oxidation Catalyst Costs

Tables B-6 and B-7 present the capital and annualized cost for an oxidation catalyst applied to simple cycle operation. The maximum CO impacts are less than 0.1 percent of the applicable ambient air quality standards. There would also be no secondary benefits, such as reducing acidic deposition, to reducing CO.

Table B-1. Federal NSPS for Electric Utility Stationary Gas Turbines

Pollutant	Emission Limitation[a]
Nitrogen Oxides[b]	0.0075 percent by volume (75 ppm) at 15 percent O_2 on a dry basis adjusted for heat rate and fuel nitrogen

[a] Applicable to electric utility gas turbines with a heat input at peak load of greater than 100 x 10^6 Btu/hr.

[b] Standard is multiplied by 14.4/Y; where Y is the manufacturer's rated heat rate in kilojoules per watt at rated load or actual measured heat rate based on the lower heating value of fuel measured at actual peak load; Y cannot be greater than 14.4. Standard is adjusted upward (additive) by the percent of nitrogen in the fuel:

Fuel-Bound Nitrogen (percent by weight)	Allowed Increase NO_x Percent by Volume
$N \leq 0.015$	0
$0.015 < N \leq 0.1$	0.04(N)
$0.1 < N \leq 0.25$	0.004+0.0067(N-0.1)
$N > 0.25$	0.005

where: N = the nitrogen content of the fuel (percent by weight).

Source: 40 CFR 60 Subpart GG.

Table B-2. Summary of Best Available Control Technology (BACT) Determinations for Nitrogen Oxide (NOx) Emissions

Facility Name	State	Permit Issue Date	Unit/Process Description	Capacity (size)	NOx Emission Limit	Control Method	Efficiency (%)	Type
WYANDOTTE ENERGY	MI	Feb-99	TURBINE, COMBINED CYCLE, POWER PLANT	500 MW	4.5 PPM	SCR	70	BACT
MOBILE ENERGY LLC	AL	Jan-99	TURBINE, GAS, COMBINED CYCLE	168 MW	0.019 LB/MMBTU	SCR & DLN COMBUSTORS DURING GAS FIRING. STEAM/WATER INJECTION DURING OIL FIRING	0	BACT-PSD
COLORADO SPRINGS UTILITIES	CO	Jan-99	TURBINE, COMBINE, NATURAL GAS FIRED	30 MW EACH	15 PPMVD ABOVE 70% LOA	POLLUTION PREVENTION BUILT INTO EQUIPMENT.	0	BACT-PSD
TENUSKA GEORGIA PARTNERS, L.P.	GA	Dec-98	TURBINE, COMBUSTION, SIMPLE CYCLE, 6	160 MW EA	15 PPMVD @ 15% O2	USING 15% EXCESS AIR. NOX EMISSION IS BECAUSE OF NAT. GAS.	0	BACT-PSD
TENUSKA GEORGIA PARTNERS, L.P.	GA	Dec-98	TURBINE, COMBUSTION, SIMPLE CYCLE, 6	160 MW EA	42 PPMVD @ 15% O2	USING 15% EXCESS AIR. NOX EMISSION IS BECAUSE OF FUEL OIL.	0	BACT-PSD
SANTA ROSA ENERGY LLC	FL	Dec-98	TURBINE, COMBUSTION, NATURAL GAS	241 MW	9.8 PPM@15%O2 DB ON	DRY LOW NOX BURNER	0	BACT-PSD
CITY OF LOMPOC (PORTABLE TUBGRINDER IC ENGINE)	CA	Dec-98	IC ENGINE, DIESEL-FIRED, PORTABLE 460 BHP, CATERPI	460 BHP	580 PPMVD @ 15% O2	DIRECT INJECTION, TURBOCHARGED, INTAKE INTERCOOLER	0	BACT-OTHER
LSP - COTTAGE GROVE, L.P.	MN	Nov-98	ENGINE, DIESEL, EMERGENCY FIRE PUMP	2.7 MMBTU/H	1.85 LB/MMBTU	LIMITED TO BURN DIESEL 150 H/YR.	0	BACT-PSD
LSP - COTTAGE GROVE, L.P.	MN	Nov-98	GENERATOR, COMBUSTION TURBINE & DUCT BURNER	1988 MMBTU/H (CTG)	4.5 PPMDV @15%O2 (NG)	SELECTIVE CATALYTIC REDUCTION (SCR) WITH A NOX CEM AND PEM.	0	BACT-PSD
WESTERN GAS RESOURCES - HILIGHT GAS PLANT	WY	Oct-98	ENGINES, COMPRESSOR, 2 EA	1650 HP	1 G/HP-H	3 - WAY CATALYST SYSTEM AND AIR/FUEL RATIO CONTRO-LLER.	0	BACT-PSD
SABA PETROLEUM, INC. (BELL COMPRESSOR PLANT)	CA	Oct-98	IC ENGINE, COMPRESSOR, NATURAL GAS-FIRED	747 BHP	0.15 G/B-HP-H	3-WAY CATALYTIC CONVERTER, MFGR: DCLI, INC; MODEL:DC67/77-10 WITH ELECTRONIC AIR/FUEL RATIO CONTROLLER	0	BACT-OTHER
CHAMPION INTERNATL CORP. & CHAMP. CLEAN ENERGY	ME	Sep-98	TURBINE, COMBINED CYCLE, NATURAL GAS	175 MW	9 PPMVD @15% O2 GAS	DRY LOW NOX BURNER-1 OPTION IS CONSIDERED FOR OIL AND IS SELECTED.	0	BACT-OTHER
TNP TECHN, LLC (FORMERLY TX-NM POWER CO.)	NM	Aug-98	GAS TURBINES	375 MMBTU/H	15 PPM	WATER INJECTION FOLLOWED BY SELECTIVE CATALYTIC REDUCTION	95	BACT-PSD
CASCO RAY ENERGY CO	ME	Jul-98	TURBINE, COMBINED CYCLE, NATURAL GAS, TWO	170 MW EACH	3.5 PPM @15% O2	SELECTIVE CATALYTIC REDUCTION	0	BACT-PSD
CITY OF LAKELAND ELECTRIC AND WATER UTILITIES	FL	Jul-98	TURBINE, COMBUSTION, GAS FIRED W/ FUEL OIL ALSO	2174 MMBTU/H	25 PPM @ 15% O2	DRY LOW NOX BURNERS FOR SIMPLE CYCLE, SCR WHEN COMBINED CYCLE	0	BACT-PSD
COLORADO SPRINGS UTILITIES-NIXON POWER PLANT	CO	Jun-98	SIMPLE CYCLE TURBINE, NATURAL GAS	1122 MM BTU/HR	25 PPM @ 15% O2	DRY LOW NOX COMBUSTION	0	BACT-PSD
BRIDGEPORT ENERGY, LLC	CT	Jun-98	TURBINES, COMBUSTION MODEL V84.3A, 2 SIEMES	260 MW/HRSG PER TURBINE	6 PPM NAT. GAS	DRY LOW NOX BURNER WITH SCR	80	BACT-PSD
UNION PACIFIC RESOURCES - PATRICK DRAW GAS PLANT	WY	May-98	ENGINE, COMPRESSOR, 9 EA	3200 HP	0.5 G/HP-H	ULTRA LOW NOX LEAN BURN TECHNOLOGY	0	BACT-PSD
UNION PACIFIC RESOURCES - PATRICK DRAW GAS PLANT	WY	May-98	ENGINES, COMPRESSOR, 2 EA	1200 HP	0.9 G/B-HP-H	ULTRA LOW NOX LEAN BURN TECHNOLOGY	0	BACT-PSD
UNION PACIFIC RESOURCES - PATRICK DRAW GAS PLANT	WY	May-98	ENGINES, COMPRESSOR, 9 EA	3200 HP	0.9 G/B-HP-H	ULTRA LOW NOX LEAN BURN TECHNOLOGY.	0	BACT-PSD
UNION PACIFIC RESOURCES - PATRICK DRAW GAS PLANT	WY	May-98	COMPRESSOR, ENGINES, 2 EA	1200 HP	0.9 G/HP-H	ULTRA LOW NOX LEAN BURNTECHNOLOGY.	0	BACT-PSD
RUMFORD POWER ASSOCIATES	ME	May-98	TURBINE GENERATOR, COMBUSTION, NATURAL GAS	1906 MMBTU/H	3.5 PPM @ 15% O2	SCR AMMONIA INJECTION SYSTEM AND CATALYTIC REACTORTO REDUCE NOX.	85	BACT-PSD
ANDROSCOGGIN ENERGY LIMITED	ME	Mar-98	GAS TURBINES, COGEN, W/DUCT BURNERS	675 MMBTU/H TURBINE	6 PPM @ 15% O2 NG	LOW NOX BURNERS, LOW NOX COMBUSTORS, SCR DURING GAS FIRING ONLY.	85	BACT-PSD
ANDROSCOGGIN ENERGY LIMITED	ME	Mar-98	GAS TURBINES, COGEN, W/DUCT BURNERS	675 MMBTU/H TURBINE	42 PPM @ 15% O2 NG OIL	LOW NOX COMBUSTORS, LOW NOX BURNERS, WATER INJECTION DURING OIL FIRING.	85	BACT-PSD
TWO ELK GENERATION PARTNERS, LIMITED PARTNERSHIP	WY	2/27/98	TURBINE, STATIONARY	33.3 MW	25 PPM @ 15% O2	DRY LOW NOX BURNERS	40	BACT-PSD
AIR LIQUIDE AMERICA CORPORATION	LA	2/13/98	TURBINE GAS, GE, 7ME 7	966 MMBTU/H	9 PPMV	DRY LOW NOX TO LIMIT NOX EMISSION TO 9PPMV	0	BACT-PSD
MILLENNIUM POWER PARTNER, LP	MA	2/2/98	TURBINE, COMBUSTION, WESTINGHOUSE MODEL 501G	2534 MMBTU/H	0.013 LB/MMBTU	DRY LOW-NOX COMBUSTION TECHNOLOGY IN CONJUNCTION WITH SCR ADD-ON NOX CONTROLS.	0	BACT-PSD
MINNESOTA METHANE TAJIUAS CORPORATION	CA	1/9/98	EQUIPMENT, LANDFILL GAS TO ENERGY PRODUCTION	43.68 MMBTU/H	0.59 G/B-HP-H	LEAN BURN, EXHAUST ROUTED THROUGH AFTERBURNER TO FURTHER COMBUST ENGINE CO AND UNBURNED HYDROCARBONS	0	BACT
BASF CORPORATION	LA	12/30/97	TURBINE, COGEN UNIT 2, GE FRAME 6	42.4 MW	8 PPMV NAT. GAS	STEAM INJECTION AND SCR TO LIMIT NOX TO 8 PPM FOR NATURAL GAS AND 25 PPM FOR WASTE GAS (80% H2)	0	BACT-PSD
ARCHIE CRIPPEN	CA	12/9/97	IC ENGINE, DETROIT DIESEL MODEL 8V-92TA	500 BHP	6.2 G/B-HP-H	NO CONTROL	0	BACT
WILLIAMS FIELD SERVICES—MIDDLE MESA CDP	NM	12/3/97	NATURAL GAS COMPRESSOR STATION, 14 ENGINES	1478 HP, EACH	4.51 LB/HR EACH ENGINE	CLEAN/LEAN BURN COMBUSTION	0	BACT-PSD
SOUTHERN NATURAL GAS	AL	Mar-98	2-9160 HP GE MODEL MS3002G NATURAL GAS TURBINES	9,160 HP	53 LB/HR		0	BACT-PSD
SOUTHERN NATURAL GAS	AL	Mar-98	9160 HP GE MODEL MS3002G NATURAL GAS FIRED TURBINE	9,160 HP	53 LB/HR		0	BACT-PSD
ALABAMA POWER COMPANY	AL	Dec-97	COMBUSTION TURBINE W/ DUCT BURNER (COMBINED CYCLE)	100 MW	15 PPM	DRY LOW NOX BURNERS	0	BACT-PSD
BUCKNELL UNIVERSITY	PA	Nov-97	NG FIRED TURBINE, SOLAR TAURUS T-7300S	5.0 MW	25 PPMV@15%O2	SOLONOX BURNER: LOW NOX BURNER	0	BACT-OTHER
NORTHERN CALIFORNIA POWER AGENCY	CA	Oct-97	GE FRAME 5 GAS TURBINE	325 MMBTU/HR	25 PPMVD @ 15% O2	DRY LOW NOX BURNERS	0	LAER
LORDSBURG L.P.	NM	Jun-97	TURBINE, NATURAL GAS-FIRED, ELEC. GEN.	100 MW	74.4 LBS/HR	DRY LOW-NOX TECHNOLOGY WHICH ADOPTS STAGED OR SCHEDULED COMBUSTION.	60	BACT-PSD
SOUTHERN CALIFORNIA GAS COMPANY	CA	May-97	VARIABLE LOAD NATURAL GAS FIRED TURBINE COMPRESSOR	50 MMBTU/HR	25 PPMVD @ 15% O2	DRY LOW NOX COMBUSTOR	0	LAER
MEAD COATED BOARD, INC.	AL	Mar-97	COMBINED CYCLE TURBINE (25 MW)	568 MMBTU/HR	25 PPMVD@ 15% O2 (GAS)	FUEL OIL SULFUR CONTENT <=0.05% BY WEIGHT, DRY LOW NOX COMBUSTOR DESIGN FIRING GAS AND DRY LOW NOX COMBUSTOR WITH WATER INJECTION FIRING OIL	0	BACT-PSD
FORMOSA PLASTICS CORPORATION, BATON ROUGE PLANT	LA	Mar-97	TURBINE/HSRG, GAS COGENERATION	450 MM BTU/HR	9 PPMV	DRY LOW NOX BURNER/COMBUSTION DESIGN AND CONSTRUCTION.	0	BACT-PSD
SOUTHWESTERN PUBLIC SERVICE COMPANY/CUNNINGHAM STA	NM	Feb-97	COMBUSTION TURBINE, NATURAL GAS	100 MW	0 SEE FACILITY NOTES	DRY LOW NOX COMBUSTION	0	BACT-PSD
CALRESOURCES LLC	CA	Jan-97	SOLAR MODEL 1100 SATURN GAS TURBINE	14 MMBTU/HR	69 PPMVD @15% O2	NO CONTROL	0	LAER
TEMPO PLASTICS	CA	Dec-96	GAS TURBINE COGENERATION UNIT	0.0	0.109 LB/MMBTU	LOW-NOX COMBUSTOR	0	LAER
SOUTHERN NATURAL GAS COMPANY	MS	Dec-96	TURBINE, NATURAL GAS-FIRED	9,160 HORSEPOWER	110 PPMV @ 15% O2, DRY	PROPER TURBINE DESIGN AND OPERATION	0	BACT-PSD
SOUTHERN NATURAL GAS COMPANY-SELMA COMPRESSOR STAT	AL	Dec-96	9160 HP GE MS3002G NATURAL GAS FIRED TURBINE	0.0	53 LB/HR		0	BACT-PSD
SOUTHWESTERN PUBLIC SERVICE CO/CUNNINGHAM STATION	NM	Nov-96	COMBUSTION TURBINE, NATURAL GAS	100 MW	15 PPM; SEE FAC. NOTES	DRY LOW NOX COMBUSTION	0	BACT-PSD
ECOELECTRICA, L.P.	PR	Oct-96	TURBINES, COMBINED-CYCLE COGENERATION	461 MW	60 LB/HR (GAS)	STEAM/WATER INJECTION AND SELECTIVE CATALYTIC REDUCTION (SCR).	72	BACT-PSD
ECOELECTRICA, L.P.	PR	Oct-96	TURBINES, COMBINED-CYCLE COGENERATION	461 MW	73 LB/HR (OIL)	STEAM/WATER INJECTION AND SELECTIVE CATALYTIC REDUCTION (SCR).	72	BACT-PSD
BLUE MOUNTAIN POWER, LP	PA	Jul-96	COMBUSTION TURBINE WITH HEAT RECOVERY BOILER	153 MW	4 PPM @ 15% O2	DRY LNB WITH SCR WATER INJECTION IN PLACE WHEN FIRING OIL. OIL FIRING LIMITS SET TO 8.4 PPM @15% O2	64	LAER
CITY OF ST.PAUL POWER PLANT	AK	Jun-96	INTERNAL COMBUSTION	3.4 MW	427 TPY	AFTERCOOLERS	0	BACT-PSD
CITY OF UNALASKA	AK	Jun-96	INTERNAL COMBUSTION	6.5 MW	633 TPY	LIMIT OF OPERATION HOURS AND AFTERCOOLERS	0	BACT-PSD
GENERAL ELECTRIC GAS TURBINES	SC	Apr-96	I.C. TURBINE	2,700 MMBTU/HR	885 LB/HR	GOOD COMBUSTION PRACTICES TO MINIMIZE EMISSIONS	0	BACT-PSD
CAROLINA POWER & LIGHT	NC	Apr-96	COMBUSTION TURBINE, 4 EACH	1,906 MMBTU/HR	512 LB/HR (OIL)	WATER INJECTION; FUEL SPEC: 0.04% N FUEL OIL	0	BACT-PSD
CAROLINA POWER & LIGHT	NC	Apr-96	COMBUSTION TURBINE, 4 EACH	1906 MMBTU/HR	158 LB/HR (GAS)	WATER INJECTION	0	BACT-PSD
MID-GEORGIA COGEN.	GA	Apr-96	COMBUSTION TURBINE (2), FUEL OIL	116 MW	20 PPMVD	WATER INJECTION WITH SCR	0	BACT-PSD
MID-GEORGIA COGEN.	GA	Apr-96	COMBUSTION TURBINE (2), NATURAL GAS	116 MW	9 PPMVD	DRY LOW NOX BURNER WITH SCR	0	BACT-PSD
GEORGIA GULF CORPORATION	LA	Mar-96	GENERATOR, NATURAL GAS FIRED TURBINE	1,123 MM BTU/HR	25 PPMV-CORR. TO 15%O2	CONTROL NOX USING STEAM INJECTION	0	BACT-PSD
SEMINOLE HARDEE UNIT 3	FL	Jan-96	COMBINED CYCLE COMBUSTION TURBINE	140 MW	15 PPM @ 15% O2	DRY LNB STAGED COMBUSTION	0	BACT-PSD
KEY WEST CITY ELECTRIC SYSTEM	FL	Sep-95	TURBINE, EXISTING CT RELOCATION TO A NEW PLANT	23 MW	75 PPM @ 15% O2	WATER INJECTION	0	BACT-PSD
UNION CARBIDE CORPORATION	LA	Sep-95	GENERATOR, GAS TURBINE	1,313 MM BTU/HR	25 PPMV CORR. TO 15% O2	DRY LOW NOX COMBUSTOR	0	BACT-PSD
PUERTO RICO ELECTRIC POWER AUTHORITY (PREPA)	PR	Jul-95	COMBUSTION TURBINES (3), 83 MW SIMPLE-CYCLE EACH	248 MW	35 LB/HR AS NO2	STEAM INJECTION PLUS SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM. USE OF NO. 2 FUEL OIL WITHNITROGEN CONTENT NOT TO EXCEED 0.10% BY WEIGHT.	0	BACT-PSD
HIGGINSVILLE MUNICIPAL POWER FACILITY	MO	Jul-95	ADD OF A DUAL FUEL FIRED TWIN-PAC TURBINE	49 MW	42 PPM BY VOL 1 HR AVG (	CONTROLS TO REGULATE THE FUEL CONSUMPTION AND THE RATIO OF WATER TO FUEL BEING FIRED IN THE TURBINES	0	BACT-PSD
HIGGINSVILLE MUNICIPAL POWER FACILITY	MO	Jul-95	ADD OF A DUAL FUEL FIRED TWIN-PAC TURBINE	49 MW	75 PPM BY VOL 1 HR AVG (	CONTROLS TO REGULATE THE FUEL CONSUMPTION AND THE RATIO OF WATER TO FUEL BEING FIRED IN THE TURBINES	0	BACT-PSD

Table B-2. Summary of Best Available Control Technology (BACT) Determinations for Nitrogen Oxide (NOx) Emissions

BROOKLYN NAVY YARD COGENERATION PARTNERS L.P.	NY	Jun-95	TURBINE, NATURAL GAS FIRED	240 MW	3.5 PPM @ 15% O2	SCR	0	LAER
PANDA-KATHLEEN, L.P.	FL	Jun-95	COMBINED CYCLE COMBUSTION TURBINE (TOTAL 115MW)	75 MW	15 PPM @ 15% O2	DRY LOW NOX BURNER	0	BACT-PSD
PROCTOR AND GAMBLE PAPER PRODUCTS CO (CHARMIN)	PA	May-95	TURBINE, NATURAL GAS	580 MMBTU/HR	55 PPM @ 15% O2	STEAM INJECTION	75	RACT
MILAGRO, WILLIAMS FIELD SERVICE	NM	May-95	TURBINE/COGEN, NATURAL GAS (2)	900 MMCF/DAY	9 PPM @ 15% O2	DRY LOW NOX (GENERAL ELECTRIC MODEL PG6541B)	94	BACT-PSD
GAINESVILLE REGIONAL UTILITIES	FL	Apr-95	SIMPLE CYCLE COMBUSTION TURBINE, GAS/NO 2 OIL B-UP	74 MW	15 PPM AT 15% OXYGEN	DRY LOW NOX BURNERS GE FRAME UNIT, CAN ANNULAR COMBUSTORS	0	BACT-PSD
GAINESVILLE REGIONAL UTILITIES	FL	Apr-95	OIL FIRED COMBUSTION TURBINE	74 MW	42 PPM AT 15% OXYGEN	WATER INJECTION	0	BACT-PSD
LEDERLE LABORATORIES	NY	Apr-95	(2) GAS TURBINES (EP #S 00101&102)	110 MMBTU/HR	42 PPM, 18 LB/HR	STEAM INJECTION	0	BACT-PSD
PILGRIM ENERGY CENTER	NY	Apr-95	(2) WESTINGHOUSE W501D5 TURBINES (EP #S 00001&2)	1,400 MMBTU/HR	4.5 PPM, 23.6 LB/HR	STEAM INJECTION FOLLOWED BY SCR	0	BACT
BALTIMORE GAS & ELECTRIC - PERRYMAN PLANT	MD	Mar-95	TURBINE, 140 MW NATURAL GAS FIRED ELECTRIC	140 MW	15 PPM @ 15% O2	DRY BURN LOW NOX BURNERS	91	BACT-PSD
FORMOSA PLASTICS CORPORATION, LOUISIANA	LA	Mar-95	TURBINE/HRSG, GAS COGENERATION	450 MM BTU/HR	9 PPMV	DRY LOW NOX BURNER/COMBUSTION DESIGN AND CONTROL	0	LAER
LSP-COTTAGE GROVE, L.P.	MN	Mar-95	COMBUSTION TURBINE/GENERATOR	1,970 MMBTU/HR	4.5 PPM @ 15% O2 GAS	SELECTIVE CATALYTIC REDUCTION (SCR)	70	BACT-PSD
EMPIRE DISTRICT ELECTRIC CO.	MO	Feb-95	INSTALL TWO NEW SIMPLE-CYCLE TURBINES	89 MW	360 TPY	WATER INJECTION.	0	BACT-PSD
MARATHON OIL CO. - INDIAN BASIN N.G. PLAN	NM	Jan-95	TURBINES, NATURAL GAS (2)	5,500 HP	7.4 LBS/HR	LEAN-PREMIXED COMBUSTION TECHNOLOGY. DRY/LOW NOX	66	BACT-PSD
KAMINE/BESICORP SYRACUSE LP	NY	Dec-94	SIEMENS V84.3 GAS TURBINE (EP #00001)	650 MMBTU/HR	25 PPM	WATER INJECTION	70	BACT
INDECK-OSWEGO ENERGY CENTER	NY	Oct-94	GE FRAME 6 GAS TURBINE	533 LB/MMBTU	42 PPM, 75.00 LB/HR	STEAM INJECTION	53	BACT
FULTON COGEN PLANT	NY	Sep-94	GE LM5000 GAS TURBINE	500 MMBTU/HR	36 PPM, 65 LB/HR	WATER INJECTION	59	BACT
CAROLINA POWER AND LIGHT	SC	Aug-94	STATIONARY GAS TURBINE	1,520 MMBTU/H	25 PPMDV @ 15% O2 (GAS)	WATER INJECTION	30	BACT-PSD
CAROLINA POWER AND LIGHT	SC	Aug-94	STATIONARY GAS TURBINE	1,520 MMBTU/H	62 PPMDV @ 15% O2 (OIL)	WATER INJECTION	30	BACT-PSD
BRUSH COGENERATION PARTNERSHIP	CO	Jul-94	TURBINE	350 MMBTU/H	25 PPM @ 15% O2	DRY LOW NOX BURNER	74	BACT-PSD
COLORADO POWER PARTNERSHIP	CO	Jul-94	TURBINES, 2 NAT GAS & 2 DUCT BURNERS	385 MMBTU/H EACH TURBINE	42 PPM @ 15% O2	WATER INJECTION	66	BACT-PSD
MUDDY RIVER L.P.	NV	Jun-94	COMBUSTION TURBINE, DIESEL & NATURAL GAS	140 MEGAWATT	303 LB/HR	LOW NOX BURNER	0	BACT-PSD
CSW NEVADA, INC.	NV	Jun-94	COMBUSTION TURBINE, DIESEL & NATURAL GAS	140 MEGAWATT	273 LB/HR	DRY LOW NOX COMBUSTOR	0	BACT-PSD
PORTLAND GENERAL ELECTRIC CO.	OR	May-94	TURBINES, NATURAL GAS (2)	1,720 MMBTU	4.5 PPM @ 15% O2	SCR	82	BACT-PSD
EMPIRE DISTRICT ELECTRIC CO.	MO	May-94	INSTALL TWO NEW SIMPLE-CYCLE TURBINES	1345 MMBTU/HR	25 PPM BY VOL 1 HR AVG (	LOW NOX BURNERS, AND WATER INJECTION	0	BACT-PSD
EMPIRE DISTRICT ELECTRIC CO.	MO	May-94	INSTALL TWO NEW SIMPLE-CYCLE TURBINES	1,345 MMBTU/HR	1,135 TPY (NO. 2 OIL)	LOW NOX BURNERS, AND WATER INJECTION	0	BACT-PSD
GEORGIA POWER COMPANY, ROBINS TURBINE PROJECT	GA	May-94	TURBINE, COMBUSTION, NATURAL GAS	80 MW	25 PPM	WATER INJECTION, FUEL SPEC: NATURAL GAS	0	BACT-PSD
WEST CAMPUS COGENERATION COMPANY	TX	May-94	GAS TURBINES	75 MW (TOTAL POWER)	200 TPY	INTERNAL COMBUSTION CONTROLS	0	BACT-PSD
FLEETWOOD COGENERATION ASSOCIATES	PA	Apr-94	NG TURBINE (GE LM6000) WITH WASTE HEAT BOILER	360 MMBTU/HR	21 LB/HR	SCR WITH LOW NOX COMBUSTORS	47	BACT-OTHER
HERMISTON GENERATING CO.	OR	Apr-94	TURBINES, NATURAL GAS (2)	1,696 MMBTU	4.5 PPM @ 15% O2	SCR	82	BACT-PSD
FLORIDA POWER CORPORATION POLK COUNTY SITE	FL	Feb-94	TURBINE, NATURAL GAS (2)	1,510 MMBTU/H	12 PPMVD @15 % O2	DRY LOW NOX COMBUSTOR	0	BACT-PSD
FLORIDA POWER CORPORATION POLK COUNTY SITE	FL	Feb-94	TURBINE, FUEL OIL (2)	1,730 MMBTU/H	42 PPMVD @ 15 %O2	WATER INJECTION	0	BACT-PSD
TECO POLK POWER STATION	FL	Feb-94	TURBINE, SYNGAS (COAL GASIFICATION)	1,755 MMBTU/H	25 PPMVD @ 15 % O2	DRY LOW NOX COMBUSTOR	0	BACT-PSD
TECO POLK POWER STATION	FL	Feb-94	TURBINE, FUEL OIL	1,765 MMBTU/H	42 PPMVD @ 15 % O2	WET INJECTION	0	BACT-PSD
INTERNATIONAL PAPER	LA	Feb-94	TURBINE/HRSG, GAS COGEN	338 MM BTU/HR TURBINE	25 PPMV 15% O2 TURBINE	DRY LOW NOX COMBUSTOR/COMBUSTION CONTROL	0	BACT
KAMINE/BESICORP CARTHAGE L.P.	NY	Jan-94	GE FRAME 6 GAS TURBINE	491 BTU/HR	42 PPM, 76.6 LB/HR	STEAM INJECTION	63	BACT
ORANGE COGENERATION LP	FL	Dec-93	TURBINE, NATURAL GAS, 2	368 MMBTU/H	15 PPM @ 15% O2	DRY LOW NOX COMBUSTOR	0	BACT-PSD
PROJECT ORANGE ASSOCIATES	NY	Dec-93	GE LM-5000 GAS TURBINE	550 MMBTU/HR	25 PPM, 47 LB/HR	STEAM INJECTION, FUEL SPEC; NATURAL GAS ONLY	80	BACT
WILLIAMS FIELD SERVICES CO. - EL CEDRO COMPRESSOR	NM	Oct-93	TURBINE, GAS-FIRED	11,257 HP	42 PPM @ 15% O2	SOLONOX COMBUSTOR, DRY LOW NOX TECHNOLOGY	66	BACT-PSD
FLORIDA GAS TRANSMISSION	FL	Sep-93	TURBINE, GAS	132 MMBTU/H	25 PPM @ 15% O2	DRY LOW NOX COMBUSTOR	0	BACT-PSD
PATOWMACK POWER PARTNERS, LIMITED PARTNERSHIP	VA	Sep-93	TURBINE, COMBUSTION, SIEMENS MODEL V84.2, 3	10.2 X109 SCF/YR NAT GAS	131 LB/HR(GAS); 339 OIL	DRY LOW NOX COMBUSTOR; DESIGN, WATER INJECTION	0	BACT-PSD
FLORIDA GAS TRANSMISSION COMPANY	AL	Aug-93	TURBINE, NATURAL GAS	12,600 BHP	0.58 GM/HP HR	AIR-TO-FUEL RATIO CONTROL, DRY LOW NOX COMBUSTION	71	BACT-PSD
LOCKPORT COGEN FACILITY	NY	Jul-93	(6) GE FRAME 6 TURBINES (EP #S 00001-00006)	424 MMBTU/HR	42 PPM	STEAM INJECTION	76	BACT
ANITEC COGEN PLANT	NY	Jul-93	GE LM5000 COMBINED CYCLE GAS TURBINE EP #00001	451 MMBTU/HR	25 PPM, 41 LB/HR	NO CONTROLS	0	BACT-OTHER
NEWARK BAY COGENERATION PARTNERSHIP, L.P.	NJ	Jun-93	TURBINES, COMBUSTION, KEROSENE-FIRED (2)	640 MMBTU/H (EACH)	18 PPMDV	SCR	0	BACT-PSD
NEWARK BAY COGENERATION PARTNERSHIP, L.P.	NJ	Jun-93	TURBINES, COMBUSTION, NATURAL GAS-FIRED (2)	617 MMBTU/HR (EACH)	6.3 PPMDV	SCR	0	BACT-PSD
TIGER BAY LP	FL	May-93	TURBINE, OIL	1,850 MMBTU/H	42 PPM @ 15% O2	WATER INJECTION	0	BACT-PSD
TIGER BAY LP	FL	May-93	TURBINE, GAS	1,615 MMBTU/H	15 PPM @ 15% O2	DRY LOW NOX COMBUSTOR	0	BACT-PSD
INDECK ENERGY COMPANY	NY	May-93	GE FRAME 6 GAS TURBINE EP #00001	491 MMBTU/HR	32 PPM	STEAM INJECTION	58	BACT
PHOENIX POWER PARTNERS	CO	May-93	TURBINE (NATURAL GAS)	311 MMBTU/HR	22 PPM @ 15% O2	DRY LOW NOX COMBUSTION	0	BACT-OTHER
TRIGEN MITCHEL FIELD	NY	Apr-93	GE FRAME 6 GAS TURBINE	425 MMBTU/HR	60 PPM, 90 LB/HR	STEAM INJECTION	20	BACT
KISSIMMEE UTILITY AUTHORITY	FL	Apr-93	TURBINE, FUEL OIL	928 MMBTU/H	42 PPM @ 15% O2	WATER INJECTION	0	BACT-PSD
KISSIMMEE UTILITY AUTHORITY	FL	Apr-93	TURBINE, FUEL OIL	371 MMBTU/H	42 PPM @ 15% O2	WATER INJECTION	0	BACT-PSD
KISSIMMEE UTILITY AUTHORITY	FL	Apr-93	TURBINE, NATURAL GAS	869 MMBTU/H	15 PPM @ 15% O2	DRY LOW NOX COMBUSTOR	0	BACT-PSD
KISSIMMEE UTILITY AUTHORITY	FL	Apr-93	TURBINE, NATURAL GAS	367 MMBTU/H	15 PPM @ 15% O2	DRY LOW NOX COMBUSTOR	0	BACT-PSD
EAST KENTUCKY POWER COOPERATIVE	KY	Mar-93	TURBINES (5), #2 FUEL OIL AND NAT. GAS FIRED	1,492 MMBTU/H (EACH)	42 PPM @ 15% O2 (OIL)	WATER INJECTION	48	SEE NOTES
INTERNATIONAL PAPER CO. RIVERDALE MILL	AL	Jan-93	TURBINE, STATIONARY (GAS-FIRED) WITH DUCT BURNER	40 MW	0.08 LB/MMBTU (GAS)	LOW NOX BURNERS (ON THE DUCT BURNER) STEAM INJECTION INTO THE TURBINE	0	BACT-PSD
OKLAHOMA MUNICIPAL POWER AUTHORITY	OK	Dec-92	TURBINE, COMBUSTION	58 MW	65 PPM @ 15% O2 (OIL)	COMBUSTION CONTROLS	83	BACT-OTHER
OKLAHOMA MUNICIPAL POWER AUTHORITY	OK	Dec-92	TURBINE, COMBUSTION	58 MW	25 PPM @ 15% O2 (GAS)	COMBUSTION CONTROLS	83	BACT-OTHER
AUBURNDALE POWER PARTNERS, LP	FL	Dec-92	TURBINE, OIL	1,170 MMBTU/H	42 PPMVD @ 15 % O2	STEAM INJECTION	0	BACT-PSD
AUBURNDALE POWER PARTNERS, LP	FL	Dec-92	TURBINE,GAS	1,214 MMBTU/H	15 PPMVD @ 15 % O2	DRY LOW NOX COMBUSTOR	0	BACT-PSD
SITHE/INDEPENDENCE POWER PARTNERS	NY	Nov-92	TURBINES, COMBUSTION (4) (NATURAL GAS) (1012 MW)	2,133 MMBTU/HR (EACH)	4.5 PPM	SCR AND DRY LOW NOX	0	BACT-OTHER
KAMINE/BESICORP BEAVER FALLS COGENERATION FACILITY	NY	Nov-92	TURBINE, COMBUSTION (NAT. GAS & OIL FUEL) (79MW)	650 MMBTU/HR	9 PPM (GAS)	DRY LOW NOX OR SCR	0	BACT-OTHER
KAMINE/BESICORP BEAVER FALLS COGENERATION FACILITY	NY	Nov-92	TURBINE, COMBUSTION (NAT. GAS & OIL FUEL) (79MW)	650 MMBTU/HR	55 PPM (OIL)	DRY LOW NOX OR SCR	0	BACT-OTHER
KAMINE/BESICORP CORNING L.P.	NY	Nov-92	TURBINE, COMBUSTION (79 MW)	653 MMBTU/HR	9 PPM	DRY LOW NOX OR SCR	0	BACT-OTHER
GRAYS FERRY CO. GENERATION PARTNERSHIP	PA	Nov-92	TURBINE (NATURAL GAS & OIL)	1,150 MMBTU	9 PPMVD (NAT. GAS)*	DRY LOW NOX BURNER, COMBUSTION CONTROL	0	BACT-OTHER
GOAL LINE, LP ICEFLOE	CA	Nov-92	TURBINE, COMBUSTION (NATURAL GAS) (42.4 MW)	386 MMBTU/HR	5 PPMVD @ 15% OXYGEN	WATER INJECTION & SCR W/ AUTOMATIC AMMONIA INJECT.	88	BACT-OTHER
BEAR ISLAND PAPER COMPANY, L.P.	VA	Oct-92	TURBINE, COMBUSTION GAS	468 X10(6) BTU/HR #2 OIL	15 PPM	SCR	61	BACT-PSD
BEAR ISLAND PAPER COMPANY, L.P.	VA	Oct-92	TURBINE, COMBUSTION GAS (TOTAL)	0.0	69.7 TPY	SCR	0	BACT-PSD
BEAR ISLAND PAPER COMPANY, L.P.	VA	Oct-92	TURBINE, COMBUSTION GAS	474 X10(6) BTU/HR N. GAS	9 PPM	SELECTIVE CATALYTIC REDUCTION (SCR)	75	BACT-PSD
GORDONSVILLE ENERGY L.P.	VA	Sep-92	TURBINE FACILITY, GAS	7.4 X10(7) GPY FUEL OIL	245 TOTAL TPY	SELECTIVE CATALYTIC REDUCTION (SCR)	80	BACT-PSD
GORDONSVILLE ENERGY L.P.	VA	Sep-92	TURBINES (2) [EACH WITH A SF]	1.4 X10(9) BTU/H #2 OIL	66 LBS/HR/UNIT	WATER INJECTION AND SCR	80	BACT-PSD
GORDONSVILLE ENERGY L.P.	VA	Sep-92	TURBINE FACILITY, GAS	1,331 X10(7) SCF/Y NAT GAS	245 TOTAL TPY	SELECTIVE CATALYTIC REDUCTION (SCR) W/ WATER INJEC	80	BACT-PSD
GORDONSVILLE ENERGY L.P.	VA	Sep-92	TURBINES (2) [EACH WITH A SF]	1.5 X10(9) BTU/HR N GAS	9 PPMDV/UNIT @ 15% O2	SCR WITH WATER INJECTION	80	BACT-PSD
NEVADA POWER COMPANY, HARRY ALLEN PEAKING PLANT	NV	Sep-92	COMBUSTION TURBINE ELECTRIC POWER GENERATION	600 MW (6 UNITS 75 EACH)	88.6 TPY (EACH TURBINE)	LOW NOX COMBUSTOR	0	BACT-PSD
KAMINE SOUTH GLENS FALLS COGEN CO	NY	Sep-92	GE FRAME 6 GAS TURBINE	498 MMBTU/HR	42 PPM, 78.6 LB/HR	WATER INJECTION	50	BACT
NORTHERN STATES POWER COMPANY	SD	Sep-92	TURBINE, SIMPLE CYCLE, 4 EACH	129 MW	24 PPM @ 15% O2 GAS	WATER INJECTION FOR GAS & DISTILLATION	0	BACT-PSD
PASNY/HOLTSVILLE COMBINED CYCLE PLANT	NY	Sep-92	TURBINE, COMBUSTION GAS (150 MW)	1,146 MMBTU/HR (GAS)*	9 PPM (GAS)	DRY LOW NOX	0	BACT-OTHER
PASNY/HOLTSVILLE COMBINED CYCLE PLANT	NY	Sep-92	TURBINE, COMBUSTION GAS (150 MW)	1,146 MMBTU/HR (GAS)*	42 PPM (OIL)	WATER INJECTOR	0	BACT-OTHER
WEPCU, PARIS SITE	WI	Aug-92	TURBINES, COMBUSTION (4)	0.0	65 PPM @ 15% O2 (OIL)	GOOD COMBUSTION PRACTICES	0	BACT-PSD
WEPCU, PARIS SITE	WI	Aug-92	TURBINES, COMBUSTION (4)	0.0	25 PPM @ 15% O2 (GAS)	GOOD COMBUSTION PRACTICES	0	BACT-PSD
FLORIDA POWER CORPORATION	FL	Aug-92	TURBINE, OIL	1,029 MMBTU/H	42 PPMVD @ 15 % O2	WET INJECTION	0	BACT-PSD
FLORIDA POWER CORPORATION	FL	Aug-92	TURBINE, OIL	1,866 MMBTU/H	42 PPMVD @ 15 % O2	WET INJECTION	0	BACT-PSD
NORTHWEST PIPELINE COMPANY	WA	Aug-92	TURBINE, GAS-FIRED	12,100 HP	198 PPM @ 15% O2	ADVANCED DRY LOW NOX COMBUSTOR (BY 07/01/95)	76	BACT-PSD
CNG TRANSMISSION	OH	Aug-92	TURBINE (NATURAL GAS) (3)	5,500 HP (EACH)	1.6 G/HP-HR*	LOW NOX COMBUSTION	0	BACT-OTHER
SARANAC ENERGY COMPANY	NY	Jul-92	TURBINES, COMBUSTION (2) (NATURAL GAS)	1,123 MMBTU/HR (EACH)	9 PPM	SCR	0	BACT-OTHER
HARTWELL ENERGY LIMITED PARTNERSHIP	GA	Jul-92	TURBINE, OIL FIRED (2 EACH)	1,840 M BTU/HR	25 PPMVD, FUEL N AFLOW	MAXIMUM WATER INJECTION	0	BACT-PSD
MAUI ELECTRIC COMPANY, LTD./MAALAEA GENERATING STA	HI	Jul-92	TURBINE, COMBINED-CYCLE COMBUSTION	28 MW	42.3 LB/HR	WATER INJECTION	69	BACT-OTHER
HARTWELL ENERGY LIMITED PARTNERSHIP	GA	Jul-92	TURBINE, GAS FIRED (2 EACH)	1,817 M BTU/HR	25 PPM @ 15% O2	MAXIMUM WATER INJECTION	0	BACT-PSD

Table B-2. Summary of Best Available Control Technology (BACT) Determinations for Nitrogen Oxide (NOx) Emissions

INDECK-YERKES ENERGY SERVICES	NY	Jun-92	GE FRAME 6 GAS TURBINE (EP #00001)	432 MMBTU/HR	42 PPM, 74 LB/HR	STEAM INJECTION	35	BACT
SELKIRK COGENERATION PARTNERS, L.P.	NY	Jun-92	COMBUSTION TURBINES (2) (252 MW)	1,173 MMBTU/HR (EACH)	9 PPM GAS	STEAM INJECTION AND SCR	0	BACT-OTHER
SELKIRK COGENERATION PARTNERS, L.P.	NY	Jun-92	COMBUSTION TURBINE (79 MW)	1,173 MMBTU/HR	25 PPM GAS	STEAM INJECTION	0	BACT-OTHER
NORTHWEST PIPELINE CORPORATION	CO	May-92	TURBINE, SOLAR TAURUS	45 MMBTU/HR	85 PPMVD (UNTIL 11/98)	DRY LOW NOX COMBUSTOR (BY 11/01/98)	0	BACT-PSD
NARRAGANSETT ELECTRIC/NEW ENGLAND POWER CO.	RI	Apr-92	TURBINE, GAS AND DUCT BURNER	1,360 MMBTU/H EACH	9 PPM @ 15% O2, GAS	SCR	0	BACT-PSD
KENTUCKY UTILITIES COMPANY	KY	Mar-92	TURBINE, #2 FUEL OIL/NATURAL GAS (8)	1,500 MM BTU/HR (EACH)	42 PPM @ 15% O2, N. GAS	WATER INJECTION	0	BACT-PSD
BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP	VA	Mar-92	TURBINE, COMBUSTION	1,175 MMBTU/H NAT. GAS	9 PPM @ 15% O2	SCR, STEAM INJECTION	91	BACT-PSD
BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP	VA	Mar-92	TURBINE, COMBUSTION	1,117 MMBTU/H NO2 FUEL OIL	15 PPM @ 15% O2	SCR, STEAM INJ.	91	BACT-PSD
BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP	VA	Mar-92	TURBINE, COMBUSTION, 2	0.0	191 T/YR/UNIT		0	BACT-PSD
THERMO INDUSTRIES, LTD.	CO	Feb-92	TURBINE, GAS FIRED, 5 EACH	246 MMBTU/H	25 PPM @ 15% O2	DRY LOW NOX TECH.	0	BACT-PSD
HAWAII ELECTRIC LIGHT CO., INC.	HI	Feb-92	TURBINE, FUEL OIL #2	20 MW	42.3 LB/HR	COMBUSTOR WATER INJECTOR, WATER INJECTION	70	BACT-PSD
SAVANNAH ELECTRIC AND POWER CO.	GA	Feb-92	TURBINES, 8	1,032 MMBTU/H, NAT GAS	25 PPM @ 15% O2	MAX WATER INJECTION	0	BACT-PSD
SAVANNAH ELECTRIC AND POWER CO.	GA	Feb-92	TURBINES, 8	972 MMBTU/H, #2 OIL	0 SEE NOTES	MAX WATER INJECTION	0	BACT-PSD
LINDEN COGENERATION TECHNOLOGY	NJ	Jan-92	TURBINE, NATURAL GAS FIRED	50 X E12 BTU/YR	33.8 LB/HR	STEAM INJECTION AND SCR	95	BACT-PSD
ALYESKA PIPELINE SERVICE COMPANY	AK	Jan-92	SOLAR CENTAUR, 3	800 KW	150 PPMVD @ 15% O2	LOW NOX BURNERS	0	NSPS
KAMINE/BESICORP NATURAL DAM LP	NY	Dec-91	GE FRAME 6 GAS TURBINE	500 MMBTU/HR	42 PPM, 80.1 LB/HR	STEAM INJECTION	35	BACT
DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION	NC	Dec-91	TURBINE, COMBUSTION	1,247 MM BTU/HR	287 LB/HR	MULTINOZZLE COMBUSTOR, MAXIMUM WATER INJECTION	0	BACT-PSD
DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION	NC	Dec-91	TURBINE, COMBUSTION	1,313 MM BTU/HR	119 LB/HR	MULTINOZZLE COMBUSTOR, MAXIMUM WATER INJECTION	0	BACT-PSD
MAUI ELECTRIC COMPANY, LTD.	HI	Dec-91	TURBINE, FUEL OIL #2	28 MW	42 PPM	WATER INJECTION	71	BACT-PSD
KALAMAZOO POWER LIMITED	MI	Dec-91	TURBINE, GAS-FIRED, 2, W/ WASTE HEAT BOILERS	1,806 MMBTU/H	15 PPMV	DRY LOW NOX TURBINES	0	BACT-PSD
LAKE COGEN LIMITED	FL	Nov-91	TURBINE, OIL, 2 EACH	42 MW	42 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
LAKE COGEN LIMITED	FL	Nov-91	TURBINE, GAS, 2 EACH	42 MW	25 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
SHELL PIPELINE CORPORATION	CA	Nov-91	GENERATOR, EMERGENCY, PROPANE FIRED	82 BHP	0.28 LB/H	3-WAY CATALYTIC CONVERTER	60	BACT-PSD
DE LA GUERRA POWER, INC	CA	Nov-91	ENGINE IC & GEN (1 OF 3)	360 HP	8.34 LB/D	NON-SELECTIVE CATALYTIC CONVERTER	90	BACT-PSD
ORLANDO UTILITIES COMMISSION	FL	Nov-91	TURBINE, GAS, 4 EACH	35 MW	42 PPM @ 15% O2	WET INJECTION	70	BACT-PSD
ORLANDO UTILITIES COMMISSION	FL	Nov-91	TURBINE, OIL, 4 EACH	35 MW	65 PPM @ 15% O2	WET INJECTION	0	BACT-PSD
SOUTHERN CALIFORNIA GAS	CA	Oct-91	TURBINE, GAS FIRED, SOLAR MODEL H	5,500 HP	8 PPM @ 15% O2	HIGH TEMP SELECT. CAT. REDUCTION	93	BACT-PSD
EL PASO NATURAL GAS	AZ	Oct-91	TURBINE, GAS, SOLAR CENTAUR H	5,500 HP	84.9 PPM @ 15% O2	LEAN BURN	0	NSPS
EL PASO NATURAL GAS	AZ	Oct-91	TURBINE, GAS, SOLAR CENTAUR H	5,500 HP	42 PPM @ 15% O2	DRY LOW NOX COMBUSTOR	51	BACT-PSD
EL PASO NATURAL GAS	AZ	Oct-91	TURBINE, GAS, SOLAR CENTAUR H	5,500 HP	85.1 PPM @ 15% O2	FUEL SPEC: LEAN FUEL MIX	0	NSPS
EL PASO NATURAL GAS	AZ	Oct-91	TURBINE, GAS, SOLAR CENTAUR H	5500 HP	42 PPM @ 15% O2	DRY LOW NOX COMBUSTOR	51	BACT-PSD
FLORIDA POWER GENERATION	FL	Oct-91	TURBINE, OIL, 8 EACH	93 MW	42 PPM @ 15% O2	WET INJECTION	0	BACT-PSD
EL PASO NATURAL GAS	AZ	Oct-91	TURBINE, NAT. GAS TRANSM., GE FRAME 3	12,000 HP	225 PPM @ 15% O2	LEAN BURN	0	BACT-PSD
EL PASO NATURAL GAS	AZ	Oct-91	TURBINE, NAT. GAS TRANSM., GE FRAME 3	12,000 HP	42 PPM @ 15% O2	DRY LOW NOX COMBUSTOR	80	BACT-PSD
NUGGET OIL CO.	CA	Oct-91	GENERATOR, STEAM, GAS FIRED	63 MMBTU/H	0.043 LB/MMBTU	LOW NOX BURNER AND FLUE GAS RECIRCULATION*	57	BACT-PSD
CAROLINA POWER AND LIGHT CO.	SC	Sep-91	TURBINE, I.C.	80 MW	292 LB/H	WATER INJECTION	50	BACT-PSD
ENRON LOUISIANA ENERGY COMPANY	LA	Aug-91	TURBINE, GAS, 2	39 MMBTU/H	40 PPM @ 15% O2	H2O INJECT 0.67 LB/LB	71	BACT-PSD
ALGONQUIN GAS TRANSMISSION CO.	RI	Jul-91	TURBINE, GAS, 2	49 MMBTU/H	100 PPM @ 15% O2	LOW NOX COMBUSTION	0	BACT-OTHER
CHARLES LARSEN POWER PLANT	FL	Jul-91	TURBINE, OIL, 1 EACH	80 MW	42 PPM @ 15% O2	WET INJECTION	0	BACT-PSD
CHARLES LARSEN POWER PLANT	FL	Jul-91	TURBINE, GAS, 1 EACH	80 MW	25 PPM @ 15% O2	WET INJECTION	0	BACT-PSD
SUMAS ENERGY INC.	WA	Jun-91	TURBINE, NATURAL GAS	88 MW	6 PPM @ 15% O2	SCR	90	BACT-PSD
SAGUARO POWER COMPANY	NV	Jun-91	COMBUSTION TURBINE GENERATOR	35 MW	16.9 PPH (WINTER)	SELECTIVE CATALYTIC REDUCTION (SCR)	80	BACT-PSD
FLORIDA POWER AND LIGHT	FL	Jun-91	TURBINE, OIL, 2 EACH	400 MW	65 PPM @ 15% O2	LOW NOX COMBUSTORS	0	BACT-PSD
FLORIDA POWER AND LIGHT	FL	Jun-91	TURBINE, GAS, 4 EACH	400 MW	25 PPM @ 15% O2	LOW NOX COMBUSTORS	0	BACT-PSD
FLORIDA POWER AND LIGHT	FL	Jun-91	TURBINE, CG, 4 EACH	400 MW	42 PPM @ 15% O2	LOW NOX COMBUSTORS	0	BACT-PSD
GRANITE ROAD LIMITED	CA	May-91	TURBINE, GAS, ELECTRIC GENERATION	461 MMBTU/H*	3.5 PPMVD @ 15% O2	SCR, STEAM INJECTION	97	BACT-PSD
NORTHERN CONSOLIDATED POWER	PA	May-91	TURBINES, GAS, 2	35 KW EACH	25 PPM @ 15% O2	STEAM INJECTION/+SCR IN 1997	65	OTHER
CIMARRON CHEMICAL	CO	Mar-91	TURBINE #1, GE FRAME 6	33 MW	25 PPM @ 15% O2	WATER INJECTION	0	OTHER
CIMARRON CHEMICAL	CO	Mar-91	TURBINE #2, GE FRAME 6	33 MW	9 PPM @ 15% O2	SCR	0	OTHER
SEMINOLE FERTILIZER CORPORATION	FL	Mar-91	TURBINE, GAS	26 MW	9 PPM @ 15% O2	SCR	0	BACT-PSD
FLORIDA POWER AND LIGHT	FL	Mar-91	TURBINE, GAS, 4 EACH	240 MW	42 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
FLORIDA POWER AND LIGHT	FL	Mar-91	TURBINE, OIL, 4 EACH	0.0	65 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
CITY UTILITIES OF SPRINGFIELD	MO	Mar-91	GENERATION OF ELECTRICAL POWER	752 MMBTU/HR	42 PPM BY VOL 1 HR AVG (	WATER INJECTION	0	BACT-PSD
CITY UTILITIES OF SPRINGFIELD	MO	Mar-91	GENERATION OF ELECTRICAL POWER	752 MMBTU/HR	65 PPM BY VOL 1 HR AVG (	WATER INJECTION	0	BACT-PSD
CITY UTILITIES OF SPRINGFIELD	MO	Mar-91	GENERATION OF ELECTRICAL POWER	585 MMBTU/HR.	42 PPM BY VOL 1 HR AVG (	WATER INJECTION	0	BACT-PSD
CITY UTILITIES OF SPRINGFIELD	MO	Mar-91	GENERATION OF ELECTRICAL POWER	585 MMBTU/HR.	65 PPM BY VOL 1 HR AVG (	WATER INJECTION	0	BACT-PSD
NEVADA COGENERATION ASSOCIATES #2	NV	Jan-91	COMBINED-CYCLE POWER GENERATION	85 MW POWER OUTPUT	61.3 LBS/HR	SELECTIVE CATALYTIC SYSTEM ON ONE UNIT	0	BACT-PSD
NEVADA COGENERATION ASSOCIATES #1	NV	Jan-91	COMBINED-CYCLE POWER GENERATION	85 MW TOTAL OUTPUT	61.3 LBS/HR	SELECTIVE CATALYTIC SYSTEM ON ONE UNIT	0	BACT-PSD
NEWARK BAY COGENERATION PARTNERSHIP	NJ	Nov-90	TURBINE, NATURAL GAS FIRED	585 MMBTU/HR	0.033 LB/MMBTU	STEAM INJECTION AND SCR	94	BACT-PSD
NORTHERN NATURAL GAS COMPANY	IA	Sep-90	ENGINE, COMPRESSOR	4,000 HP	1.6 G/B-HP-H	GOOD COMBUSTION PRACTICES	0	BACT-PSD
NORTHERN NATURAL GAS COMPANY	IA	Sep-90	ENGINES, COMPRESSOR, 2	2,000 HP EACH	1.8 G/B-HP-H	GOOD COMBUSTION PRACTICES	0	BACT-PSD
TBG COGEN COGENERATION PLANT	NY	Aug-90	GE LM2500 GAS TURBINE	215 MMBTU/HR	75 PPM + F8N CORRECTIO	WATER INJECTION	60	BACT
PEPCO - CHALK POINT PLANT	MD	Jun-90	TURBINE, 105 MW NATURAL GAS FIRED ELECTRIC	105 MW	77 PPM @ 15% O2	DRY PREMIX AND WATER INJECTION	0	BACT-PSD
PEPCO - CHALK POINT PLANT	MD	Jun-90	TURBINE, 84 MW NATURAL GAS FIRED ELECTRIC	84 MW	25 PPM @ 15% O2	QUIET COMBUSTION AND WATER INJECTION	0	BACT-PSD
PACIFIC GAS TRANSMISSION COMPANY	OR	Jun-90	TURBINE GAS, COMPRESSOR STATION	110 MMBTU/HR	199 PPM @ 15% O2	LOW NOX BURNER DESIGN	30	NSPS
PEPCO - STATION A	MD	May-90	TURBINE, 124 MW NATURAL GAS FIRED	125 MW	42 PPM @ 15% O2	WATER INJECTION	0	BACT-PSD
PEDRICKTOWN COGENERATION LIMITED PARTNERSHIP	NJ	Feb-90	TURBINE, NATURAL GAS FIRED	1,000 MMBTU/HR	0.044 LB/MMBTU	STEAM INJECTION AND SCR	93	BACT-PSD
SC ELECTRIC AND GAS COMPANY - HAGOOD STATION	SC	Dec-89	INTERNAL COMBUSTION TURBINE	110 MEGAWATTS	308 LBS/HR	WATER INJECTION	0	BACT-PSD
PEABODY MUNICIPAL LIGHT PLANT	MA	Nov-89	TURBINE, 38 MW NATURAL FAS FIRED	412 MMBTU/HR	25 PPM @ 15% O2	WATER INJECTION	0	BACT-OTHER
PACIFIC GAS TRANSMITION	OR	Nov-89	TURBINE, NAT. GAS	14,600 HP	42 PPM @ 15% O2	LOW NOX BURNERS	75	BACT-PSD
SOUTHERN MARYLAND ELECTRIC COOPERATIVE (SMECO)	MD	Oct-89	TURBINE, NATURAL GAS FIRED ELECTRIC	90 MW	199 LB/HR	WATER INJECTION	0	BACT-PSD
KINGSBURG ENERGY SYSTEMS	CA	Sep-89	TURBINE, NATURAL GAS FIRED, DUCT BURNER	35 MW	8 PPM @ 15% O2	SCR, STEAM INJECTION	90	BACT-PSD
MEGAN-RACINE ASSOCIATES, INC	NY	Aug-89	GE LM5000-N COMBINED CYCLE GAS TURBINE	401 LB/MMBTU	42 PPMDV @ 15% O2	WATER INJECTION	60	BACT

Note: PSD= Prevention of Significant Deterioration
BACT= Best Available Control Technology
LAER= Lowest Achievable Emission Rate

Table B-3. Capital Cost for Selective Catalytic Reduction for General Electric Frame "F" Simple Cycle Combustion Turbine

Cost Component	Costs	Basis of Cost Component
Direct Capital Costs		
SCR Associated Equipment	$825,252	Vendor Based Estimate
Ammonia Storage Tank	$134,225	$35 per 1,000 lb mass flow developed from vendor quotes
Flue Gas Cooling	$260,000	Vendor Based Estimate (110,000 acfm)
Instrumentation	$82,525	10% of SCR Associated Equipment
Taxes	$197,007	6% of SCR Associated Equipment and Catalyst
Freight	$164,172	5% of SCR Associated Equipment and Catalyst
Total Direct Capital Costs (TDCC)	$1,663,182	
Recurring Capital Costs (RCC)	$2,458,197	Catalyst; Vendor Based Estimate
TOTAL CAPITAL COSTS (TCC)	$2,919,595	Sum of TDCC and RCC
Direct Installation Costs		
Foundation and supports	$329,710	8% of TCC; OAQPS Cost Control Manual
Handling & Erection	$576,993	14% of TCC; OAQPS Cost Control Manual
Electrical	$164,855	4% of TCC; OAQPS Cost Control Manual
Piping	$82,428	2% of TCC; OAQPS Cost Control Manual
Insulation for ductwork	$41,214	1% of TCC; OAQPS Cost Control Manual
Painting	$41,214	1% of TCC; OAQPS Cost Control Manual
Site Preparation	$5,000	Engineering Estimate
Buildings	$15,000	Engineering Estimate
Total Direct Installation Costs (TDIC)	$1,256,414	
Total Direct Capital Costs (TDCC)	$4,176,009	
Indirect Costs		
Engineering	$291,960	10% of Total Capital Costs; OAQPS Cost Control Manual
PSM/RMP Plan	$25,000	Engineering Estimate
Construction and Field Expense	$145,980	5% of Total Capital Costs; OAQPS Cost Control Manual
Contractor Fees	$291,960	10% of Total Capital Costs; OAQPS Cost Control Manual
Start-up	$58,392	2% of Total Capital Costs; OAQPS Cost Control Manual
Performance Tests	$29,196	1% of Total Capital Costs; OAQPS Cost Control Manual
Allowance for Funds Used During Construction (AFU	$157,111	2.5% of Total Capital Costs; borrowed at a rate of 7.0% for 9 months.
Contingencies	$87,588	3% of Total Capital Costs; OAQPS Cost Control Manual
TOTAL INDIRECT CAPITAL COST (TICC)	$1,087,185	
TOTAL DIRECT and INDIRECT CAPITAL COSTS (TDICC)	$5,263,194	Sum of TDCC and TDIC

Table B-4. Annualized Cost for Selective Catalytic Reduction for General Electric Frame "F" Simple Cycle Operation

Cost Component	Costs	Basis of Cost Component
Direct Annual Costs		
Operating Personnel	$24,960	24 hours/week at $20/hr
Supervision	$3,744	15% of Operating Personnel;OAQPS Cost Control Manual
Maintenance - Labor	$13,104	0.5 hr per shift, $24/hr; OAQPS Cost Manual
- Materials	$13,104	100% of maintenance labor; OAQPS Cost Manual
Ammonia	$65,856	$300 per ton NH3 Aqueous
PSM/RMP Update	$5,000	Engineering Estimate
Inventory Cost	$89,970	Capital Recovery (10.98%) for 1/3 catalyst
Catalyst Disposal Cost	$35,793	$28/1,000 lb/hr mass flow over 3 years; developed from vendor quotes
Contingency	$7,546	3% of Direct Annual Costs
Total Direct Annual Costs (TDAC)	$259,078	
Energy Costs		
Electrical	$47,460	80kW/h for SCR; 200 kW/h for cooling fan@ $0.05/kWh times Capacity Factor
Heat Rate Penalty	$241,210	0.5% of MW output; EPA, 1993 (Page 6-20); plus fuel costs at $3/mmBtu
MW Loss Penalty	$78,611	3 days lost energy costs @ $0.05 kWh each three period; minus fuel costs at $3/mmBtu
Fuel Escalation	$8,660	Escalation of fuel over inflation; 3% of energy costs
Contingency	$11,278	3% of Energy Costs
Total Energy Costs (TEC)	$387,219	
Indirect Annual Costs		
Overhead	$17,222	60% of Operating/Supervision Labor and Ammonia
Property Taxes, Insurance, Admin.	$210,528	4% of Total Capital Costs
Annualized Total Direct Capital	$439,944	10.98% Capital Recovery Factor of 7% over 15 years times sum of TDCC, TDIC and TI
Annualized Total Direct Recurring	$936,700	38.11% Capital Recovery Factor of 7% over 3 years times RCC
Total Indirect Annual Costs (TIAC)	$1,604,395	
TOTAL ANNUALIZED COSTS	$2,250,692	Sum of TDAC, TEC and TIAC
COST EFFECTIVENESS ($ per ton removed)	$14,886	NO_x Only
	$25,267	All Pollutants

Table B-5. Summary of Best Available Control Technology (BACT) Determinations for Carbon Monoxide (CO) Emissions

Facility Name	State	Permit Issue Date	Unit/Process Description	Capacity (size)	CO Emission Limit	Control Method	Efficiency (%)	Type
PDC EL PASO MILFORD LLC	CT	Apr-99	TURBINE, COMBUSTION, ABB GT-24E,#2 WITH 2 CHILLERS	1.97 MMCF/H	13 LB/H NAT GAS	OXIDATION CATALYST	0	BACT-PSD
PDC EL PASO MILFORD LLC	CT	Apr-99	TURBINE, COMBUSTION, ABB GT-24, #1 WITH 2 CHILLERS	1.97 MMCF/H	13 LB/H NAT GAS	OXIDATION CATALYST	0	BACT-PSD
ALABAMA POWER COMPANY - THEODORE COGENERATION	AL	Mar-99	TURBINE, WITH DUCT BURNER	170 MW	0.066 LB/MMBTU	EFFICIENT COMBUSTION	0	BACT-PSD
MOBILE ENERGY LLC	AL	Jan-99	TURBINE, GAS, COMBINED CYCLE	168 MW	0.04 LB/MMBTU	GOOD COMBUSTION PRACTICES	0	BACT-PSD
TENASKA GEOROIA PARTNERS, L.P.	GA	Dec-98	TURBINE, COMBUSTION, SIMPLE CYCLE, 6	180 MW EA	15 PPMVD @ 15% O2	USINO 15% EXCESS AIR. CO EMISSION IS BECAUSE OFNATURAL GAS.	0	BACT-PSD
TENUSKA GEORGIA PARTNERS, L.P.	GA	Dec-98	TURBINE, COMBUSTION, SIMPLE CYCLE, 6	180 MW EA	33 PPMVD	CO EMISSION IS BECAUSE OF FUEL OIL. WHEN OUTPUT ISBELOW 123 MW LIMIT IS 33 PPMVD AND ABOVE 123 MW LIMIT IS 20 PPMVD.	0	BACT-PSD
WESTBROOK POWER LLC	ME	Dec-98	TURBINE, COMBINED CYCLE, TWO	528 MW TOTAL	15 PPM @15% O2	USING 15 % EXCESS AIR.	0	BACT-PSD
SANTA ROSA ENERGY LLC	FL	Dec-98	TURBINE, COMBUSTION, NATURAL GAS	241 MW	0	DRY LOW NOX BURNER GOOD COMBUSTION PRACTICE	0	BACT-PSD
GORHAM ENERGY LIMITED PARTNERSHIP	ME	Dec-98	TURBINE, COMBINED CYCLE	900 MW TOTAL	5 PPM @ 15% O2 (NAT G)	0.05% SULFUR DISTILLATE OIL #2 IS USED. EMISSION IS FROM EACH 300 MW SYSTEM.	0	BACT-PSD
WESTERN GAS RESOURCES - HILIGHT GAS PLANT	WY	Oct-98	ENGINES, COMPRESSOR, 2 EA	1650 HP	2 G/HP-H	3 - WAY CATALYST SYSTEM AND AIR/FUEL RATIO CONTRO-LLER.	0	BACT-PSD
WILLIAMS FIELD SERVICES	NM	Sep-98	IC ENGINE, COMPRESSOR	27240 HP	2.65 G/B-HP-H	LEAN-BURN ENGINE DESIGN	0	BACT-PSD
CHAMPION INTERNATL CORP. & CHAMP. CLEAN ENEROY	ME	Sep-98	TURBINE, COMBINED CYCLE, NATURAL GAS	175 MW	9 PPMVD @15% O2 GAS		0	BACT-OTHER
TNP TECHN, LLC (FORMERLY TX-NM POWER CO.)	NM	Aug-98	GAS TURBINES	375 MMBTU/H	18 PPM	GOOD COMBUSTION PRACTICES	0	BACT-PSD
WILLIAMS FIELD SERVICES CO.	NM	Jul-98	RECIPROCATING ENGINE, NAT. GAS	1375 HP	2.65 G/B-HP-H	CLEAN BURN COMBUSTION TECHNOLOGY	0	BACT-PSD
CASCO RAY ENERGY CO	ME	Jul-98	TURBINE, COMBINED CYCLE, NATURAL GAS, TWO	170 MW EACH	20 PPM @ 15% O2	15% EXCESS AIR	0	BACT-PSD
CITY OF LAKELAND ELECTRIC AND WATER UTILITIES	FL	Jul-98	TURBINE, COMBUSTION, GAS FIRED W/ FUEL OIL ALSO	2174 MMBTU/H	25 PPM	GOOD COMBUSTION WITH DRY LOW NOX BURNERS OXIDATION CATALYST MAY BE USED	0	BACT-PSD
COLORADO SPRINGS UTILITIES-NIXON POWER PLANT	CO	Jun-98	SIMPLE CYCLE TURBINE, NATURAL GAS	1122 MM BTU/HR	0.6 ORE	CATALYTIC OXIDATION	60	BACT-PSD
BRIDGEPORT ENERGY, LLC	CT	Jun-98	TURBINES, COMBUSTION MODEL V84.3A, 2 SIEMES	260 MW/HRSG PER TURBINE	10 PPM GAS & OIL	PRE-MIX FUEL FAIR TO OPTIMIZE EFFICIENCY ACTUAL EMISSIONS EXPECTED BETWEEN 5-7PPM	0	BACT-PSD
WILLIAMS FIELD SERVICES CO.	NM	Jun-98	RECIPROCATING ENGINES, NAT. GAS	21920 HP	2.65 G/B-HP-H	LEAN BURN ENGINE DESIGN	0	BACT-PSD
ENCOGEN HAWAII, L.P.	HI	Jun-98	TURBINES, COMBUSTION, 2 EA	23 MW	57.5 PPMVD @ 15% O2	GOOD COMBUSTION DESIGN AND OPERATION.	0	BACT-PSD
GENERAL ELECTRIC PLASTICS	AL	May-98	COMBINED CYCLE (TURBINE AND DUCT BURNER)	0	0.08 LBS/MMBTU	PROPER COMBUSTION	0	BACT-PSD
UNION PACIFIC RESOURCES - PATRICK DRAW GAS PLANT	WY	May-98	ENGINES, COMPRESSOR, 2 EA	1200 HP	2.6 G/B-HP-H	ULTRA LOW NOX LEAN BURN TECHNOLOGY.	0	BACT-PSD
UNION PACIFIC RESOURCES - PATRICK DRAW GAS PLANT	WY	May-98	ENGINE, COMPRESSOR, 9 EA	3200 HP	0.5 G/HP-H	ULTRA LOW NOX LEAN BURN TECHNOLOGY AND CATALYTIC CRACKING.	0	BACT-PSD
UNION PACIFIC RESOURCES - PATRICK DRAW GAS PLANT	WY	May-98	ENGINES, COMPRESSOR, 9 EA	3200 HP	0.5 G/B-HP-H	ULTRA LOW NOX LEAN BURN TECHNOLOGY. CATALYTIC CONVERTER.	0	BACT-PSD
UNION PACIFIC RESOURCES - PATRICK DRAW GAS PLANT	WY	May-98	COMPRESSOR, ENGINES, 2 EA	1200 HP	2.6 G/HP-H	ULTRA LOW NOX LEAN BURN TECHNOLOGY.	0	BACT-PSD
RUMFORD POWER ASSOCIATES	ME	May-98	TURBINE GENERATOR, COMBUSTION, NATURAL GAS	1906 MMBTU/H	15 PPM @ 15% O2	GE DRY LOW-NOX COMBUSTOR DESIGN. GOOD COMBUSTION CNTRL.	0	BACT-PSD
WILLIAMS FIELD SERVICES CO.	NM	Apr-98	NATURAL GAS RECIPROCATING ENGINE	1478 HP	2.65 G/B-HP-H	LEAN BURN DESIGN	0	BACT-PSD
WILLIAMS FIELD SERVICES CO.	NM	Apr-98	ENGINE, IC RECIPROCATING, NAT. GAS	1374 HP	2.65 G/B-HP-H	CLEAN BURN COMBUSTION TECHNOLOGY	0	BACT-PSD
ANDROSCOGGIN ENERGY LIMITED	ME	Mar-98	GAS TURBINES, COGEN, W/DUCT BURNERS	675 MMBTU/H TURBINE	74.21 LB/H NG	CATALYTIC OXIDATION, GOOD COMBUSTION PRACTICES.	0	BACT-PSD
ANDROSCOGGIN ENERGY LIMITED	ME	Mar-98	GAS TURBINES, COGEN, W/DUCT BURNERS	675 MMBTU/H TURBINE	43.73 LB/H NG OIL	CATALYTIC OXIDATION, GOOD COMBUSTION PRACTICES.	0	BACT-PSD
TIVERTON POWER ASSOCIATES	RI	Feb-98	COMBUSTION TURBINE, NATURAL GAS	265 MW	12 PPM @ 15% O2	GOOD COMBUSTION	0	BACT-PSD
AIR LIQUIDE AMERICA CORPORATION	LA	Feb-98	TURBINE GAS, GE, 7ME 7	968 MMBTU/H	25 PPMV	GOOD EOUIPMENT DESIGN, PRDPER COMBUSTION TECHNIOUEAND MIN. 2% EXCESS O2	0	BACT-PSD
MILLENNIUM POWER PARTNER, LP	MA	Feb-98	TURBINE, COMBUSTION, WESTINGHOUSE MODEL 501G	2534 MMBTU/H	0.07 LB/MMBTU	DRY LOW NOX COMBUSTION TECHNOLOGY IN CONJUNCTION WITH SCR ADD-ON NOX CONTROL.	0	BACT-PSD
MAUI ELECTRIC COMPANY	HI	Jan-98	TURBINE, COMBUSTION, 2 EA	20 MW	44 PPMVD @ 15% O2	GOOD COMBUSTION DESIGN AND OPERATION.	0	BACT-PSD
BASF CORPORATION	LA	Dec-97	TURBINE, COGEN UNIT 2, GE FRAME 6	42.4 MW	83.93 LB/MMBTU	GOOD DESIGN, PROPER COMBUSTION TECHNIQUES, 2% EXCESS O2	0	BACT-PSD
ARCHIE CRIPPEN	CA	Dec-97	IC ENGINE, DETROIT DIESEL MODEL 6V-92TA	500 BHP	0.51 G/B-HP-H	NO CONTROL	0	BACT
WILLIAMS FIELD SERVICES—MIDDLE MESA COP	NM	Dec-97	NATURAL GAS COMPRESSOR STATION, 14 ENGINES	1478 HP, EACH	6 LB/HR EACH ENGINE	CLEAN/LEAN BURN TECHNOLOGY	0	BACT-PSD
BUCKNELL UNIVERSITY	PA	Nov-97	NG FIRED TURBINE, SOLAR TAURUS T-7300S	5 MW	50 PPMV@15%O2	GOOD COMBUSTION	0	BACT-OTHER
LORDSBURG L.P.	NM	Jun-97	TURBINE, NATURAL GAS-FIRED, ELEC. GEN.	100 MW	27 LBS/HR	DRY LOW-NOX TECHNOLOGY BY MAINTAINING PROPER AIR- FUEL RATIO.	0	BACT-PSD
MEAD COATED BOARD, INC.	AL	Mar-97	COMBINED CYCLE TURBINE (25 MW)	568 MMBTU/HR	28 PPMVD@15% O2 (GAS)	PROPER DESIGN AND GOOD COMBUSTION PRACTICES	0	BACT-PSD
FORMOSA PLASTICS CORPORATION, BATON ROUGE PLANT	LA	Mar-97	TURBINE/HSRG, GAS COGENERATION	450 MM BTU/HR	70 LB/HR	COMBUSTION DESIGN AND CONSTRUCTION.	0	BACT-PSD
SOUTHWESTERN PUBLIC SERVICE COMPANY/CUNNINGHAM STA	NM	Feb-97	COMBUSTION TURBINE, NATURAL GAS	100 MW	0 SEE FACILITY NOTES	GOOD COMBUSTION PRACTICES	0	BACT-PSD
SOUTHWESTERN PUBLIC SERVICE CO/CUNNINGHAM STATION	NM	Nov-96	COMBUSTION TURBINE, NATURAL GAS	100 MW	0 SEE P2	GOOD COMBUSTION PRACTICES	0	BACT-PSD
ECOELECTRICA, L.P.	PR	Oct-96	TURBINES, COMBINED-CYCLE COGENERATION	461 MW	33 PPMDV	COMBUSTION CONTROLS.	0	BACT-PSD
ECOELECTRICA, L.P.	PR	Oct-96	TURBINES, COMBINED-CYCLE COGENERATION	461 MW	100 PPMDV AT MIN. LOAD	COMBUSTION CONTROLS.	0	BACT-PSD
BLUE MOUNTAIN POWER, LP	PA	Jul-96	COMBUSTION TURBINE WITH HEAT RECOVERY BOILER	153 MW	3.1 PPM @ 15% O2	OXIDATION CATALYST 16 PPM @ 15% O2 WHEN FIRING NO. 2 OIL. AT 75% NG LIMIT SET TO 22.1 PPM	60	OTHER
COMMONWEALTH CHESAPEAKE CORPORATION	VA	May-96	3 COMBUSTION TURBINES (OIL-FIRED)	6,000 HRS/YR	98 TPY	GOOD COMBUSTION OPERATING PRACTICES	0	BACT/NSPS
PORTSIDE ENERGY CORP.	IN	May-96	TURBINE, NATURAL GAS-FIRED	63 MEGAWATT	40 LBS/HR	GOOD COMBUSTION AND EMISSIONS NOT TO EXCEED 40 PPMVD AT 15% OXYGEN.	0	BACT-PSD
PORTSIDE ENERGY CORP.	IN	May-96	TURBINE, NATURAL GAS-FIRED	63 MEGAWATT	12 LBS/HR	GOOD COMBUSTION AND EMISSIONS NOT TO EXCEED 10 PPMVD AT 15% OXYGEN.	0	BACT-PSD
GENERAL ELECTRIC GAS TURBINES	SC	Apr-96	I.C. TURBINE	2,700 MMBTU/HR	27,169 LB/HR	GOOD COMBUSTION PRACTICES TO MINIMIZE EMISSIONS	0	BACT-PSD
CAROLINA POWER & LIGHT	NC	Apr-96	COMBUSTION TURBINE, 4 EACH	1,906 MMBTU/HR	81 LB/HR	COMBUSTION CONTROL	0	BACT-PSD
CAROLINA POWER & LIGHT	NC	Apr-96	COMBUSTION TURBINE, 4 EACH	1,906 MMBTU/HR	60 LB/HR	COMBUSTION CONTROL	0	BACT-PSD
SOUTH MISSISSIPPI ELECTRIC POWER ASSOC.	MS	Apr-96	COMBUSTION TURBINE, COMBINED CYCLE	1,299 MMBTU/HR NAT GAS	28.3 PPM @ 15% O2, GAS	GOOD COMBUSTION CONTROLS	0	BACT-PSD
MID-GEORGIA COGEN.	GA	Apr-96	COMBUSTION TURBINE (2), FUEL OIL	116 MW	30 PPMVD	COMPLETE COMBUSTION	0	BACT-PSD
MID-GEORGIA COGEN.	GA	Apr-96	COMBUSTION TURBINE (2), NATURAL GAS	116 MW	10 PPMVD	COMPLETE COMBUSTION	0	BACT-PSD
GEORGIA GULF CORPORATION	LA	Mar-96	GENERATOR, NATURAL GAS FIRED TURBINE	1,123 MM BTU/HR	972 TPY CAP FOR 3 TURB.	GOOD COMBUSTION PRACTICE AND PROPER OPERATION	0	BACT-PSD
SEMINOLE HARDEE UNIT 3	FL	Jan-96	COMBINED CYCLE COMBUSTION TURBINE	140 MW	20 PPM (NAT. GAS)	DRY LNB GOOD COMBUSTION PRACTICES	0	BACT-PSD
KEY WEST CITY ELECTRIC SYSTEM	FL	Sep-95	TURBINE, EXISTING CT RELOCATION TO A NEW PLANT	23 MW	20 PPM @ 15% O2 FULL LD	GOOD COMBUSTION	0	BACT-PSD
UNION CARBIDE CORPORATION	LA	Sep-95	GENERATOR, GAS TURBINE	1,313 MM BTU/HR	199 LB/HR	NO ADD-ON CONTROL GOOD COMBUSTION PRACTICE	0	BACT-PSD
PUERTO RICO ELECTRIC POWER AUTHORITY (PREPA)	PR	Jul-95	COMBUSTION TURBINES (3), 83 MW SIMPLE-CYCLE EACH	248 MW	20 LB/HR	MAINTAIN EACH TURBINE IN GOOD WORKING ORDER AND IMPLEMENT GOOD COMBUSTION PRACTICES.	0	BACT-PSD
PUERTO RICO ELECTRIC POWER AUTHORITY (PREPA)	PR	Jul-95	COMBUSTION TURBINES (3), 83 MW SIMPLE-CYCLE EACH	248 MW	104 LB/HR	MAINTAIN EACH TURBINE IN GOOD WORKING ORDER AND IMPLEMENT GOOD COMBUSTION PRACTICES.	0	BACT-PSD
BROOKLYN NAVY YARD COGENERATION PARTNERS L.P.	NY	Jun-95	TURBINE, NATURAL GAS FIRED	240 MW	4 PPM @ 15% O2		0	LAER
PANDA-KATHLEEN, L.P.	FL	Jun-95	COMBINED CYCLE COMBUSTION TURBINE (TOTAL 115MW)	75 MW	25 PPM @ 15% O2	COMBUSTION CONTROLS STANDARD ONLY APPLIES IF GE CT IS SELECTED, THE ABB CT WAS LESS THAN SIGNIFICANT EMIS. INCR FOR CO	0	BACT-PSD
MILAGRO, WILLIAMS FIELD SERVICE	NM	May-95	TURBINE/COGEN, NATURAL GAS (2)	900 MMCF/DAY	28 PPM @ 15% O2		0	BACT-PSD
LEDERLE LABORATORIES	NY	Apr-95	(2) GAS TURBINES (EP #S 00101&102)	110 MMBTU/HR	48 PPM, 12.6 LB/HR		0	BACT-OTHER
PILGRIM ENERGY CENTER	NY	Apr-95	(2) WESTINGHOUSE W501D5 TURBINES (EP #S 00001&2)	1,400 MMBTU/HR	10 PPM, 29.0 LB/HR		0	BACT-OTHER
BALTIMORE GAS & ELECTRIC - PERRYMAN PLANT	MD	Mar-95	TURBINE, 140 MW NATURAL GAS FIRED ELECTRIC	140 MW	20 PPM @ 15% O2	GOOD COMBUSTION PRACTICES	0	BACT-PSD
FORMOSA PLASTICS CORPORATION, LOUISIANA	LA	Mar-95	TURBINE/HRSG, GAS COGENERATION	450 MM BTU/HR	26 LB/HR	PROPER OPERATION	0	BACT-PSD
EMPIRE DISTRICT ELECTRIC CO.	MO	Feb-95	INSTALL TWO NEW SIMPLE-CYCLE TURBINES	69 MW	426 TPY	GOOD COMBUSTION CONTROL	0	BACT-PSD
MARATHON OIL CO. - INDIAN BASIN N.G. PLAN	NM	Jan-95	TURBINES, NATURAL GAS (2)	5,500 HP	13 LBS/HR	LEAN-PREMIXED COMBUSTION TECHNOLOGY.	66	BACT-PSD
KAMINE/BESICORP SYRACUSE LP	NY	Dec-94	SIEMENS V64.3 GAS TURBINE (EP #00001)	650 MMBTU/HR	9.5 PPM	NO CONTROLS	0	BACT-OTHER
INDECK-OSWEGO ENERGY CENTER	NY	Oct-94	GE FRAME 6 GAS TURBINE	533 LB/MMBTU	10 PPM, 10.00 LB/HR	NO CONTROLS	0	BACT-OTHER
FULTON COGEN PLANT	NY	Sep-94	GE LM5000 GAS TURBINE	500 MMBTU/HR	107 PPM, 120 LB/HR	NO CONTROLS	0	BACT-OTHER
CAROLINA POWER AND LIGHT	SC	Aug-94	STATIONARY GAS TURBINE	1,520 MMBTU/H	702 LB/H	PROPER OPERATION TO ACHIEVE GOOD COMBUSTION	0	BACT-PSD
CAROLINA POWER AND LIGHT	SC	Aug-94	STATIONARY GAS TURBINE	1,520 MMBTU/H	414 LB/H	PROPER OPERATION TO ACHIEVE GOOD COMBUSTION	0	BACT-PSD
SNYDER OIL CORPORATION-RIVERTON DOME GAS PLANT	WY	Jul-94	NATURAL GAS-FIRED COMPRESSOR ENGINE	520 HORSEPOWER	1.7 LBS/HR	GOOD COMBUSTION	0	BACT
SNYDER OIL CORPORATION-RIVERTON DOME GAS PLANT	WY	Jul-94	2 GAS-FIRED GENERATOR ENGINES	385 HORSEPOWER	1.3 LBS/HR	GOOD COMBUSTION	0	BACT
SNYDER OIL CORPORATION-RIVERTON DOME GAS PLANT	WY	Jul-94	1 GAS-FIRED GENERATOR ENGINE	577 HORSEPOWER	1.9 LBS/HR	GOOD COMBUSTION	0	BACT
COLORADO POWER PARTNERSHIP	CO	Jul-94	TURBINES, 2 NAT GAS & 2 DUCT BURNERS	385 MMBTU/H EACH TURBINE	22 PPM @ 15% O2		0	BACT-PSD
MUDDY RIVER L.P.	NV	Jun-94	COMBUSTION TURBINE, DIESEL & NATURAL GAS	140 MEGAWATT	77 LB/HR	FUEL SPEC: NATURAL GAS	0	BACT-PSD
CSW NEVADA, INC.	NV	Jun-94	COMBUSTION TURBINE, DIESEL & NATURAL GAS	140 MEGAWATT	83 LB/HR	FUEL SPEC: NATURAL GAS	0	BACT-PSD
PORTLAND GENERAL ELECTRIC CO.	OR	May-94	TURBINES, NATURAL GAS (2)	1,720 MMBTU	15 PPM @ 15% O2	GOOD COMBUSTION PRACTICES	0	BACT-PSD

Table B-5. Summary of Best Available Control Technology (BACT) Determinations for Carbon Monoxide (CO) Emissions

Facility Name	State	Permit Issue Date	Unit/Process Description	Capacity (size)	CO Emission Limit	Control Method	Efficiency (%)	Type
EMPIRE DISTRICT ELECTRIC CO.	MO	May-94	INSTALL TWO NEW SIMPLE-CYCLE TURBINES	1,345 MMBTU/HR	120 TPY	NONE	0	BACT-PSD
EMPIRE DISTRICT ELECTRIC CO.	MO	May-94	INSTALL TWO NEW SIMPLE-CYCLE TURBINES	1,345 MMBTU/HR	1290 TPY	NONE	0	BACT-PSD
NAVY PUBLIC WORKS CENTER	VA	May-94	1 EMERGENCY GENERATOR	1,500 KW	14.4 TPY	RETARD TIMING 6 DEGREES	0	NSPS
WEST CAMPUS COGENERATION COMPANY	TX	May-94	GAS TURBINES	75 MW (TOTAL POWER)	300 TPY	INTERNAL COMBUSTION CONTROLS	0	BACT
HERMISTON GENERATING CO.	*OR*	*Apr-94*	*TURBINES, NATURAL GAS (2)*	*1,696 MMBTU*	*15 PPM @ 15% O2*	*GOOD COMBUSTION PRACTICES*	*0*	*BACT-PSD*
FLORIDA POWER CORPORATION POLK COUNTY SITE	FL	Feb-94	TURBINE, NATURAL GAS (2)	1,510 MMBTU/H	25 PPMVD	GOOD COMBUSTION PRACTICES	0	BACT-PSD
FLORIDA POWER CORPORATION POLK COUNTY SITE	FL	Feb-94	TURBINE, FUEL OIL (2)	1,730 MMBTU/H	30 PPMVD	GOOD COMBUSTION PRACTICES	0	BACT-PSD
TECO POLK POWER STATION	FL	Feb-94	TURBINE, SYNGAS (COAL GASIFICATION)	1,755 MMBTU/H	25 PPMVD	GOOD COMBUSTION	0	BACT-PSD
TECO POLK POWER STATION	FL	Feb-94	TURBINE, FUEL OIL	1,765 MMBTU/H	40 PPMVD	GOOD COMBUSTION	0	BACT-PSD
INTERNATIONAL PAPER	LA	Feb-94	TURBINE/HRSG, GAS COGEN	338 MM BTU/HR TURBINE	166 LB/HR	COMBUSTION CONTROL	0	BACT
KAMINE/BESICORP CARTHAGE L.P.	NY	Jan-94	GE FRAME 6 GAS TURBINE	491 BTU/HR	10 PPM, 11.0 LB/HR	NO CONTROLS	0	BACT-OTHER
ORANGE COGENERATION LP	FL	Dec-93	TURBINE, NATURAL GAS, 2	368 MMBTU/H	30 PPMVD	GOOD COMBUSTION	0	BACT-PSD
PROJECT ORANGE ASSOCIATES	*NY*	*Dec-93*	*GE LM-5000 GAS TURBINE*	*550 MMBTU/HR*	*92 LB/HR TEMP > 20F*	*NO CONTROLS*	*0*	*BACT-OTHER*
WILLIAMS FIELD SERVICES CO. - EL CEDRO COMPRESSOR	NM	Oct-93	TURBINE, GAS-FIRED	11,257 HP	50 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
PATOWMACK POWER PARTNERS, LIMITED PARTNERSHIP	VA	Sep-93	TURBINE, COMBUSTION, SIEMENS MODEL V84.2, 3	10.2 X109 SCF/YR NAT GAS	26 LB/HR	GOOD COMBUSTION OPERATING PRACTICES	0	BACT-PSD
FLORIDA GAS TRANSMISSION COMPANY	AL	Aug-93	TURBINE, NATURAL GAS	12,600 BHP	0.42 GM/HP HR	AIR-TO-FUEL RATIO CONTROL, DRY COMBUSTION CONTROLS	0	BACT-PSD
LOCKPORT COGEN FACILITY	NY	Jul-93	(6) GE FRAME 6 TURBINES (EP #S 00001-00006)	424 MMBTU/HR	10 PPM	NO CONTROLS	0	BACT-OTHER
ANITEC COGEN PLANT	NY	Jul-93	GE LM5000 COMBINED CYCLE GAS TURBINE EP #00001	451 MMBTU/HR	36 PPM, 33 LB/HR	BAFFLE CHAMBER	80	SEE NOTE #4
NEWARK BAY COGENERATION PARTNERSHIP, L.P.	NJ	Jun-93	TURBINES, COMBUSTION, KEROSENE-FIRED (2)	640 MMBTU/H (EACH)	2.6 PPMDV	OXIDATION CATALYST	0	OTHER
NEWARK BAY COGENERATION PARTNERSHIP, L.P.	NJ	Jun-93	TURBINES, COMBUSTION, NATURAL GAS-FIRED (2)	617 MMBTU/HR (EACH)	1.6 PPMDV	OXIDATION CATALYST	0	OTHER
PSI ENERGY, INC. WABASH RIVER STATION	IN	May-93	COMBINED CYCLE SYNGAS TURBINE	1,775 MMBTU/HR	15 LESS THAN PPM	*OPERATION PRACTICES AND GOOD COMBUSTION, COMBINED CYCLE* SYNGAS TURBINE	0	BACT-PSD
TIGER BAY LP	FL	May-93	TURBINE, OIL	1,850 MMBTU/H	98.4 LB/H	GOOD COMBUSTION PRACTICES	0	BACT-PSD
TIGER BAY LP	FL	May-93	TURBINE, GAS	1,615 MMBTU/H	49 LB/H	GOOD COMBUSTION PRACTICES	0	BACT-PSO
INOECK ENERGY COMPANY	NY	May-93	GE FRAME 6 GAS TURBINE EP #00001	491 MMBTU/HR	40 PPM	NO CONTROLS	0	BACT-OTHER
TRIGEN MITCHEL FIELD	NY	Apr-93	GE FRAME 6 GAS TURBINE	425 MMBTU/HR	10 PPM, 10.0 LB/HR	NO CONTROLS	0	BACT-OTHER
KISSIMMEE UTILITY AUTHORITY	FL	Apr-93	TURBINE, FUEL OIL	926 MMBTU/H	65 LB/H	GOOD COMBUSTION PRACTICES	0	BACT-PSD
KISSIMMEE UTILITY AUTHORITY	FL	Apr-93	TURBINE, FUEL OIL	371 MMBTU/H	76 LB/H	GOOO COMBUSTION PRACTICES	0	BACT-PSD
KISSIMMEE UTILITY AUTHORITY	FL	Apr-93	TURBINE, NATURAL GAS	869 MMBTU/H	54 LB/H	GOOD COMBUSTION PRACTICES	0	BACT-PSD
KISSIMMEE UTILITY AUTHORITY	FL	Apr-93	TURBINE, NATURAL GAS	367 MMBTU/H	40 LB/H	GOOD COMBUSTION PRACTICES	0	BACT-PSO
EAST KENTUCKY POWER COOPERATIVE	KY	Mar-93	TURBINES (5), #2 FUEL OIL AND NAT. GAS FIRED	1,492 MMBTU/H (EACH)	75 LBS/H (EACH)	PROPER COMBUSTION TECHNIOUES	0	BACT-OTHER
INTERNATIONAL PAPER CO. RIVERDALE MILL	AL	Jan-93	TURBINE, STATIONARY (GAS-FIRED) WITH DUCT BURNER	40 MW	22 LB/HR	DESIGN	0	BACT-PSD
AUBURNDALE POWER PARTNERS, LP	FL	Dec-92	TURBINE, OIL	1,170 MMBTU/H	25 PPMVD	GOOD COMBUSTION PRACTICES	0	BACT-PSO
AUBURNDALE POWER PARTNERS, LP	FL	Dec-92	TURBINE,GAS	1,214 MMBTU/H	15 PPMVD	GOOD COMBUSTION PRACTICES	0	BACT-PSD
SITHE/INDEPENDENCE POWER PARTNERS	NY	Nov-92	TURBINES, COMBUSTION (4) (NATURAL GAS) (1012 MW)	2,133 MMBTU/HR (EACH)	13 PPM	COMBUSTION CONTROLS	0	BACT-OTHER
KAMINE/BESICORP BEAVER FALLS COGENERATION FACILITY	NY	Nov-92	TURBINE, COMBUSTION (NAT. GAS & OIL FUEL) (79MW)	650 MMBTU/HR	9.5 PPM	COMBUSTION CONTROLS	0	BACT-OTHER
GRAYS FERRY CO. GENERATION PARTNERSHIP	PA	Nov-92	TURBINE (NATURAL GAS & OIL)	1,150 MMBTU	0.0055 LB/MMBTU (GAS)*	COMBUSTION	0	BACT-OTHER
BEAR ISLAND PAPER COMPANY, L.P.	VA	Oct-92	TURBINE, COMBUSTION GAS	468 X10(6) BTU/HR #2 OIL	11 LBS/HR	GOOD COMBUSTION	0	BACT-PSD
BEAR ISLAND PAPER COMPANY, L.P.	VA	Oct-92	TURBINE, COMBUSTION GAS (TOTAL)	0	48 TPY	GOOD COMBUSTION	0	BACT-PSD
BEAR ISLAND PAPER COMPANY, L.P.	VA	Oct-92	TURBINE, COMBUSTION GAS	474 X10(6) BTU/HR N. GAS	11 LBS/HR	GOOD COMBUSTION	0	BACT-PSD
PHILADELPHIA SOUTHWEST WATER TREATMENT PLANT	PA	Oct-92	ENGINES (2) (NATURAL GAS)	443 KW (EACH)	0	LEAN BURN ENGINE	0	OTHER
PHILADELPHIA NORTHEAST WATER TREATMENT PLANT	PA	Oct-92	ENGINES (3) (NATURAL GAS)	443 KW (EACH)	0	LEAN BURN ENGINE	0	OTHER
GORDONSVILLE ENERGY L.P.	VA	Sep-92	TURBINE FACILITY, GAS	7.44 X10(7) GPY FUEL OIL	250 TOTAL TPY	GOOD COMBUSTION PRACTICES	0	BACT-PSD
GORDONSVILLE ENERGY L.P.	VA	Sep-92	TURBINES (2) [EACH WITH A SF]	1.36 X10(9) BTU/H #2 OIL	68 LBS/HR/UNIT	GOOO COMBUSTION PRACTICES	0	BACT-PSD
GORDONSVILLE ENERGY L.P.	VA	Sep-92	TURBINE FACILITY, GAS	1,331 X10(7) SCF/Y NAT GAS	250 TOTAL TPY	GOOD COMBUSTION PRACTICES	0	BACT-PSD
GORDONSVILLE ENERGY L.P.	VA	Sep-92	TURBINES (2) [EACH WITH A SF]	1.51 X10(9) BTU/HR N GAS	57 LBS/HR/UNIT	GOOD COMBUSTION PRACTICES	0	BACT-PSD
NEVADA POWER COMPANY, HARRY ALLEN PEAKING PLANT	NV	Sep-92	COMBUSTION TURBINE ELECTRIC POWER GENERATION	600 MW (6 UNITS 75 EACH)	153 TPY (EACH TURBINE)	PRECISION CONTROL FOR THE LOW NOX COMBUSTOR	0	BACT-PSD
KAMINE SOUTH GLENS FALLS COGEN CO	NY	Sep-92	GE FRAME 6 GAS TURBINE	498 MMBTU/HR	9 PPM, 11.0 LB/HR	NO CONTROLS	0	BACT-OTHER
NORTHERN STATES POWER COMPANY	SD	Sep-92	TURBINE, SIMPLE CYCLE, 4 EACH	129 MW	50 PPM FOR GAS	GOOD COMBUSTION TECHNIQUES	0	BACT-PSD
PASNY/HOLTSVILLE COMBINED CYCLE PLANT	NY	Sep-92	TURBINE, COMBUSTION GAS (150 MW)	1,148 MMBTU/HR (GAS)*	6.5 PPM	COMBUSTION CONTROL	0	BACT-OTHER
WEPCU, PARIS SITE	WI	Aug-92	TURBINES, COMBUSTION (4)	0	25 LBS/HR (SEE NOTES)		0	BACT-PSD
FLORIDA POWER CORPORATION	FL	Aug-92	TURBINE, OIL	1,029 MMBTU/H	54 LB/H	GOOD COMBUSTION PRACTICES	0	BACT-PSD
FLORIDA POWER CORPORATION	FL	Aug-92	TURBINE, OIL	1,866 MMBTU/H	79 LB/H	GOOD COMBUSTION PRACTICES	0	BACT-PSD
CNG TRANSMISSION	OH	Aug-92	TURBINE (NATURAL GAS) (3)	5,500 HP (EACH)	0.015 G/HP-HR	FUEL SPEC: USE OF NATURAL GAS	0	OTHER
SARANAC ENERGY COMPANY	NY	Jul-92	TURBINES, COMBUSTION (2) (NATURAL GAS)	1,123 MMBTU/HR (EACH)	3 PPM	OXIDATION CATALYST	0	BACT-OTHER
HARTWELL ENERGY LIMITED PARTNERSHIP	GA	Jul-92	TURBINE, OIL FIRED (2 EACH)	1,840 M BTU/HR	25 PPMVD @ FULL LOAD	FUEL SPEC: CLEAN BURNING FUELS	0	BACT-PSD
MAUI ELECTRIC COMPANY, LTD./MAALAEA GENERATING STA	HI	Jul-92	TURBINE, COMBINED-CYCLE COMBUSTION	28 MW	27 LB/HR	COMBUSTION TECHNOLOGY/DESIGN	0	BACT-OTHER
HARTWELL ENERGY LIMITED PARTNERSHIP	GA	Jul-92	TURBINE, GAS FIRED (2 EACH)	1,817 M BTU/HR	25 PPMVD @ FULL LOAD	FUEL SPEC: CLEAN BURNING FUELS	0	BACT-PSD
INDECK-YERKES ENERGY SERVICES	NY	Jun-92	GE FRAME 6 GAS TURBINE (EP #00001)	432 MMBTU/HR	10 PPM, 10 LB/HR	NO CONTROLS	0	BACT-OTHER
SELKIRK COGENERATION PARTNERS, L.P.	NY	Jun-92	COMBUSTION TURBINES (2) (252 MW)	1,173 MMBTU/HR (EACH)	10 PPM	COMBUSTION CONTRDLS	0	BACT-OTHER
SELKIRK COGENERATION PARTNERS, L.P.	NY	Jun-92	COMBUSTION TURBINE (79 MW)	1,173 MMBTU/HR	25 PPM	COMBUSTION CONTROL	0	BACT-OTHER
TENASKA WASHINGTON PARTNERS, L.P.	WA	May-92	COGENERATION PLANT, COMBINED CYCLE	1.63 MMBTU/HR	20 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
NARRAGANSETT ELECTRIC/NEW ENGLAND POWER CO.	RI	Apr-92	TURBINE, GAS AND DUCT BURNER	1,360 MMBTU/H EACH	11 PPM @ 15% O2, GAS		0	BACT-PSD
KENTUCKY UTILITIES COMPANY	KY	Mar-92	TURBINE, #2 FUEL OIL/NATURAL GAS (8)	1,500 MM BTU/HR (EACH)	75 LB/HR (EACH)	COMBUSTION CONTROL	0	BACT-PSD
BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP	VA	Mar-92	TURBINE, COMBUSTION	1,175 MMBTU/H NAT. GAS	62 LB/H/UNIT	FURNACE DESIGN	91	BACT-PSD
BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP	VA	Mar-92	TURBINE, COMBUSTION	1,117 MMBTU/H NO2 FUEL OIL	62 LB/H/UNIT	FURNACE DESIGN	91	BACT-PSD
BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP	VA	Mar-92	TURBINE, COMBUSTION, 2	0	229 T/YR/UNIT		0	BACT-PSD
THERMO INDUSTRIES, LTD.	CO	Feb-92	TURBINE, GAS FIRED, 5 EACH	248 MMBTU/H	25 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
HAWAII ELECTRIC LIGHT CO., INC.	HI	Feb-92	TURBINE, FUEL OIL #2	20 MW	27 LB/HR @ 100% PEAKLD	COMBUSTION DESIGN	0	BACT-PSD
HAWAII ELECTRIC LIGHT CO., INC.	HI	Feb-92	TURBINE, FUEL OIL #2	20 MW	56 LB/H @ 75-<100% PKLD	COMBUSTION DESIGN	0	BACT-PSD
HAWAII ELECTRIC LIGHT CO., INC.	HI	Feb-92	TURBINE, FUEL OIL #2	20 MW	161 LB/H @ 50-<75% PKLD	COMBUSTION DESIGN	0	BACT-PSD
HAWAII ELECTRIC LIGHT CO., INC.	HI	Feb-92	TURBINE, FUEL OIL #2	20 MW	476 LB/H @ 25-<50% PKLD	COMBUSTION DESIGN	0	BACT-PSD
SAVANNAH ELECTRIC AND POWER CO.	GA	Feb-92	TURBINES, 6	1,032 MMBTU/H, NAT GAS	9 PPM @ 15% O2	FUEL SPEC: LOW SULFUR FUEL OIL	0	BACT-PSD
SAVANNAH ELECTRIC AND POWER CO.	GA	Feb-92	TURBINES, 6	972 MMBTU/H, #2 OIL	9 PPM @ 15% O2	FUEL SPEC: LOW SULFUR FUEL OIL	0	BACT-PSD
KAMINE/BESICORP NATURAL DAM LP	NY	Dec-91	GE FRAME 6 GAS TURBINE	500 MMBTU/HR	0.02 LB/MMBTU, 10 LB/HR	NO CONTROLS	0	BACT-OTHER
DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION	NC	Dec-91	TURBINE, COMBUSTION	1,247 MM BTU/HR	60 LB/HR	COMBUSTION CONTROL	0	BACT-PSD
DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION	NC	Dec-91	TURBINE, COMBUSTION	1,313 MM BTU/HR	59 LB/HR	COMBUSTION CONTROL	0	BACT-PSD
MAUI ELECTRIC COMPANY, LTD.	HI	Dec-91	TURBINE, FUEL OIL #2	28 MW	0 SEE NOTES	GOOD COMBUSTION PRACTICES	0	BACT-PSD
KALAMAZOO POWER LIMITED	MI	Dec-91	TURBINE, GAS-FIRED, 2, W/ WASTE HEAT BOILERS	1,806 MMBTU/H	20 PPMV	DRY LOW NOX TURBINES	0	BACT-PSD
LAKE COGEN LIMITED	FL	Nov-91	TURBINE, OIL, 2 EACH	42 MW	76 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
LAKE COGEN LIMITED	FL	Nov-91	TURBINE, GAS, 2 EACH	42 MW	42 PPM @ 15% O2	COMBUSTIDN CONTROL	0	BACT-PSD
ORLANOO UTILITIES COMMISSION	FL	Nov-91	TURBINE, GAS, 4 EACH	35 MW	10 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
ORLANOO UTILITIES COMMISSION	FL	Nov-91	TURBINE, OIL, 4 EACH	35 MW	10 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
SOUTHERN CALIFORNIA GAS	CA	Oct-91	TURBINE, GAS-FIRED	48 MMBTU/H	7.74 PPM @ 15% O2	HIGH TEMPERATURE OXIDATION CATALYST	60	BACT-PSD
SOUTHERN CALIFORNIA GAS	CA	Oct-91	TURBINE, GAS FIRED, SOLAR MODEL H	5,500 HP	7.74 PPM @ 15% O2	HIGH TEMP OXIDATION CATALYST	60	BACT-PSD
EL PASO NATURAL GAS	AZ	Oct-91	TURBINE, GAS, SOLAR CENTAUR H	5,500 HP	10.5 PPM @ 15% O2	FUEL SPEC: LEAN FUEL MIX	0	BACT-PSD
EL PASO NATURAL GAS	AZ	Oct-91	TURBINE, GAS, SOLAR CENTAUR H	5,500 HP	10.5 PPM @ 15% O2	FUEL SPEC: LEAN FUEL MIX	0	BACT-PSD
FLORIDA POWER GENERATION	FL	Oct-91	TURBINE, OIL, 6 EACH	93 MW	54 LB/H	COMBUSTION CONTROL	0	BACT-PSD
EL PASO NATURAL GAS	AZ	Oct-91	TURBINE, NAT. GAS TRANSM., GE FRAME 3	12,000 HP	60 PPM @ 15% O2	LEAN BURN	0	BACT-PSD
CAROLINA POWER AND LIGHT CO.	SC	Sep-91	TURBINE, I.C.	60 MW	60 LB/H		0	BACT-PSD
ENRON LOUISIANA ENERGY COMPANY	LA	Aug-91	TURBINE, GAS, 2	39 MMBTU/H	60 PPM @ 15% O2	BASE CASE, NO ADDITIOHAL CONTROLS	0	BACT-PSD
ALGONQUIN GAS TRANSMISSION CO.	RI	Jul-91	TURBINE, GAS, 2	49 MMBTU/H	0.114 LB/MMBTU	GOOD COMBUSTION PRACTICES	0	BACT-OTHER
CHARLES LARSEN POWER PLANT	FL	Jul-91	TURBINE, OIL, 1 EACH	60 MW	25 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
CHARLES LARSEN POWER PLANT	FL	Jul-91	TURBINE, GAS, 1 EACH	60 MW	25 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
SUMAS ENERGY INC.	WA	Jun-91	TURBINE, NATURAL GAS	88 MW	6 PPM @ 15% O2	CO CATALYST	60	BACT-PSD
SAGUARO POWER COMPANY	NV	Jun-91	COMBUSTION TURBINE GENERATOR	34.5 MW	9 PPH	CONVERTER (CATALYTIC)	90	BACT-PSD
FLORIDA POWER AND LIGHT	FL	Jun-91	TURBINE, OIL, 2 EACH	400 MW	33 PPM @ 15% O2	COMBUSTIDN CONTROL	0	BACT-PSD
FLORIDA POWER AND LIGHT	FL	Jun-91	TURBINE, GAS, 4 EACH	400 MW	30 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
FLORIDA POWER AND LIGHT	FL	Jun-91	TURBINE, CG, 4 EACH	400 MW	33 PPM @ 15% O2	COMBUSTIDN CONTROL	0	BACT-PSD
NORTHERN CONSOLIDATED POWER	PA	May-91	TURBINES, GAS, 2	34.6 KW EACH	110 T/YR	OXIDATION CATALYST	90	OTHER

Table B-5. Summary of Best Available Control Technology (BACT) Determinations for Carbon Monoxide (CO) Emissions

Facility Name	State	Permit Issue Date	Unit/Process Description	Capacity (size)	CO Emission Limit	Control Method	Efficiency (%)	Type
LAKEWOOD COGENERATION, L.P.	NJ	Apr-91	TURBINES (#2 FUEL OIL) (2)	1,190 MMBTU/HR (EACH)	0.06 LB/MMBTU	TURBINE DESIGN	0	BACT-OTHER
LAKEWOOD COGENERATION, L.P.	NJ	Apr-91	TURBINES (NATURAL GAS) (2)	1,190 MMBTU/HR (EACH)	0.026 LB/MMBTU	TURBINE DESIGN	0	BACT-OTHER
CIMARRON CHEMICAL	CO	Mar-91	TURBINE #2, GE FRAME 6	33 MW	250 T/YR, LESS THAN	CO CATALYST	0	OTHER
FLORIDA POWER AND LIGHT	FL	Mar-91	TURBINE, GAS, 4 EACH	240 MW	30 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
FLORIDA POWER AND LIGHT	FL	Mar-91	TURBINE, OIL, 4 EACH	0	33 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
NEVADA COGENERATION ASSOCIATES #2	NV	Jan-91	COMBINED-CYCLE POWER GENERATION	85 MW POWER OUTPUT	40 LBS/HR	CATALYTIC CONVERTER	0	BACT-PSD
NEVADA COGENERATION ASSOCIATES #1	NV	Jan-91	COMBINED-CYCLE POWER GENERATION	85 MW TOTAL OUTPUT	40 LBS/HR	CATALYTIC CONVERTER	0	BACT-PSD
NEWARK BAY COGENERATION PARTNERSHIP	NJ	Nov-90	TURBINE, NATURAL GAS FIRED	585 MMBTU/HR	0.0055 LB/MMBTU	CATALYTIC OXIDATION	80	BACT-PSD
TBG COGEN COGENERATION PLANT	NY	Aug-90	GE LM2500 GAS TURBINE	215 MMBTU/HR	0.181 LB/MMBTU	CATALYTIC OXIDIZER	80	BACT
SC ELECTRIC AND GAS COMPANY - HAGOOD STATION	SC	Dec-89	INTERNAL COMBUSTION TURBINE	110 MEGAWATTS	23 LBS/HR	GOOD COMBUSTION PRACTICES	0	BACT-PSD
PEABODY MUNICIPAL LIGHT PLANT	MA	Nov-89	TURBINE, 38 MW NATURAL FAS FIRED	412 MMBTU/HR	40 PPM @ 15% O2	GOOD COMBUSTION PRACTICES	0	BACT-OTHER
MEGAN-RACINE ASSOCIATES, INC	NY	Aug-89	GE LM5000-N COMBINED CYCLE GAS TURBINE	401 LB/MMBTU	0.026 LB/MMBTU, 11 LB/HR	NO CONTROLS	0	BACT-OTHER
UNOCAL	CA	Jul-89	TURBINE, GAS (SEE NOTES)	0	10 PPM @ 15% O2	OXIDATION CATALYST	75	BACT-OTHER

Note: PSD= Prevention of Significant Deterioration
BACT= Best Available Control Technology
LAER= Lowest Achievable Emission Rate

Table B-6. Direct and Indirect Capital Costs for CO Catalyst for Frame "F" Simple Cycle Operation

Cost Component	Costs	Basis of Cost Component
Direct Capital Costs		
CO Associated Equipment	$235,000	Vendor Quote
Instrumentation	$23,500	10% of SCR Associated Equipment
Sales Tax	$14,100	6% of SCR Associated Equipment/Catalyst
Freight	$47,965	5% of SCR Associated Equipment/Catalyst
Total Direct Capital Costs (TDCC)	$320,565	
Recurring Capital Costs (RCC)	$724,290	Catalyst; Vendor Based Estimate
TOTAL CAPITAL COSTS	$1,044,855	Sum of TDCC, TDIC and RCC
Direct Installation Costs		
Foundation and supports	$83,588	8% of Total Capital Costs; OAQPS Cost Control Manual
Handling & Erection	$146,280	14% of Total Capital Costs; OAQPS Cost Control Manual
Electrical	$41,794	4% of Total Capital Costs; OAQPS Cost Control Manual
Piping	$20,897	2% of Total Capital Costs; OAQPS Cost Control Manual
Insulation for ductwork	$10,449	1% of Total Capital Costs; OAQPS Cost Control Manual
Painting	$10,449	1% of Total Capital Costs; OAQPS Cost Control Manual
Site Preparation	$5,000	Engineering Estimate
Buildings	$0	
Total Direct Installation Costs (TDIC)	$318,456	
Indirect Costs		
Engineering	$104,485	10% of Total Capital Costs; OAQPS Cost Control Manual
Construction and Field Expense	$52,243	5% of Total Capital Costs; OAQPS Cost Control Manual
Contractor Fees	$104,485	10% of Total Capital Costs; OAQPS Cost Control Manual
Start-up	$20,897	2% of Total Capital Costs; OAQPS Cost Control Manual
Performance Tests	$10,449	1% of Total Capital Costs; OAQPS Cost Control Manual
Allowance for Funds Used During Constructi	$56,226	2.5% of Total Capital Costs; borrowed at a rate 7.0% for 9 months
Contingencies	$31,346	3% of Total Capital Costs; OAQPS Cost Control Manual
TOTAL INDIRECT CAPITAL COST (TICC)	$380,131	
TOTAL DIRECT and INDIRECT CAPITAL COSTS (TDICC)	$1,743,442	Sum of TDCC, TDIC and TICC

Table B-7. Annualized Cost for CO Catalyst for Frame "F" Simple Cycle Operation

Cost Component	Cost	Basis of Cost Estimate
Direct Annual Costs		
Operating Personnel	$8,320	8 hours/week at $20/hr
Supervision	$1,248	15% of Operating Personnel;OAQPS Cost Control Manual
Maintenance - Labor	$4,368	0.5 hr per shift, $24/hr; OAQPS Cost Manual
- Materials	$4,368	100% of maintenance labor; OAQPS Cost Manual
Inventory Cost	$26,509.02	Capital Recovery (11.74%) for 1/3 catalyst
Catalyst Disposal Cost	$37,025	$28/1,000 lb/hr mass flow over 3 years; developed from vendor quotes
Contingency	$2,455	3% of direct costs
Total Direct Annual Costs (TDAC)	$84,293	
Energy Costs		
Heat Rate Penalty	$59,346	0.2% of MW output; EPA, 1993 (Page 6-20)
MW Loss Penalty	$42,015	2 days replacement energy costs @ $0.01 kWh each three period
Fuel Escalation	$3,041	Escalation of fuel over inflation; 3% of energy costs
Contingency	$3,132	3% of energy costs
Total Energy Costs (TEC)	$107,533	
Indirect Annual Costs		
Overhead	$8,362	60% of Operating/Supervision Labor and Ammonia
Property Taxes, insurance, admin.	$69,738	4% of Total Capital Costs
Annualized Total Direct Capital	$111,903	10.98% Capital Recovery Factor of 7% over 15 years times sum of TDCC, TDIC and TICC
Annualized Total Direct Recurring	$276,027	38.11% Capital Recovery Factor of 7% over 3 years times RCC
Total Indirect Annual Costs (TIAC)	$466,029	
TOTAL ANNUALIZED COSTS	$657,856	Sum of TDAC, TEC and TIAC
COST EFFECTIVENESS	$9,508	

APPENDIX C

BUILDING DOWNWASH INFORMATION FROM BPIP

```
'BPIP data for Sonat Power Project, Pasco County Site'
'ST'
'FEET' 0.3048
'UTMN' 0
 6
'InlFilt1' 1 0.0
4 47
-94 104
-94 140
-58 140
-58 104
'InlFilt2' 1 0.0
4 47
 22 104
 22 140
 58 140
 58 104
'InlFilt3' 1 0.0
4 47
138 104
138 140
174 140
174 104
'Turb1' 1 0.0
4 22.
-131 34
-131 76
-101 76
-101 34
'Turb2' 1 0.0
4 22.
-15  34
-15  76
15   76
15   34
'Turb3' 1 0.0
4 22.
101  34
101  76
131  76
131  34
3
'CT1' 0.0 60 -116 0
'CT2' 0.0 60    0 0
'CT3' 0.0 60  116 0
0
```

BPIP (Dated: 95086)

DATE : 10/08/99
TIME : 18:15:34
BPIP data for Sonat Power Project, Pasco County Site

============================
BPIP PROCESSING INFORMATION:
============================

The ST flag has been set for processing for an ISCST2 run.

Inputs entered in FEET will be converted to meters using a conversion factor of 0.3048. Output will be in meters.

UTMP is set to UTMN. The input is assumed to be in a local X-Y coordinate system as opposed to a UTM coordinate system. True North is in the positive Y direction.

Plant north is set to 0.00 degrees with respect to True North.

BPIP data for Sonat Power Project, Pasco County Site

PRELIMINARY* GEP STACK HEIGHT RESULTS TABLE
(Output Units: meters)

Stack Name	Stack Height	Stack-Building Base Elevation Differences	GEP** EQN1	Preliminary* GEP Stack Height Value
CT1	18.29	0.00	35.81	65.00
CT2	18.29	0.00	35.81	65.00
CT3	18.29	0.00	35.81	65.00

* Results are based on Determinants 1 & 2 on pages 1 & 2 of the GEP Technical Support Document. Determinant 3 may be investigated for additional stack height credit. Final values result after Determinant 3 has been taken into consideration.

** Results were derived from Equation 1 on page 6 of GEP Technical Support Document. Values have been adjusted for any stack-building base elevation differences.

Note: Criteria for determining stack heights for modeling emission limitations for a source can be found in Table 3.1 of the GEP Technical Support Document.

BPIP (Dated: 95086)

DATE : 10/08/99
TIME : 18:15:34

BPIP data for Sonat Power Project, Pasco County Site

BPIP output is in meters

SO BUILDHGT CT1	6.71	6.71	6.71	14.33	0.00	0.00
SO BUILDHGT CT1	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT CT1	0.00	6.71	6.71	6.71	6.71	6.71
SO BUILDHGT CT1	14.33	14.33	14.33	14.33	14.33	14.33
SO BUILDHGT CT1	6.71	6.71	0.00	0.00	0.00	0.00
SO BUILDHGT CT1	0.00	6.71	6.71	6.71	6.71	6.71
SO BUILDWID CT1	11.23	12.97	14.32	15.46	0.00	0.00
SO BUILDWID CT1	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID CT1	0.00	15.23	14.32	12.97	11.23	9.14
SO BUILDWID CT1	12.71	14.06	14.99	15.46	15.46	14.99
SO BUILDWID CT1	15.16	14.19	0.00	0.00	0.00	0.00
SO BUILDWID CT1	0.00	15.23	14.32	12.97	11.23	9.14

SO BUILDHGT CT2	6.71	6.71	6.71	14.33	0.00	0.00
SO BUILDHGT CT2	0.00	0.00	0.00	6.71	6.71	6.71
SO BUILDHGT CT2	14.33	14.33	14.33	14.33	6.71	6.71
SO BUILDHGT CT2	14.33	14.33	14.33	14.33	14.33	14.33
SO BUILDHGT CT2	6.71	6.71	0.00	0.00	0.00	0.00

SO BUILDHGT	CT2	0.00	6.71	6.71	6.71	6.71	6.71
SO BUILDWID	CT2	11.23	12.97	14.32	15.46	0.00	0.00
SO BUILDWID	CT2	0.00	0.00	0.00	14.19	15.16	15.66
SO BUILDWID	CT2	15.46	15.46	14.99	14.06	11.23	9.14
SO BUILDWID	CT2	12.71	14.06	14.99	15.46	15.46	14.99
SO BUILDWID	CT2	15.16	14.19	0.00	0.00	0.00	0.00
SO BUILDWID	CT2	0.00	15.23	14.32	12.97	11.23	9.14

SO BUILDHGT	CT3	6.71	6.71	6.71	14.33	0.00	0.00
SO BUILDHGT	CT3	0.00	0.00	0.00	6.71	6.71	14.33
SO BUILDHGT	CT3	14.33	14.33	14.33	14.33	6.71	6.71
SO BUILDHGT	CT3	14.33	14.33	14.33	14.33	0.00	0.00
SO BUILDHGT	CT3	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT	CT3	0.00	6.71	6.71	6.71	6.71	6.71
SO BUILDWID	CT3	11.23	12.97	14.32	15.46	0.00	0.00
SO BUILDWID	CT3	0.00	0.00	0.00	14.19	15.16	14.99
SO BUILDWID	CT3	15.46	15.46	14.99	14.06	11.23	9.14
SO BUILDWID	CT3	12.71	14.06	14.99	15.46	0.00	0.00
SO BUILDWID	CT3	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID	CT3	0.00	15.23	14.32	12.97	11.23	9.14

APPENDIX D

DETAILED SUMMARY OF ISCST MODEL RESULTS

ISCBOB3 RELEASE 98056

ISCST3 OUTPUT FILE NUMBER 1 :PCNGC2.087
ISCST3 OUTPUT FILE NUMBER 2 :PCNGC2.088
ISCST3 OUTPUT FILE NUMBER 3 :PCNGC2.089
ISCST3 OUTPUT FILE NUMBER 4 :PCNGC2.090
ISCST3 OUTPUT FILE NUMBER 5 :PCNGC2.091
First title for last output file is: 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99
Second title for last output file is: NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES

AVERAGING TIME	YEAR	CONC (ug/m3)	DIR (deg) or X (m)	DIST (m) or Y (m)	PERIOD ENDING (YYMMDDHH)
SOURCE GROUP ID:	BASE32				
Annual					
	1987	0.01250	240.	15000.	87123124
	1988	0.01203	220.	15000.	88123124
	1989	0.01200	210.	300.	89123124
	1990	0.01548	250.	15000.	90123124
	1991	0.01387	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.14986	80.	7000.	87040624
	1988	0.20016	220.	20000.	88091324
	1989	0.20057	180.	20000.	89012324
	1990	0.19059	230.	20000.	90011624
	1991	0.14603	270.	7000.	91061124
HIGH 8-Hour					
	1987	0.40941	60.	20000.	87120408
	1988	0.39224	240.	20000.	88011524
	1989	0.43474	180.	20000.	89012308
	1990	0.39973	180.	20000.	90041208
	1991	0.32971	190.	20000.	91120424
HIGH 3-Hour					
	1987	0.80356	110.	20000.	87031003
	1988	0.75844	220.	20000.	88091324
	1989	0.65210	350.	20000.	89060824
	1990	0.62812	250.	10000.	90041312
	1991	0.82157	70.	2000.	91051215
HIGH 1-Hour					
	1987	1.67977	90.	1500.	87082614
	1988	1.61780	20.	2000.	88082914
	1989	1.72393	20.	1500.	89091413
	1990	1.67867	30.	2000.	90042312
	1991	1.75901	290.	1500.	91083113
SOURCE GROUP ID:	BASE95				
Annual					
	1987	0.01323	240.	15000.	87123124
	1988	0.01275	220.	15000.	88123124
	1989	0.01207	210.	300.	89123124
	1990	0.01646	250.	15000.	90123124
	1991	0.01470	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.15384	230.	7000.	87042724
	1988	0.20962	220.	15000.	88091324
	1989	0.21031	180.	20000.	89012324
	1990	0.20367	240.	15000.	90102724
	1991	0.15041	270.	7000.	91061124
HIGH 8-Hour					
	1987	0.43046	60.	20000.	87120408
	1988	0.41153	240.	20000.	88011524
	1989	0.45722	180.	20000.	89012308
	1990	0.42038	180.	20000.	90041208
	1991	0.34719	240.	20000.	91122608
HIGH 3-Hour					
	1987	0.84237	110.	20000.	87031003
	1988	0.79569	220.	20000.	88091324
	1989	0.68454	350.	20000.	89060824
	1990	0.96421	270.	2000.	90061315
	1991	0.82886	70.	2000.	91051215
HIGH 1-Hour					
	1987	1.87654	280.	1500.	87070113
	1988	1.63082	20.	2000.	88082914
	1989	1.77930	30.	1500.	89081114
	1990	1.83473	260.	1500.	90071913
	1991	1.87601	330.	1500.	91052413
SOURCE GROUP ID:	LD7532				
Annual					
	1987	0.01474	240.	15000.	87123124
	1988	0.01406	220.	15000.	88123124
	1989	0.01241	200.	15000.	89123124
	1990	0.01830	250.	12000.	90123124
	1991	0.01647	240.	15000.	91123124

HIGH 24-Hour					
	1987	0.17837	270.	10000.	87052424
	1988	0.22817	220.	15000.	88091324
	1989	0.22800	180.	20000.	89012324
	1990	0.22115	240.	15000.	90102724
	1991	0.17506	270.	10000.	91061124
HIGH 8-Hour					
	1987	0.46831	60.	20000.	87120408
	1988	0.44585	240.	20000.	88011524
	1989	0.49772	180.	20000.	89012308
	1990	0.45744	180.	20000.	90041208
	1991	0.38141	240.	20000.	91122608
HIGH 3-Hour					
	1987	0.91164	110.	20000.	87031003
	1988	0.86268	220.	20000.	88091324
	1989	0.74301	350.	20000.	89060824
	1990	0.97715	270.	2000.	90061315
	1991	0.84142	70.	2000.	91051215
HIGH 1-Hour					
	1987	2.08723	280.	1500.	87052413
	1988	1.95538	20.	1500.	88062313
	1989	2.01672	330.	1500.	89032712
	1990	2.10306	70.	1500.	90081414
	1991	2.11116	190.	1500.	91090612
SOURCE GROUP ID:	LD7595				
Annual					
	1987	0.01541	240.	15000.	87123124
	1988	0.01465	220.	15000.	88123124
	1989	0.01305	200.	15000.	89123124
	1990	0.01933	250.	12000.	90123124
	1991	0.01730	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.18474	270.	10000.	87052424
	1988	0.23809	220.	15000.	88091324
	1989	0.24264	180.	20000.	89012324
	1990	0.23077	240.	15000.	90102724
	1991	0.18007	270.	10000.	91061124
HIGH 8-Hour					
	1987	0.48846	60.	20000.	87120408
	1988	0.45321	240.	20000.	88011524
	1989	0.51941	180.	20000.	89012308
	1990	0.47715	180.	20000.	90041208
	1991	0.39989	240.	20000.	91122608
HIGH 3-Hour					
	1987	0.94824	110.	20000.	87031003
	1988	0.89810	220.	20000.	88091324
	1989	0.77397	350.	20000.	89060824
	1990	0.98371	270.	2000.	90061315
	1991	0.84777	70.	2000.	91051215
HIGH 1-Hour					
	1987	2.16525	70.	1500.	87080713
	1988	2.15849	160.	1500.	88080712
	1989	2.16931	10.	1500.	89061912
	1990	2.16125	290.	1500.	90071012
	1991	2.15496	320.	1500.	91061514
SOURCE GROUP ID:	LD5032				
Annual					
	1987	0.01748	240.	15000.	87123124
	1988	0.01645	220.	15000.	88123124
	1989	0.01491	200.	15000.	89123124
	1990	0.02193	250.	12000.	90123124
	1991	0.01968	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.20940	250.	12000.	87112324
	1988	0.24477	220.	20000.	88091324
	1989	0.27144	180.	15000.	89012324
	1990	0.25914	240.	15000.	90102724
	1991	0.19554	270.	10000.	91061124
HIGH 8-Hour					
	1987	0.54853	60.	15000.	87120408
	1988	0.51340	160.	1500.	88080716
	1989	0.58095	180.	15000.	89012308
	1990	0.56041	160.	1500.	90061716
	1991	0.45314	240.	20000.	91122608
HIGH 3-Hour					
	1987	1.06065	110.	15000.	87031003
	1988	0.94509	220.	20000.	88091324
	1989	0.86428	350.	15000.	89060824
	1990	1.19100	40.	1500.	90042312
	1991	0.91482	270.	20000.	91010306
HIGH 1-Hour					
	1987	2.51606	250.	1500.	87082212
	1988	2.55249	360.	1500.	88081913

	1989	2.51463	180.	1500.	89041613
	1990	2.54539	20.	1500.	90050211
	1991	2.44075	330.	1500.	91040612
SOURCE GROUP ID:	LD5095				
Annual					
	1987	0.01827	240.	15000.	87123124
	1988	0.01723	220.	15000.	88123124
	1989	0.01593	180.	15000.	89123124
	1990	0.02291	250.	12000.	90123124
	1991	0.02078	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.21713	250.	12000.	87112324
	1988	0.25332	220.	20000.	88091324
	1989	0.28173	180.	15000.	89012324
	1990	0.26876	240.	15000.	90102724
	1991	0.21391	250.	5000.	91090224
HIGH 8-Hour					
	1987	0.56988	60.	15000.	87120408
	1988	0.51708	160.	1500.	88080716
	1989	0.60406	180.	15000.	89012308
	1990	0.56485	160.	1500.	90061716
	1991	0.47092	240.	20000.	91122608
HIGH 3-Hour					
	1987	1.09960	110.	15000.	87031003
	1988	0.98000	220.	20000.	88091324
	1989	0.89692	350.	15000.	89060824
	1990	1.20041	40.	1500.	90042312
	1991	0.94919	270.	20000.	91010306
HIGH 1-Hour					
	1987	2.53071	250.	1500.	87082212
	1988	2.56687	360.	1500.	88081913
	1989	2.52873	180.	1500.	89041613
	1990	2.55945	20.	1500.	90050211
	1991	2.45385	330.	1500.	91040612

All receptor computations reported with respect to a user-specified origin

GRID	0.00	0.00
DISCRETE	0.00	0.00

ISCBOB3 RELEASE 98056

ISCST3 OUTPUT FILE NUMBER 1 :PCFOC2.087
ISCST3 OUTPUT FILE NUMBER 2 :PCFOC2.088
ISCST3 OUTPUT FILE NUMBER 3 :PCFOC2.089
ISCST3 OUTPUT FILE NUMBER 4 :PCFOC2.090
ISCST3 OUTPUT FILE NUMBER 5 :PCFOC2.091
First title for last output file is: 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99
Second title for last output file is: FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES

AVERAGING TIME	YEAR	CONC (ug/m3)	DIR (deg) or X (m)	DIST (m) or Y (m)	PERIOD ENDING (YYMMDDHH)
SOURCE GROUP ID:	BASE32				
Annual					
	1987	0.01220	240.	15000.	87123124
	1988	0.01176	220.	15000.	88123124
	1989	0.01197	210.	300.	89123124
	1990	0.01511	250.	15000.	90123124
	1991	0.01348	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.14848	80.	7000.	87040624
	1988	0.19637	220.	20000.	88091324
	1989	0.19650	180.	20000.	89012324
	1990	0.18646	230.	20000.	90011624
	1991	0.14425	270.	7000.	91061124
HIGH 8-Hour					
	1987	0.40055	60.	20000.	87120408
	1988	0.38407	240.	20000.	88011524
	1989	0.42529	180.	20000.	89012308
	1990	0.39103	180.	20000.	90041208
	1991	0.32258	190.	20000.	91120424
HIGH 3-Hour					
	1987	0.78718	110.	20000.	87031003
	1988	0.74278	220.	20000.	88091324
	1989	0.63849	350.	20000.	89060824
	1990	0.62548	250.	10000.	90041312
	1991	0.81844	70.	2000.	91051215
HIGH 1-Hour					
	1987	1.67360	90.	1500.	87082614
	1988	1.61219	20.	2000.	88082914
	1989	1.70797	310.	1500.	89070913
	1990	1.67268	30.	2000.	90042312
	1991	1.62428	270.	2000.	91061113
SOURCE GROUP ID:	BASE95				
Annual					
	1987	0.01281	240.	15000.	87123124
	1988	0.01226	220.	15000.	88123124
	1989	0.01203	210.	300.	89123124
	1990	0.01589	250.	15000.	90123124
	1991	0.01426	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.15146	230.	7000.	87042724
	1988	0.20425	220.	20000.	88091324
	1989	0.20501	180.	20000.	89012324
	1990	0.19506	230.	20000.	90011624
	1991	0.14799	270.	7000.	91061124
HIGH 8-Hour					
	1987	0.41900	60.	20000.	87120408
	1988	0.40107	240.	20000.	88011524
	1989	0.44500	180.	20000.	89012308
	1990	0.40915	180.	20000.	90041208
	1991	0.33743	190.	20000.	91120424
HIGH 3-Hour					
	1987	0.82127	110.	20000.	87031003
	1988	0.77536	220.	20000.	88091324
	1989	0.66682	350.	20000.	89060824
	1990	0.96013	270.	2000.	90061315
	1991	0.82491	70.	2000.	91051215
HIGH 1-Hour					
	1987	1.81249	150.	1500.	87080813
	1988	1.62376	20.	2000.	88082914
	1989	1.77214	30.	1500.	89081114
	1990	1.81690	260.	1500.	90071613
	1991	1.79430	340.	1500.	91050913
SOURCE GROUP ID:	LD7532				
Annual					
	1987	0.01459	240.	15000.	87123124
	1988	0.01383	220.	15000.	88123124
	1989	0.01222	200.	15000.	89123124
	1990	0.01820	250.	12000.	90123124
	1991	0.01632	240.	15000.	91123124

HIGH 24-Hour					
	1987	0.17756	270.	10000.	87052424
	1988	0.22691	220.	15000.	88091324
	1989	0.22680	180.	20000.	89012324
	1990	0.21995	240.	15000.	90102724
	1991	0.17442	270.	10000.	91061124
HIGH 8-Hour					
	1987	0.46575	60.	20000.	87120408
	1988	0.44355	240.	20000.	88011524
	1989	0.49499	180.	20000.	89012308
	1990	0.45494	180.	20000.	90041208
	1991	0.37909	240.	20000.	91122608
HIGH 3-Hour					
	1987	0.90698	110.	20000.	87031003
	1988	0.85813	220.	20000.	88091324
	1989	0.73904	350.	20000.	89060824
	1990	0.97629	270.	2000.	90061315
	1991	0.84059	70.	2000.	91051215
HIGH 1-Hour					
	1987	2.08542	280.	1500.	87052413
	1988	1.95341	20.	1500.	88062313
	1989	2.01472	330.	1500.	89032712
	1990	2.01716	200.	1500.	90081313
	1991	2.10928	190.	1500.	91090612
SOURCE GROUP ID:	LD7595				
Annual					
	1987	0.01519	240.	15000.	87123124
	1988	0.01451	220.	15000.	88123124
	1989	0.01284	200.	15000.	89123124
	1990	0.01891	250.	12000.	90123124
	1991	0.01703	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.18232	270.	10000.	87052424
	1988	0.23434	220.	15000.	88091324
	1989	0.23909	180.	20000.	89012324
	1990	0.22712	240.	15000.	90102724
	1991	0.17816	270.	10000.	91061124
HIGH 8-Hour					
	1987	0.48086	60.	20000.	87120408
	1988	0.44614	240.	20000.	88011524
	1989	0.51123	180.	20000.	89012308
	1990	0.46972	180.	20000.	90041208
	1991	0.39290	240.	20000.	91122608
HIGH 3-Hour					
	1987	0.93446	110.	20000.	87031003
	1988	0.88473	220.	20000.	88091324
	1989	0.76228	350.	20000.	89060824
	1990	0.98126	270.	2000.	90061315
	1991	0.84540	70.	2000.	91051215
HIGH 1-Hour					
	1987	2.14442	110.	1500.	87080314
	1988	1.96530	20.	1500.	88062313
	1989	2.15718	330.	1500.	89062212
	1990	2.15566	290.	1500.	90071012
	1991	2.14965	320.	1500.	91061514
SOURCE GROUP ID:	LD5032				
Annual					
	1987	0.01697	240.	15000.	87123124
	1988	0.01600	220.	15000.	88123124
	1989	0.01455	200.	15000.	89123124
	1990	0.02135	250.	12000.	90123124
	1991	0.01922	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.20479	250.	12000.	87112324
	1988	0.23955	220.	20000.	88091324
	1989	0.26540	180.	15000.	89012324
	1990	0.25342	240.	15000.	90102724
	1991	0.19252	270.	10000.	91061124
HIGH 8-Hour					
	1987	0.53570	60.	15000.	87120408
	1988	0.51126	160.	1500.	88080716
	1989	0.56886	180.	20000.	89012308
	1990	0.52192	180.	20000.	90041208
	1991	0.44256	240.	20000.	91122608
HIGH 3-Hour					
	1987	1.03718	110.	15000.	87031003
	1988	0.92348	220.	20000.	88091324
	1989	0.84469	350.	20000.	89060824
	1990	1.18537	40.	1500.	90042312
	1991	0.89405	270.	20000.	91010306
HIGH 1-Hour					
	1987	2.50711	250.	1500.	87082212
	1988	2.37705	260.	1500.	88040513

	1989	2.42552	30.	1500.	89062011
	1990	2.46374	40.	1500.	90082112
	1991	2.38353	130.	1500.	91092113
SOURCE GROUP ID:	LD5095				
Annual					
	1987	0.01803	240.	15000.	87123124
	1988	0.01693	220.	15000.	88123124
	1989	0.01539	200.	15000.	89123124
	1990	0.02249	250.	12000.	90123124
	1991	0.02048	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.21441	250.	12000.	87112324
	1988	0.25034	220.	20000.	88091324
	1989	0.27813	180.	15000.	89012324
	1990	0.26538	240.	15000.	90102724
	1991	0.21183	250.	5000.	91090224
HIGH 8-Hour					
	1987	0.56239	60.	15000.	87120408
	1988	0.51573	160.	1500.	88080716
	1989	0.59601	180.	15000.	89012308
	1990	0.56325	160.	1500.	90061716
	1991	0.46470	240.	20000.	91122608
HIGH 3-Hour					
	1987	1.08596	110.	15000.	87031003
	1988	0.96769	220.	20000.	88091324
	1989	0.88536	350.	15000.	89060824
	1990	1.19704	40.	1500.	90042312
	1991	0.93713	270.	20000.	91010306
HIGH 1-Hour					
	1987	2.52544	250.	1500.	87082212
	1988	2.56171	360.	1500.	88081913
	1989	2.52369	180.	1500.	89041613
	1990	2.55440	20.	1500.	90050211
	1991	2.44915	330.	1500.	91040612

All receptor computations reported with respect to a user-specified origin

GRID	0.00	0.00
DISCRETE	0.00	0.00

```
CO STARTING
CO TITLEONE 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE      10/9/99
CO TITLETWO NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES
CO MODELOPT DFAULT CONC   RURAL NOCMPL
CO AVERTIME  PERIOD 24 8 3 1
CO POLLUTID GEN
CO DCAYCOEF    .000000
CO RUNORNOT RUN
CO FINISHED

SO STARTING

** Source Location Cards:
**          SRCID SRCTYP        XS             YS             ZS
** MODELING ORIGIN CT 2 STACK LOCATION
** LOCATION IS USED FOR POLAR DISCRETE RECEPTORS.
**  CT STACK NUMBER CODE
** ------------------------
**  A -  CT 1
**  B -  CT 2
**  C -  CT 3
** Source Location Cards:
**          SRCID SRCTYP      XS        YS        ZS
**   UTM                      (m)       (m)       (m)
SO LOCATION  BASE32A  POINT  -35.36    0.0       0.0
SO LOCATION  BASE32B  POINT    0.00    0.0       0.0
SO LOCATION  BASE32C  POINT   35.36    0.0       0.0
**
SO LOCATION  BASE95A  POINT  -35.36    0.0       0.0
SO LOCATION  BASE95B  POINT    0.00    0.0       0.0
SO LOCATION  BASE95C  POINT   35.36    0.0       0.0
**
SO LOCATION  LD7532A  POINT  -35.36    0.0       0.0
SO LOCATION  LD7532B  POINT    0.00    0.0       0.0
SO LOCATION  LD7532C  POINT   35.36    0.0       0.0
**
SO LOCATION  LD7595A  POINT  -35.36    0.0       0.0
SO LOCATION  LD7595B  POINT    0.00    0.0       0.0
SO LOCATION  LD7595C  POINT   35.36    0.0       0.0
**
SO LOCATION  LD5032A  POINT  -35.36    0.0       0.0
SO LOCATION  LD5032B  POINT    0.00    0.0       0.0
SO LOCATION  LD5032C  POINT   35.36    0.0       0.0
**
SO LOCATION  LD5095A  POINT  -35.36    0.0       0.0
SO LOCATION  LD5095B  POINT    0.00    0.0       0.0
SO LOCATION  LD5095C  POINT   35.36    0.0       0.0

** Source Parameter Cards:
** POINT:   SRCID           QS       HS        TS        VS        DS
**                         (g/s)     (m)       (K)      (m/s)      (m)
SO SRCPARAM   BASE32A     3.333     18.3      865.0     36.2      6.71
SO SRCPARAM   BASE32B     3.334     18.3      865.0     36.2      6.71
SO SRCPARAM   BASE32C     3.333     18.3      865.0     36.2      6.71
**
SO SRCPARAM   BASE95A     3.333     18.3      886.0     33.9      6.71
SO SRCPARAM   BASE95B     3.334     18.3      886.0     33.9      6.71
SO SRCPARAM   BASE95C     3.333     18.3      886.0     33.9      6.71
**
SO SRCPARAM   LD7532A     3.333     18.3      905.0     30.6      6.71
SO SRCPARAM   LD7532B     3.334     18.3      905.0     30.6      6.71
SO SRCPARAM   LD7532C     3.333     18.3      905.0     30.6      6.71
**
SO SRCPARAM   LD7595A     3.333     18.3      918.0     29.0      6.71
SO SRCPARAM   LD7595B     3.334     18.3      918.0     29.0      6.71
SO SRCPARAM   LD7595C     3.333     18.3      918.0     29.0      6.71
**
SO SRCPARAM   LD5032A     3.333     18.3      906.0     25.7      6.71
SO SRCPARAM   LD5032B     3.334     18.3      906.0     25.7      6.71
SO SRCPARAM   LD5032C     3.333     18.3      906.0     25.7      6.71
**
SO SRCPARAM   LD5095A     3.333     18.3      922.0     24.5      6.71
SO SRCPARAM   LD5095B     3.334     18.3      922.0     24.5      6.71
SO SRCPARAM   LD5095C     3.333     18.3      922.0     24.5      6.71
**
SO BUILDHGT BASE32A-BASE95A     6.71     6.71     6.71    14.33     0.00     0.00
SO BUILDHGT BASE32A-BASE95A     0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT BASE32A-BASE95A     0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDHGT BASE32A-BASE95A    14.33    14.33    14.33    14.33    14.33    14.33
SO BUILDHGT BASE32A-BASE95A     6.71     6.71     0.00     0.00     0.00     0.00
SO BUILDHGT BASE32A-BASE95A     0.00     6.71     6.71     6.71     6.71     6.71
```

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SO BUILDWID BASE32A-BASE95A    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID BASE32A-BASE95A     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID BASE32A-BASE95A     0.00   15.23   14.32   12.97   11.23    9.14
SO BUILDWID BASE32A-BASE95A    12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID BASE32A-BASE95A    15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID BASE32A-BASE95A     0.00   15.23   14.32   12.97   11.23    9.14
**
SO BUILDHGT LD5032A-LD7595A     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT LD5032A-LD7595A     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032A-LD7595A     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDHGT LD5032A-LD7595A    14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032A-LD7595A     6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032A-LD7595A     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID LD5032A-LD7595A    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID LD5032A-LD7595A     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID LD5032A-LD7595A     0.00   15.23   14.32   12.97   11.23    9.14
SO BUILDWID LD5032A-LD7595A    12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID LD5032A-LD7595A    15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID LD5032A-LD7595A     0.00   15.23   14.32   12.97   11.23    9.14
**
SO BUILDHGT BASE32B-BASE95B     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT BASE32B-BASE95B     0.00    0.00    0.00    6.71    6.71    6.71
SO BUILDHGT BASE32B-BASE95B    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT BASE32B-BASE95B    14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT BASE32B-BASE95B     6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT BASE32B-BASE95B     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID BASE32B-BASE95B    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID BASE32B-BASE95B     0.00    0.00    0.00   14.19   15.16   15.66
SO BUILDWID BASE32B-BASE95B    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID BASE32B-BASE95B    12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID BASE32B-BASE95B    15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID BASE32B-BASE95B     0.00   15.23   14.32   12.97   11.23    9.14
**
SO BUILDHGT LD5032B-LD7595B     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT LD5032B-LD7595B     0.00    0.00    0.00    6.71    6.71    6.71
SO BUILDHGT LD5032B-LD7595B    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD5032B-LD7595B    14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032B-LD7595B     6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032B-LD7595B     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID LD5032B-LD7595B    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID LD5032B-LD7595B     0.00    0.00    0.00   14.19   15.16   15.66
SO BUILDWID LD5032B-LD7595B    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID LD5032B-LD7595B    12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID LD5032B-LD7595B    15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID LD5032B-LD7595B     0.00   15.23   14.32   12.97   11.23    9.14
**
SO BUILDHGT BASE32C-BASE95C     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT BASE32C-BASE95C     0.00    0.00    0.00    6.71    6.71   14.33
SO BUILDHGT BASE32C-BASE95C    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT BASE32C-BASE95C    14.33   14.33   14.33   14.33    0.00    0.00
SO BUILDHGT BASE32C-BASE95C     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT BASE32C-BASE95C     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID BASE32C-BASE95C    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID BASE32C-BASE95C     0.00    0.00    0.00   14.19   15.16   14.99
SO BUILDWID BASE32C-BASE95C    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID BASE32C-BASE95C    12.71   14.06   14.99   15.46    0.00    0.00
SO BUILDWID BASE32C-BASE95C     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID BASE32C-BASE95C     0.00   15.23   14.32   12.97   11.23    9.14
**
SO BUILDHGT LD5032C-LD7595C     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT LD5032C-LD7595C     0.00    0.00    0.00    6.71    6.71   14.33
SO BUILDHGT LD5032C-LD7595C    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD5032C-LD7595C    14.33   14.33   14.33   14.33    0.00    0.00
SO BUILDHGT LD5032C-LD7595C     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032C-LD7595C     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID LD5032C-LD7595C    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID LD5032C-LD7595C     0.00    0.00    0.00   14.19   15.16   14.99
SO BUILDWID LD5032C-LD7595C    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID LD5032C-LD7595C    12.71   14.06   14.99   15.46    0.00    0.00
SO BUILDWID LD5032C-LD7595C     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID LD5032C-LD7595C     0.00   15.23   14.32   12.97   11.23    9.14
**
SO EMISUNIT    .100000E+07 (GRAMS/SEC)          (MICROGRAMS/CUBIC-METER)
SO SRCGROUP BASE32 BASE32A BASE32B BASE32C
SO SRCGROUP BASE95 BASE95A BASE95B BASE95C
SO SRCGROUP LD7532 LD7532A LD7532B LD7532C
SO SRCGROUP LD7595 LD7595A LD7595B LD7595C
SO SRCGROUP LD5032 LD5032A LD5032B LD5032C
SO SRCGROUP LD5095 LD5095A LD5095B LD5095C
**
SO FINISHED
```

```
RE STARTING
RE GRIDPOLR POL STA
RE GRIDPOLR POL ORIG  0.0   0.0
RE GRIDPOLR POL DIST  300 500 700 1000 1500 2000 2500 3000 4000 5000
RE GRIDPOLR POL DIST  7000 10000 12000 15000 20000 25000 30000
RE GRIDPOLR POL GDIR  36  10.00  10.00
RE GRIDPOLR POL END
RE DISCPOLR BASE32B      173.        10
RE DISCPOLR BASE32B      200.        10
RE DISCPOLR BASE32B      182.        20
RE DISCPOLR BASE32B      200.        20
RE DISCPOLR BASE32B      171.        30
RE DISCPOLR BASE32B      200.        30
RE DISCPOLR BASE32B      133.        40
RE DISCPOLR BASE32B      200.        40
RE DISCPOLR BASE32B      111.        50
RE DISCPOLR BASE32B      200.        50
RE DISCPOLR BASE32B       99.        60
RE DISCPOLR BASE32B      100.        60
RE DISCPOLR BASE32B      200.        60
RE DISCPOLR BASE32B       91.        70
RE DISCPOLR BASE32B      100.        70
RE DISCPOLR BASE32B      200.        70
RE DISCPOLR BASE32B       87.        80
RE DISCPOLR BASE32B      100.        80
RE DISCPOLR BASE32B      200.        80
RE DISCPOLR BASE32B       85.        90
RE DISCPOLR BASE32B      100.        90
RE DISCPOLR BASE32B      200.        90
RE DISCPOLR BASE32B       87.       100
RE DISCPOLR BASE32B      100.       100
RE DISCPOLR BASE32B      200.       100
RE DISCPOLR BASE32B       91.       110
RE DISCPOLR BASE32B      100.       110
RE DISCPOLR BASE32B      200.       110
RE DISCPOLR BASE32B       99.       120
RE DISCPOLR BASE32B      100.       120
RE DISCPOLR BASE32B      200.       120
RE DISCPOLR BASE32B      111.       130
RE DISCPOLR BASE32B      200.       130
RE DISCPOLR BASE32B      127.       140
RE DISCPOLR BASE32B      200.       140
RE DISCPOLR BASE32B      113.       150
RE DISCPOLR BASE32B      200.       150
RE DISCPOLR BASE32B      104.       160
RE DISCPOLR BASE32B      200.       160
RE DISCPOLR BASE32B       99.       170
RE DISCPOLR BASE32B      100.       170
RE DISCPOLR BASE32B      200.       170
RE DISCPOLR BASE32B       98.       180
RE DISCPOLR BASE32B      100.       180
RE DISCPOLR BASE32B      200.       180
RE DISCPOLR BASE32B       99.       190
RE DISCPOLR BASE32B      100.       190
RE DISCPOLR BASE32B      200.       190
RE DISCPOLR BASE32B      104.       200
RE DISCPOLR BASE32B      200.       200
RE DISCPOLR BASE32B      113.       210
RE DISCPOLR BASE32B      200.       210
RE DISCPOLR BASE32B      127.       220
RE DISCPOLR BASE32B      200.       220
RE DISCPOLR BASE32B      152.       230
RE DISCPOLR BASE32B      200.       230
RE DISCPOLR BASE32B      158.       240
RE DISCPOLR BASE32B      200.       240
RE DISCPOLR BASE32B      146.       250
RE DISCPOLR BASE32B      200.       250
RE DISCPOLR BASE32B      139.       260
RE DISCPOLR BASE32B      200.       260
RE DISCPOLR BASE32B      137.       270
RE DISCPOLR BASE32B      200.       270
RE DISCPOLR BASE32B      139.       280
RE DISCPOLR BASE32B      200.       280
RE DISCPOLR BASE32B      146.       290
RE DISCPOLR BASE32B      200.       290
RE DISCPOLR BASE32B      158.       300
RE DISCPOLR BASE32B      200.       300
RE DISCPOLR BASE32B      179.       310
RE DISCPOLR BASE32B      200.       310
RE DISCPOLR BASE32B      213.       320
RE DISCPOLR BASE32B      197.       330
RE DISCPOLR BASE32B      200.       330
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RE DISCPOLR BASE32B      182.       340
RE DISCPOLR BASE32B      200.       340
RE DISCPOLR BASE32B      173.       350
RE DISCPOLR BASE32B      200.       350
RE DISCPOLR BASE32B      171.       360
RE DISCPOLR BASE32B      200.       360
RE FINISHED

ME STARTING
ME INPUTFIL D:\MET\TPA87D.MET
ME ANEMHGHT    6.700 METERS
ME SURFDATA  12842  1987            TAMPA
ME UAIRDATA  12842  1987            RUSKIN
ME WINDCATS    1.54    3.09    5.14    8.23   10.80
ME FINISHED

OU STARTING
OU RECTABLE ALLAVE FIRST
OU FINISHED

***********************************
*** SETUP Finishes Successfully ***
***********************************

  *** ISCST3 - VERSION 99155 ***    *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE      10/9/99        **
                                    *** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES      ***
**MODELOPTs:
CONC                         RURAL  FLAT          DFAULT

                                          ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Simple Terrain Model is Selected

**Model Is Setup For Calculation of Average CONCentration Values.

  --  SCAVENGING/DEPOSITION LOGIC --
**Model Uses NO DRY DEPLETION.  DDPLETE =  F
**Model Uses NO WET DEPLETION.  WDPLETE =  F
**NO WET SCAVENGING Data Provided.
**NO GAS DRY DEPOSITION Data Provided.
**Model Does NOT Use GRIDDED TERRAIN Data for Depletion Calculations

**Model Uses RURAL Dispersion.

**Model Uses Regulatory DEFAULT Options:
           1. Final Plume Rise.
           2. Stack-tip Downwash.
           3. Buoyancy-induced Dispersion.
           4. Use Calms Processing Routine.
           5. Not Use Missing Data Processing Routine.
           6. Default Wind Profile Exponents.
           7. Default Vertical Potential Temperature Gradients.
           8. "Upper Bound" Values for Supersquat Buildings.
           9. No Exponential Decay for RURAL Mode

**Model Assumes Receptors on FLAT Terrain.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  4 Short Term Average(s) of:  24-HR   8-HR   3-HR   1-HR
    and Calculates PERIOD Averages

**This Run Includes:    18 Source(s);      6 Source Group(s); and     693 Receptor(s)

**The Model Assumes A Pollutant Type of:  GEN

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of PERIOD Averages by Receptor
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Anem. Hgt. (m) =     6.70 ;    Decay Coef. =    0.000     ;    Rot. Angle =     0.0
                 Emission Units = (GRAMS/SEC)                              ;  Emission Rate Unit Factor =   0.1
                 Output Units   = (MICROGRAMS/CUBIC-METER)

**Approximate Storage Requirements of Model =     1.5 MB of RAM.
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**Input Runstream File: PCNGC2.I87
**Output Print File: PCNGC2.087

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (USER UNITS)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMIS SCA
BASE32A	0	0.33330E+01	-35.4	0.0	0.0	18.30	865.00	36.20	6.71	YES	
BASE32B	0	0.33340E+01	0.0	0.0	0.0	18.30	865.00	36.20	6.71	YES	
BASE32C	0	0.33330E+01	35.4	0.0	0.0	18.30	865.00	36.20	6.71	YES	
BASE95A	0	0.33330E+01	-35.4	0.0	0.0	18.30	886.00	33.90	6.71	YES	
BASE95B	0	0.33340E+01	0.0	0.0	0.0	18.30	886.00	33.90	6.71	YES	
BASE95C	0	0.33330E+01	35.4	0.0	0.0	18.30	886.00	33.90	6.71	YES	
LD7532A	0	0.33330E+01	-35.4	0.0	0.0	18.30	905.00	30.60	6.71	YES	
LD7532B	0	0.33340E+01	0.0	0.0	0.0	18.30	905.00	30.60	6.71	YES	
LD7532C	0	0.33330E+01	35.4	0.0	0.0	18.30	905.00	30.60	6.71	YES	
LD7595A	0	0.33330E+01	-35.4	0.0	0.0	18.30	918.00	29.00	6.71	YES	
LD7595B	0	0.33340E+01	0.0	0.0	0.0	18.30	918.00	29.00	6.71	YES	
LD7595C	0	0.33330E+01	35.4	0.0	0.0	18.30	918.00	29.00	6.71	YES	
LD5032A	0	0.33330E+01	-35.4	0.0	0.0	18.30	906.00	25.70	6.71	YES	
LD5032B	0	0.33340E+01	0.0	0.0	0.0	18.30	906.00	25.70	6.71	YES	
LD5032C	0	0.33330E+01	35.4	0.0	0.0	18.30	906.00	25.70	6.71	YES	
LD5095A	0	0.33330E+01	-35.4	0.0	0.0	18.30	922.00	24.50	6.71	YES	
LD5095B	0	0.33340E+01	0.0	0.0	0.0	18.30	922.00	24.50	6.71	YES	
LD5095C	0	0.33330E+01	35.4	0.0	0.0	18.30	922.00	24.50	6.71	YES	

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
BASE32	BASE32A , BASE32B , BASE32C ,
BASE95	BASE95A , BASE95B , BASE95C ,
LD7532	LD7532A , LD7532B , LD7532C ,
LD7595	LD7595A , LD7595B , LD7595C ,
LD5032	LD5032A , LD5032B , LD5032C ,
LD5095	LD5095A , LD5095B , LD5095C ,

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: BASE32A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

SOURCE ID: BASE32B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

SOURCE ID: BASE32C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	0.0,	0.0,	0
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

SOURCE ID: BASE95A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

*** ISCST3 - VERSION 99155 ***   *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE   10/9/99 ***
*** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC   RURAL FLAT   DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: BASE95B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

SOURCE ID: BASE95C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	0.0,	0.0,	0
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

SOURCE ID: LD7532A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

SOURCE ID: LD7532B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0

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  31   0.0,    0.0, 0    32   6.7,  15.2, 0    33   6.7,  14.3, 0    34   6.7,  13.0, 0    35   6.7,  11.2, 0
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 *** ISCST3 - VERSION 99155 ***    *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE      10/9/99         **
                                  *** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES      ***
**MODELOPTs:
CONC                        RURAL  FLAT         DFAULT

                                      *** DIRECTION SPECIFIC BUILDING DIMENSIONS ***


SOURCE ID: LD7532C
 IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK
   1   6.7,  11.2, 0     2   6.7,  13.0, 0     3   6.7,  14.3, 0     4  14.3,  15.5, 0     5   0.0,   0.0, 0
   7   0.0,   0.0, 0     8   0.0,   0.0, 0     9   0.0,   0.0, 0    10   6.7,  14.2, 0    11   6.7,  15.2, 0
  13  14.3,  15.5, 0    14  14.3,  15.5, 0    15  14.3,  15.0, 0    16  14.3,  14.1, 0    17   6.7,  11.2, 0
  19  14.3,  12.7, 0    20  14.3,  14.1, 0    21  14.3,  15.0, 0    22  14.3,  15.5, 0    23   0.0,   0.0, 0
  25   0.0,   0.0, 0    26   0.0,   0.0, 0    27   0.0,   0.0, 0    28   0.0,   0.0, 0    29   0.0,   0.0, 0
  31   0.0,   0.0, 0    32   6.7,  15.2, 0    33   6.7,  14.3, 0    34   6.7,  13.0, 0    35   6.7,  11.2, 0


SOURCE ID: LD7595A
 IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK
   1   6.7,  11.2, 0     2   6.7,  13.0, 0     3   6.7,  14.3, 0     4  14.3,  15.5, 0     5   0.0,   0.0, 0
   7   0.0,   0.0, 0     8   0.0,   0.0, 0     9   0.0,   0.0, 0    10   0.0,   0.0, 0    11   0.0,   0.0, 0
  13   0.0,   0.0, 0    14   6.7,  15.2, 0    15   6.7,  14.3, 0    16   6.7,  13.0, 0    17   6.7,  11.2, 0
  19  14.3,  12.7, 0    20  14.3,  14.1, 0    21  14.3,  15.0, 0    22  14.3,  15.5, 0    23  14.3,  15.5, 0
  25   6.7,  15.2, 0    26   6.7,  14.2, 0    27   0.0,   0.0, 0    28   0.0,   0.0, 0    29   0.0,   0.0, 0
  31   0.0,   0.0, 0    32   6.7,  15.2, 0    33   6.7,  14.3, 0    34   6.7,  13.0, 0    35   6.7,  11.2, 0


SOURCE ID: LD7595B
 IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK
   1   6.7,  11.2, 0     2   6.7,  13.0, 0     3   6.7,  14.3, 0     4  14.3,  15.5, 0     5   0.0,   0.0, 0
   7   0.0,   0.0, 0     8   0.0,   0.0, 0     9   0.0,   0.0, 0    10   6.7,  14.2, 0    11   6.7,  15.2, 0
  13  14.3,  15.5, 0    14  14.3,  15.5, 0    15  14.3,  15.0, 0    16  14.3,  14.1, 0    17   6.7,  11.2, 0
  19  14.3,  12.7, 0    20  14.3,  14.1, 0    21  14.3,  15.0, 0    22  14.3,  15.5, 0    23  14.3,  15.5, 0
  25   6.7,  15.2, 0    26   6.7,  14.2, 0    27   0.0,   0.0, 0    28   0.0,   0.0, 0    29   0.0,   0.0, 0
  31   0.0,   0.0, 0    32   6.7,  15.2, 0    33   6.7,  14.3, 0    34   6.7,  13.0, 0    35   6.7,  11.2, 0


SOURCE ID: LD7595C
 IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK
   1   6.7,  11.2, 0     2   6.7,  13.0, 0     3   6.7,  14.3, 0     4  14.3,  15.5, 0     5   0.0,   0.0, 0
   7   0.0,   0.0, 0     8   0.0,   0.0, 0     9   0.0,   0.0, 0    10   6.7,  14.2, 0    11   6.7,  15.2, 0
  13  14.3,  15.5, 0    14  14.3,  15.5, 0    15  14.3,  15.0, 0    16  14.3,  14.1, 0    17   6.7,  11.2, 0
  19  14.3,  12.7, 0    20  14.3,  14.1, 0    21  14.3,  15.0, 0    22  14.3,  15.5, 0    23   0.0,   0.0, 0
  25   0.0,   0.0, 0    26   0.0,   0.0, 0    27   0.0,   0.0, 0    28   0.0,   0.0, 0    29   0.0,   0.0, 0
  31   0.0,   0.0, 0    32   6.7,  15.2, 0    33   6.7,  14.3, 0    34   6.7,  13.0, 0    35   6.7,  11.2, 0
```

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 *** ISCST3 - VERSION 99155 ***    *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE      10/9/99         **
                                  *** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES      ***
**MODELOPTs:
CONC                        RURAL  FLAT         DFAULT

                                      *** DIRECTION SPECIFIC BUILDING DIMENSIONS ***


SOURCE ID: LD5032A
 IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK
   1   6.7,  11.2, 0     2   6.7,  13.0, 0     3   6.7,  14.3, 0     4  14.3,  15.5, 0     5   0.0,   0.0, 0
   7   0.0,   0.0, 0     8   0.0,   0.0, 0     9   0.0,   0.0, 0    10   0.0,   0.0, 0    11   0.0,   0.0, 0
  13   0.0,   0.0, 0    14   6.7,  15.2, 0    15   6.7,  14.3, 0    16   6.7,  13.0, 0    17   6.7,  11.2, 0
  19  14.3,  12.7, 0    20  14.3,  14.1, 0    21  14.3,  15.0, 0    22  14.3,  15.5, 0    23  14.3,  15.5, 0
  25   6.7,  15.2, 0    26   6.7,  14.2, 0    27   0.0,   0.0, 0    28   0.0,   0.0, 0    29   0.0,   0.0, 0
  31   0.0,   0.0, 0    32   6.7,  15.2, 0    33   6.7,  14.3, 0    34   6.7,  13.0, 0    35   6.7,  11.2, 0


SOURCE ID: LD5032B
 IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK
   1   6.7,  11.2, 0     2   6.7,  13.0, 0     3   6.7,  14.3, 0     4  14.3,  15.5, 0     5   0.0,   0.0, 0
   7   0.0,   0.0, 0     8   0.0,   0.0, 0     9   0.0,   0.0, 0    10   6.7,  14.2, 0    11   6.7,  15.2, 0
  13  14.3,  15.5, 0    14  14.3,  15.5, 0    15  14.3,  15.0, 0    16  14.3,  14.1, 0    17   6.7,  11.2, 0
  19  14.3,  12.7, 0    20  14.3,  14.1, 0    21  14.3,  15.0, 0    22  14.3,  15.5, 0    23  14.3,  15.5, 0
  25   6.7,  15.2, 0    26   6.7,  14.2, 0    27   0.0,   0.0, 0    28   0.0,   0.0, 0    29   0.0,   0.0, 0
  31   0.0,   0.0, 0    32   6.7,  15.2, 0    33   6.7,  14.3, 0    34   6.7,  13.0, 0    35   6.7,  11.2, 0
```

SOURCE ID: LD5032C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	0.0,	0.0,	0
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

SOURCE ID: LD5095A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***
**MODELOPTs:
CONC RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: LD5095B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

SOURCE ID: LD5095C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	0.0,	0.0,	0
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***
**MODELOPTs:
CONC RURAL FLAT DFAULT

*** GRIDDED RECEPTOR NETWORK SUMMARY ***

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

*** ORIGIN FOR POLAR NETWORK ***
X-ORIG = 0.00 ; Y-ORIG = 0.00 (METERS)

*** DISTANCE RANGES OF NETWORK ***
(METERS)

300.0,	500.0,	700.0,	1000.0,	1500.0,	2000.0,	2500.0,	3000.0,	4000.0,	5000
7000.0,	10000.0,	12000.0,	15000.0,	20000.0,	25000.0,	30000.0,			

*** DIRECTION RADIALS OF NETWORK ***
(DEGREES)

10.0,	20.0,	30.0,	40.0,	50.0,	60.0,	70.0,	80.0,	90.0,	100
110.0,	120.0,	130.0,	140.0,	150.0,	160.0,	170.0,	180.0,	190.0,	200
210.0,	220.0,	230.0,	240.0,	250.0,	260.0,	270.0,	280.0,	290.0,	300
310.0,	320.0,	330.0,	340.0,	350.0,	360.0,				

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***
**MODELOPTs:
CONC RURAL FLAT DFAULT

*** DISCRETE POLAR RECEPTORS ***
ORIGIN: (DIST, DIR, ZELEV, ZFLAG)
SRCID: (METERS,DEG,METERS,METERS)

```
BASE32B : (   173.0,    10.0,    0.0,    0.0);      BASE32B : (   200.0,    10.0,    0.0,
BASE32B : (   182.0,    20.0,    0.0,    0.0);      BASE32B : (   200.0,    20.0,    0.0,
BASE32B : (   171.0,    30.0,    0.0,    0.0);      BASE32B : (   200.0,    30.0,    0.0,
BASE32B : (   133.0,    40.0,    0.0,    0.0);      BASE32B : (   200.0,    40.0,    0.0,
BASE32B : (   111.0,    50.0,    0.0,    0.0);      BASE32B : (   200.0,    50.0,    0.0,
BASE32B : (    99.0,    60.0,    0.0,    0.0);      BASE32B : (   100.0,    60.0,    0.0,
BASE32B : (   200.0,    60.0,    0.0,    0.0);      BASE32B : (    91.0,    70.0,    0.0,
BASE32B : (   100.0,    70.0,    0.0,    0.0);      BASE32B : (   200.0,    70.0,    0.0,
BASE32B : (    87.0,    80.0,    0.0,    0.0);      BASE32B : (   100.0,    80.0,    0.0,
BASE32B : (   200.0,    80.0,    0.0,    0.0);      BASE32B : (    85.0,    90.0,    0.0,
BASE32B : (   100.0,    90.0,    0.0,    0.0);      BASE32B : (   200.0,    90.0,    0.0,
BASE32B : (    87.0,   100.0,    0.0,    0.0);      BASE32B : (   100.0,   100.0,    0.0,
BASE32B : (   200.0,   100.0,    0.0,    0.0);      BASE32B : (    91.0,   110.0,    0.0,
BASE32B : (   100.0,   110.0,    0.0,    0.0);      BASE32B : (   200.0,   110.0,    0.0,
BASE32B : (    99.0,   120.0,    0.0,    0.0);      BASE32B : (   100.0,   120.0,    0.0,
BASE32B : (   200.0,   120.0,    0.0,    0.0);      BASE32B : (   111.0,   130.0,    0.0,
BASE32B : (   200.0,   130.0,    0.0,    0.0);      BASE32B : (   127.0,   140.0,    0.0,
BASE32B : (   200.0,   140.0,    0.0,    0.0);      BASE32B : (   113.0,   150.0,    0.0,
BASE32B : (   200.0,   150.0,    0.0,    0.0);      BASE32B : (   104.0,   160.0,    0.0,
BASE32B : (   200.0,   160.0,    0.0,    0.0);      BASE32B : (    99.0,   170.0,    0.0,
BASE32B : (   100.0,   170.0,    0.0,    0.0);      BASE32B : (   200.0,   170.0,    0.0,
BASE32B : (    98.0,   180.0,    0.0,    0.0);      BASE32B : (   100.0,   180.0,    0.0,
BASE32B : (   200.0,   180.0,    0.0,    0.0);      BASE32B : (    99.0,   190.0,    0.0,
BASE32B : (   100.0,   190.0,    0.0,    0.0);      BASE32B : (   200.0,   190.0,    0.0,
BASE32B : (   104.0,   200.0,    0.0,    0.0);      BASE32B : (   200.0,   200.0,    0.0,
BASE32B : (   113.0,   210.0,    0.0,    0.0);      BASE32B : (   200.0,   210.0,    0.0,
BASE32B : (   127.0,   220.0,    0.0,    0.0);      BASE32B : (   200.0,   220.0,    0.0,
BASE32B : (   152.0,   230.0,    0.0,    0.0);      BASE32B : (   200.0,   230.0,    0.0,
BASE32B : (   158.0,   240.0,    0.0,    0.0);      BASE32B : (   200.0,   240.0,    0.0,
BASE32B : (   146.0,   250.0,    0.0,    0.0);      BASE32B : (   200.0,   250.0,    0.0,
BASE32B : (   139.0,   260.0,    0.0,    0.0);      BASE32B : (   200.0,   260.0,    0.0,
BASE32B : (   137.0,   270.0,    0.0,    0.0);      BASE32B : (   200.0,   270.0,    0.0,
BASE32B : (   139.0,   280.0,    0.0,    0.0);      BASE32B : (   200.0,   280.0,    0.0,
BASE32B : (   146.0,   290.0,    0.0,    0.0);      BASE32B : (   200.0,   290.0,    0.0,
BASE32B : (   158.0,   300.0,    0.0,    0.0);      BASE32B : (   200.0,   300.0,    0.0,
BASE32B : (   179.0,   310.0,    0.0,    0.0);      BASE32B : (   200.0,   310.0,    0.0,
BASE32B : (   213.0,   320.0,    0.0,    0.0);      BASE32B : (   197.0,   330.0,    0.0,
BASE32B : (   200.0,   330.0,    0.0,    0.0);      BASE32B : (   182.0,   340.0,    0.0,
BASE32B : (   200.0,   340.0,    0.0,    0.0);      BASE32B : (   173.0,   350.0,    0.0,
BASE32B : (   200.0,   350.0,    0.0,    0.0);      BASE32B : (   171.0,   360.0,    0.0,
BASE32B : (   200.0,   360.0,    0.0,    0.0);
```

*** ISCST3 - VERSION 99155 ***   *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE   10/9/99   **
*** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES   ***

**MODELOPTs:
CONC   RURAL FLAT   DFAULT

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA F

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** WIND PROFILE EXPONENTS ***

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E
B	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E

C	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E
D	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E
E	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E
F	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E

*** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***
(DEGREES KELVIN PER METER)

STABILITY	WIND SPEED CATEGORY					
CATEGORY	1	2	3	4	5	6
A	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E
B	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E
C	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E
D	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E
E	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E
F	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***
**MODELOPTs:
CONC RURAL FLAT DFAULT

*** THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

FILE: D:\MET\TPA87D.MET
FORMAT: (4I2,2F9.4,F6.1,I2,2F7.1,f9.4,f10.1,f8.4,i4,f7.2)
SURFACE STATION NO.: 12842 UPPER AIR STATION NO.: 12842
NAME: TAMPA NAME: RUSKIN
YEAR: 1987 YEAR: 1987

YR MN DY HR	FLOW VECTOR	SPEED (M/S)	TEMP (K)	STAB CLASS	MIXING HEIGHT (M) RURAL	URBAN	USTAR (M/S)	M-O LENGTH (M)	Z-0 (M)	IPCODE	PRATE (mm/HR)
87 01 01 01	341.0	6.17	293.7	4	598.7	598.7	0.0000	0.0	0.0000	0	0.00
87 01 01 02	358.0	4.12	293.2	5	651.8	1306.0	0.0000	0.0	0.0000	0	0.00
87 01 01 03	34.0	6.17	293.2	4	704.8	704.8	0.0000	0.0	0.0000	0	0.00
87 01 01 04	73.0	6.69	291.5	4	757.8	757.8	0.0000	0.0	0.0000	0	0.00
87 01 01 05	83.0	7.20	290.9	4	810.8	810.8	0.0000	0.0	0.0000	0	0.00
87 01 01 06	102.0	7.20	290.4	4	863.8	863.8	0.0000	0.0	0.0000	0	0.00
87 01 01 07	105.0	6.69	289.3	4	916.9	916.9	0.0000	0.0	0.0000	0	0.00
87 01 01 08	113.0	7.72	288.7	4	969.9	969.9	0.0000	0.0	0.0000	0	0.00
87 01 01 09	107.0	6.17	288.2	4	1022.9	1022.9	0.0000	0.0	0.0000	0	0.00
87 01 01 10	121.0	6.17	288.2	4	1075.9	1075.9	0.0000	0.0	0.0000	0	0.00
87 01 01 11	114.0	6.69	287.6	4	1128.9	1128.9	0.0000	0.0	0.0000	0	0.00
87 01 01 12	116.0	6.17	287.0	4	1182.0	1182.0	0.0000	0.0	0.0000	0	0.00
87 01 01 13	133.0	7.20	287.6	4	1235.0	1235.0	0.0000	0.0	0.0000	0	0.00
87 01 01 14	119.0	7.72	287.6	4	1288.0	1288.0	0.0000	0.0	0.0000	0	0.00
87 01 01 15	132.0	7.20	288.2	4	1288.0	1288.0	0.0000	0.0	0.0000	0	0.00
87 01 01 16	134.0	7.72	289.3	4	1288.0	1288.0	0.0000	0.0	0.0000	0	0.00
87 01 01 17	141.0	7.20	288.2	4	1288.0	1288.0	0.0000	0.0	0.0000	0	0.00
87 01 01 18	137.0	5.14	287.6	5	1286.4	1238.1	0.0000	0.0	0.0000	0	0.00
87 01 01 19	144.0	3.60	286.5	5	1281.2	1078.6	0.0000	0.0	0.0000	0	0.00
87 01 01 20	117.0	2.06	285.4	6	1276.0	919.0	0.0000	0.0	0.0000	0	0.00
87 01 01 21	110.0	1.54	284.8	7	1270.9	759.5	0.0000	0.0	0.0000	0	0.00
87 01 01 22	112.0	0.00	283.7	7	1265.7	600.0	0.0000	0.0	0.0000	0	0.00
87 01 01 23	120.0	2.57	283.7	6	1260.5	440.5	0.0000	0.0	0.0000	0	0.00
87 01 01 24	130.0	1.54	282.6	7	1255.4	281.0	0.0000	0.0	0.0000	0	0.00

*** NOTES: STABILITY CLASS 1=A, 2=B, 3=C, 4=D, 5=E AND 6=F.
FLOW VECTOR IS DIRECTION TOWARD WHICH WIND IS BLOWING.

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***
**MODELOPTs:
CONC RURAL FLAT DFAULT

*** THE SUMMARY OF MAXIMUM PERIOD (8760 HRS) RESULTS ***

** CONC OF GEN IN (MICROGRAMS/CUBIC-METER) **

GROUP ID		AVERAGE CONC	RECEPTOR (XR,	YR,	ZELEV,	ZFLAG)	OF TYPE	NETWORK GRID-ID
BASE32	1ST HIGHEST VALUE IS	0.01250 AT (	-12990.38,	-7500.00,	0.00,	0.00)	GP	POL
	2ND HIGHEST VALUE IS	0.01234 AT (	-10392.30,	-6000.00,	0.00,	0.00)	GP	POL
	3RD HIGHEST VALUE IS	0.01226 AT (	-17320.51,	-10000.00,	0.00,	0.00)	GP	POL

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BASE95   1ST HIGHEST VALUE IS    0.01323 AT (  -12990.38,    -7500.00,      0.00,      0.00)  GP    POL
         2ND HIGHEST VALUE IS    0.01309 AT (  -10392.30,    -6000.00,      0.00,      0.00)  GP    POL
         3RD HIGHEST VALUE IS    0.01294 AT (  -17320.51,   -10000.00,      0.00,      0.00)  GP    POL

LD7532   1ST HIGHEST VALUE IS    0.01474 AT (  -12990.38,    -7500.00,      0.00,      0.00)  GP    POL
         2ND HIGHEST VALUE IS    0.01468 AT (  -10392.30,    -6000.00,      0.00,      0.00)  GP    POL
         3RD HIGHEST VALUE IS    0.01449 AT (   -8660.25,    -5000.00,      0.00,      0.00)  GP    POL

LD7595   1ST HIGHEST VALUE IS    0.01541 AT (  -12990.38,    -7500.00,      0.00,      0.00)  GP    POL
         2ND HIGHEST VALUE IS    0.01535 AT (  -10392.30,    -6000.00,      0.00,      0.00)  GP    POL
         3RD HIGHEST VALUE IS    0.01513 AT (   -8660.25,    -5000.00,      0.00,      0.00)  GP    POL

LD5032   1ST HIGHEST VALUE IS    0.01748 AT (  -12990.38,    -7500.00,      0.00,      0.00)  GP    POL
         2ND HIGHEST VALUE IS    0.01746 AT (  -10392.30,    -6000.00,      0.00,      0.00)  GP    POL
         3RD HIGHEST VALUE IS    0.01736 AT (  -11276.31,    -4104.24,      0.00,      0.00)  GP    POL

LD5095   1ST HIGHEST VALUE IS    0.01827 AT (  -12990.38,    -7500.00,      0.00,      0.00)  GP    POL
         2ND HIGHEST VALUE IS    0.01827 AT (  -10392.30,    -6000.00,      0.00,      0.00)  GP    POL
         3RD HIGHEST VALUE IS    0.01807 AT (   -8660.25,    -5000.00,      0.00,      0.00)  GP    POL

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
  *** ISCST3 - VERSION 99155 ***    *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE      10/9/99       **
                                   *** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES      ***
**MODELOPTs:
CONC                         RURAL  FLAT          DFAULT

                                            *** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

                                     ** CONC OF GEN      IN (MICROGRAMS/CUBIC-METER)                **

                                                  DATE
GROUP ID                              AVERAGE CONC     (YYMMDDHH)            RECEPTOR  (XR, YR, ZELEV, ZFLAG)     O
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

BASE32   HIGH  1ST HIGH VALUE IS      0.14986c ON 87040624: AT (    6893.65,     1215.54,       0.00,       0.00

BASE95   HIGH  1ST HIGH VALUE IS      0.15384c ON 87042724: AT (   -5362.31,    -4499.51,       0.00,       0.00

LD7532   HIGH  1ST HIGH VALUE IS      0.17837  ON 87052424: AT (  -10000.00,        0.00,       0.00,       0.00

LD7595   HIGH  1ST HIGH VALUE IS      0.18474  ON 87052424: AT (  -10000.00,        0.00,       0.00,       0.00

LD5032   HIGH  1ST HIGH VALUE IS      0.20940  ON 87112324: AT (  -11276.31,    -4104.24,       0.00,       0.00

LD5095   HIGH  1ST HIGH VALUE IS      0.21713  ON 87112324: AT (  -11276.31,    -4104.24,       0.00,       0.00

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
  *** ISCST3 - VERSION 99155 ***    *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE      10/9/99       **
                                   *** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES      ***
**MODELOPTs:
CONC                         RURAL  FLAT          DFAULT

                                            *** THE SUMMARY OF HIGHEST  8-HR RESULTS ***

                                     ** CONC OF GEN      IN (MICROGRAMS/CUBIC-METER)                **

                                                  DATE
GROUP ID                              AVERAGE CONC     (YYMMDDHH)            RECEPTOR  (XR, YR, ZELEV, ZFLAG)     O
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

BASE32   HIGH  1ST HIGH VALUE IS      0.40941  ON 87120408: AT (   17320.51,    10000.00,       0.00,       0.00

BASE95   HIGH  1ST HIGH VALUE IS      0.43046  ON 87120408: AT (   17320.51,    10000.00,       0.00,       0.00

LD7532   HIGH  1ST HIGH VALUE IS      0.46831  ON 87120408: AT (   17320.51,    10000.00,       0.00,       0.00

LD7595   HIGH  1ST HIGH VALUE IS      0.48846  ON 87120408: AT (   17320.51,    10000.00,       0.00,       0.00

LD5032   HIGH  1ST HIGH VALUE IS      0.54853  ON 87120408: AT (   12990.38,     7500.00,       0.00,       0.00
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LD5095	HIGH	1ST HIGH VALUE IS	0.56988	ON 87120408: AT (	12990.38,	7500.00,	0.00,	0.00

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** THE SUMMARY OF HIGHEST 3-HR RESULTS ***

** CONC OF GEN IN (MICROGRAMS/CUBIC-METER) **

GROUP ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR,	YR,	ZELEV,	ZFLAG) O
BASE32	HIGH	1ST HIGH VALUE IS	0.80356	ON 87031003: AT (	18793.85,	-6840.40,	0.00,	0.00
BASE95	HIGH	1ST HIGH VALUE IS	0.84237	ON 87031003: AT (	18793.85,	-6840.40,	0.00,	0.00
LD7532	HIGH	1ST HIGH VALUE IS	0.91164	ON 87031003: AT (	18793.85,	-6840.40,	0.00,	0.00
LD7595	HIGH	1ST HIGH VALUE IS	0.94824	ON 87031003: AT (	18793.85,	-6840.40,	0.00,	0.00
LD5032	HIGH	1ST HIGH VALUE IS	1.06065	ON 87031003: AT (	14095.39,	-5130.30,	0.00,	0.00
LD5095	HIGH	1ST HIGH VALUE IS	1.09960	ON 87031003: AT (	14095.39,	-5130.30,	0.00,	0.00

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF GEN IN (MICROGRAMS/CUBIC-METER) **

GROUP ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR,	YR,	ZELEV,	ZFLAG) O
BASE32	HIGH	1ST HIGH VALUE IS	1.67977	ON 87082614: AT (	1500.00,	0.00,	0.00,	0.00
BASE95	HIGH	1ST HIGH VALUE IS	1.87654	ON 87070113: AT (	-1477.21,	260.47,	0.00,	0.00
LD7532	HIGH	1ST HIGH VALUE IS	2.08723	ON 87052413: AT (	-1477.21,	260.47,	0.00,	0.00
LD7595	HIGH	1ST HIGH VALUE IS	2.16525	ON 87080713: AT (	1409.54,	513.03,	0.00,	0.00
LD5032	HIGH	1ST HIGH VALUE IS	2.51606	ON 87082212: AT (	-1409.54,	-513.03,	0.00,	0.00
LD5095	HIGH	1ST HIGH VALUE IS	2.53071	ON 87082212: AT (	-1409.54,	-513.03,	0.00,	0.00

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** Message Summary : ISCST3 Model Execution ***

--------- Summary of Total Messages --------

```
A Total of            0 Fatal Error Message(s)
A Total of            0 Warning Message(s)
A Total of          531 Informational Message(s)

A Total of          531 Calm Hours Identified

   ******** FATAL ERROR MESSAGES ********
              ***  NONE  ***

   ********   WARNING MESSAGES   ********
              ***  NONE  ***

   ************************************
   *** ISCST3 Finishes Successfully ***
   ************************************
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CO STARTING
CO TITLEONE 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE      10/9/99
CO TITLETWO FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES
CO MODELOPT DFAULT CONC   RURAL NOCMPL
CO AVERTIME  PERIOD 24 8 3 1
CO POLLUTID GEN
CO DCAYCOEF    .000000
CO RUNORNOT RUN
CO FINISHED

SO STARTING

** Source Location Cards:
**          SRCID SRCTYP        XS             YS              ZS
** MODELING ORIGIN CT 2 STACK LOCATION
** LOCATION IS USED FOR POLAR DISCRETE RECEPTORS.
**  CT STACK NUMBER CODE
** ------------------------
**  A -  CT 1
**  B -  CT 2
**  C -  CT 3
** Source Location Cards:
**          SRCID SRCTYP       XS          YS          ZS
**   UTM                       (m)         (m)         (m)
SO LOCATION  BASE32A  POINT  -35.36     0.0        0.0
SO LOCATION  BASE32B  POINT    0.00     0.0        0.0
SO LOCATION  BASE32C  POINT   35.36     0.0        0.0
**
SO LOCATION  BASE95A  POINT  -35.36     0.0        0.0
SO LOCATION  BASE95B  POINT    0.00     0.0        0.0
SO LOCATION  BASE95C  POINT   35.36     0.0        0.0
**
SO LOCATION  LD7532A  POINT  -35.36     0.0        0.0
SO LOCATION  LD7532B  POINT    0.00     0.0        0.0
SO LOCATION  LD7532C  POINT   35.36     0.0        0.0
**
SO LOCATION  LD7595A  POINT  -35.36     0.0        0.0
SO LOCATION  LD7595B  POINT    0.00     0.0        0.0
SO LOCATION  LD7595C  POINT   35.36     0.0        0.0
**
SO LOCATION  LD5032A  POINT  -35.36     0.0        0.0
SO LOCATION  LD5032B  POINT    0.00     0.0        0.0
SO LOCATION  LD5032C  POINT   35.36     0.0        0.0
**
SO LOCATION  LD5095A  POINT  -35.36     0.0        0.0
SO LOCATION  LD5095B  POINT    0.00     0.0        0.0
SO LOCATION  LD5095C  POINT   35.36     0.0        0.0
**
** Source Parameter Cards:
** POINT:   SRCID             QS        HS         TS        VS        DS
**                           (g/s)      (m)        (K)      (m/s)      (m)
SO SRCPARAM   BASE32A      3.333     18.3       853.2     37.31     6.71
SO SRCPARAM   BASE32B      3.334     18.3       853.2     37.31     6.71
SO SRCPARAM   BASE32C      3.333     18.3       853.2     37.31     6.71
**
SO SRCPARAM   BASE95A      3.333     18.3       878.2     35.05     6.71
SO SRCPARAM   BASE95B      3.334     18.3       878.2     35.05     6.71
SO SRCPARAM   BASE95C      3.333     18.3       878.2     35.05     6.71
**
SO SRCPARAM   LD7532A      3.333     18.3       905.4     30.78     6.71
SO SRCPARAM   LD7532B      3.334     18.3       905.4     30.78     6.71
SO SRCPARAM   LD7532C      3.333     18.3       905.4     30.78     6.71
**
SO SRCPARAM   LD7595A      3.333     18.3       914.3     29.57     6.71
SO SRCPARAM   LD7595B      3.334     18.3       914.3     29.57     6.71
SO SRCPARAM   LD7595C      3.333     18.3       914.3     29.57     6.71
**
SO SRCPARAM   LD5032A      3.333     18.3       922.0     26.12     6.71
SO SRCPARAM   LD5032B      3.334     18.3       922.0     26.12     6.71
SO SRCPARAM   LD5032C      3.333     18.3       922.0     26.12     6.71
**
SO SRCPARAM   LD5095A      3.333     18.3       922.0     24.84     6.71
SO SRCPARAM   LD5095B      3.334     18.3       922.0     24.84     6.71
SO SRCPARAM   LD5095C      3.333     18.3       922.0     24.84     6.71
**
SO BUILDHGT BASE32A-BASE95A     6.71     6.71     6.71    14.33     0.00     0.00
SO BUILDHGT BASE32A-BASE95A     0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT BASE32A-BASE95A     0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDHGT BASE32A-BASE95A    14.33    14.33    14.33    14.33    14.33    14.33
SO BUILDHGT BASE32A-BASE95A     6.71     6.71     0.00     0.00     0.00     0.00
SO BUILDHGT BASE32A-BASE95A     0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDWID BASE32A-BASE95A    11.23    12.97    14.32    15.46     0.00     0.00
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SO BUILDWID BASE32A-BASE95A     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID BASE32A-BASE95A     0.00   15.23   14.32   12.97   11.23    9.14
SO BUILDWID BASE32A-BASE95A    12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID BASE32A-BASE95A    15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID BASE32A-BASE95A     0.00   15.23   14.32   12.97   11.23    9.14
**
SO BUILDHGT LD5032A-LD7595A     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT LD5032A-LD7595A     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032A-LD7595A     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDHGT LD5032A-LD7595A    14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032A-LD7595A     6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032A-LD7595A     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID LD5032A-LD7595A    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID LD5032A-LD7595A     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID LD5032A-LD7595A     0.00   15.23   14.32   12.97   11.23    9.14
SO BUILDWID LD5032A-LD7595A    12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID LD5032A-LD7595A    15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID LD5032A-LD7595A     0.00   15.23   14.32   12.97   11.23    9.14
**
SO BUILDHGT BASE32B-BASE95B     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT BASE32B-BASE95B     0.00    0.00    0.00    6.71    6.71    6.71
SO BUILDHGT BASE32B-BASE95B    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT BASE32B-BASE95B    14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT BASE32B-BASE95B     6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT BASE32B-BASE95B     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID BASE32B-BASE95B    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID BASE32B-BASE95B     0.00    0.00    0.00   14.19   15.16   15.66
SO BUILDWID BASE32B-BASE95B    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID BASE32B-BASE95B    12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID BASE32B-BASE95B    15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID BASE32B-BASE95B     0.00   15.23   14.32   12.97   11.23    9.14
**
SO BUILDHGT LD5032B-LD7595B     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT LD5032B-LD7595B     0.00    0.00    0.00    6.71    6.71    6.71
SO BUILDHGT LD5032B-LD7595B    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD5032B-LD7595B    14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032B-LD7595B     6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032B-LD7595B     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID LD5032B-LD7595B    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID LD5032B-LD7595B     0.00    0.00    0.00   14.19   15.16   15.66
SO BUILDWID LD5032B-LD7595B    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID LD5032B-LD7595B    12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID LD5032B-LD7595B    15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID LD5032B-LD7595B     0.00   15.23   14.32   12.97   11.23    9.14
**
SO BUILDHGT BASE32C-BASE95C     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT BASE32C-BASE95C     0.00    0.00    0.00    6.71    6.71   14.33
SO BUILDHGT BASE32C-BASE95C    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT BASE32C-BASE95C    14.33   14.33   14.33   14.33    0.00    0.00
SO BUILDHGT BASE32C-BASE95C     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT BASE32C-BASE95C     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID BASE32C-BASE95C    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID BASE32C-BASE95C     0.00    0.00    0.00   14.19   15.16   14.99
SO BUILDWID BASE32C-BASE95C    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID BASE32C-BASE95C    12.71   14.06   14.99   15.46    0.00    0.00
SO BUILDWID BASE32C-BASE95C     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID BASE32C-BASE95C     0.00   15.23   14.32   12.97   11.23    9.14
**
SO BUILDHGT LD5032C-LD7595C     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT LD5032C-LD7595C     0.00    0.00    0.00    6.71    6.71   14.33
SO BUILDHGT LD5032C-LD7595C    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD5032C-LD7595C    14.33   14.33   14.33   14.33    0.00    0.00
SO BUILDHGT LD5032C-LD7595C     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032C-LD7595C     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID LD5032C-LD7595C    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID LD5032C-LD7595C     0.00    0.00    0.00   14.19   15.16   14.99
SO BUILDWID LD5032C-LD7595C    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID LD5032C-LD7595C    12.71   14.06   14.99   15.46    0.00    0.00
SO BUILDWID LD5032C-LD7595C     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID LD5032C-LD7595C     0.00   15.23   14.32   12.97   11.23    9.14
**
SO EMISUNIT    .100000E+07 (GRAMS/SEC)          (MICROGRAMS/CUBIC-METER)
SO SRCGROUP BASE32 BASE32A BASE32B BASE32C
SO SRCGROUP BASE95 BASE95A BASE95B BASE95C
SO SRCGROUP LD7532 LD7532A LD7532B LD7532C
SO SRCGROUP LD7595 LD7595A LD7595B LD7595C
SO SRCGROUP LD5032 LD5032A LD5032B LD5032C
SO SRCGROUP LD5095 LD5095A LD5095B LD5095C
**
SO FINISHED

RE STARTING
RE GRIDPOLR POL STA
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RE GRIDPOLR POL ORIG  0.0   0.0
RE GRIDPOLR POL DIST  300 500 700 1000 1500 2000 2500 3000 4000 5000
RE GRIDPOLR POL DIST  7000 10000 12000 15000 20000 25000 30000
RE GRIDPOLR POL GDIR  36  10.00  10.00
RE GRIDPOLR POL END
RE DISCPOLR BASE32B      173.        10
RE DISCPOLR BASE32B      200.        10
RE DISCPOLR BASE32B      182.        20
RE DISCPOLR BASE32B      200.        20
RE DISCPOLR BASE32B      171.        30
RE DISCPOLR BASE32B      200.        30
RE DISCPOLR BASE32B      133.        40
RE DISCPOLR BASE32B      200.        40
RE DISCPOLR BASE32B      111.        50
RE DISCPOLR BASE32B      200.        50
RE DISCPOLR BASE32B       99.        60
RE DISCPOLR BASE32B      100.        60
RE DISCPOLR BASE32B      200.        60
RE DISCPOLR BASE32B       91.        70
RE DISCPOLR BASE32B      100.        70
RE DISCPOLR BASE32B      200.        70
RE DISCPOLR BASE32B       87.        80
RE DISCPOLR BASE32B      100.        80
RE DISCPOLR BASE32B      200.        80
RE DISCPOLR BASE32B       85.        90
RE DISCPOLR BASE32B      100.        90
RE DISCPOLR BASE32B      200.        90
RE DISCPOLR BASE32B       87.       100
RE DISCPOLR BASE32B      100.       100
RE DISCPOLR BASE32B      200.       100
RE DISCPOLR BASE32B       91.       110
RE DISCPOLR BASE32B      100.       110
RE DISCPOLR BASE32B      200.       110
RE DISCPOLR BASE32B       99.       120
RE DISCPOLR BASE32B      100.       120
RE DISCPOLR BASE32B      200.       120
RE DISCPOLR BASE32B      111.       130
RE DISCPOLR BASE32B      200.       130
RE DISCPOLR BASE32B      127.       140
RE DISCPOLR BASE32B      200.       140
RE DISCPOLR BASE32B      113.       150
RE DISCPOLR BASE32B      200.       150
RE DISCPOLR BASE32B      104.       160
RE DISCPOLR BASE32B      200.       160
RE DISCPOLR BASE32B       99.       170
RE DISCPOLR BASE32B      100.       170
RE DISCPOLR BASE32B      200.       170
RE DISCPOLR BASE32B       98.       180
RE DISCPOLR BASE32B      100.       180
RE DISCPOLR BASE32B      200.       180
RE DISCPOLR BASE32B       99.       190
RE DISCPOLR BASE32B      100.       190
RE DISCPOLR BASE32B      200.       190
RE DISCPOLR BASE32B      104.       200
RE DISCPOLR BASE32B      200.       200
RE DISCPOLR BASE32B      113.       210
RE DISCPOLR BASE32B      200.       210
RE DISCPOLR BASE32B      127.       220
RE DISCPOLR BASE32B      200.       220
RE DISCPOLR BASE32B      152.       230
RE DISCPOLR BASE32B      200.       230
RE DISCPOLR BASE32B      158.       240
RE DISCPOLR BASE32B      200.       240
RE DISCPOLR BASE32B      146.       250
RE DISCPOLR BASE32B      200.       250
RE DISCPOLR BASE32B      139.       260
RE DISCPOLR BASE32B      200.       260
RE DISCPOLR BASE32B      137.       270
RE DISCPOLR BASE32B      200.       270
RE DISCPOLR BASE32B      139.       280
RE DISCPOLR BASE32B      200.       280
RE DISCPOLR BASE32B      146.       290
RE DISCPOLR BASE32B      200.       290
RE DISCPOLR BASE32B      158.       300
RE DISCPOLR BASE32B      200.       300
RE DISCPOLR BASE32B      179.       310
RE DISCPOLR BASE32B      200.       310
RE DISCPOLR BASE32B      213.       320
RE DISCPOLR BASE32B      197.       330
RE DISCPOLR BASE32B      200.       330
RE DISCPOLR BASE32B      182.       340
RE DISCPOLR BASE32B      200.       340
RE DISCPOLR BASE32B      173.       350
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RE DISCPOLR BASE32B      200.       350
RE DISCPOLR BASE32B      171.       360
RE DISCPOLR BASE32B      200.       360
RE FINISHED

ME STARTING
ME INPUTFIL D:\MET\TPA87D.MET
ME ANEMHGHT    6.700 METERS
ME SURFDATA  12842  1987            TAMPA
ME UAIRDATA  12842  1987            RUSKIN
ME WINDCATS    1.54     3.09     5.14     8.23    10.80
ME FINISHED

OU STARTING
OU RECTABLE ALLAVE FIRST
OU FINISHED

***********************************
*** SETUP Finishes Successfully ***
***********************************

  *** ISCST3 - VERSION 99155 ***    *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE      10/9/99        **
                                    *** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES         ***
**MODELOPTs:
CONC                          RURAL  FLAT          DFAULT

                                         ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Simple Terrain Model is Selected

**Model Is Setup For Calculation of Average CONCentration Values.

  --  SCAVENGING/DEPOSITION LOGIC --
**Model Uses NO DRY DEPLETION.  DDPLETE =  F
**Model Uses NO WET DEPLETION.  WDPLETE =  F
**NO WET SCAVENGING Data Provided.
**NO GAS DRY DEPOSITION Data Provided.
**Model Does NOT Use GRIDDED TERRAIN Data for Depletion Calculations

**Model Uses RURAL Dispersion.

**Model Uses Regulatory DEFAULT Options:
          1. Final Plume Rise.
          2. Stack-tip Downwash.
          3. Buoyancy-induced Dispersion.
          4. Use Calms Processing Routine.
          5. Not Use Missing Data Processing Routine.
          6. Default Wind Profile Exponents.
          7. Default Vertical Potential Temperature Gradients.
          8. "Upper Bound" Values for Supersquat Buildings.
          9. No Exponential Decay for RURAL Mode

**Model Assumes Receptors on FLAT Terrain.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  4 Short Term Average(s) of:  24-HR   8-HR   3-HR   1-HR
    and Calculates PERIOD Averages

**This Run Includes:    18 Source(s);      6 Source Group(s); and     693 Receptor(s)

**The Model Assumes A Pollutant Type of:  GEN

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of PERIOD Averages by Receptor
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                 m for Missing Hours
                                                                 b for Both Calm and Missing Hours

**Misc. Inputs:  Anem. Hgt. (m) =     6.70 ;    Decay Coef. =    0.000     ;    Rot. Angle =     0.0
                 Emission Units = (GRAMS/SEC)                              ;  Emission Rate Unit Factor =   0.1
                 Output Units   = (MICROGRAMS/CUBIC-METER)

**Approximate Storage Requirements of Model =     1.5 MB of RAM.

**Input Runstream File:          PCFOC2.I87
**Output Print File:             PCFOC2.O87
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*** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (USER UNITS)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMIS SCA
BASE32A	0	0.33330E+01	-35.4	0.0	0.0	18.30	853.20	37.31	6.71	YES	
BASE32B	0	0.33340E+01	0.0	0.0	0.0	18.30	853.20	37.31	6.71	YES	
BASE32C	0	0.33330E+01	35.4	0.0	0.0	18.30	853.20	37.31	6.71	YES	
BASE95A	0	0.33330E+01	-35.4	0.0	0.0	18.30	878.20	35.05	6.71	YES	
BASE95B	0	0.33340E+01	0.0	0.0	0.0	18.30	878.20	35.05	6.71	YES	
BASE95C	0	0.33330E+01	35.4	0.0	0.0	18.30	878.20	35.05	6.71	YES	
LD7532A	0	0.33330E+01	-35.4	0.0	0.0	18.30	905.40	30.78	6.71	YES	
LD7532B	0	0.33340E+01	0.0	0.0	0.0	18.30	905.40	30.78	6.71	YES	
LD7532C	0	0.33330E+01	35.4	0.0	0.0	18.30	905.40	30.78	6.71	YES	
LD7595A	0	0.33330E+01	-35.4	0.0	0.0	18.30	914.30	29.57	6.71	YES	
LD7595B	0	0.33340E+01	0.0	0.0	0.0	18.30	914.30	29.57	6.71	YES	
LD7595C	0	0.33330E+01	35.4	0.0	0.0	18.30	914.30	29.57	6.71	YES	
LD5032A	0	0.33330E+01	-35.4	0.0	0.0	18.30	922.00	26.12	6.71	YES	
LD5032B	0	0.33340E+01	0.0	0.0	0.0	18.30	922.00	26.12	6.71	YES	
LD5032C	0	0.33330E+01	35.4	0.0	0.0	18.30	922.00	26.12	6.71	YES	
LD5095A	0	0.33330E+01	-35.4	0.0	0.0	18.30	922.00	24.84	6.71	YES	
LD5095B	0	0.33340E+01	0.0	0.0	0.0	18.30	922.00	24.84	6.71	YES	
LD5095C	0	0.33330E+01	35.4	0.0	0.0	18.30	922.00	24.84	6.71	YES	

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
BASE32	BASE32A , BASE32B , BASE32C ,
BASE95	BASE95A , BASE95B , BASE95C ,
LD7532	LD7532A , LD7532B , LD7532C ,
LD7595	LD7595A , LD7595B , LD7595C ,
LD5032	LD5032A , LD5032B , LD5032C ,
LD5095	LD5095A , LD5095B , LD5095C ,

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: BASE32A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

SOURCE ID: BASE32B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0

7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

SOURCE ID: BASE32C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	0.0,	0.0,	0
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

SOURCE ID: BASE95A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: BASE95B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

SOURCE ID: BASE95C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	0.0,	0.0,	0
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

SOURCE ID: LD7532A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

SOURCE ID: LD7532B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:

CONC RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: LD7532C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	0.0,	0.0,	0
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

SOURCE ID: LD7595A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

SOURCE ID: LD7595B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

SOURCE ID: LD7595C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	0.0,	0.0,	0
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: LD5032A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

SOURCE ID: LD5032B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

SOURCE ID: LD5032C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0

19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	0.0,	0.0,	0
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

SOURCE ID: LD5095A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: LD5095B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

SOURCE ID: LD5095C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	0.0,	0.0,	0
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** GRIDDED RECEPTOR NETWORK SUMMARY ***

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

*** ORIGIN FOR POLAR NETWORK ***
X-ORIG = 0.00 ; Y-ORIG = 0.00 (METERS)

*** DISTANCE RANGES OF NETWORK ***
(METERS)

300.0, 500.0, 700.0, 1000.0, 1500.0, 2000.0, 2500.0, 3000.0, 4000.0, 5000
7000.0, 10000.0, 12000.0, 15000.0, 20000.0, 25000.0, 30000.0,

*** DIRECTION RADIALS OF NETWORK ***
(DEGREES)

10.0, 20.0, 30.0, 40.0, 50.0, 60.0, 70.0, 80.0, 90.0, 100
110.0, 120.0, 130.0, 140.0, 150.0, 160.0, 170.0, 180.0, 190.0, 200
210.0, 220.0, 230.0, 240.0, 250.0, 260.0, 270.0, 280.0, 290.0, 300
310.0, 320.0, 330.0, 340.0, 350.0, 360.0,

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** DISCRETE POLAR RECEPTORS ***
ORIGIN: (DIST, DIR, ZELEV, ZFLAG)
SRCID: (METERS,DEG,METERS,METERS)

BASE32B : (173.0, 10.0, 0.0, 0.0); BASE32B : (200.0, 10.0, 0.0,
BASE32B : (182.0, 20.0, 0.0, 0.0); BASE32B : (200.0, 20.0, 0.0,

```
   BASE32B : (    171.0,      30.0,       0.0,       0.0);      BASE32B : (    200.0,      30.0,       0.0,
   BASE32B : (    133.0,      40.0,       0.0,       0.0);      BASE32B : (    200.0,      40.0,       0.0,
   BASE32B : (    111.0,      50.0,       0.0,       0.0);      BASE32B : (    200.0,      50.0,       0.0,
   BASE32B : (     99.0,      60.0,       0.0,       0.0);      BASE32B : (    100.0,      60.0,       0.0,
   BASE32B : (    200.0,      60.0,       0.0,       0.0);      BASE32B : (     91.0,      70.0,       0.0,
   BASE32B : (    100.0,      70.0,       0.0,       0.0);      BASE32B : (    200.0,      70.0,       0.0,
   BASE32B : (     87.0,      80.0,       0.0,       0.0);      BASE32B : (    100.0,      80.0,       0.0,
   BASE32B : (    200.0,      80.0,       0.0,       0.0);      BASE32B : (     85.0,      90.0,       0.0,
   BASE32B : (    100.0,      90.0,       0.0,       0.0);      BASE32B : (    200.0,      90.0,       0.0,
   BASE32B : (     87.0,     100.0,       0.0,       0.0);      BASE32B : (    100.0,     100.0,       0.0,
   BASE32B : (    200.0,     100.0,       0.0,       0.0);      BASE32B : (     91.0,     110.0,       0.0,
   BASE32B : (    100.0,     110.0,       0.0,       0.0);      BASE32B : (    200.0,     110.0,       0.0,
   BASE32B : (     99.0,     120.0,       0.0,       0.0);      BASE32B : (    100.0,     120.0,       0.0,
   BASE32B : (    200.0,     120.0,       0.0,       0.0);      BASE32B : (    111.0,     130.0,       0.0,
   BASE32B : (    200.0,     130.0,       0.0,       0.0);      BASE32B : (    127.0,     140.0,       0.0,
   BASE32B : (    200.0,     140.0,       0.0,       0.0);      BASE32B : (    113.0,     150.0,       0.0,
   BASE32B : (    200.0,     150.0,       0.0,       0.0);      BASE32B : (    104.0,     160.0,       0.0,
   BASE32B : (    200.0,     160.0,       0.0,       0.0);      BASE32B : (     99.0,     170.0,       0.0,
   BASE32B : (    100.0,     170.0,       0.0,       0.0);      BASE32B : (    200.0,     170.0,       0.0,
   BASE32B : (     98.0,     180.0,       0.0,       0.0);      BASE32B : (    100.0,     180.0,       0.0,
   BASE32B : (    200.0,     180.0,       0.0,       0.0);      BASE32B : (     99.0,     190.0,       0.0,
   BASE32B : (    100.0,     190.0,       0.0,       0.0);      BASE32B : (    200.0,     190.0,       0.0,
   BASE32B : (    104.0,     200.0,       0.0,       0.0);      BASE32B : (    200.0,     200.0,       0.0,
   BASE32B : (    113.0,     210.0,       0.0,       0.0);      BASE32B : (    200.0,     210.0,       0.0,
   BASE32B : (    127.0,     220.0,       0.0,       0.0);      BASE32B : (    200.0,     220.0,       0.0,
   BASE32B : (    152.0,     230.0,       0.0,       0.0);      BASE32B : (    200.0,     230.0,       0.0,
   BASE32B : (    158.0,     240.0,       0.0,       0.0);      BASE32B : (    200.0,     240.0,       0.0,
   BASE32B : (    146.0,     250.0,       0.0,       0.0);      BASE32B : (    200.0,     250.0,       0.0,
   BASE32B : (    139.0,     260.0,       0.0,       0.0);      BASE32B : (    200.0,     260.0,       0.0,
   BASE32B : (    137.0,     270.0,       0.0,       0.0);      BASE32B : (    200.0,     270.0,       0.0,
   BASE32B : (    139.0,     280.0,       0.0,       0.0);      BASE32B : (    200.0,     280.0,       0.0,
   BASE32B : (    146.0,     290.0,       0.0,       0.0);      BASE32B : (    200.0,     290.0,       0.0,
   BASE32B : (    158.0,     300.0,       0.0,       0.0);      BASE32B : (    200.0,     300.0,       0.0,
   BASE32B : (    179.0,     310.0,       0.0,       0.0);      BASE32B : (    200.0,     310.0,       0.0,
   BASE32B : (    213.0,     320.0,       0.0,       0.0);      BASE32B : (    197.0,     330.0,       0.0,
   BASE32B : (    200.0,     330.0,       0.0,       0.0);      BASE32B : (    182.0,     340.0,       0.0,
   BASE32B : (    200.0,     340.0,       0.0,       0.0);      BASE32B : (    173.0,     350.0,       0.0,
   BASE32B : (    200.0,     350.0,       0.0,       0.0);      BASE32B : (    171.0,     360.0,       0.0,
   BASE32B : (    200.0,     360.0,       0.0,       0.0);
 *** ISCST3 - VERSION 99155 ***    *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE      10/9/99        **
                                   *** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES         ***
**MODELOPTs:
CONC                         RURAL  FLAT          DFAULT


                                        *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                          (1=YES; 0=NO)

          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

            NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA F


                                     *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                          (METERS/SEC)

                                              1.54,    3.09,    5.14,    8.23,   10.80,


                                                  *** WIND PROFILE EXPONENTS ***

            STABILITY                              WIND SPEED CATEGORY
            CATEGORY        1              2              3              4              5              6
               A        .70000E-01     .70000E-01     .70000E-01     .70000E-01     .70000E-01     .70000E
               B        .70000E-01     .70000E-01     .70000E-01     .70000E-01     .70000E-01     .70000E
               C        .10000E+00     .10000E+00     .10000E+00     .10000E+00     .10000E+00     .10000E
               D        .15000E+00     .15000E+00     .15000E+00     .15000E+00     .15000E+00     .15000E
               E        .35000E+00     .35000E+00     .35000E+00     .35000E+00     .35000E+00     .35000E
               F        .55000E+00     .55000E+00     .55000E+00     .55000E+00     .55000E+00     .55000E


                                         *** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***
                                                   (DEGREES KELVIN PER METER)
```

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E
B	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E
C	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E
D	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E
E	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E
F	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***
**MODELOPTs:
CONC RURAL FLAT DFAULT

*** THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

FILE: D:\MET\TPA87D.MET
FORMAT: (4I2,2F9.4,F6.1,I2,2F7.1,f9.4,f10.1,f8.4,i4,f7.2)
SURFACE STATION NO.: 12842 UPPER AIR STATION NO.: 12842
NAME: TAMPA NAME: RUSKIN
YEAR: 1987 YEAR: 1987

YR	MN	DY	HR	FLOW VECTOR	SPEED (M/S)	TEMP (K)	STAB CLASS	MIXING HEIGHT (M) RURAL	URBAN	USTAR (M/S)	M-O LENGTH (M)	Z-0 (M)	IPCODE	PRATE (mm/HR)
87	01	01	01	341.0	6.17	293.7	4	598.7	598.7	0.0000	0.0	0.0000	0	0.00
87	01	01	02	358.0	4.12	293.2	5	651.8	1306.0	0.0000	0.0	0.0000	0	0.00
87	01	01	03	34.0	6.17	293.2	4	704.8	704.8	0.0000	0.0	0.0000	0	0.00
87	01	01	04	73.0	6.69	291.5	4	757.8	757.8	0.0000	0.0	0.0000	0	0.00
87	01	01	05	83.0	7.20	290.9	4	810.8	810.8	0.0000	0.0	0.0000	0	0.00
87	01	01	06	102.0	7.20	290.4	4	863.8	863.8	0.0000	0.0	0.0000	0	0.00
87	01	01	07	105.0	6.69	289.3	4	916.9	916.9	0.0000	0.0	0.0000	0	0.00
87	01	01	08	113.0	7.72	288.7	4	969.9	969.9	0.0000	0.0	0.0000	0	0.00
87	01	01	09	107.0	6.17	288.2	4	1022.9	1022.9	0.0000	0.0	0.0000	0	0.00
87	01	01	10	121.0	6.17	288.2	4	1075.9	1075.9	0.0000	0.0	0.0000	0	0.00
87	01	01	11	114.0	6.69	287.6	4	1128.9	1128.9	0.0000	0.0	0.0000	0	0.00
87	01	01	12	116.0	6.17	287.0	4	1182.0	1182.0	0.0000	0.0	0.0000	0	0.00
87	01	01	13	133.0	7.20	287.6	4	1235.0	1235.0	0.0000	0.0	0.0000	0	0.00
87	01	01	14	119.0	7.72	287.6	4	1288.0	1288.0	0.0000	0.0	0.0000	0	0.00
87	01	01	15	132.0	7.20	288.2	4	1288.0	1288.0	0.0000	0.0	0.0000	0	0.00
87	01	01	16	134.0	7.72	289.3	4	1288.0	1288.0	0.0000	0.0	0.0000	0	0.00
87	01	01	17	141.0	7.20	288.2	4	1288.0	1288.0	0.0000	0.0	0.0000	0	0.00
87	01	01	18	137.0	5.14	287.6	5	1286.4	1238.1	0.0000	0.0	0.0000	0	0.00
87	01	01	19	144.0	3.60	286.5	5	1281.2	1078.6	0.0000	0.0	0.0000	0	0.00
87	01	01	20	117.0	2.06	285.4	6	1276.0	919.0	0.0000	0.0	0.0000	0	0.00
87	01	01	21	110.0	1.54	284.8	7	1270.9	759.5	0.0000	0.0	0.0000	0	0.00
87	01	01	22	112.0	0.00	283.7	7	1265.7	600.0	0.0000	0.0	0.0000	0	0.00
87	01	01	23	120.0	2.57	283.7	6	1260.5	440.5	0.0000	0.0	0.0000	0	0.00
87	01	01	24	130.0	1.54	282.6	7	1255.4	281.0	0.0000	0.0	0.0000	0	0.00

*** NOTES: STABILITY CLASS 1=A, 2=B, 3=C, 4=D, 5=E AND 6=F.
FLOW VECTOR IS DIRECTION TOWARD WHICH WIND IS BLOWING.
*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***
**MODELOPTs:
CONC RURAL FLAT DFAULT

*** THE SUMMARY OF MAXIMUM PERIOD (8760 HRS) RESULTS ***

** CONC OF GEN IN (MICROGRAMS/CUBIC-METER) **

GROUP ID		AVERAGE CONC	RECEPTOR (XR,	YR,	ZELEV,	ZFLAG)	OF TYPE	NETWORK GRID-ID
BASE32	1ST HIGHEST VALUE IS	0.01220 AT (	-12990.38,	-7500.00,	0.00,	0.00)	GP	POL
	2ND HIGHEST VALUE IS	0.01202 AT (	-10392.30,	-6000.00,	0.00,	0.00)	GP	POL
	3RD HIGHEST VALUE IS	0.01198 AT (	-17320.51,	-10000.00,	0.00,	0.00)	GP	POL
BASE95	1ST HIGHEST VALUE IS	0.01281 AT (	-12990.38,	-7500.00,	0.00,	0.00)	GP	POL
	2ND HIGHEST VALUE IS	0.01265 AT (	-10392.30,	-6000.00,	0.00,	0.00)	GP	POL
	3RD HIGHEST VALUE IS	0.01255 AT (	-17320.51,	-10000.00,	0.00,	0.00)	GP	POL
LD7532	1ST HIGHEST VALUE IS	0.01459 AT (	-12990.38,	-7500.00,	0.00,	0.00)	GP	POL
	2ND HIGHEST VALUE IS	0.01453 AT (	-10392.30,	-6000.00,	0.00,	0.00)	GP	POL
	3RD HIGHEST VALUE IS	0.01432 AT (	-8660.25,	-5000.00,	0.00,	0.00)	GP	POL
LD7595	1ST HIGHEST VALUE IS	0.01519 AT (	-12990.38,	-7500.00,	0.00,	0.00)	GP	POL

	2ND HIGHEST VALUE IS	0.01512 AT (	-10392.30,	-6000.00,	0.00,	0.00)	GP	POL
	3RD HIGHEST VALUE IS	0.01491 AT (	-8660.25,	-5000.00,	0.00,	0.00)	GP	POL
LD5032	1ST HIGHEST VALUE IS	0.01697 AT (	-12990.38,	-7500.00,	0.00,	0.00)	GP	POL
	2ND HIGHEST VALUE IS	0.01692 AT (	-10392.30,	-6000.00,	0.00,	0.00)	GP	POL
	3RD HIGHEST VALUE IS	0.01678 AT (	-11276.31,	-4104.24,	0.00,	0.00)	GP	POL
LD5095	1ST HIGHEST VALUE IS	0.01803 AT (	-12990.38,	-7500.00,	0.00,	0.00)	GP	POL
	2ND HIGHEST VALUE IS	0.01803 AT (	-10392.30,	-6000.00,	0.00,	0.00)	GP	POL
	3RD HIGHEST VALUE IS	0.01783 AT (	-8660.25,	-5000.00,	0.00,	0.00)	GP	POL

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF GEN IN (MICROGRAMS/CUBIC-METER) **

GROUP ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR,	YR,	ZELEV,	ZFLAG)	O
BASE32	HIGH	1ST HIGH VALUE IS	0.14848c	ON 87040624: AT (	6893.65,	1215.54,	0.00,	0.00	
BASE95	HIGH	1ST HIGH VALUE IS	0.15146c	ON 87042724: AT (	-5362.31,	-4499.51,	0.00,	0.00	
LD7532	HIGH	1ST HIGH VALUE IS	0.17756	ON 87052424: AT (	-10000.00,	0.00,	0.00,	0.00	
LD7595	HIGH	1ST HIGH VALUE IS	0.18232	ON 87052424: AT (	-10000.00,	0.00,	0.00,	0.00	
LD5032	HIGH	1ST HIGH VALUE IS	0.20479	ON 87112324: AT (	-11276.31,	-4104.24,	0.00,	0.00	
LD5095	HIGH	1ST HIGH VALUE IS	0.21441	ON 87112324: AT (	-11276.31,	-4104.24,	0.00,	0.00	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF GEN IN (MICROGRAMS/CUBIC-METER) **

GROUP ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR,	YR,	ZELEV,	ZFLAG)	O
BASE32	HIGH	1ST HIGH VALUE IS	0.40055	ON 87120408: AT (	17320.51,	10000.00,	0.00,	0.00	
BASE95	HIGH	1ST HIGH VALUE IS	0.41900	ON 87120408: AT (	17320.51,	10000.00,	0.00,	0.00	
LD7532	HIGH	1ST HIGH VALUE IS	0.46575	ON 87120408: AT (	17320.51,	10000.00,	0.00,	0.00	
LD7595	HIGH	1ST HIGH VALUE IS	0.48086	ON 87120408: AT (	17320.51,	10000.00,	0.00,	0.00	
LD5032	HIGH	1ST HIGH VALUE IS	0.53570	ON 87120408: AT (	12990.38,	7500.00,	0.00,	0.00	
LD5095	HIGH	1ST HIGH VALUE IS	0.56239	ON 87120408: AT (	12990.38,	7500.00,	0.00,	0.00	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** THE SUMMARY OF HIGHEST 3-HR RESULTS ***

** CONC OF GEN IN (MICROGRAMS/CUBIC-METER) **

GROUP ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR,	YR,	ZELEV,	ZFLAG)	O
BASE32	HIGH	1ST HIGH VALUE IS	0.78718	ON 87031003: AT (	18793.85,	-6840.40,	0.00,	0.00	
BASE95	HIGH	1ST HIGH VALUE IS	0.82127	ON 87031003: AT (	18793.85,	-6840.40,	0.00,	0.00	
LD7532	HIGH	1ST HIGH VALUE IS	0.90698	ON 87031003: AT (	18793.85,	-6840.40,	0.00,	0.00	
LD7595	HIGH	1ST HIGH VALUE IS	0.93446	ON 87031003: AT (	18793.85,	-6840.40,	0.00,	0.00	
LD5032	HIGH	1ST HIGH VALUE IS	1.03718	ON 87031003: AT (	14095.39,	-5130.30,	0.00,	0.00	
LD5095	HIGH	1ST HIGH VALUE IS	1.08596	ON 87031003: AT (	14095.39,	-5130.30,	0.00,	0.00	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF GEN IN (MICROGRAMS/CUBIC-METER) **

GROUP ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR,	YR,	ZELEV,	ZFLAG)	O
BASE32	HIGH	1ST HIGH VALUE IS	1.67360	ON 87082614: AT (	1500.00,	0.00,	0.00,	0.00	
BASE95	HIGH	1ST HIGH VALUE IS	1.81249	ON 87080813: AT (	750.00,	-1299.04,	0.00,	0.00	
LD7532	HIGH	1ST HIGH VALUE IS	2.08542	ON 87052413: AT (	-1477.21,	260.47,	0.00,	0.00	
LD7595	HIGH	1ST HIGH VALUE IS	2.14442	ON 87080314: AT (	1409.54,	-513.03,	0.00,	0.00	
LD5032	HIGH	1ST HIGH VALUE IS	2.50711	ON 87082212: AT (	-1409.54,	-513.03,	0.00,	0.00	
LD5095	HIGH	1ST HIGH VALUE IS	2.52544	ON 87082212: AT (	-1409.54,	-513.03,	0.00,	0.00	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 **
*** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** Message Summary : ISCST3 Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 0 Warning Message(s)
A Total of 531 Informational Message(s)

A Total of 531 Calm Hours Identified

******** FATAL ERROR MESSAGES ********
*** NONE ***

```
********   WARNING MESSAGES   ********
           ***  NONE  ***


************************************
*** ISCST3 Finishes Successfully ***
************************************
```

ISCBOB3 RELEASE 98056

ISCST3 OUTPUT FILE NUMBER 1 :PCNGC1.087
ISCST3 OUTPUT FILE NUMBER 2 :PCNGC1.088
ISCST3 OUTPUT FILE NUMBER 3 :PCNGC1.089
ISCST3 OUTPUT FILE NUMBER 4 :PCNGC1.090
ISCST3 OUTPUT FILE NUMBER 5 :PCNGC1.091
First title for last output file is: 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99
Second title for last output file is: NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES

AVERAGING TIME	YEAR	CONC (ug/m3)	DIR (deg) or X (m)	DIST (m) or Y (m)	PERIOD ENDING (YYMMDDHH)
SOURCE GROUP ID:	BASE32				
Annual					
	1987	0.00231	343700.	3178300.	87123124
	1988	0.00340	340300.	3165700.	88123124
	1989	0.00661	340700.	3171900.	89123124
	1990	0.00380	340300.	3165700.	90123124
	1991	0.00250	340300.	3169800.	91123124
HIGH 24-Hour					
	1987	0.07733	343700.	3178300.	87062724
	1988	0.07329	340700.	3171900.	88071424
	1989	0.10830	342000.	3174000.	89040524
	1990	0.08685	331500.	3183400.	90021624
	1991	0.07494	340700.	3171900.	91040824
HIGH 8-Hour					
	1987	0.18764	342000.	3174000.	87012524
	1988	0.20647	340300.	3167700.	88090624
	1989	0.27993	340700.	3171900.	89043008
	1990	0.24463	331500.	3183400.	90021608
	1991	0.22141	340300.	3165700.	91012008
HIGH 3-Hour					
	1987	0.40472	340700.	3171900.	87080124
	1988	0.52192	343700.	3178300.	88090724
	1989	0.64122	340700.	3171900.	89060824
	1990	0.41779	342000.	3174000.	90050924
	1991	0.53976	340700.	3171900.	91040824
HIGH 1-Hour					
	1987	0.84611	342000.	3174000.	87122018
	1988	0.86100	343700.	3178300.	88051403
	1989	0.87069	340300.	3167700.	89122603
	1990	0.85150	340300.	3165700.	90010601
	1991	0.85891	340300.	3167700.	91012005
SOURCE GROUP ID:	BASE95				
Annual					
	1987	0.00241	343700.	3178300.	87123124
	1988	0.00362	340300.	3165700.	88123124
	1989	0.00702	340700.	3171900.	89123124
	1990	0.00403	340300.	3165700.	90123124
	1991	0.00270	340300.	3169800.	91123124
HIGH 24-Hour					
	1987	0.08067	343700.	3178300.	87062724
	1988	0.07655	340700.	3171900.	88071424
	1989	0.11477	342000.	3174000.	89040524
	1990	0.08967	331500.	3183400.	90021624
	1991	0.07828	340700.	3171900.	91040824
HIGH 8-Hour					
	1987	0.19742	342000.	3174000.	87012524
	1988	0.21683	340300.	3167700.	88090624
	1989	0.29427	340700.	3171900.	89043008
	1990	0.25308	331500.	3183400.	90021608
	1991	0.23411	340300.	3165700.	91012008
HIGH 3-Hour					
	1987	0.42584	340700.	3171900.	87080124
	1988	0.54358	343700.	3178300.	88090724
	1989	0.66694	340700.	3171900.	89060824
	1990	0.43732	342000.	3174000.	90050924
	1991	0.56642	340700.	3171900.	91040824
HIGH 1-Hour					
	1987	0.89223	342000.	3174000.	87122018
	1988	0.90638	343700.	3178300.	88051403
	1989	0.91764	340300.	3167700.	89122603
	1990	0.89515	340300.	3165700.	90010601
	1991	0.90500	340300.	3167700.	91012005
SOURCE GROUP ID:	LD7532				
Annual					
	1987	0.00262	343700.	3178300.	87123124
	1988	0.00406	340300.	3165700.	88123124
	1989	0.00761	340700.	3171900.	89123124
	1990	0.00443	340300.	3165700.	90123124

	1991	0.00291	340300.	3169800.	91123124
HIGH 24-Hour					
	1987	0.08666	343700.	3178300.	87062724
	1988	0.08236	340700.	3171900.	88071424
	1989	0.12547	342000.	3174000.	89040524
	1990	0.09460	331500.	3183400.	90021624
	1991	0.08576	340300.	3165700.	91012024
HIGH 8-Hour					
	1987	0.21508	342000.	3174000.	87012524
	1988	0.23551	340300.	3167700.	88090624
	1989	0.32024	340700.	3171900.	89043008
	1990	0.26781	331500.	3183400.	90021608
	1991	0.25728	340300.	3165700.	91012008
HIGH 3-Hour					
	1987	0.46433	340700.	3171900.	87080124
	1988	0.58192	343700.	3178300.	88090724
	1989	0.71245	340700.	3171900.	89060824
	1990	0.47227	342000.	3174000.	90050924
	1991	0.61435	340700.	3171900.	91040824
HIGH 1-Hour					
	1987	0.97589	342000.	3174000.	87122018
	1988	0.98827	343700.	3178300.	88051403
	1989	1.00187	340300.	3167700.	89122603
	1990	0.98072	340300.	3165700.	90061906
	1991	0.98806	340300.	3167700.	91012005
SOURCE GROUP ID:	LD7595				
Annual					
	1987	0.00280	343700.	3178300.	87123124
	1988	0.00424	340300.	3165700.	88123124
	1989	0.00802	340700.	3171900.	89123124
	1990	0.00462	340300.	3165700.	90123124
	1991	0.00309	340300.	3169800.	91123124
HIGH 24-Hour					
	1987	0.08980	343700.	3178300.	87062724
	1988	0.08541	340700.	3171900.	88071424
	1989	0.13122	342000.	3174000.	89040524
	1990	0.09713	331500.	3183400.	90021624
	1991	0.08993	340300.	3165700.	91012024
HIGH 8-Hour					
	1987	0.22452	342000.	3174000.	87012524
	1988	0.24542	340300.	3167700.	88090624
	1989	0.33411	340700.	3171900.	89043008
	1990	0.27540	331500.	3183400.	90021608
	1991	0.26979	340300.	3165700.	91012008
HIGH 3-Hour					
	1987	0.48496	340700.	3171900.	87080124
	1988	0.60191	343700.	3178300.	88090724
	1989	0.73613	340700.	3171900.	89060824
	1990	0.49068	342000.	3174000.	90050924
	1991	0.63972	340700.	3171900.	91040824
HIGH 1-Hour					
	1987	1.02061	342000.	3174000.	87122018
	1988	1.03189	343700.	3178300.	88051403
	1989	1.04687	340300.	3167700.	89122603
	1990	1.02920	340300.	3165700.	90061906
	1991	1.03240	340300.	3167700.	91012005
SOURCE GROUP ID:	LD5032				
Annual					
	1987	0.00312	343700.	3178300.	87123124
	1988	0.00474	340300.	3165700.	88123124
	1989	0.00904	340700.	3171900.	89123124
	1990	0.00516	340300.	3165700.	90123124
	1991	0.00349	340300.	3169800.	91123124
HIGH 24-Hour					
	1987	0.10386	343700.	3178300.	87062724
	1988	0.09398	340700.	3171900.	88071424
	1989	0.14784	342000.	3174000.	89040524
	1990	0.10751	340700.	3171900.	90021924
	1991	0.10198	340300.	3165700.	91012024
HIGH 8-Hour					
	1987	0.25225	340300.	3165700.	87072708
	1988	0.27367	340300.	3167700.	88090624
	1989	0.37392	340700.	3171900.	89043008
	1990	0.31474	340700.	3171900.	90021908
	1991	0.30594	340300.	3165700.	91012008
HIGH 3-Hour					
	1987	0.54476	340700.	3171900.	87080124
	1988	0.65767	343700.	3178300.	88090724
	1989	0.80221	340700.	3171900.	89060824
	1990	0.54276	342000.	3174000.	90050924
	1991	0.71178	340700.	3171900.	91040824
HIGH 1-Hour					

	1987	1.14907	342000.	3174000.	87122018
	1988	1.15629	343700.	3178300.	88051403
	1989	1.17381	340300.	3167700.	89122603
	1990	1.17043	340300.	3165700.	90061906
	1991	1.15845	340300.	3167700.	91012005
SOURCE GROUP ID:	LD5095				
Annual					
	1987	0.00322	343700.	3178300.	87123124
	1988	0.00493	340300.	3165700.	88123124
	1989	0.00939	340700.	3171900.	89123124
	1990	0.00533	340300.	3165700.	90123124
	1991	0.00362	340300.	3169800.	91123124
HIGH 24-Hour					
	1987	0.10671	343700.	3178300.	87062724
	1988	0.09671	340700.	3171900.	88071424
	1989	0.15331	342000.	3174000.	89040524
	1990	0.11227	340700.	3171900.	90021924
	1991	0.10600	340300.	3165700.	91012024
HIGH 8-Hour					
	1987	0.26167	340300.	3165700.	87072708
	1988	0.28278	340300.	3167700.	88090624
	1989	0.38696	340700.	3171900.	89043008
	1990	0.32901	340700.	3171900.	90021908
	1991	0.31800	340300.	3165700.	91012008
HIGH 3-Hour					
	1987	0.56433	340700.	3171900.	87080124
	1988	0.67534	343700.	3178300.	88090724
	1989	0.82300	340700.	3171900.	89060824
	1990	0.55943	342000.	3174000.	90050924
	1991	0.73500	340700.	3171900.	91040824
HIGH 1-Hour					
	1987	1.19103	342000.	3174000.	87122018
	1988	1.19685	343700.	3178300.	88051403
	1989	1.21591	340300.	3167700.	89122603
	1990	1.21687	340300.	3165700.	90061906
	1991	1.19987	340300.	3167700.	91012005

All receptor computations reported with respect to a user-specified origin

GRID	0.00	0.00
DISCRETE	0.00	0.00

ISCBOB3 RELEASE 98056

ISCST3 OUTPUT FILE NUMBER 1 :PCFOC1.087
ISCST3 OUTPUT FILE NUMBER 2 :PCFOC1.088
ISCST3 OUTPUT FILE NUMBER 3 :PCFOC1.089
ISCST3 OUTPUT FILE NUMBER 4 :PCFOC1:090
ISCST3 OUTPUT FILE NUMBER 5 :PCFOC1.091
First title for last output file is: 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99
Second title for last output file is: FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES

AVERAGING TIME	YEAR	CONC (ug/m3)	DIR (deg) or X (m)	DIST (m) or Y (m)	PERIOD ENDING (YYMMDDHH)
SOURCE GROUP ID:	BASE32				
Annual					
	1987	0.00226	343700.	3178300.	87123124
	1988	0.00330	340300.	3165700.	88123124
	1989	0.00649	340700.	3171900.	89123124
	1990	0.00373	340300.	3165700.	90123124
	1991	0.00246	340300.	3169800.	91123124
HIGH 24-Hour					
	1987	0.07591	343700.	3178300.	87062724
	1988	0.07192	340700.	3171900.	88071424
	1989	0.10584	342000.	3174000.	89040524
	1990	0.08565	331500.	3183400.	90021624
	1991	0.07354	340700.	3171900.	91040824
HIGH 8-Hour					
	1987	0.18353	342000.	3174000.	87012524
	1988	0.20212	340300.	3167700.	88090624
	1989	0.27393	340700.	3171900.	89043008
	1990	0.24102	331500.	3183400.	90021608
	1991	0.21610	340300.	3165700.	91012008
HIGH 3-Hour					
	1987	0.39591	340700.	3171900.	87080124
	1988	0.51273	343700.	3178300.	88090724
	1989	0.63032	340700.	3171900.	89060824
	1990	0.40957	342000.	3174000.	90050924
	1991	0.52854	340700.	3171900.	91040824
HIGH 1-Hour					
	1987	0.82682	342000.	3174000.	87122018
	1988	0.84195	343700.	3178300.	88051403
	1989	0.85089	340300.	3167700.	89122603
	1990	0.83316	340300.	3165700.	90010601
	1991	0.83955	340300.	3167700.	91012005
SOURCE GROUP ID:	BASE95				
Annual					
	1987	0.00235	343700.	3178300.	87123124
	1988	0.00347	340300.	3165700.	88123124
	1989	0.00678	340700.	3171900.	89123124
	1990	0.00387	340300.	3165700.	90123124
	1991	0.00262	340300.	3169800.	91123124
HIGH 24-Hour					
	1987	0.07885	343700.	3178300.	87062724
	1988	0.07478	340700.	3171900.	88071424
	1989	0.11157	342000.	3174000.	89040524
	1990	0.08815	331500.	3183400.	90021624
	1991	0.07646	340700.	3171900.	91040824
HIGH 8-Hour					
	1987	0.19209	342000.	3174000.	87012524
	1988	0.21118	340300.	3167700.	88090624
	1989	0.28645	340700.	3171900.	89043008
	1990	0.24850	331500.	3183400.	90021608
	1991	0.22718	340300.	3165700.	91012008
HIGH 3-Hour					
	1987	0.41429	340700.	3171900.	87080124
	1988	0.53180	343700.	3178300.	88090724
	1989	0.65294	340700.	3171900.	89060824
	1990	0.42667	342000.	3174000.	90050924
	1991	0.55188	340700.	3171900.	91040824
HIGH 1-Hour					
	1987	0.86705	342000.	3174000.	87122018
	1988	0.88164	343700.	3178300.	88051403
	1989	0.89215	340300.	3167700.	89122603
	1990	0.87136	340300.	3165700.	90010601
	1991	0.87991	340300.	3167700.	91012005
SOURCE GROUP ID:	LD7532				
Annual					
	1987	0.00261	343700.	3178300.	87123124
	1988	0.00399	340300.	3165700.	88123124
	1989	0.00758	340700.	3171900.	89123124
	1990	0.00437	340300.	3165700.	90123124

	1991	0.00289	340300.	3169800.	91123124
HIGH 24-Hour					
	1987	0.08625	343700.	3178300.	87062724
	1988	0.08197	340700.	3171900.	88071424
	1989	0.12474	342000.	3174000.	89040524
	1990	0.09427	331500.	3183400.	90021624
	1991	0.08523	340300.	3165700.	91012024
HIGH 8-Hour					
	1987	0.21388	342000.	3174000.	87012524
	1988	0.23424	340300.	3167700.	88090624
	1989	0.31847	340700.	3171900.	89043008
	1990	0.26683	331500.	3183400.	90021608
	1991	0.25570	340300.	3165700.	91012008
HIGH 3-Hour					
	1987	0.46169	340700.	3171900.	87080124
	1988	0.57934	343700.	3178300.	88090724
	1989	0.70939	340700.	3171900.	89060824
	1990	0.46991	342000.	3174000.	90050924
	1991	0.61110	340700.	3171900.	91040824
HIGH 1-Hour					
	1987	0.97019	342000.	3174000.	87122018
	1988	0.98272	343700.	3178300.	88051403
	1989	0.99620	340300.	3167700.	89122603
	1990	0.97455	340300.	3165700.	90061906
	1991	0.98244	340300.	3167700.	91012005
SOURCE GROUP ID:	LD7595				
Annual					
	1987	0.00276	343700.	3178300.	87123124
	1988	0.00414	340300.	3165700.	88123124
	1989	0.00786	340700.	3171900.	89123124
	1990	0.00456	340300.	3165700.	90123124
	1991	0.00297	340300.	3169800.	91123124
HIGH 24-Hour					
	1987	0.08862	343700.	3178300.	87062724
	1988	0.08426	340700.	3171900.	88071424
	1989	0.12905	342000.	3174000.	89040524
	1990	0.09618	331500.	3183400.	90021624
	1991	0.08835	340300.	3165700.	91012024
HIGH 8-Hour					
	1987	0.22096	342000.	3174000.	87012524
	1988	0.24168	340300.	3167700.	88090624
	1989	0.32887	340700.	3171900.	89043008
	1990	0.27255	331500.	3183400.	90021608
	1991	0.26506	340300.	3165700.	91012008
HIGH 3-Hour					
	1987	0.47715	340700.	3171900.	87080124
	1988	0.59439	343700.	3178300.	88090724
	1989	0.72722	340700.	3171900.	89060824
	1990	0.48374	342000.	3174000.	90050924
	1991	0.63015	340700.	3171900.	91040824
HIGH 1-Hour					
	1987	1.00371	342000.	3174000.	87122018
	1988	1.01542	343700.	3178300.	88051403
	1989	1.02991	340300.	3167700.	89122603
	1990	1.01083	340300.	3165700.	90061906
	1991	1.01567	340300.	3167700.	91012005
SOURCE GROUP ID:	LD5032				
Annual					
	1987	0.00304	343700.	3178300.	87123124
	1988	0.00465	340300.	3165700.	88123124
	1989	0.00888	340700.	3171900.	89123124
	1990	0.00506	340300.	3165700.	90123124
	1991	0.00343	340300.	3169800.	91123124
HIGH 24-Hour					
	1987	0.10210	343700.	3178300.	87062724
	1988	0.09229	340700.	3171900.	88071424
	1989	0.14451	342000.	3174000.	89040524
	1990	0.10465	340700.	3171900.	90021924
	1991	0.09958	340300.	3165700.	91012024
HIGH 8-Hour					
	1987	0.24646	340300.	3165700.	87072708
	1988	0.26804	340300.	3167700.	88090624
	1989	0.36598	340700.	3171900.	89043008
	1990	0.30616	340700.	3171900.	90021908
	1991	0.29874	340300.	3165700.	91012008
HIGH 3-Hour					
	1987	0.53271	340700.	3171900.	87080124
	1988	0.64671	343700.	3178300.	88090724
	1989	0.78917	340700.	3171900.	89060824
	1990	0.53243	342000.	3174000.	90050924
	1991	0.69746	340700.	3171900.	91040824
HIGH 1-Hour					

	1987	1.12341	342000.	3174000.	87122018
	1988	1.13159	343700.	3178300.	88051403
	1989	1.14905	340300.	3167700.	89122603
	1990	1.14192	340300.	3165700.	90061906
	1991	1.13358	340300.	3167700.	91012005
SOURCE GROUP ID:	LD5095				
Annual					
	1987	0.00318	343700.	3178300.	87123124
	1988	0.00483	340300.	3165700.	88123124
	1989	0.00924	340700.	3171900.	89123124
	1990	0.00527	340300.	3165700.	90123124
	1991	0.00359	340300.	3169800.	91123124
HIGH 24-Hour					
	1987	0.10571	343700.	3178300.	87062724
	1988	0.09575	340700.	3171900.	88071424
	1989	0.15138	342000.	3174000.	89040524
	1990	0.11059	340700.	3171900.	90021924
	1991	0.10459	340300.	3165700.	91012024
HIGH 8-Hour					
	1987	0.25834	340300.	3165700.	87072708
	1988	0.27957	340300.	3167700.	88090624
	1989	0.38237	340700.	3171900.	89043008
	1990	0.32397	340700.	3171900.	90021908
	1991	0.31378	340300.	3165700.	91012008
HIGH 3-Hour					
	1987	0.55741	340700.	3171900.	87080124
	1988	0.66913	343700.	3178300.	88090724
	1989	0.81568	340700.	3171900.	89060824
	1990	0.55356	342000.	3174000.	90050924
	1991	0.72683	340700.	3171900.	91040824
HIGH 1-Hour					
	1987	1.17625	342000.	3174000.	87122018
	1988	1.18261	343700.	3178300.	88051403
	1989	1.20131	340300.	3167700.	89122603
	1990	1.20044	340300.	3165700.	90061906
	1991	1.18540	340300.	3167700.	91012005

All receptor computations reported with respect to a user-specified origin

GRID	0.00	0.00
DISCRETE	0.00	0.00

```
CO STARTING
CO TITLEONE 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99
CO TITLETWO NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES
CO MODELOPT DFAULT CONC   RURAL NOCMPL
CO AVERTIME  PERIOD 24 8 3 1
CO POLLUTID GEN
CO DCAYCOEF    .000000
CO RUNORNOT RUN
CO FINISHED

SO STARTING

** Source Location Cards:
**          SRCID SRCTYP       XS            YS             ZS
** MODELING ORIGIN CT 2 STACK LOCATION
** LOCATION IS USED FOR POLAR DISCRETE RECEPTORS.
**  CT STACK NUMBER CODE
** ------------------------
**  A -  CT 1
**  B -  CT 2
**  C -  CT 3
** Source Location Cards:
**          SRCID SRCTYP      XS         YS        ZS
**   UTM                      (m)        (m)       (m)
SO LOCATION  BASE32A  POINT  347200.  3138800.  0.0
SO LOCATION  BASE32B  POINT  347200.  3138800.  0.0
SO LOCATION  BASE32C  POINT  347200.  3138800.  0.0
**
SO LOCATION  BASE95A  POINT  347200.  3138800.  0.0
SO LOCATION  BASE95B  POINT  347200.  3138800.  0.0
SO LOCATION  BASE95C  POINT  347200.  3138800.  0.0
**
SO LOCATION  LD7532A  POINT  347200.  3138800.  0.0
SO LOCATION  LD7532B  POINT  347200.  3138800.  0.0
SO LOCATION  LD7532C  POINT  347200.  3138800.  0.0
**
SO LOCATION  LD7595A  POINT  347200.  3138800.  0.0
SO LOCATION  LD7595B  POINT  347200.  3138800.  0.0
SO LOCATION  LD7595C  POINT  347200.  3138800.  0.0
**
SO LOCATION  LD5032A  POINT  347200.  3138800.  0.0
SO LOCATION  LD5032B  POINT  347200.  3138800.  0.0
SO LOCATION  LD5032C  POINT  347200.  3138800.  0.0
**
SO LOCATION  LD5095A  POINT  347200.  3138800.  0.0
SO LOCATION  LD5095B  POINT  347200.  3138800.  0.0
SO LOCATION  LD5095C  POINT  347200.  3138800.  0.0
**
** Source Parameter Cards:
** POINT:   SRCID           QS       HS        TS        VS        DS
**                         (g/s)     (m)       (K)      (m/s)      (m)
SO SRCPARAM   BASE32A     3.333     18.3      865.0     36.2      6.71
SO SRCPARAM   BASE32B     3.334     18.3      865.0     36.2      6.71
SO SRCPARAM   BASE32C     3.333     18.3      865.0     36.2      6.71
**
SO SRCPARAM   BASE95A     3.333     18.3      886.0     33.9      6.71
SO SRCPARAM   BASE95B     3.334     18.3      886.0     33.9      6.71
SO SRCPARAM   BASE95C     3.333     18.3      886.0     33.9      6.71
**
SO SRCPARAM   LD7532A     3.333     18.3      905.0     30.6      6.71
SO SRCPARAM   LD7532B     3.334     18.3      905.0     30.6      6.71
SO SRCPARAM   LD7532C     3.333     18.3      905.0     30.6      6.71
**
SO SRCPARAM   LD7595A     3.333     18.3      918.0     29.0      6.71
SO SRCPARAM   LD7595B     3.334     18.3      918.0     29.0      6.71
SO SRCPARAM   LD7595C     3.333     18.3      918.0     29.0      6.71
**
SO SRCPARAM   LD5032A     3.333     18.3      906.0     25.7      6.71
SO SRCPARAM   LD5032B     3.334     18.3      906.0     25.7      6.71
SO SRCPARAM   LD5032C     3.333     18.3      906.0     25.7      6.71
**
SO SRCPARAM   LD5095A     3.333     18.3      922.0     24.5      6.71
SO SRCPARAM   LD5095B     3.334     18.3      922.0     24.5      6.71
SO SRCPARAM   LD5095C     3.333     18.3      922.0     24.5      6.71
**
SO BUILDHGT BASE32A-BASE95A     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT BASE32A-BASE95A     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT BASE32A-BASE95A     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDHGT BASE32A-BASE95A    14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT BASE32A-BASE95A     6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT BASE32A-BASE95A     0.00    6.71    6.71    6.71    6.71    6.71
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SO BUILDWID BASE32A-BASE95A    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID BASE32A-BASE95A     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID BASE32A-BASE95A     0.00   15.23   14.32   12.97   11.23    9.14
SO BUILDWID BASE32A-BASE95A    12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID BASE32A-BASE95A    15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID BASE32A-BASE95A     0.00   15.23   14.32   12.97   11.23    9.14
**
SO BUILDHGT LD5032A-LD7595A     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT LD5032A-LD7595A     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032A-LD7595A     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDHGT LD5032A-LD7595A    14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032A-LD7595A     6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032A-LD7595A     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID LD5032A-LD7595A    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID LD5032A-LD7595A     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID LD5032A-LD7595A     0.00   15.23   14.32   12.97   11.23    9.14
SO BUILDWID LD5032A-LD7595A    12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID LD5032A-LD7595A    15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID LD5032A-LD7595A     0.00   15.23   14.32   12.97   11.23    9.14
**
SO BUILDHGT BASE32B-BASE95B     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT BASE32B-BASE95B     0.00    0.00    0.00    6.71    6.71    6.71
SO BUILDHGT BASE32B-BASE95B    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT BASE32B-BASE95B    14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT BASE32B-BASE95B     6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT BASE32B-BASE95B     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID BASE32B-BASE95B    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID BASE32B-BASE95B     0.00    0.00    0.00   14.19   15.16   15.66
SO BUILDWID BASE32B-BASE95B    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID BASE32B-BASE95B    12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID BASE32B-BASE95B    15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID BASE32B-BASE95B     0.00   15.23   14.32   12.97   11.23    9.14
**
SO BUILDHGT LD5032B-LD7595B     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT LD5032B-LD7595B     0.00    0.00    0.00    6.71    6.71    6.71
SO BUILDHGT LD5032B-LD7595B    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD5032B-LD7595B    14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032B-LD7595B     6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032B-LD7595B     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID LD5032B-LD7595B    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID LD5032B-LD7595B     0.00    0.00    0.00   14.19   15.16   15.66
SO BUILDWID LD5032B-LD7595B    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID LD5032B-LD7595B    12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID LD5032B-LD7595B    15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID LD5032B-LD7595B     0.00   15.23   14.32   12.97   11.23    9.14
**
SO BUILDHGT BASE32C-BASE95C     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT BASE32C-BASE95C     0.00    0.00    0.00    6.71    6.71   14.33
SO BUILDHGT BASE32C-BASE95C    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT BASE32C-BASE95C    14.33   14.33   14.33   14.33    0.00    0.00
SO BUILDHGT BASE32C-BASE95C     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT BASE32C-BASE95C     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID BASE32C-BASE95C    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID BASE32C-BASE95C     0.00    0.00    0.00   14.19   15.16   14.99
SO BUILDWID BASE32C-BASE95C    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID BASE32C-BASE95C    12.71   14.06   14.99   15.46    0.00    0.00
SO BUILDWID BASE32C-BASE95C     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID BASE32C-BASE95C     0.00   15.23   14.32   12.97   11.23    9.14
**
SO BUILDHGT LD5032C-LD7595C     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT LD5032C-LD7595C     0.00    0.00    0.00    6.71    6.71   14.33
SO BUILDHGT LD5032C-LD7595C    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD5032C-LD7595C    14.33   14.33   14.33   14.33    0.00    0.00
SO BUILDHGT LD5032C-LD7595C     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032C-LD7595C     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID LD5032C-LD7595C    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID LD5032C-LD7595C     0.00    0.00    0.00   14.19   15.16   14.99
SO BUILDWID LD5032C-LD7595C    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID LD5032C-LD7595C    12.71   14.06   14.99   15.46    0.00    0.00
SO BUILDWID LD5032C-LD7595C     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID LD5032C-LD7595C     0.00   15.23   14.32   12.97   11.23    9.14
**
SO EMISUNIT    .100000E+07 (GRAMS/SEC)         (MICROGRAMS/CUBIC-METER)
SO SRCGROUP BASE32 BASE32A BASE32B BASE32C
SO SRCGROUP BASE95 BASE95A BASE95B BASE95C
SO SRCGROUP LD7532 LD7532A LD7532B LD7532C
SO SRCGROUP LD7595 LD7595A LD7595B LD7595C
SO SRCGROUP LD5032 LD5032A LD5032B LD5032C
SO SRCGROUP LD5095 LD5095A LD5095B LD5095C
**
SO FINISHED
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```
RE STARTING
RE DISCCART  340300 3165700
RE DISCCART  340300 3167700
RE DISCCART  340300 3169800
RE DISCCART  340700 3171900
RE DISCCART  342000 3174000
RE DISCCART  343000 3176200
RE DISCCART  343700 3178300
RE DISCCART  342400 3180600
RE DISCCART  341100 3183400
RE DISCCART  339000 3183400
RE DISCCART  336500 3183400
RE DISCCART  334000 3183400
RE DISCCART  331500 3183400
RE FINISHED

ME STARTING
ME INPUTFIL D:\MET\TPA87D.MET
ME ANEMHGHT    6.700 METERS
ME SURFDATA  12842  1987            TAMPA
ME UAIRDATA  12842  1987            RUSKIN
ME WINDCATS    1.54    3.09    5.14    8.23   10.80
ME FINISHED

OU STARTING
OU RECTABLE ALLAVE FIRST SECOND
OU FINISHED

***********************************
*** SETUP Finishes Successfully ***
***********************************
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  *** ISCST3 - VERSION 99155 ***   *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99        ***
                                  *** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES      ***
**MODELOPTs:
CONC                            RURAL  FLAT          DFAULT

                                                 ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Simple Terrain Model is Selected

**Model Is Setup For Calculation of Average CONCentration Values.

  --  SCAVENGING/DEPOSITION LOGIC --
**Model Uses NO DRY DEPLETION.  DDPLETE =  F
**Model Uses NO WET DEPLETION.  WDPLETE =  F
**NO WET SCAVENGING Data Provided.
**NO GAS DRY DEPOSITION Data Provided.
**Model Does NOT Use GRIDDED TERRAIN Data for Depletion Calculations

**Model Uses RURAL Dispersion.

**Model Uses Regulatory DEFAULT Options:
           1. Final Plume Rise.
           2. Stack-tip Downwash.
           3. Buoyancy-induced Dispersion.
           4. Use Calms Processing Routine.
           5. Not Use Missing Data Processing Routine.
           6. Default Wind Profile Exponents.
           7. Default Vertical Potential Temperature Gradients.
           8. "Upper Bound" Values for Supersquat Buildings.
           9. No Exponential Decay for RURAL Mode

**Model Assumes Receptors on FLAT Terrain.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  4 Short Term Average(s) of:  24-HR   8-HR   3-HR   1-HR
    and Calculates PERIOD Averages

**This Run Includes:    18 Source(s);      6 Source Group(s); and      13 Receptor(s)

**The Model Assumes A Pollutant Type of:  GEN

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of PERIOD Averages by Receptor
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
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m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Anem. Hgt. (m) = 6.70 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = (GRAMS/SEC) ; Emission Rate Unit Factor = 0.10
Output Units = (MICROGRAMS/CUBIC-METER)

**Approximate Storage Requirements of Model = 1.2 MB of RAM.

**Input Runstream File: PCNGC1.I87
**Output Print File: PCNGC1.O87
*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99 ***
*** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***
**MODELOPTs:
CONC RURAL FLAT DFAULT

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (USER UNITS)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISS SCAL
BASE32A	0	0.33330E+01	347200.0	3138800.0	0.0	18.30	865.00	36.20	6.71	YES	
BASE32B	0	0.33340E+01	347200.0	3138800.0	0.0	18.30	865.00	36.20	6.71	YES	
BASE32C	0	0.33330E+01	347200.0	3138800.0	0.0	18.30	865.00	36.20	6.71	YES	
BASE95A	0	0.33330E+01	347200.0	3138800.0	0.0	18.30	886.00	33.90	6.71	YES	
BASE95B	0	0.33340E+01	347200.0	3138800.0	0.0	18.30	886.00	33.90	6.71	YES	
BASE95C	0	0.33330E+01	347200.0	3138800.0	0.0	18.30	886.00	33.90	6.71	YES	
LD7532A	0	0.33330E+01	347200.0	3138800.0	0.0	18.30	905.00	30.60	6.71	YES	
LD7532B	0	0.33340E+01	347200.0	3138800.0	0.0	18.30	905.00	30.60	6.71	YES	
LD7532C	0	0.33330E+01	347200.0	3138800.0	0.0	18.30	905.00	30.60	6.71	YES	
LD7595A	0	0.33330E+01	347200.0	3138800.0	0.0	18.30	918.00	29.00	6.71	YES	
LD7595B	0	0.33340E+01	347200.0	3138800.0	0.0	18.30	918.00	29.00	6.71	YES	
LD7595C	0	0.33330E+01	347200.0	3138800.0	0.0	18.30	918.00	29.00	6.71	YES	
LD5032A	0	0.33330E+01	347200.0	3138800.0	0.0	18.30	906.00	25.70	6.71	YES	
LD5032B	0	0.33340E+01	347200.0	3138800.0	0.0	18.30	906.00	25.70	6.71	YES	
LD5032C	0	0.33330E+01	347200.0	3138800.0	0.0	18.30	906.00	25.70	6.71	YES	
LD5095A	0	0.33330E+01	347200.0	3138800.0	0.0	18.30	922.00	24.50	6.71	YES	
LD5095B	0	0.33340E+01	347200.0	3138800.0	0.0	18.30	922.00	24.50	6.71	YES	
LD5095C	0	0.33330E+01	347200.0	3138800.0	0.0	18.30	922.00	24.50	6.71	YES	

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99 ***
*** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***
**MODELOPTs:
CONC RURAL FLAT DFAULT

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
BASE32	BASE32A , BASE32B , BASE32C ,
BASE95	BASE95A , BASE95B , BASE95C ,
LD7532	LD7532A , LD7532B , LD7532C ,
LD7595	LD7595A , LD7595B , LD7595C ,
LD5032	LD5032A , LD5032B , LD5032C ,
LD5095	LD5095A , LD5095B , LD5095C ,

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99 ***
*** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***
**MODELOPTs:
CONC RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: BASE32A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

SOURCE ID: BASE32B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

SOURCE ID: BASE32C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	0.0,	0.0,	0	
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

SOURCE ID: BASE95A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99 ***
*** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: BASE95B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

SOURCE ID: BASE95C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	0.0,	0.0,	0	
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

SOURCE ID: LD7532A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

SOURCE ID: LD7532B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99 ***
*** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: LD7532C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	0.0,	0.0,	0	
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

SOURCE ID: LD7595A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

SOURCE ID: LD7595B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

SOURCE ID: LD7595C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	0.0,	0.0,	0	
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99 ***
*** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: LD5032A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

SOURCE ID: LD5032B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

SOURCE ID: LD5032C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	0.0,	0.0,	0	
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

SOURCE ID: LD5095A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99 ***
*** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: LD5095B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

SOURCE ID: LD5095C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	0.0,	0.0,	0	
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99 ***
*** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZFLAG)
(METERS)

(340300.0,	3165700.0,	0.0,	0.0);	(340300.0,	3167700.0,	0.0,	0.0);
(340300.0,	3169800.0,	0.0,	0.0);	(340700.0,	3171900.0,	0.0,	0.0);
(342000.0,	3174000.0,	0.0,	0.0);	(343000.0,	3176200.0,	0.0,	0.0);
(343700.0,	3178300.0,	0.0,	0.0);	(342400.0,	3180600.0,	0.0,	0.0);
(341100.0,	3183400.0,	0.0,	0.0);	(339000.0,	3183400.0,	0.0,	0.0);
(336500.0,	3183400.0,	0.0,	0.0);	(334000.0,	3183400.0,	0.0,	0.0);
(331500.0,	3183400.0,	0.0,	0.0);				

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99 ***
*** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

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1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1
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NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FI

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** WIND PROFILE EXPONENTS ***

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-
B	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-
C	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+
D	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+
E	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+
F	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+

*** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***
(DEGREES KELVIN PER METER)

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+
B	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+
C	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+
D	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+
E	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-
F	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99 ***
*** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

FILE: D:\MET\TPA87D.MET
FORMAT: (4I2,2F9.4,F6.1,I2,2F7.1,f9.4,f10.1,f8.4,i4,f7.2)
SURFACE STATION NO.: 12842 UPPER AIR STATION NO.: 12842
NAME: TAMPA NAME: RUSKIN
YEAR: 1987 YEAR: 1987

YR	MN	DY	HR	FLOW VECTOR	SPEED (M/S)	TEMP (K)	STAB CLASS	MIXING HEIGHT (M) RURAL	URBAN	USTAR (M/S)	M-O LENGTH (M)	Z-0 (M)	IPCODE	PRATE (mm/HR)
87	01	01	01	341.0	6.17	293.7	4	598.7	598.7	0.0000	0.0	0.0000	0	0.00
87	01	01	02	358.0	4.12	293.2	5	651.8	1306.0	0.0000	0.0	0.0000	0	0.00
87	01	01	03	34.0	6.17	293.2	4	704.8	704.8	0.0000	0.0	0.0000	0	0.00
87	01	01	04	73.0	6.69	291.5	4	757.8	757.8	0.0000	0.0	0.0000	0	0.00
87	01	01	05	83.0	7.20	290.9	4	810.8	810.8	0.0000	0.0	0.0000	0	0.00
87	01	01	06	102.0	7.20	290.4	4	863.8	863.8	0.0000	0.0	0.0000	0	0.00
87	01	01	07	105.0	6.69	289.3	4	916.9	916.9	0.0000	0.0	0.0000	0	0.00
87	01	01	08	113.0	7.72	288.7	4	969.9	969.9	0.0000	0.0	0.0000	0	0.00
87	01	01	09	107.0	6.17	288.2	4	1022.9	1022.9	0.0000	0.0	0.0000	0	0.00
87	01	01	10	121.0	6.17	288.2	4	1075.9	1075.9	0.0000	0.0	0.0000	0	0.00
87	01	01	11	114.0	6.69	287.6	4	1128.9	1128.9	0.0000	0.0	0.0000	0	0.00
87	01	01	12	116.0	6.17	287.0	4	1182.0	1182.0	0.0000	0.0	0.0000	0	0.00
87	01	01	13	133.0	7.20	287.6	4	1235.0	1235.0	0.0000	0.0	0.0000	0	0.00
87	01	01	14	119.0	7.72	287.6	4	1288.0	1288.0	0.0000	0.0	0.0000	0	0.00
87	01	01	15	132.0	7.20	288.2	4	1288.0	1288.0	0.0000	0.0	0.0000	0	0.00
87	01	01	16	134.0	7.72	289.3	4	1288.0	1288.0	0.0000	0.0	0.0000	0	0.00

87	01	01	17	141.0	7.20	288.2	4	1288.0	1288.0	0.0000	0.0	0.0000	0	0.00
87	01	01	18	137.0	5.14	287.6	5	1286.4	1238.1	0.0000	0.0	0.0000	0	0.00
87	01	01	19	144.0	3.60	286.5	5	1281.2	1078.6	0.0000	0.0	0.0000	0	0.00
87	01	01	20	117.0	2.06	285.4	6	1276.0	919.0	0.0000	0.0	0.0000	0	0.00
87	01	01	21	110.0	1.54	284.8	7	1270.9	759.5	0.0000	0.0	0.0000	0	0.00
87	01	01	22	112.0	0.00	283.7	7	1265.7	600.0	0.0000	0.0	0.0000	0	0.00
87	01	01	23	120.0	2.57	283.7	6	1260.5	440.5	0.0000	0.0	0.0000	0	0.00
87	01	01	24	130.0	1.54	282.6	7	1255.4	281.0	0.0000	0.0	0.0000	0	0.00

*** NOTES: STABILITY CLASS 1=A, 2=B, 3=C, 4=D, 5=E AND 6=F.
FLOW VECTOR IS DIRECTION TOWARD WHICH WIND IS BLOWING.

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99 ***
*** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** THE SUMMARY OF MAXIMUM PERIOD (8760 HRS) RESULTS ***

** CONC OF GEN IN (MICROGRAMS/CUBIC-METER) **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
BASE32	1ST HIGHEST VALUE IS	0.00231 AT	(343700.00, 3178300.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.00214 AT	(343000.00, 3176200.00, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.00214 AT	(342000.00, 3174000.00, 0.00, 0.00)	DC	NA
BASE95	1ST HIGHEST VALUE IS	0.00241 AT	(343700.00, 3178300.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.00224 AT	(342000.00, 3174000.00, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.00223 AT	(343000.00, 3176200.00, 0.00, 0.00)	DC	NA
LD7532	1ST HIGHEST VALUE IS	0.00262 AT	(343700.00, 3178300.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.00246 AT	(342000.00, 3174000.00, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.00244 AT	(343000.00, 3176200.00, 0.00, 0.00)	DC	NA
LD7595	1ST HIGHEST VALUE IS	0.00280 AT	(343700.00, 3178300.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.00265 AT	(342000.00, 3174000.00, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.00262 AT	(343000.00, 3176200.00, 0.00, 0.00)	DC	NA
LD5032	1ST HIGHEST VALUE IS	0.00312 AT	(343700.00, 3178300.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.00301 AT	(342000.00, 3174000.00, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.00294 AT	(343000.00, 3176200.00, 0.00, 0.00)	DC	NA
LD5095	1ST HIGHEST VALUE IS	0.00322 AT	(343700.00, 3178300.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.00311 AT	(342000.00, 3174000.00, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.00304 AT	(343000.00, 3176200.00, 0.00, 0.00)	DC	NA

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99 ***
*** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF GEN IN (MICROGRAMS/CUBIC-METER) **

GROUP ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF
BASE32	HIGH	1ST HIGH VALUE IS	0.07733	ON 87062724: AT	(343700.00, 3178300.00, 0.00, 0.00)	
	HIGH	2ND HIGH VALUE IS	0.06216	ON 87020224: AT	(343700.00, 3178300.00, 0.00, 0.00)	
BASE95	HIGH	1ST HIGH VALUE IS	0.08067	ON 87062724: AT	(343700.00, 3178300.00, 0.00, 0.00)	
	HIGH	2ND HIGH VALUE IS	0.06453	ON 87020224: AT	(343700.00, 3178300.00, 0.00, 0.00)	
LD7532	HIGH	1ST HIGH VALUE IS	0.08666	ON 87062724: AT	(343700.00, 3178300.00, 0.00, 0.00)	
	HIGH	2ND HIGH VALUE IS	0.06867	ON 87020224: AT	(343700.00, 3178300.00, 0.00, 0.00)	
LD7595	HIGH	1ST HIGH VALUE IS	0.08980	ON 87062724: AT	(343700.00, 3178300.00, 0.00, 0.00)	
	HIGH	2ND HIGH VALUE IS	0.07083	ON 87020224: AT	(343700.00, 3178300.00, 0.00, 0.00)	

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LD5032    HIGH  1ST HIGH VALUE IS       0.10386  ON 87062724: AT (  343700.00,  3178300.00,       0.00,       0.00)
          HIGH  2ND HIGH VALUE IS       0.07673  ON 87020224: AT (  343700.00,  3178300.00,       0.00,       0.00)

LD5095    HIGH  1ST HIGH VALUE IS       0.10671  ON 87062724: AT (  343700.00,  3178300.00,       0.00,       0.00)
          HIGH  2ND HIGH VALUE IS       0.07861  ON 87020224: AT (  343700.00,  3178300.00,       0.00,       0.00)

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
  *** ISCST3 - VERSION 99155 ***    *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99        ***
                                   *** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES      ***
**MODELOPTs:
CONC                          RURAL  FLAT          DFAULT

                                        *** THE SUMMARY OF HIGHEST  8-HR RESULTS ***

                                  ** CONC OF GEN      IN (MICROGRAMS/CUBIC-METER)                   **

                                                  DATE
GROUP ID                          AVERAGE CONC     (YYMMDDHH)             RECEPTOR  (XR, YR, ZELEV, ZFLAG)     OF
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

BASE32    HIGH  1ST HIGH VALUE IS       0.18764  ON 87012524: AT (  342000.00,  3174000.00,       0.00,       0.00)
          HIGH  2ND HIGH VALUE IS       0.15437c ON 87020124: AT (  342000.00,  3174000.00,       0.00,       0.00)

BASE95    HIGH  1ST HIGH VALUE IS       0.19742  ON 87012524: AT (  342000.00,  3174000.00,       0.00,       0.00)
          HIGH  2ND HIGH VALUE IS       0.16408c ON 87020124: AT (  342000.00,  3174000.00,       0.00,       0.00)

LD7532    HIGH  1ST HIGH VALUE IS       0.21508  ON 87012524: AT (  342000.00,  3174000.00,       0.00,       0.00)
          HIGH  2ND HIGH VALUE IS       0.18199c ON 87020124: AT (  342000.00,  3174000.00,       0.00,       0.00)

LD7595    HIGH  1ST HIGH VALUE IS       0.22452  ON 87012524: AT (  342000.00,  3174000.00,       0.00,       0.00)
          HIGH  2ND HIGH VALUE IS       0.19176c ON 87020124: AT (  342000.00,  3174000.00,       0.00,       0.00)

LD5032    HIGH  1ST HIGH VALUE IS       0.25225c ON 87072708: AT (  340300.00,  3165700.00,       0.00,       0.00)
          HIGH  2ND HIGH VALUE IS       0.22037c ON 87020124: AT (  342000.00,  3174000.00,       0.00,       0.00)

LD5095    HIGH  1ST HIGH VALUE IS       0.26167c ON 87072708: AT (  340300.00,  3165700.00,       0.00,       0.00)
          HIGH  2ND HIGH VALUE IS       0.23004c ON 87020124: AT (  342000.00,  3174000.00,       0.00,       0.00)

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
  *** ISCST3 - VERSION 99155 ***    *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99        ***
                                   *** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES      ***
**MODELOPTs:
CONC                          RURAL  FLAT          DFAULT

                                        *** THE SUMMARY OF HIGHEST  3-HR RESULTS ***

                                  ** CONC OF GEN      IN (MICROGRAMS/CUBIC-METER)                   **

                                                  DATE
GROUP ID                          AVERAGE CONC     (YYMMDDHH)             RECEPTOR  (XR, YR, ZELEV, ZFLAG)     OF
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

BASE32    HIGH  1ST HIGH VALUE IS       0.40472  ON 87080124: AT (  340700.00,  3171900.00,       0.00,       0.00)
          HIGH  2ND HIGH VALUE IS       0.29932  ON 87061503: AT (  342000.00,  3174000.00,       0.00,       0.00)

BASE95    HIGH  1ST HIGH VALUE IS       0.42584  ON 87080124: AT (  340700.00,  3171900.00,       0.00,       0.00)
          HIGH  2ND HIGH VALUE IS       0.31824  ON 87061503: AT (  342000.00,  3174000.00,       0.00,       0.00)

LD7532    HIGH  1ST HIGH VALUE IS       0.46433  ON 87080124: AT (  340700.00,  3171900.00,       0.00,       0.00)
          HIGH  2ND HIGH VALUE IS       0.35342  ON 87061503: AT (  342000.00,  3174000.00,       0.00,       0.00)

LD7595    HIGH  1ST HIGH VALUE IS       0.48496  ON 87080124: AT (  340700.00,  3171900.00,       0.00,       0.00)
          HIGH  2ND HIGH VALUE IS       0.37264  ON 87061503: AT (  342000.00,  3174000.00,       0.00,       0.00)

LD5032    HIGH  1ST HIGH VALUE IS       0.54476  ON 87080124: AT (  340700.00,  3171900.00,       0.00,       0.00)
          HIGH  2ND HIGH VALUE IS       0.42964  ON 87061503: AT (  342000.00,  3174000.00,       0.00,       0.00)

LD5095    HIGH  1ST HIGH VALUE IS       0.56433  ON 87080124: AT (  340700.00,  3171900.00,       0.00,       0.00)
          HIGH  2ND HIGH VALUE IS       0.44872  ON 87061503: AT (  342000.00,  3174000.00,       0.00,       0.00)
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 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
  *** ISCST3 - VERSION 99155 ***     *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99          ***
                                    *** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES        ***
**MODELOPTs:
CONC                         RURAL  FLAT          DFAULT

                                                 *** THE SUMMARY OF HIGHEST  1-HR RESULTS ***

                                          ** CONC OF GEN      IN (MICROGRAMS/CUBIC-METER)                     **

                                                          DATE
GROUP ID                             AVERAGE CONC     (YYMMDDHH)             RECEPTOR  (XR, YR, ZELEV, ZFLAG)      OF
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

BASE32   HIGH  1ST HIGH VALUE IS       0.84611  ON 87122018: AT (  342000.00,  3174000.00,        0.00,       0.00)
         HIGH  2ND HIGH VALUE IS       0.83158  ON 87062307: AT (  342000.00,  3174000.00,        0.00,       0.00)

BASE95   HIGH  1ST HIGH VALUE IS       0.89223  ON 87122018: AT (  342000.00,  3174000.00,        0.00,       0.00)
         HIGH  2ND HIGH VALUE IS       0.87315  ON 87062307: AT (  342000.00,  3174000.00,        0.00,       0.00)

LD7532   HIGH  1ST HIGH VALUE IS       0.97589  ON 87122018: AT (  342000.00,  3174000.00,        0.00,       0.00)
         HIGH  2ND HIGH VALUE IS       0.94808  ON 87062307: AT (  342000.00,  3174000.00,        0.00,       0.00)

LD7595   HIGH  1ST HIGH VALUE IS       1.02061  ON 87122018: AT (  342000.00,  3174000.00,        0.00,       0.00)
         HIGH  2ND HIGH VALUE IS       0.98777  ON 87062307: AT (  342000.00,  3174000.00,        0.00,       0.00)

LD5032   HIGH  1ST HIGH VALUE IS       1.14907  ON 87122018: AT (  342000.00,  3174000.00,        0.00,       0.00)
         HIGH  2ND HIGH VALUE IS       1.10105  ON 87062307: AT (  342000.00,  3174000.00,        0.00,       0.00)

LD5095   HIGH  1ST HIGH VALUE IS       1.19103  ON 87122018: AT (  342000.00,  3174000.00,        0.00,       0.00)
         HIGH  2ND HIGH VALUE IS       1.13746  ON 87062307: AT (  342000.00,  3174000.00,        0.00,       0.00)

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
  *** ISCST3 - VERSION 99155 ***     *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99          ***
                                    *** NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES        ***
**MODELOPTs:
CONC                         RURAL  FLAT          DFAULT

*** Message Summary : ISCST3 Model Execution ***

 --------- Summary of Total Messages --------

A Total of           0 Fatal Error Message(s)
A Total of           0 Warning Message(s)
A Total of         531 Informational Message(s)

A Total of         531 Calm Hours Identified

   ******** FATAL ERROR MESSAGES ********
              ***  NONE  ***

   ********   WARNING MESSAGES   ********
              ***  NONE  ***

   ************************************
   *** ISCST3 Finishes Successfully ***
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CO STARTING
CO TITLEONE 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99
CO TITLETWO FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES
CO MODELOPT DFAULT CONC   RURAL NOCMPL
CO AVERTIME  PERIOD 24 8 3 1
CO POLLUTID GEN
CO DCAYCOEF    .000000
CO RUNORNOT RUN
CO FINISHED

SO STARTING

** Source Location Cards:
**          SRCID SRCTYP        XS            YS             ZS
** MODELING ORIGIN CT 2 STACK LOCATION
** LOCATION IS USED FOR POLAR DISCRETE RECEPTORS.
**  CT STACK NUMBER CODE
** ------------------------
**  A -  CT 1
**  B -  CT 2
**  C -  CT 3
** Source Location Cards:
**          SRCID SRCTYP      XS         YS        ZS
**   UTM                     (m)        (m)       (m)
SO LOCATION  BASE32A  POINT  347200.  3138800.  0.0
SO LOCATION  BASE32B  POINT  347200.  3138800.  0.0
SO LOCATION  BASE32C  POINT  347200.  3138800.  0.0
**
SO LOCATION  BASE95A  POINT  347200.  3138800.  0.0
SO LOCATION  BASE95B  POINT  347200.  3138800.  0.0
SO LOCATION  BASE95C  POINT  347200.  3138800.  0.0
**
SO LOCATION  LD7532A  POINT  347200.  3138800.  0.0
SO LOCATION  LD7532B  POINT  347200.  3138800.  0.0
SO LOCATION  LD7532C  POINT  347200.  3138800.  0.0
**
SO LOCATION  LD7595A  POINT  347200.  3138800.  0.0
SO LOCATION  LD7595B  POINT  347200.  3138800.  0.0
SO LOCATION  LD7595C  POINT  347200.  3138800.  0.0
**
SO LOCATION  LD5032A  POINT  347200.  3138800.  0.0
SO LOCATION  LD5032B  POINT  347200.  3138800.  0.0
SO LOCATION  LD5032C  POINT  347200.  3138800.  0.0
**
SO LOCATION  LD5095A  POINT  347200.  3138800.  0.0
SO LOCATION  LD5095B  POINT  347200.  3138800.  0.0
SO LOCATION  LD5095C  POINT  347200.  3138800.  0.0
** Source Parameter Cards:
** POINT:   SRCID              QS       HS         TS         VS         DS
**                           (g/s)     (m)        (K)       (m/s)       (m)
SO SRCPARAM   BASE32A      3.333    18.3       853.2      37.31      6.71
SO SRCPARAM   BASE32B      3.334    18.3       853.2      37.31      6.71
SO SRCPARAM   BASE32C      3.333    18.3       853.2      37.31      6.71
**
SO SRCPARAM   BASE95A      3.333    18.3       878.2      35.05      6.71
SO SRCPARAM   BASE95B      3.334    18.3       878.2      35.05      6.71
SO SRCPARAM   BASE95C      3.333    18.3       878.2      35.05      6.71
**
SO SRCPARAM   LD7532A      3.333    18.3       905.4      30.78      6.71
SO SRCPARAM   LD7532B      3.334    18.3       905.4      30.78      6.71
SO SRCPARAM   LD7532C      3.333    18.3       905.4      30.78      6.71
**
SO SRCPARAM   LD7595A      3.333    18.3       914.3      29.57      6.71
SO SRCPARAM   LD7595B      3.334    18.3       914.3      29.57      6.71
SO SRCPARAM   LD7595C      3.333    18.3       914.3      29.57      6.71
**
SO SRCPARAM   LD5032A      3.333    18.3       922.0      26.12      6.71
SO SRCPARAM   LD5032B      3.334    18.3       922.0      26.12      6.71
SO SRCPARAM   LD5032C      3.333    18.3       922.0      26.12      6.71
**
SO SRCPARAM   LD5095A      3.333    18.3       922.0      24.84      6.71
SO SRCPARAM   LD5095B      3.334    18.3       922.0      24.84      6.71
SO SRCPARAM   LD5095C      3.333    18.3       922.0      24.84      6.71
**
SO BUILDHGT BASE32A-BASE95A     6.71     6.71     6.71    14.33     0.00     0.00
SO BUILDHGT BASE32A-BASE95A     0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT BASE32A-BASE95A     0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDHGT BASE32A-BASE95A    14.33    14.33    14.33    14.33    14.33    14.33
SO BUILDHGT BASE32A-BASE95A     6.71     6.71     0.00     0.00     0.00     0.00
SO BUILDHGT BASE32A-BASE95A     0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDWID BASE32A-BASE95A    11.23    12.97    14.32    15.46     0.00     0.00
SO BUILDWID BASE32A-BASE95A     0.00     0.00     0.00     0.00     0.00     0.00
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SO BUILDWID BASE32A-BASE95A     0.00   15.23   14.32   12.97   11.23    9.14
SO BUILDWID BASE32A-BASE95A    12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID BASE32A-BASE95A    15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID BASE32A-BASE95A     0.00   15.23   14.32   12.97   11.23    9.14
**
SO BUILDHGT LD5032A-LD7595A     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT LD5032A-LD7595A     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032A-LD7595A     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDHGT LD5032A-LD7595A    14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032A-LD7595A     6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032A-LD7595A     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID LD5032A-LD7595A    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID LD5032A-LD7595A     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID LD5032A-LD7595A     0.00   15.23   14.32   12.97   11.23    9.14
SO BUILDWID LD5032A-LD7595A    12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID LD5032A-LD7595A    15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID LD5032A-LD7595A     0.00   15.23   14.32   12.97   11.23    9.14
**
SO BUILDHGT BASE32B-BASE95B     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT BASE32B-BASE95B     0.00    0.00    0.00    6.71    6.71    6.71
SO BUILDHGT BASE32B-BASE95B    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT BASE32B-BASE95B    14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT BASE32B-BASE95B     6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT BASE32B-BASE95B     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID BASE32B-BASE95B    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID BASE32B-BASE95B     0.00    0.00    0.00   14.19   15.16   15.66
SO BUILDWID BASE32B-BASE95B    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID BASE32B-BASE95B    12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID BASE32B-BASE95B    15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID BASE32B-BASE95B     0.00   15.23   14.32   12.97   11.23    9.14
**
SO BUILDHGT LD5032B-LD7595B     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT LD5032B-LD7595B     0.00    0.00    0.00    6.71    6.71    6.71
SO BUILDHGT LD5032B-LD7595B    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD5032B-LD7595B    14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032B-LD7595B     6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032B-LD7595B     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID LD5032B-LD7595B    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID LD5032B-LD7595B     0.00    0.00    0.00   14.19   15.16   15.66
SO BUILDWID LD5032B-LD7595B    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID LD5032B-LD7595B    12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID LD5032B-LD7595B    15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID LD5032B-LD7595B     0.00   15.23   14.32   12.97   11.23    9.14
**
SO BUILDHGT BASE32C-BASE95C     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT BASE32C-BASE95C     0.00    0.00    0.00    6.71    6.71   14.33
SO BUILDHGT BASE32C-BASE95C    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT BASE32C-BASE95C    14.33   14.33   14.33   14.33    0.00    0.00
SO BUILDHGT BASE32C-BASE95C     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT BASE32C-BASE95C     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID BASE32C-BASE95C    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID BASE32C-BASE95C     0.00    0.00    0.00   14.19   15.16   14.99
SO BUILDWID BASE32C-BASE95C    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID BASE32C-BASE95C    12.71   14.06   14.99   15.46    0.00    0.00
SO BUILDWID BASE32C-BASE95C     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID BASE32C-BASE95C     0.00   15.23   14.32   12.97   11.23    9.14
**
SO BUILDHGT LD5032C-LD7595C     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT LD5032C-LD7595C     0.00    0.00    0.00    6.71    6.71   14.33
SO BUILDHGT LD5032C-LD7595C    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD5032C-LD7595C    14.33   14.33   14.33   14.33    0.00    0.00
SO BUILDHGT LD5032C-LD7595C     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032C-LD7595C     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID LD5032C-LD7595C    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID LD5032C-LD7595C     0.00    0.00    0.00   14.19   15.16   14.99
SO BUILDWID LD5032C-LD7595C    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID LD5032C-LD7595C    12.71   14.06   14.99   15.46    0.00    0.00
SO BUILDWID LD5032C-LD7595C     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID LD5032C-LD7595C     0.00   15.23   14.32   12.97   11.23    9.14
**
SO EMISUNIT    .100000E+07 (GRAMS/SEC)          (MICROGRAMS/CUBIC-METER)
SO SRCGROUP BASE32 BASE32A BASE32B BASE32C
SO SRCGROUP BASE95 BASE95A BASE95B BASE95C
SO SRCGROUP LD7532 LD7532A LD7532B LD7532C
SO SRCGROUP LD7595 LD7595A LD7595B LD7595C
SO SRCGROUP LD5032 LD5032A LD5032B LD5032C
SO SRCGROUP LD5095 LD5095A LD5095B LD5095C
SO FINISHED

RE STARTING
RE DISCCART  340300 3165700
RE DISCCART  340300 3167700
RE DISCCART  340300 3169800
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RE DISCCART  340700 3171900
RE DISCCART  342000 3174000
RE DISCCART  343000 3176200
RE DISCCART  343700 3178300
RE DISCCART  342400 3180600
RE DISCCART  341100 3183400
RE DISCCART  339000 3183400
RE DISCCART  336500 3183400
RE DISCCART  334000 3183400
RE DISCCART  331500 3183400
RE FINISHED

ME STARTING
ME INPUTFIL D:\MET\TPA87D.MET
ME ANEMHGHT    6.700 METERS
ME SURFDATA  12842  1987            TAMPA
ME UAIRDATA  12842  1987            RUSKIN
ME WINDCATS    1.54     3.09    5.14    8.23   10.80
ME FINISHED

OU STARTING
OU RECTABLE ALLAVE FIRST SECOND
OU FINISHED

***********************************
*** SETUP Finishes Successfully ***
***********************************

 *** ISCST3 - VERSION 99155 ***    *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99       ***
                                  *** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES         ***
 **MODELOPTs:
 CONC                         RURAL  FLAT          DFAULT

                                                   ***     MODEL SETUP OPTIONS SUMMARY       ***
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 **Simple Terrain Model is Selected

 **Model Is Setup For Calculation of Average CONCentration Values.

   --  SCAVENGING/DEPOSITION LOGIC --
 **Model Uses NO DRY DEPLETION.  DDPLETE =  F
 **Model Uses NO WET DEPLETION.  WDPLETE =  F
 **NO WET SCAVENGING Data Provided.
 **NO GAS DRY DEPOSITION Data Provided.
 **Model Does NOT Use GRIDDED TERRAIN Data for Depletion Calculations

 **Model Uses RURAL Dispersion.

 **Model Uses Regulatory DEFAULT Options:
           1. Final Plume Rise.
           2. Stack-tip Downwash.
           3. Buoyancy-induced Dispersion.
           4. Use Calms Processing Routine.
           5. Not Use Missing Data Processing Routine.
           6. Default Wind Profile Exponents.
           7. Default Vertical Potential Temperature Gradients.
           8. "Upper Bound" Values for Supersquat Buildings.
           9. No Exponential Decay for RURAL Mode

 **Model Assumes Receptors on FLAT Terrain.

 **Model Assumes No FLAGPOLE Receptor Heights.

 **Model Calculates  4 Short Term Average(s) of:  24-HR   8-HR   3-HR   1-HR
    and Calculates PERIOD Averages

 **This Run Includes:    18 Source(s);      6 Source Group(s); and      13 Receptor(s)

 **The Model Assumes A Pollutant Type of:  GEN

 **Model Set To Continue RUNning After the Setup Testing.

 **Output Options Selected:
         Model Outputs Tables of PERIOD Averages by Receptor
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

 **NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                 m for Missing Hours
                                                                 b for Both Calm and Missing Hours

 **Misc. Inputs:  Anem. Hgt. (m) =     6.70 ;    Decay Coef. =    0.000     ;    Rot. Angle =     0.0
                  Emission Units = (GRAMS/SEC)                              ;  Emission Rate Unit Factor =   0.10
```

Output Units = (MICROGRAMS/CUBIC-METER)

**Approximate Storage Requirements of Model = 1.2 MB of RAM.

**Input Runstream File: PCFOC1.I87
**Output Print File: PCFOC1.O87

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99 ***
*** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (USER UNITS)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISS SCAL
BASE32A	0	0.33330E+01	347200.0	3138800.0	0.0	18.30	853.20	37.31	6.71	YES	
BASE32B	0	0.33340E+01	347200.0	3138800.0	0.0	18.30	853.20	37.31	6.71	YES	
BASE32C	0	0.33330E+01	347200.0	3138800.0	0.0	18.30	853.20	37.31	6.71	YES	
BASE95A	0	0.33330E+01	347200.0	3138800.0	0.0	18.30	878.20	35.05	6.71	YES	
BASE95B	0	0.33340E+01	347200.0	3138800.0	0.0	18.30	878.20	35.05	6.71	YES	
BASE95C	0	0.33330E+01	347200.0	3138800.0	0.0	18.30	878.20	35.05	6.71	YES	
LD7532A	0	0.33330E+01	347200.0	3138800.0	0.0	18.30	905.40	30.78	6.71	YES	
LD7532B	0	0.33340E+01	347200.0	3138800.0	0.0	18.30	905.40	30.78	6.71	YES	
LD7532C	0	0.33330E+01	347200.0	3138800.0	0.0	18.30	905.40	30.78	6.71	YES	
LD7595A	0	0.33330E+01	347200.0	3138800.0	0.0	18.30	914.30	29.57	6.71	YES	
LD7595B	0	0.33340E+01	347200.0	3138800.0	0.0	18.30	914.30	29.57	6.71	YES	
LD7595C	0	0.33330E+01	347200.0	3138800.0	0.0	18.30	914.30	29.57	6.71	YES	
LD5032A	0	0.33330E+01	347200.0	3138800.0	0.0	18.30	922.00	26.12	6.71	YES	
LD5032B	0	0.33340E+01	347200.0	3138800.0	0.0	18.30	922.00	26.12	6.71	YES	
LD5032C	0	0.33330E+01	347200.0	3138800.0	0.0	18.30	922.00	26.12	6.71	YES	
LD5095A	0	0.33330E+01	347200.0	3138800.0	0.0	18.30	922.00	24.84	6.71	YES	
LD5095B	0	0.33340E+01	347200.0	3138800.0	0.0	18.30	922.00	24.84	6.71	YES	
LD5095C	0	0.33330E+01	347200.0	3138800.0	0.0	18.30	922.00	24.84	6.71	YES	

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99 ***
*** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
BASE32	BASE32A , BASE32B , BASE32C ,
BASE95	BASE95A , BASE95B , BASE95C ,
LD7532	LD7532A , LD7532B , LD7532C ,
LD7595	LD7595A , LD7595B , LD7595C ,
LD5032	LD5032A , LD5032B , LD5032C ,
LD5095	LD5095A , LD5095B , LD5095C ,

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99 ***
*** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: BASE32A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	

31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

SOURCE ID: BASE32B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

SOURCE ID: BASE32C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	0.0,	0.0,	0	
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

SOURCE ID: BASE95A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99 ***
*** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: BASE95B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

SOURCE ID: BASE95C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	0.0,	0.0,	0	
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

SOURCE ID: LD7532A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

SOURCE ID: LD7532B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	

25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99 ***
*** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: LD7532C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	0.0,	0.0,	0	
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

SOURCE ID: LD7595A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

SOURCE ID: LD7595B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

SOURCE ID: LD7595C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	0.0,	0.0,	0	
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99 ***
*** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: LD5032A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

SOURCE ID: LD5032B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	I
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	

```
SOURCE ID: LD5032C
 IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  I
   1   6.7,  11.2, 0      2   6.7,  13.0, 0      3   6.7,  14.3, 0      4  14.3,  15.5, 0      5   0.0,   0.0, 0
   7   0.0,   0.0, 0      8   0.0,   0.0, 0      9   0.0,   0.0, 0     10   6.7,  14.2, 0     11   6.7,  15.2, 0
  13  14.3,  15.5, 0     14  14.3,  15.5, 0     15  14.3,  15.0, 0     16  14.3,  14.1, 0     17   6.7,  11.2, 0
  19  14.3,  12.7, 0     20  14.3,  14.1, 0     21  14.3,  15.0, 0     22  14.3,  15.5, 0     23   0.0,   0.0, 0
  25   0.0,   0.0, 0     26   0.0,   0.0, 0     27   0.0,   0.0, 0     28   0.0,   0.0, 0     29   0.0,   0.0, 0
  31   0.0,   0.0, 0     32   6.7,  15.2, 0     33   6.7,  14.3, 0     34   6.7,  13.0, 0     35   6.7,  11.2, 0


SOURCE ID: LD5095A
 IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  I
   1   6.7,  11.2, 0      2   6.7,  13.0, 0      3   6.7,  14.3, 0      4  14.3,  15.5, 0      5   0.0,   0.0, 0
   7   0.0,   0.0, 0      8   0.0,   0.0, 0      9   0.0,   0.0, 0     10   0.0,   0.0, 0     11   0.0,   0.0, 0
  13   0.0,   0.0, 0     14   6.7,  15.2, 0     15   6.7,  14.3, 0     16   6.7,  13.0, 0     17   6.7,  11.2, 0
  19  14.3,  12.7, 0     20  14.3,  14.1, 0     21  14.3,  15.0, 0     22  14.3,  15.5, 0     23  14.3,  15.5, 0
  25   6.7,  15.2, 0     26   6.7,  14.2, 0     27   0.0,   0.0, 0     28   0.0,   0.0, 0     29   0.0,   0.0, 0
  31   0.0,   0.0, 0     32   6.7,  15.2, 0     33   6.7,  14.3, 0     34   6.7,  13.0, 0     35   6.7,  11.2, 0

  *** ISCST3 - VERSION 99155 ***     *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99          ***
                                     *** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES           ***
**MODELOPTs:
CONC                          RURAL  FLAT          DFAULT

                                            *** DIRECTION SPECIFIC BUILDING DIMENSIONS ***


SOURCE ID: LD5095B
 IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  I
   1   6.7,  11.2, 0      2   6.7,  13.0, 0      3   6.7,  14.3, 0      4  14.3,  15.5, 0      5   0.0,   0.0, 0
   7   0.0,   0.0, 0      8   0.0,   0.0, 0      9   0.0,   0.0, 0     10   6.7,  14.2, 0     11   6.7,  15.2, 0
  13  14.3,  15.5, 0     14  14.3,  15.5, 0     15  14.3,  15.0, 0     16  14.3,  14.1, 0     17   6.7,  11.2, 0
  19  14.3,  12.7, 0     20  14.3,  14.1, 0     21  14.3,  15.0, 0     22  14.3,  15.5, 0     23  14.3,  15.5, 0
  25   6.7,  15.2, 0     26   6.7,  14.2, 0     27   0.0,   0.0, 0     28   0.0,   0.0, 0     29   0.0,   0.0, 0
  31   0.0,   0.0, 0     32   6.7,  15.2, 0     33   6.7,  14.3, 0     34   6.7,  13.0, 0     35   6.7,  11.2, 0


SOURCE ID: LD5095C
 IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  I
   1   6.7,  11.2, 0      2   6.7,  13.0, 0      3   6.7,  14.3, 0      4  14.3,  15.5, 0      5   0.0,   0.0, 0
   7   0.0,   0.0, 0      8   0.0,   0.0, 0      9   0.0,   0.0, 0     10   6.7,  14.2, 0     11   6.7,  15.2, 0
  13  14.3,  15.5, 0     14  14.3,  15.5, 0     15  14.3,  15.0, 0     16  14.3,  14.1, 0     17   6.7,  11.2, 0
  19  14.3,  12.7, 0     20  14.3,  14.1, 0     21  14.3,  15.0, 0     22  14.3,  15.5, 0     23   0.0,   0.0, 0
  25   0.0,   0.0, 0     26   0.0,   0.0, 0     27   0.0,   0.0, 0     28   0.0,   0.0, 0     29   0.0,   0.0, 0
  31   0.0,   0.0, 0     32   6.7,  15.2, 0     33   6.7,  14.3, 0     34   6.7,  13.0, 0     35   6.7,  11.2, 0

  *** ISCST3 - VERSION 99155 ***     *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99          ***
                                     *** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES           ***
**MODELOPTs:
CONC                          RURAL  FLAT          DFAULT


                                             *** DISCRETE CARTESIAN RECEPTORS ***
                                               (X-COORD, Y-COORD, ZELEV, ZFLAG)
                                                          (METERS)

     ( 340300.0, 3165700.0,       0.0,       0.0);        ( 340300.0, 3167700.0,       0.0,       0.0);
     ( 340300.0, 3169800.0,       0.0,       0.0);        ( 340700.0, 3171900.0,       0.0,       0.0);
     ( 342000.0, 3174000.0,       0.0,       0.0);        ( 343000.0, 3176200.0,       0.0,       0.0);
     ( 343700.0, 3178300.0,       0.0,       0.0);        ( 342400.0, 3180600.0,       0.0,       0.0);
     ( 341100.0, 3183400.0,       0.0,       0.0);        ( 339000.0, 3183400.0,       0.0,       0.0);
     ( 336500.0, 3183400.0,       0.0,       0.0);        ( 334000.0, 3183400.0,       0.0,       0.0);
     ( 331500.0, 3183400.0,       0.0,       0.0);
  *** ISCST3 - VERSION 99155 ***     *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99          ***
                                     *** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES           ***
**MODELOPTs:
CONC                          RURAL  FLAT          DFAULT


                                         *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                          (1=YES; 0=NO)

          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
```

1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FI

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** WIND PROFILE EXPONENTS ***

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-
B	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-
C	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+
D	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+
E	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+
F	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+

*** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***
(DEGREES KELVIN PER METER)

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+
B	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+
C	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+
D	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+
E	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-
F	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-

*** ISCST3 - VERSION 99155 ***   *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99   ***
*** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES   ***

**MODELOPTs:
CONC   RURAL FLAT   DFAULT

*** THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

FILE: D:\MET\TPA87D.MET
FORMAT: (4I2,2F9.4,F6.1,I2,2F7.1,f9.4,f10.1,f8.4,i4,f7.2)
SURFACE STATION NO.: 12842   UPPER AIR STATION NO.: 12842
NAME: TAMPA   NAME: RUSKIN
YEAR: 1987   YEAR: 1987

YR	MN	DY	HR	FLOW VECTOR	SPEED (M/S)	TEMP (K)	STAB CLASS	MIXING HEIGHT (M) RURAL	URBAN	USTAR (M/S)	M-O LENGTH (M)	Z-0 (M)	IPCODE	PRATE (mm/HR)
87	01	01	01	341.0	6.17	293.7	4	598.7	598.7	0.0000	0.0	0.0000	0	0.00
87	01	01	02	358.0	4.12	293.2	5	651.8	1306.0	0.0000	0.0	0.0000	0	0.00
87	01	01	03	34.0	6.17	293.2	4	704.8	704.8	0.0000	0.0	0.0000	0	0.00
87	01	01	04	73.0	6.69	291.5	4	757.8	757.8	0.0000	0.0	0.0000	0	0.00
87	01	01	05	83.0	7.20	290.9	4	810.8	810.8	0.0000	0.0	0.0000	0	0.00
87	01	01	06	102.0	7.20	290.4	4	863.8	863.8	0.0000	0.0	0.0000	0	0.00
87	01	01	07	105.0	6.69	289.3	4	916.9	916.9	0.0000	0.0	0.0000	0	0.00
87	01	01	08	113.0	7.72	288.7	4	969.9	969.9	0.0000	0.0	0.0000	0	0.00
87	01	01	09	107.0	6.17	288.2	4	1022.9	1022.9	0.0000	0.0	0.0000	0	0.00
87	01	01	10	121.0	6.17	288.2	4	1075.9	1075.9	0.0000	0.0	0.0000	0	0.00
87	01	01	11	114.0	6.69	287.6	4	1128.9	1128.9	0.0000	0.0	0.0000	0	0.00
87	01	01	12	116.0	6.17	287.0	4	1182.0	1182.0	0.0000	0.0	0.0000	0	0.00
87	01	01	13	133.0	7.20	287.6	4	1235.0	1235.0	0.0000	0.0	0.0000	0	0.00
87	01	01	14	119.0	7.72	287.6	4	1288.0	1288.0	0.0000	0.0	0.0000	0	0.00
87	01	01	15	132.0	7.20	288.2	4	1288.0	1288.0	0.0000	0.0	0.0000	0	0.00
87	01	01	16	134.0	7.72	289.3	4	1288.0	1288.0	0.0000	0.0	0.0000	0	0.00
87	01	01	17	141.0	7.20	288.2	4	1288.0	1288.0	0.0000	0.0	0.0000	0	0.00
87	01	01	18	137.0	5.14	287.6	5	1286.4	1238.1	0.0000	0.0	0.0000	0	0.00
87	01	01	19	144.0	3.60	286.5	5	1281.2	1078.6	0.0000	0.0	0.0000	0	0.00
87	01	01	20	117.0	2.06	285.4	6	1276.0	919.0	0.0000	0.0	0.0000	0	0.00
87	01	01	21	110.0	1.54	284.8	7	1270.9	759.5	0.0000	0.0	0.0000	0	0.00
87	01	01	22	112.0	0.00	283.7	7	1265.7	600.0	0.0000	0.0	0.0000	0	0.00
87	01	01	23	120.0	2.57	283.7	6	1260.5	440.5	0.0000	0.0	0.0000	0	0.00
87	01	01	24	130.0	1.54	282.6	7	1255.4	281.0	0.0000	0.0	0.0000	0	0.00

*** NOTES: STABILITY CLASS 1=A, 2=B, 3=C, 4=D, 5=E AND 6=F.
FLOW VECTOR IS DIRECTION TOWARD WHICH WIND IS BLOWING.

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99 ***
*** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
CONC RURAL FLAT DFAULT

*** THE SUMMARY OF MAXIMUM PERIOD (8760 HRS) RESULTS ***

** CONC OF GEN IN (MICROGRAMS/CUBIC-METER) **

GROUP ID		AVERAGE CONC		RECEPTOR (XR,	YR,	ZELEV,	ZFLAG)	OF TYPE	NETWORK GRID-ID
SE32	1ST HIGHEST VALUE IS	0.00226	AT (	343700.00,	3178300.00,	0.00,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.00209	AT (	343000.00,	3176200.00,	0.00,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.00208	AT (	342000.00,	3174000.00,	0.00,	0.00)	DC	NA
SE95	1ST HIGHEST VALUE IS	0.00235	AT (	343700.00,	3178300.00,	0.00,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.00218	AT (	342000.00,	3174000.00,	0.00,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.00218	AT (	343000.00,	3176200.00,	0.00,	0.00)	DC	NA
LD7532	1ST HIGHEST VALUE IS	0.00261	AT (	343700.00,	3178300.00,	0.00,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.00245	AT (	342000.00,	3174000.00,	0.00,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.00243	AT (	343000.00,	3176200.00,	0.00,	0.00)	DC	NA
LD7595	1ST HIGHEST VALUE IS	0.00276	AT (	343700.00,	3178300.00,	0.00,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.00261	AT (	342000.00,	3174000.00,	0.00,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.00259	AT (	343000.00,	3176200.00,	0.00,	0.00)	DC	NA
LD5032	1ST HIGHEST VALUE IS	0.00304	AT (	343700.00,	3178300.00,	0.00,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.00292	AT (	342000.00,	3174000.00,	0.00,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.00286	AT (	343000.00,	3176200.00,	0.00,	0.00)	DC	NA
5095	1ST HIGHEST VALUE IS	0.00318	AT (	343700.00,	3178300.00,	0.00,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.00306	AT (	342000.00,	3174000.00,	0.00,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.00300	AT (	343000.00,	3176200.00,	0.00,	0.00)	DC	NA

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

*** ISCST3 - VERSION 99155 *** *** 1987 SONAT PASCO CNTY/3 CTS SIMPLE CYCLE/CLASS I AREA 10/9/99 ***
*** FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES ***

**MODELOPTs:
NC RURAL FLAT DFAULT

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF GEN IN (MICROGRAMS/CUBIC-METER) **

GROUP ID			AVERAGE CONC	DATE (YYMMDDHH)		RECEPTOR (XR,	YR,	ZELEV,	ZFLAG)	OF
ASE32	HIGH	1ST HIGH VALUE IS	0.07591	ON 87062724:	AT (	343700.00,	3178300.00,	0.00,	0.00)	
	HIGH	2ND HIGH VALUE IS	0.06114	ON 87020224:	AT (	343700.00,	3178300.00,	0.00,	0.00)	
ASE95	HIGH	1ST HIGH VALUE IS	0.07885	ON 87062724:	AT (	343700.00,	3178300.00,	0.00,	0.00)	
	HIGH	2ND HIGH VALUE IS	0.06324	ON 87020224:	AT (	343700.00,	3178300.00,	0.00,	0.00)	
LD7532	HIGH	1ST HIGH VALUE IS	0.08625	ON 87062724:	AT (	343700.00,	3178300.00,	0.00,	0.00)	
	HIGH	2ND HIGH VALUE IS	0.06840	ON 87020224:	AT (	343700.00,	3178300.00,	0.00,	0.00)	
D7595	HIGH	1ST HIGH VALUE IS	0.08862	ON 87062724:	AT (	343700.00,	3178300.00,	0.00,	0.00)	
	HIGH	2ND HIGH VALUE IS	0.07002	ON 87020224:	AT (	343700.00,	3178300.00,	0.00,	0.00)	
D5032	HIGH	1ST HIGH VALUE IS	0.10210	ON 87062724:	AT (	343700.00,	3178300.00,	0.00,	0.00)	
	HIGH	2ND HIGH VALUE IS	0.07559	ON 87020224:	AT (	343700.00,	3178300.00,	0.00,	0.00)	
LD5095	HIGH	1ST HIGH VALUE IS	0.10571	ON 87062724:	AT (	343700.00,	3178300.00,	0.00,	0.00)	
	HIGH	2ND HIGH VALUE IS	0.07795	ON 87020224:	AT (	343700.00,	3178300.00,	0.00,	0.00)	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART

```
CO STARTING
CO TITLEONE 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE      10/9/99
CO TITLETWO FUEL OIL, SO2 3-HR BASELOAD 95 DEG. F
CO MODELOPT DFAULT CONC   RURAL NOCMPL
CO AVERTIME  3
CO POLLUTID SO2
CO DCAYCOEF     .000000
CO RUNORNOT RUN
CO FINISHED

SO STARTING

** Source Location Cards:
**         SRCID SRCTYP        XS            YS             ZS
** MODELING ORIGIN CT 2 STACK LOCATION
** LOCATION IS USED FOR POLAR DISCRETE RECEPTORS.
**  CT STACK NUMBER CODE
** -----------------------
**  A -  CT 1
**  B -  CT 2
**  C -  CT 3
** Source Location Cards:
**         SRCID SRCTYP      XS         YS        ZS
**   UTM                    (m)        (m)       (m)
**
SO LOCATION  BASE95A  POINT  -35.36    0.0       0.0
SO LOCATION  BASE95B  POINT    0.00    0.0       0.0
SO LOCATION  BASE95C  POINT   35.36    0.0       0.0
**
**
** Source Parameter Cards:
** POINT:   SRCID             QS        HS         TS         VS         DS
**                           (g/s)      (m)        (K)       (m/s)       (m)
**
SO SRCPARAM   BASE95A     11.77     18.3      878.2      35.05      6.71
SO SRCPARAM   BASE95B     11.77     18.3      878.2      35.05      6.71
SO SRCPARAM   BASE95C     11.77     18.3      878.2      35.05      6.71
**
**
SO BUILDHGT BASE32A-BASE95A      6.71     6.71     6.71    14.33     0.00     0.00
SO BUILDHGT BASE32A-BASE95A      0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT BASE32A-BASE95A      0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDHGT BASE32A-BASE95A     14.33    14.33    14.33    14.33    14.33    14.33
SO BUILDHGT BASE32A-BASE95A      6.71     6.71     0.00     0.00     0.00     0.00
SO BUILDHGT BASE32A-BASE95A      0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDWID BASE32A-BASE95A     11.23    12.97    14.32    15.46     0.00     0.00
SO BUILDWID BASE32A-BASE95A      0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID BASE32A-BASE95A      0.00    15.23    14.32    12.97    11.23     9.14
SO BUILDWID BASE32A-BASE95A     12.71    14.06    14.99    15.46    15.46    14.99
SO BUILDWID BASE32A-BASE95A     15.16    14.19     0.00     0.00     0.00     0.00
SO BUILDWID BASE32A-BASE95A      0.00    15.23    14.32    12.97    11.23     9.14
**
**
SO BUILDHGT BASE32B-BASE95B      6.71     6.71     6.71    14.33     0.00     0.00
SO BUILDHGT BASE32B-BASE95B      0.00     0.00     0.00     6.71     6.71     6.71
SO BUILDHGT BASE32B-BASE95B     14.33    14.33    14.33    14.33     6.71     6.71
SO BUILDHGT BASE32B-BASE95B     14.33    14.33    14.33    14.33    14.33    14.33
SO BUILDHGT BASE32B-BASE95B      6.71     6.71     0.00     0.00     0.00     0.00
SO BUILDHGT BASE32B-BASE95B      0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDWID BASE32B-BASE95B     11.23    12.97    14.32    15.46     0.00     0.00
SO BUILDWID BASE32B-BASE95B      0.00     0.00     0.00    14.19    15.16    15.66
SO BUILDWID BASE32B-BASE95B     15.46    15.46    14.99    14.06    11.23     9.14
SO BUILDWID BASE32B-BASE95B     12.71    14.06    14.99    15.46    15.46    14.99
SO BUILDWID BASE32B-BASE95B     15.16    14.19     0.00     0.00     0.00     0.00
SO BUILDWID BASE32B-BASE95B      0.00    15.23    14.32    12.97    11.23     9.14
**
**
SO BUILDHGT BASE32C-BASE95C      6.71     6.71     6.71    14.33     0.00     0.00
SO BUILDHGT BASE32C-BASE95C      0.00     0.00     0.00     6.71     6.71    14.33
SO BUILDHGT BASE32C-BASE95C     14.33    14.33    14.33    14.33     6.71     6.71
SO BUILDHGT BASE32C-BASE95C     14.33    14.33    14.33    14.33     0.00     0.00
SO BUILDHGT BASE32C-BASE95C      0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT BASE32C-BASE95C      0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDWID BASE32C-BASE95C     11.23    12.97    14.32    15.46     0.00     0.00
SO BUILDWID BASE32C-BASE95C      0.00     0.00     0.00    14.19    15.16    14.99
SO BUILDWID BASE32C-BASE95C     15.46    15.46    14.99    14.06    11.23     9.14
```

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SO BUILDWID BASE32C-BASE95C    12.71   14.06   14.99   15.46    0.00    0.00
SO BUILDWID BASE32C-BASE95C     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID BASE32C-BASE95C     0.00   15.23   14.32   12.97   11.23    9.14
**
**
SO EMISUNIT    .100000E+07 (GRAMS/SEC)          (MICROGRAMS/CUBIC-METER)
SO SRCGROUP BASE95 BASE95A BASE95B BASE95C
**
SO FINISHED

RE STARTING
RE GRIDPOLR POL STA
RE GRIDPOLR POL ORIG  0.0   0.0
RE GRIDPOLR POL DIST  1400 1500 1600 1700 1800 1900 2000
RE GRIDPOLR POL DIST  2100 2200 2300 2400
RE GRIDPOLR POL GDIR   9 262.00   2.00
RE GRIDPOLR POL END
RE FINISHED

ME STARTING
ME INPUTFIL C:\DDIRMET\TPA90D.MET
ME ANEMHGHT    6.700 METERS
ME SURFDATA  12842  1990            TAMPA
ME UAIRDATA  12842  1990            RUSKIN
ME WINDCATS    1.54     3.09    5.14    8.23   10.80
ME FINISHED

OU STARTING
OU RECTABLE ALLAVE FIRST
OU FINISHED

*************************************
*** SETUP Finishes Successfully ***
*************************************

  *** ISCST3 - VERSION 99155 ***    *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE     10/9/99        ***         10/24
                                    *** FUEL OIL, SO2 3-HR BASELOAD 95 DEG. F                               ***         12:43:
**MODELOPTs:                                                                                                            PAGE
CONC                         RURAL  FLAT          DFAULT                                                          NOCMPL

                                             ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Simple Terrain Model is Selected

**Model Is Setup For Calculation of Average CONCentration Values.

  -- SCAVENGING/DEPOSITION LOGIC --
**Model Uses NO DRY DEPLETION.  DDPLETE =  F
**Model Uses NO WET DEPLETION.  WDPLETE =  F
**NO WET SCAVENGING Data Provided.
**NO GAS DRY DEPOSITION Data Provided.
**Model Does NOT Use GRIDDED TERRAIN Data for Depletion Calculations

**Model Uses RURAL Dispersion.

**Model Uses Regulatory DEFAULT Options:
           1. Final Plume Rise.
           2. Stack-tip Downwash.
           3. Buoyancy-induced Dispersion.
           4. Use Calms Processing Routine.
           5. Not Use Missing Data Processing Routine.
           6. Default Wind Profile Exponents.
           7. Default Vertical Potential Temperature Gradients.
           8. "Upper Bound" Values for Supersquat Buildings.
           9. No Exponential Decay for RURAL Mode

**Model Assumes Receptors on FLAT Terrain.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  1 Short Term Average(s) of:   3-HR

**This Run Includes:     3 Source(s);      1 Source Group(s); and      99 Receptor(s)

**The Model Assumes A Pollutant Type of:  SO2
```

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Anem. Hgt. (m) = 6.70 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = (GRAMS/SEC) ; Emission Rate Unit Factor = 0.10000E+07
Output Units = (MICROGRAMS/CUBIC-METER)

**Approximate Storage Requirements of Model = 1.2 MB of RAM.

**Input Runstream File: REFSO203.I90
**Output Print File: REFSO203.O90

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (USER UNITS)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
BASE95A	0	0.11770E+02	-35.4	0.0	0.0	18.30	878.20	35.05	6.71	YES	
BASE95B	0	0.11770E+02	0.0	0.0	0.0	18.30	878.20	35.05	6.71	YES	
BASE95C	0	0.11770E+02	35.4	0.0	0.0	18.30	878.20	35.05	6.71	YES	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
BASE95	BASE95A , BASE95B , BASE95C ,

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: BASE95A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	6	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	12	0.0,	0
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	30	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	36	6.7,	9

SOURCE ID: BASE95B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	6	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	12	6.7,	15
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	30	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	36	6.7,	9

SOURCE ID: BASE95C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	6	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	12	14.3,	15
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	0.0,	0.0,	0	24	0.0,	0
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	30	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	36	6.7,	9

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, SO2 3-HR BASELOAD 95 DEG. F *** 12:43:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** GRIDDED RECEPTOR NETWORK SUMMARY ***

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

*** ORIGIN FOR POLAR NETWORK ***
X-ORIG = 0.00 ; Y-ORIG = 0.00 (METERS)

*** DISTANCE RANGES OF NETWORK ***
(METERS)

1400.0, 1500.0, 1600.0, 1700.0, 1800.0, 1900.0, 2000.0, 2100.0, 2200.0, 2300.0,
2400.0,

*** DIRECTION RADIALS OF NETWORK ***
(DEGREES)

262.0, 264.0, 266.0, 268.0, 270.0, 272.0, 274.0, 276.0, 278.0,

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, SO2 3-HR BASELOAD 95 DEG. F *** 12:43:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** WIND PROFILE EXPONENTS ***

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
B	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
C	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00
D	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00
E	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00
F	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00

*** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***

(DEGREES KELVIN PER METER)

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
B	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
C	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
D	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
E	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01
F	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, SO2 3-HR BASELOAD 95 DEG. F *** 12:43:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

FILE: C:\DDIRMET\TPA90D.MET
FORMAT: (4I2,2F9.4,F6.1,I2,2F7.1,f9.4,f10.1,f8.4,i4,f7.2)
SURFACE STATION NO.: 12842 UPPER AIR STATION NO.: 12842
NAME: TAMPA NAME: RUSKIN
YEAR: 1990 YEAR: 1990

YR MN DY HR	FLOW VECTOR	SPEED (M/S)	TEMP (K)	STAB CLASS	MIXING HEIGHT (M) RURAL	URBAN	USTAR (M/S)	M-O LENGTH (M)	Z-0 (M)	IPCODE	PRATE (mm/HR)
90 01 01 01	11.0	4.63	293.2	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 02	358.0	4.63	292.6	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 03	4.0	4.12	292.0	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 04	3.0	5.14	292.0	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 05	13.0	5.66	292.0	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 06	2.0	5.66	291.5	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 07	55.0	2.06	290.9	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 08	153.0	4.63	292.0	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 09	137.0	4.63	289.8	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 10	171.0	4.63	287.6	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 11	164.0	5.66	288.2	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 12	166.0	6.69	288.7	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 13	173.0	6.69	291.5	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 14	169.0	6.17	289.3	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 15	162.0	4.63	289.3	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 16	184.0	4.63	290.4	3	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 17	161.0	5.66	289.8	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 18	167.0	5.14	287.0	5	1309.0	1257.3	0.0000	0.0	0.0000	0	0.00
90 01 01 19	184.0	3.60	285.4	5	1309.0	1092.1	0.0000	0.0	0.0000	0	0.00
90 01 01 20	187.0	3.09	284.3	6	1309.0	926.9	0.0000	0.0	0.0000	0	0.00
90 01 01 21	200.0	2.57	283.2	6	1309.0	761.6	0.0000	0.0	0.0000	0	0.00
90 01 01 22	192.0	4.12	283.2	5	1309.0	596.4	0.0000	0.0	0.0000	0	0.00
90 01 01 23	210.0	3.09	282.6	6	1309.0	431.2	0.0000	0.0	0.0000	0	0.00
90 01 01 24	190.0	3.09	282.0	6	1309.0	266.0	0.0000	0.0	0.0000	0	0.00

*** NOTES: STABILITY CLASS 1=A, 2=B, 3=C, 4=D, 5=E AND 6=F.
FLOW VECTOR IS DIRECTION TOWARD WHICH WIND IS BLOWING.

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, SO2 3-HR BASELOAD 95 DEG. F *** 12:43:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE 1ST HIGHEST 3-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: BASE95 ***
INCLUDING SOURCE(S): BASE95A , BASE95B , BASE95C ,

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

** CONC OF SO2 IN (MICROGRAMS/CUBIC-METER) **

DIRECTION (DEGREES)	DISTANCE (METERS) 1400.00	1500.00	1600.00	1700.00	1800.00
262.0	2.21262 (90061315)	2.77431 (90061315)	3.15332 (90061315)	3.35102 (90061315)	3.40586 (900
264.0	2.28108 (90061315)	2.85980 (90061315)	3.24929 (90061315)	3.45169 (90061315)	3.50715 (900
266.0	2.31267 (90061315)	2.90203 (90061315)	3.29850 (90061315)	3.50436 (90061315)	3.56064 (900

268.0	2.30633 (90061315)	2.89977 (90061315)	3.29967 (90061315)	3.50780 (90061315)	3.56517 (900
270.0	2.26265 (90061315)	2.85357 (90061315)	3.25333 (90061315)	3.46256 (90061315)	3.52132 (900
272.0	2.18379 (90061315)	2.76570 (90061315)	3.16179 (90061315)	3.37092 (90061315)	3.43137 (900
274.0	2.07334 (90061315)	2.63997 (90061315)	3.02890 (90061315)	3.23672 (90061315)	3.29912 (900
276.0	1.93610 (90061315)	2.48155 (90061315)	2.85994 (90061315)	3.06517 (90061315)	3.12967 (900
278.0	1.77774 (90061315)	2.29663 (90061315)	2.66122 (90061315)	2.86253 (90061315)	2.92916 (900

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, SO2 3-HR BASELOAD 95 DEG. F *** 12:43:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE 1ST HIGHEST 3-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: BASE95 ***
INCLUDING SOURCE(S): BASE95A , BASE95B , BASE95C ,

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

** CONC OF SO2 IN (MICROGRAMS/CUBIC-METER) **

DIRECTION (DEGREES)	DISTANCE (METERS) 1900.00	2000.00	2100.00	2200.00	2300.00
262.0	3.36724 (90061315)	3.27846 (90061315)	3.16945 (90061315)	3.05702 (90061315)	2.94872 (900
264.0	3.46693 (90061315)	3.37579 (90061315)	3.26449 (90061315)	3.15010 (90061315)	3.04015 (900
266.0	3.51971 (90061315)	3.42729 (90061315)	3.31474 (90061315)	3.19935 (90061315)	3.08860 (900
268.0	3.52447 (90061315)	3.43189 (90061315)	3.31915 (90061315)	3.20368 (90061315)	3.09296 (900
270.0	3.48183 (90061315)	3.39023 (90061315)	3.27835 (90061315)	3.16373 (90061315)	3.05386 (900
272.0	3.39408 (90061315)	3.30460 (90061315)	3.19464 (90061315)	3.08178 (90061315)	2.97357 (900
274.0	3.26499 (90061315)	3.17876 (90061315)	3.07177 (90061315)	2.96158 (90061315)	2.85585 (900
276.0	3.09960 (90061315)	3.01772 (90061315)	2.91473 (90061315)	2.80812 (90061315)	2.70566 (900
278.0	2.90391 (90061315)	2.82741 (90061315)	2.72943 (90061315)	2.62729 (90061315)	2.52887 (900

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, SO2 3-HR BASELOAD 95 DEG. F *** 12:43:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE 1ST HIGHEST 3-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: BASE95 ***
INCLUDING SOURCE(S): BASE95A , BASE95B , BASE95C ,

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

** CONC OF SO2 IN (MICROGRAMS/CUBIC-METER) **

DIRECTION (DEGREES)	DISTANCE (METERS) 2400.00
262.0	2.84706 (90061315)
264.0	2.93702 (90061315)
266.0	2.98479 (90061315)
268.0	2.98924 (90061315)
270.0	2.95098 (90061315)
272.0	2.87227 (90061315)
274.0	2.75687 (90061315)
276.0	2.60973 (90061315)
278.0	2.43669 (90061315)

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, SO2 3-HR BASELOAD 95 DEG. F *** 12:43:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE SUMMARY OF HIGHEST 3-HR RESULTS ***

** CONC OF SO2 IN (MICROGRAMS/CUBIC-METER) **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWOR GRID-I
BASE95 HIGH 1ST HIGH VALUE IS	3.56517	ON 90061315: AT (	-1798.90, -62.82, 0.00, 0.00)	GP	POL

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

```
                          BD = BOUNDARY
  *** ISCST3 - VERSION 99155 ***     *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE      10/9/99        ***       10/24
                                    *** FUEL OIL, SO2 3-HR BASELOAD 95 DEG. F                                ***       12:43:
**MODELOPTs:                                                                                                          PAGE
CONC                           RURAL  FLAT          DFAULT                                                   NOCMPL


*** Message Summary : ISCST3 Model Execution ***

 --------- Summary of Total Messages --------

A Total of           0 Fatal Error Message(s)
A Total of           0 Warning Message(s)
A Total of         509 Informational Message(s)

A Total of         509 Calm Hours Identified

   ******** FATAL ERROR MESSAGES ********
              ***  NONE  ***

   ********   WARNING MESSAGES   ********
              ***  NONE  ***

   ************************************
   *** ISCST3 Finishes Successfully ***
   ************************************
```

```
CO STARTING
CO TITLEONE 1989 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE      10/9/99
CO TITLETWO FUEL OIL, SO2 24-HR BASELOAD 32 DEG. F
CO MODELOPT DFAULT CONC   RURAL NOCMPL
CO AVERTIME  24
CO POLLUTID SO2
CO DCAYCOEF     .000000
CO RUNORNOT RUN
CO FINISHED

SO STARTING

** Source Location Cards:
**          SRCID SRCTYP        XS            YS            ZS
** MODELING ORIGIN CT 2 STACK LOCATION
** LOCATION IS USED FOR POLAR DISCRETE RECEPTORS.
**  CT STACK NUMBER CODE
** -----------------------
**  A -  CT 1
**  B -  CT 2
**  C -  CT 3
** Source Location Cards:
**          SRCID SRCTYP      XS        YS        ZS
**   UTM                      (m)       (m)       (m)
SO LOCATION  BASE32A  POINT  -35.36     0.0       0.0
SO LOCATION  BASE32B  POINT    0.00     0.0       0.0
SO LOCATION  BASE32C  POINT   35.36     0.0       0.0
**
**
** Source Parameter Cards:
** POINT:   SRCID          QS       HS        TS        VS        DS
**                        (g/s)     (m)       (K)      (m/s)      (m)
SO SRCPARAM   BASE32A     12.79     18.3      853.2     37.31     6.71
SO SRCPARAM   BASE32B     12.79     18.3      853.2     37.31     6.71
SO SRCPARAM   BASE32C     12.79     18.3      853.2     37.31     6.71
**
**
SO BUILDHGT BASE32A-BASE95A     6.71     6.71     6.71    14.33     0.00     0.00
SO BUILDHGT BASE32A-BASE95A     0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT BASE32A-BASE95A     0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDHGT BASE32A-BASE95A    14.33    14.33    14.33    14.33    14.33    14.33
SO BUILDHGT BASE32A-BASE95A     6.71     6.71     0.00     0.00     0.00     0.00
SO BUILDHGT BASE32A-BASE95A     0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDWID BASE32A-BASE95A    11.23    12.97    14.32    15.46     0.00     0.00
SO BUILDWID BASE32A-BASE95A     0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID BASE32A-BASE95A     0.00    15.23    14.32    12.97    11.23     9.14
SO BUILDWID BASE32A-BASE95A    12.71    14.06    14.99    15.46    15.46    14.99
SO BUILDWID BASE32A-BASE95A    15.16    14.19     0.00     0.00     0.00     0.00
SO BUILDWID BASE32A-BASE95A     0.00    15.23    14.32    12.97    11.23     9.14
**
**
SO BUILDHGT BASE32B-BASE95B     6.71     6.71     6.71    14.33     0.00     0.00
SO BUILDHGT BASE32B-BASE95B     0.00     0.00     0.00     6.71     6.71     6.71
SO BUILDHGT BASE32B-BASE95B    14.33    14.33    14.33    14.33     6.71     6.71
SO BUILDHGT BASE32B-BASE95B    14.33    14.33    14.33    14.33    14.33    14.33
SO BUILDHGT BASE32B-BASE95B     6.71     6.71     0.00     0.00     0.00     0.00
SO BUILDHGT BASE32B-BASE95B     0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDWID BASE32B-BASE95B    11.23    12.97    14.32    15.46     0.00     0.00
SO BUILDWID BASE32B-BASE95B     0.00     0.00     0.00    14.19    15.16    15.66
SO BUILDWID BASE32B-BASE95B    15.46    15.46    14.99    14.06    11.23     9.14
SO BUILDWID BASE32B-BASE95B    12.71    14.06    14.99    15.46    15.46    14.99
SO BUILDWID BASE32B-BASE95B    15.16    14.19     0.00     0.00     0.00     0.00
SO BUILDWID BASE32B-BASE95B     0.00    15.23    14.32    12.97    11.23     9.14
**
**
SO BUILDHGT BASE32C-BASE95C     6.71     6.71     6.71    14.33     0.00     0.00
SO BUILDHGT BASE32C-BASE95C     0.00     0.00     0.00     6.71     6.71    14.33
SO BUILDHGT BASE32C-BASE95C    14.33    14.33    14.33    14.33     6.71     6.71
SO BUILDHGT BASE32C-BASE95C    14.33    14.33    14.33    14.33     0.00     0.00
SO BUILDHGT BASE32C-BASE95C     0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT BASE32C-BASE95C     0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDWID BASE32C-BASE95C    11.23    12.97    14.32    15.46     0.00     0.00
SO BUILDWID BASE32C-BASE95C     0.00     0.00     0.00    14.19    15.16    14.99
SO BUILDWID BASE32C-BASE95C    15.46    15.46    14.99    14.06    11.23     9.14
SO BUILDWID BASE32C-BASE95C    12.71    14.06    14.99    15.46     0.00     0.00
SO BUILDWID BASE32C-BASE95C     0.00     0.00     0.00     0.00     0.00     0.00
```

```
SO BUILDWID BASE32C-BASE95C     0.00    15.23    14.32    12.97    11.23     9.14
**
**
SO EMISUNIT    .100000E+07 (GRAMS/SEC)          (MICROGRAMS/CUBIC-METER)
SO SRCGROUP BASE32 BASE32A BASE32B BASE32C
**
SO FINISHED

RE STARTING
RE GRIDPOLR POL STA
RE GRIDPOLR POL ORIG  0.0   0.0
RE GRIDPOLR POL DIST  19100 19200 19300 19400 19500 19600 19700 19800 19900
RE GRIDPOLR POL DIST  20000 20100 20200 20300 20400 20500 20600 20700 20800
RE GRIDPOLR POL DIST  20900
RE GRIDPOLR POL GDIR  9  172.00  2.00
RE GRIDPOLR POL END
RE FINISHED

ME STARTING
ME INPUTFIL C:\DDIRMET\TPA89D.MET
ME ANEMHGHT    6.700 METERS
ME SURFDATA  12842  1989           TAMPA
ME UAIRDATA  12842  1989           RUSKIN
ME WINDCATS    1.54    3.09    5.14    8.23    10.80
ME FINISHED

OU STARTING
OU RECTABLE ALLAVE FIRST
OU FINISHED

************************************
*** SETUP Finishes Successfully ***
************************************

  *** ISCST3 - VERSION 99155 ***    *** 1989 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE      10/9/99         ***        10/24
                                   *** FUEL OIL, SO2 24-HR BASELOAD 32 DEG. F                                 ***        12:36:
**MODELOPTs:                                                                                                              PAGE
CONC                      RURAL  FLAT          DFAULT                                                          NOCMPL

                                          ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Simple Terrain Model is Selected

**Model Is Setup For Calculation of Average CONCentration Values.

  -- SCAVENGING/DEPOSITION LOGIC --
**Model Uses NO DRY DEPLETION.  DDPLETE =  F
**Model Uses NO WET DEPLETION.  WDPLETE =  F
**NO WET SCAVENGING Data Provided.
**NO GAS DRY DEPOSITION Data Provided.
**Model Does NOT Use GRIDDED TERRAIN Data for Depletion Calculations

**Model Uses RURAL Dispersion.

**Model Uses Regulatory DEFAULT Options:
          1. Final Plume Rise.
          2. Stack-tip Downwash.
          3. Buoyancy-induced Dispersion.
          4. Use Calms Processing Routine.
          5. Not Use Missing Data Processing Routine.
          6. Default Wind Profile Exponents.
          7. Default Vertical Potential Temperature Gradients.
          8. "Upper Bound" Values for Supersquat Buildings.
          9. No Exponential Decay for RURAL Mode

**Model Assumes Receptors on FLAT Terrain.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  1 Short Term Average(s) of:  24-HR

**This Run Includes:     3 Source(s);      1 Source Group(s); and     171 Receptor(s)

**The Model Assumes A Pollutant Type of:  SO2

**Model Set To Continue RUNning After the Setup Testing.
```

**Output Options Selected:
Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Anem. Hgt. (m) = 6.70 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = (GRAMS/SEC) ; Emission Rate Unit Factor = 0.10000E+07
Output Units = (MICROGRAMS/CUBIC-METER)

**Approximate Storage Requirements of Model = 1.2 MB of RAM.

**Input Runstream File: REFS0224.189
**Output Print File: REFS0224.089

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*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (USER UNITS)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
BASE32A	0	0.12790E+02	-35.4	0.0	0.0	18.30	853.20	37.31	6.71	YES	
BASE32B	0	0.12790E+02	0.0	0.0	0.0	18.30	853.20	37.31	6.71	YES	
BASE32C	0	0.12790E+02	35.4	0.0	0.0	18.30	853.20	37.31	6.71	YES	

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*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
BASE32	BASE32A , BASE32B , BASE32C ,

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*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: BASE32A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	6.7	11.2	0	2	6.7	13.0	0	3	6.7	14.3	0	4	14.3	15.5	0	5	0.0	0.0	0	6	0.0	0
7	0.0	0.0	0	8	0.0	0.0	0	9	0.0	0.0	0	10	0.0	0.0	0	11	0.0	0.0	0	12	0.0	0
13	0.0	0.0	0	14	6.7	15.2	0	15	6.7	14.3	0	16	6.7	13.0	0	17	6.7	11.2	0	18	6.7	9
19	14.3	12.7	0	20	14.3	14.1	0	21	14.3	15.0	0	22	14.3	15.5	0	23	14.3	15.5	0	24	14.3	15
25	6.7	15.2	0	26	6.7	14.2	0	27	0.0	0.0	0	28	0.0	0.0	0	29	0.0	0.0	0	30	0.0	0
31	0.0	0.0	0	32	6.7	15.2	0	33	6.7	14.3	0	34	6.7	13.0	0	35	6.7	11.2	0	36	6.7	9

SOURCE ID: BASE32B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	6.7	11.2	0	2	6.7	13.0	0	3	6.7	14.3	0	4	14.3	15.5	0	5	0.0	0.0	0	6	0.0	0
7	0.0	0.0	0	8	0.0	0.0	0	9	0.0	0.0	0	10	6.7	14.2	0	11	6.7	15.2	0	12	6.7	15
13	14.3	15.5	0	14	14.3	15.5	0	15	14.3	15.0	0	16	14.3	14.1	0	17	6.7	11.2	0	18	6.7	9
19	14.3	12.7	0	20	14.3	14.1	0	21	14.3	15.0	0	22	14.3	15.5	0	23	14.3	15.5	0	24	14.3	15
25	6.7	15.2	0	26	6.7	14.2	0	27	0.0	0.0	0	28	0.0	0.0	0	29	0.0	0.0	0	30	0.0	0
31	0.0	0.0	0	32	6.7	15.2	0	33	6.7	14.3	0	34	6.7	13.0	0	35	6.7	11.2	0	36	6.7	9

SOURCE ID: BASE32C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	6	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	12	14.3,	15
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	0.0,	0.0,	0	24	0.0,	0
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	30	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	36	6.7,	9

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*** GRIDDED RECEPTOR NETWORK SUMMARY ***

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

*** ORIGIN FOR POLAR NETWORK ***
X-ORIG = 0.00 ; Y-ORIG = 0.00 (METERS)

*** DISTANCE RANGES OF NETWORK ***
(METERS)

19100.0, 19200.0, 19300.0, 19400.0, 19500.0, 19600.0, 19700.0, 19800.0, 19900.0, 20000.0,
20100.0, 20200.0, 20300.0, 20400.0, 20500.0, 20600.0, 20700.0, 20800.0, 20900.0,

*** DIRECTION RADIALS OF NETWORK ***
(DEGREES)

172.0, 174.0, 176.0, 178.0, 180.0, 182.0, 184.0, 186.0, 188.0,

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*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** WIND PROFILE EXPONENTS ***

STABILITY	WIND SPEED CATEGORY					
CATEGORY	1	2	3	4	5	6
A	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
B	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
C	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00
D	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00
E	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00
F	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00

*** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***
(DEGREES KELVIN PER METER)

STABILITY CATEGORY	1	2	3	4	5	6
A	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
B	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
C	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
D	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
E	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01
F	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01

(WIND SPEED CATEGORY)

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*** THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

FILE: C:\DDIRMET\TPA89D.MET
FORMAT: (4I2,2F9.4,F6.1,I2,2F7.1,f9.4,f10.1,f8.4,i4,f7.2)
SURFACE STATION NO.: 12842 UPPER AIR STATION NO.: 12842
NAME: TAMPA NAME: RUSKIN
YEAR: 1989 YEAR: 1989

YR MN DY HR	FLOW VECTOR	SPEED (M/S)	TEMP (K)	STAB CLASS	MIXING HEIGHT (M) RURAL	URBAN	USTAR (M/S)	M-O LENGTH (M)	Z-0 (M)	IPCODE	PRATE (mm/HR)
89 01 01 01	181.0	0.00	293.2	6	999.5	590.0	0.0000	0.0	0.0000	0	0.00
89 01 01 02	338.0	2.06	293.7	5	999.1	590.0	0.0000	0.0	0.0000	0	0.00
89 01 01 03	4.0	1.54	293.7	4	998.8	998.8	0.0000	0.0	0.0000	0	0.00
89 01 01 04	13.0	1.54	293.2	4	998.4	998.4	0.0000	0.0	0.0000	0	0.00
89 01 01 05	353.0	2.06	293.2	4	998.1	998.1	0.0000	0.0	0.0000	0	0.00
89 01 01 06	352.0	1.54	292.6	4	997.8	997.8	0.0000	0.0	0.0000	0	0.00
89 01 01 07	355.0	2.06	292.6	4	997.4	997.4	0.0000	0.0	0.0000	0	0.00
89 01 01 08	333.0	2.06	292.0	4	997.1	997.1	0.0000	0.0	0.0000	0	0.00
89 01 01 09	337.0	2.06	293.2	4	996.7	996.7	0.0000	0.0	0.0000	0	0.00
89 01 01 10	351.0	2.57	294.3	3	996.4	996.4	0.0000	0.0	0.0000	0	0.00
89 01 01 11	24.0	3.09	298.2	3	996.0	996.0	0.0000	0.0	0.0000	0	0.00
89 01 01 12	6.0	4.12	297.6	3	995.7	995.7	0.0000	0.0	0.0000	0	0.00
89 01 01 13	3.0	5.14	299.3	3	995.3	995.3	0.0000	0.0	0.0000	0	0.00
89 01 01 14	9.0	5.14	299.3	4	995.0	995.0	0.0000	0.0	0.0000	0	0.00
89 01 01 15	12.0	4.63	298.7	3	995.0	995.0	0.0000	0.0	0.0000	0	0.00
89 01 01 16	24.0	3.60	298.7	3	995.0	995.0	0.0000	0.0	0.0000	0	0.00
89 01 01 17	41.0	3.60	297.6	4	995.0	995.0	0.0000	0.0	0.0000	0	0.00
89 01 01 18	57.0	3.60	295.4	5	993.9	991.5	0.0000	0.0	0.0000	0	0.00
89 01 01 19	64.0	3.09	294.3	6	990.5	980.4	0.0000	0.0	0.0000	0	0.00
89 01 01 20	27.0	2.57	293.7	6	987.0	969.4	0.0000	0.0	0.0000	0	0.00
89 01 01 21	20.0	2.57	293.2	5	983.6	958.3	0.0000	0.0	0.0000	0	0.00
89 01 01 22	92.0	3.09	293.2	4	980.1	980.1	0.0000	0.0	0.0000	0	0.00
89 01 01 23	110.0	1.54	292.6	5	976.7	936.1	0.0000	0.0	0.0000	0	0.00
89 01 01 24	70.0	2.06	292.6	4	973.2	973.2	0.0000	0.0	0.0000	0	0.00

*** NOTES: STABILITY CLASS 1=A, 2=B, 3=C, 4=D, 5=E AND 6=F.
FLOW VECTOR IS DIRECTION TOWARD WHICH WIND IS BLOWING.

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CONC RURAL FLAT DFAULT NOCMPL

*** THE 1ST HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: BASE32 ***
INCLUDING SOURCE(S): BASE32A , BASE32B , BASE32C ,

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

** CONC OF SO2 IN (MICROGRAMS/CUBIC-METER) **

DIRECTION (DEGREES)	DISTANCE (METERS) 19100.00	19200.00	19300.00	19400.00	19500.00
172.0	0.28195c(89040624)	0.28112c(89040624)	0.28029c(89040624)	0.27946c(89040624)	0.27863c(890
174.0	0.32653c(89040624)	0.32561c(89040624)	0.32470c(89040624)	0.32379c(89040624)	0.32289c(890
176.0	0.38806c(89040624)	0.38724c(89040624)	0.38642c(89040624)	0.38560c(89040624)	0.38478c(890
178.0	0.51153 (89012324)	0.51131 (89012324)	0.51108 (89012324)	0.51084 (89012324)	0.51060 (890

180.0	0.75392 (89012324)	0.75397 (89012324)	0.75401 (89012324)	0.75404 (89012324)	0.75405 (890
182.0	0.60069 (89012324)	0.60049 (89012324)	0.60029 (89012324)	0.60008 (89012324)	0.59986 (890
184.0	0.46819 (89102824)	0.46828 (89102824)	0.46837 (89102824)	0.46844 (89102824)	0.46851 (891
186.0	0.60804 (89120424)	0.60851 (89120424)	0.60896 (89120424)	0.60940 (89120424)	0.60984 (891
188.0	0.81264 (89120424)	0.81351 (89120424)	0.81436 (89120424)	0.81519 (89120424)	0.81602 (891

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CONC RURAL FLAT DFAULT NOCMPL

*** THE 1ST HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: BASE32 ***
INCLUDING SOURCE(S): BASE32A , BASE32B , BASE32C ,

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

** CONC OF SO2 IN (MICROGRAMS/CUBIC-METER) **

DIRECTION (DEGREES)	DISTANCE (METERS) 19600.00	19700.00	19800.00	19900.00	20000.00
172.0	0.27780c(89040624)	0.27697c(89040624)	0.27615c(89040624)	0.27532c(89040624)	0.27449c(890
174.0	0.32198c(89040624)	0.32107c(89040624)	0.32017c(89040624)	0.31927c(89040624)	0.31836c(890
176.0	0.38397c(89040624)	0.38315c(89040624)	0.38234c(89040624)	0.38153c(89040624)	0.38072c(890
178.0	0.51036 (89012324)	0.51010 (89012324)	0.50984 (89012324)	0.50958 (89012324)	0.50931 (890
180.0	0.75405 (89012324)	0.75405 (89012324)	0.75403 (89012324)	0.75399 (89012324)	0.75395 (890
182.0	0.59963 (89012324)	0.59940 (89012324)	0.59916 (89012324)	0.59891 (89012324)	0.59865 (890
184.0	0.46857 (89102824)	0.46862 (89102824)	0.46867 (89102824)	0.46870 (89102824)	0.46873 (891
186.0	0.61026 (89120424)	0.61067 (89120424)	0.61107 (89120424)	0.61146 (89120424)	0.61183 (891
188.0	0.81682 (89120424)	0.81761 (89120424)	0.81839 (89120424)	0.81915 (89120424)	0.81989 (891

*** ISCST3 - VERSION 99155 *** *** 1989 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
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**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE 1ST HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: BASE32 ***
INCLUDING SOURCE(S): BASE32A , BASE32B , BASE32C ,

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

** CONC OF SO2 IN (MICROGRAMS/CUBIC-METER) **

DIRECTION (DEGREES)	DISTANCE (METERS) 20100.00	20200.00	20300.00	20400.00	20500.00
172.0	0.27367c(89040624)	0.27283c(89040624)	0.27199c(89040624)	0.27115c(89040624)	0.27032c(890
174.0	0.31742c(89040624)	0.31646c(89040624)	0.31573 (89103024)	0.31564 (89103024)	0.31554 (891
176.0	0.37977c(89040624)	0.37881c(89040624)	0.37785c(89040624)	0.37690c(89040624)	0.37595c(890
178.0	0.50870 (89012324)	0.50804 (89012324)	0.50738 (89012324)	0.50671 (89012324)	0.50605 (890
180.0	0.75335 (89012324)	0.75272 (89012324)	0.75209 (89012324)	0.75146 (89012324)	0.75083 (890
182.0	0.59801 (89012324)	0.59732 (89012324)	0.59663 (89012324)	0.59595 (89012324)	0.59526 (890
184.0	0.46838 (89102824)	0.46798 (89102824)	0.46757 (89102824)	0.46717 (89102824)	0.46676 (891
186.0	0.61163 (89120424)	0.61135 (89120424)	0.61107 (89120424)	0.61078 (89120424)	0.61049 (891
188.0	0.81980 (89120424)	0.81965 (89120424)	0.81950 (89120424)	0.81934 (89120424)	0.81918 (891

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CONC RURAL FLAT DFAULT NOCMPL

*** THE 1ST HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: BASE32 ***
INCLUDING SOURCE(S): BASE32A , BASE32B , BASE32C ,

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

** CONC OF SO2 IN (MICROGRAMS/CUBIC-METER) **

DIRECTION (DEGREES)	DISTANCE (METERS) 20600.00	20700.00	20800.00	20900.00
172.0	0.26949c(89040624)	0.26866c(89040624)	0.26783c(89040624)	0.26701c(89040624)
174.0	0.31544 (89103024)	0.31534 (89103024)	0.31524 (89103024)	0.31514 (89103024)
176.0	0.37501c(89040624)	0.37407c(89040624)	0.37313c(89040624)	0.37220c(89040624)
178.0	0.50539 (89012324)	0.50472 (89012324)	0.50406 (89012324)	0.50339 (89012324)
180.0	0.75019 (89012324)	0.74955 (89012324)	0.74891 (89012324)	0.74826 (89012324)
182.0	0.59457 (89012324)	0.59388 (89012324)	0.59318 (89012324)	0.59249 (89012324)

```
   184.0 |     0.46635 (89102824)     0.46593 (89102824)     0.46552 (89102824)     0.46510 (89102824)
   186.0 |     0.61020 (89120424)     0.60990 (89120424)     0.60960 (89120424)     0.60929 (89120424)
   188.0 |     0.81901 (89120424)     0.81883 (89120424)     0.81865 (89120424)     0.81846 (89120424)
 *** ISCST3 - VERSION 99155 ***    *** 1989 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE     10/9/99        ***        10/24
                                   *** FUEL OIL, SO2 24-HR BASELOAD 32 DEG. F                              ***        12:36:
**MODELOPTs:                                                                                                          PAGE
CONC                       RURAL  FLAT          DFAULT                                                        NOCMPL

                                            *** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

                                    ** CONC OF SO2      IN (MICROGRAMS/CUBIC-METER)                  **

                                                    DATE                                                              NETWOR
GROUP ID                         AVERAGE CONC     (YYMMDDHH)            RECEPTOR  (XR, YR, ZELEV, ZFLAG)     OF TYPE  GRID-I
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

BASE32   HIGH  1ST HIGH VALUE IS      0.81989  ON 89120424: AT (   -2783.46,    -19805.36,       0.00,       0.00)  GP    POL

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
 *** ISCST3 - VERSION 99155 ***    *** 1989 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE     10/9/99        ***        10/24
                                   *** FUEL OIL, SO2 24-HR BASELOAD 32 DEG. F                              ***        12:36:
**MODELOPTs:                                                                                                          PAGE
CONC                       RURAL  FLAT          DFAULT                                                        NOCMPL

*** Message Summary : ISCST3 Model Execution ***

 --------- Summary of Total Messages --------

A Total of          0 Fatal Error Message(s)
A Total of          0 Warning Message(s)
A Total of        523 Informational Message(s)

A Total of        523 Calm Hours Identified

   ******** FATAL ERROR MESSAGES ********
              ***  NONE  ***

   ********   WARNING MESSAGES   ********
              ***  NONE  ***

   *************************************
   *** ISCST3 Finishes Successfully ***
   *************************************
```

```
CO STARTING
CO TITLEONE 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE      10/9/99
CO TITLETWO FUEL OIL, SO2 ANNUAL BASELOAD 32 DEG. F
CO MODELOPT DFAULT CONC   RURAL NOCMPL
CO AVERTIME  PERIOD
CO POLLUTID SO2
CO DCAYCOEF    .000000
CO RUNORNOT RUN
CO FINISHED

SO STARTING

** Source Location Cards:
**          SRCID SRCTYP        XS             YS             ZS
** MODELING ORIGIN CT 2 STACK LOCATION
** LOCATION IS USED FOR POLAR DISCRETE RECEPTORS.
**  CT STACK NUMBER CODE
** -----------------------
**  A -  CT 1
**  B -  CT 2
**  C -  CT 3
** Source Location Cards:
**          SRCID SRCTYP      XS        YS        ZS
**   UTM                      (m)       (m)       (m)
SO LOCATION  BASE32A  POINT  -35.36     0.0       0.0
SO LOCATION  BASE32B  POINT    0.00     0.0       0.0
SO LOCATION  BASE32C  POINT   35.36     0.0       0.0
**
**
** Source Parameter Cards:
** POINT:   SRCID           QS       HS         TS        VS        DS
**                         (g/s)     (m)        (K)       (m/s)     (m)
SO SRCPARAM   BASE32A      12.79     18.3       853.2     37.31     6.71
SO SRCPARAM   BASE32B      12.79     18.3       853.2     37.31     6.71
SO SRCPARAM   BASE32C      12.79     18.3       853.2     37.31     6.71
**
**
SO BUILDHGT BASE32A-BASE95A     6.71     6.71     6.71    14.33     0.00     0.00
SO BUILDHGT BASE32A-BASE95A     0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT BASE32A-BASE95A     0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDHGT BASE32A-BASE95A    14.33    14.33    14.33    14.33    14.33    14.33
SO BUILDHGT BASE32A-BASE95A     6.71     6.71     0.00     0.00     0.00     0.00
SO BUILDHGT BASE32A-BASE95A     0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDWID BASE32A-BASE95A    11.23    12.97    14.32    15.46     0.00     0.00
SO BUILDWID BASE32A-BASE95A     0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID BASE32A-BASE95A     0.00    15.23    14.32    12.97    11.23     9.14
SO BUILDWID BASE32A-BASE95A    12.71    14.06    14.99    15.46    15.46    14.99
SO BUILDWID BASE32A-BASE95A    15.16    14.19     0.00     0.00     0.00     0.00
SO BUILDWID BASE32A-BASE95A     0.00    15.23    14.32    12.97    11.23     9.14
**
**
SO BUILDHGT BASE32B-BASE95B     6.71     6.71     6.71    14.33     0.00     0.00
SO BUILDHGT BASE32B-BASE95B     0.00     0.00     0.00     6.71     6.71     6.71
SO BUILDHGT BASE32B-BASE95B    14.33    14.33    14.33    14.33     6.71     6.71
SO BUILDHGT BASE32B-BASE95B    14.33    14.33    14.33    14.33    14.33    14.33
SO BUILDHGT BASE32B-BASE95B     6.71     6.71     0.00     0.00     0.00     0.00
SO BUILDHGT BASE32B-BASE95B     0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDWID BASE32B-BASE95B    11.23    12.97    14.32    15.46     0.00     0.00
SO BUILDWID BASE32B-BASE95B     0.00     0.00     0.00    14.19    15.16    15.66
SO BUILDWID BASE32B-BASE95B    15.46    15.46    14.99    14.06    11.23     9.14
SO BUILDWID BASE32B-BASE95B    12.71    14.06    14.99    15.46    15.46    14.99
SO BUILDWID BASE32B-BASE95B    15.16    14.19     0.00     0.00     0.00     0.00
SO BUILDWID BASE32B-BASE95B     0.00    15.23    14.32    12.97    11.23     9.14
**
**
SO BUILDHGT BASE32C-BASE95C     6.71     6.71     6.71    14.33     0.00     0.00
SO BUILDHGT BASE32C-BASE95C     0.00     0.00     0.00     6.71     6.71    14.33
SO BUILDHGT BASE32C-BASE95C    14.33    14.33    14.33    14.33     6.71     6.71
SO BUILDHGT BASE32C-BASE95C    14.33    14.33    14.33    14.33     0.00     0.00
SO BUILDHGT BASE32C-BASE95C     0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT BASE32C-BASE95C     0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDWID BASE32C-BASE95C    11.23    12.97    14.32    15.46     0.00     0.00
SO BUILDWID BASE32C-BASE95C     0.00     0.00     0.00    14.19    15.16    14.99
SO BUILDWID BASE32C-BASE95C    15.46    15.46    14.99    14.06    11.23     9.14
SO BUILDWID BASE32C-BASE95C    12.71    14.06    14.99    15.46     0.00     0.00
SO BUILDWID BASE32C-BASE95C     0.00     0.00     0.00     0.00     0.00     0.00
```

```
SO BUILDWID BASE32C-BASE95C     0.00   15.23   14.32   12.97   11.23    9.14
**
**
SO EMISUNIT    .100000E+07 (GRAMS/SEC)         (MICROGRAMS/CUBIC-METER)
SO SRCGROUP BASE32 BASE32A BASE32B BASE32C
**
SO FINISHED

RE STARTING
RE GRIDPOLR POL STA
RE GRIDPOLR POL ORIG  0.0   0.0
RE GRIDPOLR POL DIST  14100 14200 14300 14400 14500 14600 14700 14800 14900
RE GRIDPOLR POL DIST  15000 15100 15200 15300 15400 15500 15600 15700 15800
RE GRIDPOLR POL DIST  15900
RE GRIDPOLR POL GDIR  9  242.00  2.00
RE GRIDPOLR POL END
RE FINISHED

ME STARTING
ME INPUTFIL C:\DDIRMET\TPA90D.MET
ME ANEMHGHT    6.700 METERS
ME SURFDATA  12842  1990            TAMPA
ME UAIRDATA  12842  1990            RUSKIN
ME WINDCATS    1.54    3.09    5.14    8.23    10.80
ME FINISHED

OU STARTING
OU RECTABLE ALLAVE FIRST
OU FINISHED

************************************
*** SETUP Finishes Successfully ***
************************************

  *** ISCST3 - VERSION 99155 ***    *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE      10/9/99        ***        10/24
                                    *** FUEL OIL, SO2 ANNUAL BASELOAD 32 DEG. F                                ***        12:36:
**MODELOPTs:                                                                                                              PAGE
CONC                        RURAL  FLAT          DFAULT                                                         NOCMPL

                                                *** MODEL SETUP OPTIONS SUMMARY      ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Simple Terrain Model is Selected

**Model Is Setup For Calculation of Average CONCentration Values.

  -- SCAVENGING/DEPOSITION LOGIC --
**Model Uses NO DRY DEPLETION.  DDPLETE =  F
**Model Uses NO WET DEPLETION.  WDPLETE =  F
**NO WET SCAVENGING Data Provided.
**NO GAS DRY DEPOSITION Data Provided.
**Model Does NOT Use GRIDDED TERRAIN Data for Depletion Calculations

**Model Uses RURAL Dispersion.

**Model Uses Regulatory DEFAULT Options:
          1. Final Plume Rise.
          2. Stack-tip Downwash.
          3. Buoyancy-induced Dispersion.
          4. Use Calms Processing Routine.
          5. Not Use Missing Data Processing Routine.
          6. Default Wind Profile Exponents.
          7. Default Vertical Potential Temperature Gradients.
          8. "Upper Bound" Values for Supersquat Buildings.
          9. No Exponential Decay for RURAL Mode

**Model Assumes Receptors on FLAT Terrain.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates PERIOD Averages Only

**This Run Includes:     3 Source(s);      1 Source Group(s); and     171 Receptor(s)

**The Model Assumes A Pollutant Type of:  SO2

**Model Set To Continue RUNning After the Setup Testing.
```

**Output Options Selected:
Model Outputs Tables of PERIOD Averages by Receptor
Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Anem. Hgt. (m) = 6.70 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = (GRAMS/SEC) ; Emission Rate Unit Factor = 0.10000E+07
Output Units = (MICROGRAMS/CUBIC-METER)

**Approximate Storage Requirements of Model = 1.2 MB of RAM.

**Input Runstream File: REFSO2AN.I90
**Output Print File: REFSO2AN.O90

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, SO2 ANNUAL BASELOAD 32 DEG. F *** 12:36:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (USER UNITS)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
BASE32A	0	0.12790E+02	-35.4	0.0	0.0	18.30	853.20	37.31	6.71	YES	
BASE32B	0	0.12790E+02	0.0	0.0	0.0	18.30	853.20	37.31	6.71	YES	
BASE32C	0	0.12790E+02	35.4	0.0	0.0	18.30	853.20	37.31	6.71	YES	

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, SO2 ANNUAL BASELOAD 32 DEG. F *** 12:36:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
BASE32	BASE32A , BASE32B , BASE32C ,

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, SO2 ANNUAL BASELOAD 32 DEG. F *** 12:36:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: BASE32A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	6	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	12	0.0,	0
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	30	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	36	6.7,	9

SOURCE ID: BASE32B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	6	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	12	6.7,	15
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	30	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	36	6.7,	9

SOURCE ID: BASE32C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	6	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	12	14.3,	15
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	0.0,	0.0,	0	24	0.0,	0
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	30	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	36	6.7,	9

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, SO2 ANNUAL BASELOAD 32 DEG. F *** 12:36:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** GRIDDED RECEPTOR NETWORK SUMMARY ***

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

*** ORIGIN FOR POLAR NETWORK ***
X-ORIG = 0.00 ; Y-ORIG = 0.00 (METERS)

*** DISTANCE RANGES OF NETWORK ***
(METERS)

14100.0, 14200.0, 14300.0, 14400.0, 14500.0, 14600.0, 14700.0, 14800.0, 14900.0, 15000.0,
15100.0, 15200.0, 15300.0, 15400.0, 15500.0, 15600.0, 15700.0, 15800.0, 15900.0,

*** DIRECTION RADIALS OF NETWORK ***
(DEGREES)

242.0, 244.0, 246.0, 248.0, 250.0, 252.0, 254.0, 256.0, 258.0,

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, SO2 ANNUAL BASELOAD 32 DEG. F *** 12:36:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** WIND PROFILE EXPONENTS ***

STABILITY	WIND SPEED CATEGORY					
CATEGORY	1	2	3	4	5	6
A	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
B	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
C	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00
D	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00
E	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00
F	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00

*** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***

(DEGREES KELVIN PER METER)

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
B	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
C	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
D	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
E	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01
F	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, SO2 ANNUAL BASELOAD 32 DEG. F *** 12:36:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

FILE: C:\DDIRMET\TPA90D.MET
FORMAT: (4I2,2F9.4,F6.1,I2,2F7.1,f9.4,f10.1,f8.4,i4,f7.2)
SURFACE STATION NO.: 12842 UPPER AIR STATION NO.: 12842
NAME: TAMPA NAME: RUSKIN
YEAR: 1990 YEAR: 1990

YR	MN	DY	HR	FLOW VECTOR	SPEED (M/S)	TEMP (K)	STAB CLASS	MIXING HEIGHT (M) RURAL	URBAN	USTAR (M/S)	M-O LENGTH (M)	Z-0 (M)	IPCODE	PRATE (mm/HR)
90	01	01	01	11.0	4.63	293.2	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	02	358.0	4.63	292.6	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	03	4.0	4.12	292.0	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	04	3.0	5.14	292.0	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	05	13.0	5.66	292.0	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	06	2.0	5.66	291.5	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	07	55.0	2.06	290.9	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	08	153.0	4.63	292.0	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	09	137.0	4.63	289.8	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	10	171.0	4.63	287.6	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	11	164.0	5.66	288.2	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	12	166.0	6.69	288.7	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	13	173.0	6.69	291.5	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	14	169.0	6.17	289.3	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	15	162.0	4.63	289.3	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	16	184.0	4.63	290.4	3	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	17	161.0	5.66	289.8	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	18	167.0	5.14	287.0	5	1309.0	1257.3	0.0000	0.0	0.0000	0	0.00
90	01	01	19	184.0	3.60	285.4	5	1309.0	1092.1	0.0000	0.0	0.0000	0	0.00
90	01	01	20	187.0	3.09	284.3	6	1309.0	926.9	0.0000	0.0	0.0000	0	0.00
90	01	01	21	200.0	2.57	283.2	6	1309.0	761.6	0.0000	0.0	0.0000	0	0.00
90	01	01	22	192.0	4.12	283.2	5	1309.0	596.4	0.0000	0.0	0.0000	0	0.00
90	01	01	23	210.0	3.09	282.6	6	1309.0	431.2	0.0000	0.0	0.0000	0	0.00
90	01	01	24	190.0	3.09	282.0	6	1309.0	266.0	0.0000	0.0	0.0000	0	0.00

*** NOTES: STABILITY CLASS 1=A, 2=B, 3=C, 4=D, 5=E AND 6=F.
FLOW VECTOR IS DIRECTION TOWARD WHICH WIND IS BLOWING.

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, SO2 ANNUAL BASELOAD 32 DEG. F *** 12:36:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE PERIOD (8760 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: BASE32 ***
INCLUDING SOURCE(S): BASE32A , BASE32B , BASE32C ,

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

** CONC OF SO2 IN (MICROGRAMS/CUBIC-METER) **

DIRECTION (DEGREES)	DISTANCE (METERS) 14100.00	14200.00	14300.00	14400.00	14500.00	14600.00	14700.00	14800.00	14
242.00	0.05106	0.05107	0.05108	0.05108	0.05109	0.05109	0.05110	0.05110	0
244.00	0.05298	0.05299	0.05300	0.05301	0.05302	0.05303	0.05303	0.05304	0
246.00	0.05662	0.05664	0.05665	0.05667	0.05668	0.05669	0.05670	0.05671	0

248.00	0.05781	0.05783	0.05784	0.05785	0.05785	0.05786	0.05787	0.05788	0
250.00	0.05795	0.05796	0.05796	0.05797	0.05797	0.05798	0.05798	0.05798	0
252.00	0.05849	0.05849	0.05850	0.05850	0.05851	0.05851	0.05851	0.05852	0
254.00	0.06011	0.06013	0.06015	0.06016	0.06018	0.06019	0.06021	0.06022	0
256.00	0.05870	0.05871	0.05873	0.05875	0.05876	0.05878	0.05879	0.05880	0
258.00	0.05592	0.05594	0.05595	0.05597	0.05598	0.05599	0.05600	0.05601	0

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, SO2 ANNUAL BASELOAD 32 DEG. F *** 12:36:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE PERIOD (8760 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: BASE32 ***
INCLUDING SOURCE(S): BASE32A , BASE32B , BASE32C ,

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

** CONC OF SO2 IN (MICROGRAMS/CUBIC-METER) **

DIRECTION (DEGREES)	DISTANCE (METERS) 15000.00	15100.00	15200.00	15300.00	15400.00	15500.00	15600.00	15700.00	15
242.00	0.05110	0.05108	0.05106	0.05103	0.05101	0.05098	0.05095	0.05093	0
244.00	0.05304	0.05302	0.05300	0.05297	0.05294	0.05292	0.05289	0.05286	0
246.00	0.05673	0.05671	0.05669	0.05666	0.05664	0.05662	0.05659	0.05657	0
248.00	0.05788	0.05786	0.05784	0.05781	0.05778	0.05776	0.05773	0.05770	0
250.00	0.05798	0.05795	0.05793	0.05790	0.05787	0.05784	0.05781	0.05778	0
252.00	0.05851	0.05849	0.05846	0.05844	0.05841	0.05838	0.05835	0.05832	0
254.00	0.06024	0.06023	0.06021	0.06020	0.06018	0.06016	0.06015	0.06013	0
256.00	0.05882	0.05881	0.05879	0.05878	0.05876	0.05874	0.05872	0.05870	0
258.00	0.05603	0.05602	0.05600	0.05598	0.05596	0.05594	0.05592	0.05590	0

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, SO2 ANNUAL BASELOAD 32 DEG. F *** 12:36:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE PERIOD (8760 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: BASE32 ***
INCLUDING SOURCE(S): BASE32A , BASE32B , BASE32C ,

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

** CONC OF SO2 IN (MICROGRAMS/CUBIC-METER) **

DIRECTION (DEGREES)	DISTANCE (METERS) 15900.00
242.00	0.05087
244.00	0.05280
246.00	0.05651
248.00	0.05764
250.00	0.05772
252.00	0.05826
254.00	0.06009
256.00	0.05866
258.00	0.05585

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, SO2 ANNUAL BASELOAD 32 DEG. F *** 12:36:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE SUMMARY OF MAXIMUM PERIOD (8760 HRS) RESULTS ***

** CONC OF SO2 IN (MICROGRAMS/CUBIC-METER) **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
BASE32	1ST HIGHEST VALUE IS	0.06024 AT	(-14418.93, -4134.56, 0.00, 0.00)	GP	POL
	2ND HIGHEST VALUE IS	0.06023 AT	(-14322.80, -4107.00, 0.00, 0.00)	GP	POL
	3RD HIGHEST VALUE IS	0.06023 AT	(-14515.05, -4162.12, 0.00, 0.00)	GP	POL
	4TH HIGHEST VALUE IS	0.06022 AT	(-14226.67, -4079.43, 0.00, 0.00)	GP	POL
	5TH HIGHEST VALUE IS	0.06021 AT	(-14611.18, -4189.69, 0.00, 0.00)	GP	POL
	6TH HIGHEST VALUE IS	0.06021 AT	(-14130.55, -4051.87, 0.00, 0.00)	GP	POL
	7TH HIGHEST VALUE IS	0.06020 AT	(-14707.30, -4217.25, 0.00, 0.00)	GP	POL

```
        8TH HIGHEST VALUE IS       0.06019 AT (  -14034.42,    -4024.31,       0.00,       0.00)  GP   POL
        9TH HIGHEST VALUE IS       0.06018 AT (  -14803.43,    -4244.82,       0.00,       0.00)  GP   POL
       10TH HIGHEST VALUE IS       0.06018 AT (  -13938.29,    -3996.74,       0.00,       0.00)  GP   POL


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
  *** ISCST3 - VERSION 99155 ***    *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE      10/9/99        ***        10/24
                                   *** FUEL OIL, SO2 ANNUAL BASELOAD 32 DEG. F                               ***        12:36:
**MODELOPTs:                                                                                                            PAGE
CONC                        RURAL  FLAT          DFAULT                                                         NOCMPL


*** Message Summary : ISCST3 Model Execution ***

 --------- Summary of Total Messages --------

A Total of           0 Fatal Error Message(s)
A Total of           0 Warning Message(s)
A Total of         509 Informational Message(s)

A Total of         509 Calm Hours Identified


   ******** FATAL ERROR MESSAGES ********
              ***   NONE   ***


   ********   WARNING MESSAGES   ********
              ***   NONE   ***


   *************************************
   *** ISCST3 Finishes Successfully ***
   *************************************
```

```
CO STARTING
CO TITLEONE 1989 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE      10/9/99
CO TITLETWO FUEL OIL, PM 24 HR 50% LOAD 95 DEG. F
CO MODELOPT DFAULT CONC   RURAL NOCMPL
CO AVERTIME  24
CO POLLUTID GEN
CO DCAYCOEF    .000000
CO RUNORNOT RUN
CO FINISHED

SO STARTING

** Source Location Cards:
**          SRCID SRCTYP        XS            YS            ZS
** MODELING ORIGIN CT 2 STACK LOCATION
** LOCATION IS USED FOR POLAR DISCRETE RECEPTORS.
**  CT STACK NUMBER CODE
** -----------------------
**  A -  CT 1
**  B -  CT 2
**  C -  CT 3
** Source Location Cards:
**          SRCID SRCTYP      XS        YS       ZS
**   UTM                     (m)       (m)      (m)
**
**
SO LOCATION  LD5095A  POINT  -35.36    0.0      0.0
SO LOCATION  LD5095B  POINT    0.00    0.0      0.0
SO LOCATION  LD5095C  POINT   35.36    0.0      0.0
**
** Source Parameter Cards:
** POINT:   SRCID            QS        HS        TS        VS        DS
**                          (g/s)      (m)       (K)      (m/s)      (m)
**
SO SRCPARAM   LD5095A     2.14      18.3     922.0     24.84     6.71
SO SRCPARAM   LD5095B     2.14      18.3     922.0     24.84     6.71
SO SRCPARAM   LD5095C     2.14      18.3     922.0     24.84     6.71
**
**
SO BUILDHGT LD5032A-LD7595A     6.71     6.71     6.71    14.33     0.00     0.00
SO BUILDHGT LD5032A-LD7595A     0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT LD5032A-LD7595A     0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDHGT LD5032A-LD7595A    14.33    14.33    14.33    14.33    14.33    14.33
SO BUILDHGT LD5032A-LD7595A     6.71     6.71     0.00     0.00     0.00     0.00
SO BUILDHGT LD5032A-LD7595A     0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDWID LD5032A-LD7595A    11.23    12.97    14.32    15.46     0.00     0.00
SO BUILDWID LD5032A-LD7595A     0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID LD5032A-LD7595A     0.00    15.23    14.32    12.97    11.23     9.14
SO BUILDWID LD5032A-LD7595A    12.71    14.06    14.99    15.46    15.46    14.99
SO BUILDWID LD5032A-LD7595A    15.16    14.19     0.00     0.00     0.00     0.00
SO BUILDWID LD5032A-LD7595A     0.00    15.23    14.32    12.97    11.23     9.14
**
**
SO BUILDHGT LD5032B-LD7595B     6.71     6.71     6.71    14.33     0.00     0.00
SO BUILDHGT LD5032B-LD7595B     0.00     0.00     0.00     6.71     6.71     6.71
SO BUILDHGT LD5032B-LD7595B    14.33    14.33    14.33    14.33     6.71     6.71
SO BUILDHGT LD5032B-LD7595B    14.33    14.33    14.33    14.33    14.33    14.33
SO BUILDHGT LD5032B-LD7595B     6.71     6.71     0.00     0.00     0.00     0.00
SO BUILDHGT LD5032B-LD7595B     0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDWID LD5032B-LD7595B    11.23    12.97    14.32    15.46     0.00     0.00
SO BUILDWID LD5032B-LD7595B     0.00     0.00     0.00    14.19    15.16    15.66
SO BUILDWID LD5032B-LD7595B    15.46    15.46    14.99    14.06    11.23     9.14
SO BUILDWID LD5032B-LD7595B    12.71    14.06    14.99    15.46    15.46    14.99
SO BUILDWID LD5032B-LD7595B    15.16    14.19     0.00     0.00     0.00     0.00
SO BUILDWID LD5032B-LD7595B     0.00    15.23    14.32    12.97    11.23     9.14
**
**
SO BUILDHGT LD5032C-LD7595C     6.71     6.71     6.71    14.33     0.00     0.00
SO BUILDHGT LD5032C-LD7595C     0.00     0.00     0.00     6.71     6.71    14.33
SO BUILDHGT LD5032C-LD7595C    14.33    14.33    14.33    14.33     6.71     6.71
SO BUILDHGT LD5032C-LD7595C    14.33    14.33    14.33    14.33     0.00     0.00
SO BUILDHGT LD5032C-LD7595C     0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT LD5032C-LD7595C     0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDWID LD5032C-LD7595C    11.23    12.97    14.32    15.46     0.00     0.00
SO BUILDWID LD5032C-LD7595C     0.00     0.00     0.00    14.19    15.16    14.99
SO BUILDWID LD5032C-LD7595C    15.46    15.46    14.99    14.06    11.23     9.14
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```
SO BUILDWID LD5032C-LD7595C    12.71   14.06   14.99   15.46    0.00    0.00
SO BUILDWID LD5032C-LD7595C     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID LD5032C-LD7595C     0.00   15.23   14.32   12.97   11.23    9.14
**
SO EMISUNIT    .100000E+07 (GRAMS/SEC)         (MICROGRAMS/CUBIC-METER)
SO SRCGROUP LD5095 LD5095A LD5095B LD5095C
**
SO FINISHED

RE STARTING
RE GRIDPOLR POL STA
RE GRIDPOLR POL ORIG  0.0   0.0
RE GRIDPOLR POL DIST  14100 14200 14300 14400 14500 14600 14700 14800 14900
RE GRIDPOLR POL DIST  15000 15100 15200 15300 15400 15500 15600 15700 15800
RE GRIDPOLR POL DIST  15900
RE GRIDPOLR POL GDIR  9  172.00  2.00
RE GRIDPOLR POL END
RE FINISHED

ME STARTING
ME INPUTFIL C:\DDIRMET\TPA89D.MET
ME ANEMHGHT    6.700 METERS
ME SURFDATA  12842  1989            TAMPA
ME UAIRDATA  12842  1989            RUSKIN
ME WINDCATS    1.54    3.09    5.14    8.23   10.80
ME FINISHED

OU STARTING
OU RECTABLE ALLAVE FIRST
OU FINISHED

*************************************
*** SETUP Finishes Successfully ***
*************************************

  *** ISCST3 - VERSION 99155 ***    *** 1989 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE      10/9/99          ***        10/24
                                    *** FUEL OIL, PM 24 HR 50% LOAD 95 DEG. F                                   ***        15:49:
**MODELOPTs:                                                                                                               PAGE
CONC                           RURAL  FLAT          DFAULT                                                        NOCMPL

                                              ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Simple Terrain Model is Selected

**Model Is Setup For Calculation of Average CONCentration Values.

  --  SCAVENGING/DEPOSITION LOGIC --
**Model Uses NO DRY DEPLETION.  DDPLETE =  F
**Model Uses NO WET DEPLETION.  WDPLETE =  F
**NO WET SCAVENGING Data Provided.
**NO GAS DRY DEPOSITION Data Provided.
**Model Does NOT Use GRIDDED TERRAIN Data for Depletion Calculations

**Model Uses RURAL Dispersion.

**Model Uses Regulatory DEFAULT Options:
           1. Final Plume Rise.
           2. Stack-tip Downwash.
           3. Buoyancy-induced Dispersion.
           4. Use Calms Processing Routine.
           5. Not Use Missing Data Processing Routine.
           6. Default Wind Profile Exponents.
           7. Default Vertical Potential Temperature Gradients.
           8. "Upper Bound" Values for Supersquat Buildings.
           9. No Exponential Decay for RURAL Mode

**Model Assumes Receptors on FLAT Terrain.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  1 Short Term Average(s) of:  24-HR

**This Run Includes:     3 Source(s);      1 Source Group(s); and     171 Receptor(s)

**The Model Assumes A Pollutant Type of:  GEN
```

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Anem. Hgt. (m) = 6.70 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = (GRAMS/SEC) ; Emission Rate Unit Factor = 0.10000E+07
Output Units = (MICROGRAMS/CUBIC-METER)

**Approximate Storage Requirements of Model = 1.2 MB of RAM.

**Input Runstream File: REFPM24.I89
**Output Print File: REFPM24.O89

*** ISCST3 - VERSION 99155 *** *** 1989 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, PM 24 HR 50% LOAD 95 DEG. F *** 15:49:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (USER UNITS)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
LD5095A	0	0.21400E+01	-35.4	0.0	0.0	18.30	922.00	24.84	6.71	YES	
LD5095B	0	0.21400E+01	0.0	0.0	0.0	18.30	922.00	24.84	6.71	YES	
LD5095C	0	0.21400E+01	35.4	0.0	0.0	18.30	922.00	24.84	6.71	YES	

*** ISCST3 - VERSION 99155 *** *** 1989 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, PM 24 HR 50% LOAD 95 DEG. F *** 15:49:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
LD5095	LD5095A , LD5095B , LD5095C ,

*** ISCST3 - VERSION 99155 *** *** 1989 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, PM 24 HR 50% LOAD 95 DEG. F *** 15:49:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: LD5095A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	6	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	12	0.0,	0
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	30	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	36	6.7,	9

SOURCE ID: LD5095B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	6	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	12	6.7,	15
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	30	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	36	6.7,	9

SOURCE ID: LD5095C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	.14.3,	15.5,	0	5	0.0,	0.0,	0	6	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	12	14.3,	15
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	0.0,	0.0,	0	24	0.0,	0
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	30	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	36	6.7,	9

*** ISCST3 - VERSION 99155 *** *** 1989 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, PM 24 HR 50% LOAD 95 DEG. F *** 15:49:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** GRIDDED RECEPTOR NETWORK SUMMARY ***

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

*** ORIGIN FOR POLAR NETWORK ***
X-ORIG = 0.00 ; Y-ORIG = 0.00 (METERS)

*** DISTANCE RANGES OF NETWORK ***
(METERS)

14100.0, 14200.0, 14300.0, 14400.0, 14500.0, 14600.0, 14700.0, 14800.0, 14900.0, 15000.0,
15100.0, 15200.0, 15300.0, 15400.0, 15500.0, 15600.0, 15700.0, 15800.0, 15900.0,

*** DIRECTION RADIALS OF NETWORK ***
(DEGREES)

172.0, 174.0, 176.0, 178.0, 180.0, 182.0, 184.0, 186.0, 188.0,

*** ISCST3 - VERSION 99155 *** *** 1989 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, PM 24 HR 50% LOAD 95 DEG. F *** 15:49:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** WIND PROFILE EXPONENTS ***

STABILITY	WIND SPEED CATEGORY					
CATEGORY	1	2	3	4	5	6
A	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
B	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
C	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00
D	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00
E	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00
F	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00

*** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***

(DEGREES KELVIN PER METER)

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
B	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
C	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
D	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
E	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01
F	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01

*** ISCST3 - VERSION 99155 *** *** 1989 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, PM 24 HR 50% LOAD 95 DEG. F *** 15:49:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

FILE: C:\DDIRMET\TPA89D.MET
FORMAT: (4I2,2F9.4,F6.1,I2,2F7.1,f9.4,f10.1,f8.4,i4,f7.2)
SURFACE STATION NO.: 12842 UPPER AIR STATION NO.: 12842
NAME: TAMPA NAME: RUSKIN
YEAR: 1989 YEAR: 1989

YR MN DY HR	FLOW VECTOR	SPEED (M/S)	TEMP (K)	STAB CLASS	MIXING HEIGHT (M) RURAL	URBAN	USTAR (M/S)	M-O LENGTH (M)	Z-0 (M)	IPCODE	PRATE (mm/HR)
89 01 01 01	181.0	0.00	293.2	6	999.5	590.0	0.0000	0.0	0.0000	0	0.00
89 01 01 02	338.0	2.06	293.7	5	999.1	590.0	0.0000	0.0	0.0000	0	0.00
89 01 01 03	4.0	1.54	293.7	4	998.8	998.8	0.0000	0.0	0.0000	0	0.00
89 01 01 04	13.0	1.54	293.2	4	998.4	998.4	0.0000	0.0	0.0000	0	0.00
89 01 01 05	353.0	2.06	293.2	4	998.1	998.1	0.0000	0.0	0.0000	0	0.00
89 01 01 06	352.0	1.54	292.6	4	997.8	997.8	0.0000	0.0	0.0000	0	0.00
89 01 01 07	355.0	2.06	292.6	4	997.4	997.4	0.0000	0.0	0.0000	0	0.00
89 01 01 08	333.0	2.06	292.0	4	997.1	997.1	0.0000	0.0	0.0000	0	0.00
89 01 01 09	337.0	2.06	293.2	4	996.7	996.7	0.0000	0.0	0.0000	0	0.00
89 01 01 10	351.0	2.57	294.3	3	996.4	996.4	0.0000	0.0	0.0000	0	0.00
89 01 01 11	24.0	3.09	298.2	3	996.0	996.0	0.0000	0.0	0.0000	0	0.00
89 01 01 12	6.0	4.12	297.6	3	995.7	995.7	0.0000	0.0	0.0000	0	0.00
89 01 01 13	3.0	5.14	299.3	3	995.3	995.3	0.0000	0.0	0.0000	0	0.00
89 01 01 14	9.0	5.14	299.3	4	995.0	995.0	0.0000	0.0	0.0000	0	0.00
89 01 01 15	12.0	4.63	298.7	3	995.0	995.0	0.0000	0.0	0.0000	0	0.00
89 01 01 16	24.0	3.60	298.7	3	995.0	995.0	0.0000	0.0	0.0000	0	0.00
89 01 01 17	41.0	3.60	297.6	4	995.0	995.0	0.0000	0.0	0.0000	0	0.00
89 01 01 18	57.0	3.60	295.4	5	993.9	991.5	0.0000	0.0	0.0000	0	0.00
89 01 01 19	64.0	3.09	294.3	6	990.5	980.4	0.0000	0.0	0.0000	0	0.00
89 01 01 20	27.0	2.57	293.7	6	987.0	969.4	0.0000	0.0	0.0000	0	0.00
89 01 01 21	20.0	2.57	293.2	5	983.6	958.3	0.0000	0.0	0.0000	0	0.00
89 01 01 22	92.0	3.09	293.2	4	980.1	980.1	0.0000	0.0	0.0000	0	0.00
89 01 01 23	110.0	1.54	292.6	5	976.7	936.1	0.0000	0.0	0.0000	0	0.00
89 01 01 24	70.0	2.06	292.6	4	973.2	973.2	0.0000	0.0	0.0000	0	0.00

*** NOTES: STABILITY CLASS 1=A, 2=B, 3=C, 4=D, 5=E AND 6=F.
FLOW VECTOR IS DIRECTION TOWARD WHICH WIND IS BLOWING.

*** ISCST3 - VERSION 99155 *** *** 1989 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, PM 24 HR 50% LOAD 95 DEG. F *** 15:49:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE 1ST HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: LD5095 ***
INCLUDING SOURCE(S): LD5095A , LD5095B , LD5095C ,

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

** CONC OF GEN IN (MICROGRAMS/CUBIC-METER) **

DIRECTION (DEGREES)	DISTANCE (METERS) 14100.00	14200.00	14300.00	14400.00	14500.00
172.0	0.06303 (89051124)	0.06277 (89051124)	0.06250 (89051124)	0.06224 (89051124)	0.06198 (890
174.0	0.07831c(89020824)	0.07831c(89020824)	0.07831c(89020824)	0.07830c(89020824)	0.07829c(890
176.0	0.10287c(89020824)	0.10294c(89020824)	0.10301c(89020824)	0.10307c(89020824)	0.10313c(890

178.0	0.12811 (89012324)	0.12815 (89012324)	0.12818 (89012324)	0.12820 (89012324)	0.12822 (890
180.0	0.17764 (89012324)	0.17777 (89012324)	0.17789 (89012324)	0.17800 (89012324)	0.17811 (890
182.0	0.14143 (89012324)	0.14147 (89012324)	0.14150 (89012324)	0.14153 (89012324)	0.14155 (890
184.0	0.11218c(89041624)	0.11224c(89041624)	0.11229c(89041624)	0.11235c(89041624)	0.11241c(890
186.0	0.14170 (89120424)	0.14189 (89120424)	0.14209 (89120424)	0.14227 (89120424)	0.14245 (891
188.0	0.18670 (89120424)	0.18703 (89120424)	0.18736 (89120424)	0.18767 (89120424)	0.18799 (891

*** ISCST3 - VERSION 99155 *** *** 1989 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, PM 24 HR 50% LOAD 95 DEG. F *** 15:49:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE 1ST HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: LD5095 ***
INCLUDING SOURCE(S): LD5095A , LD5095B , LD5095C ,

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

** CONC OF GEN IN (MICROGRAMS/CUBIC-METER) **

DIRECTION (DEGREES)	DISTANCE (METERS) 14600.00	14700.00	14800.00	14900.00	15000.00
172.0	0.06173 (89051124)	0.06148 (89051124)	0.06123 (89051124)	0.06099 (89051124)	0.06075 (890
174.0	0.07828c(89020824)	0.07827c(89020824)	0.07825c(89020824)	0.07824c(89020824)	0.07821c(890
176.0	0.10319c(89020824)	0.10324c(89020824)	0.10329c(89020824)	0.10334c(89020824)	0.10338c(890
178.0	0.12824 (89012324)	0.12825 (89012324)	0.12826 (89012324)	0.12826 (89012324)	0.12826 (890
180.0	0.17821 (89012324)	0.17831 (89012324)	0.17840 (89012324)	0.17848 (89012324)	0.17856 (890
182.0	0.14156 (89012324)	0.14157 (89012324)	0.14158 (89012324)	0.14158 (89012324)	0.14158 (890
184.0	0.11246c(89041624)	0.11251c(89041624)	0.11256c(89041624)	0.11261c(89041624)	0.11266c(890
186.0	0.14263 (89120424)	0.14280 (89120424)	0.14297 (89120424)	0.14313 (89120424)	0.14329 (891
188.0	0.18829 (89120424)	0.18859 (89120424)	0.18888 (89120424)	0.18917 (89120424)	0.18945 (891

*** ISCST3 - VERSION 99155 *** *** 1989 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, PM 24 HR 50% LOAD 95 DEG. F *** 15:49:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE 1ST HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: LD5095 ***
INCLUDING SOURCE(S): LD5095A , LD5095B , LD5095C ,

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

** CONC OF GEN IN (MICROGRAMS/CUBIC-METER) **

DIRECTION (DEGREES)	DISTANCE (METERS) 15100.00	15200.00	15300.00	15400.00	15500.00
172.0	0.06073 (89120324)	0.06077 (89120324)	0.06081 (89120324)	0.06085 (89120324)	0.06088 (891
174.0	0.07819c(89020824)	0.07816c(89020824)	0.07814c(89020824)	0.07810c(89020824)	0.07807c(890
176.0	0.10342c(89020824)	0.10345c(89020824)	0.10349c(89020824)	0.10352c(89020824)	0.10354c(890
178.0	0.12826 (89012324)	0.12826 (89012324)	0.12825 (89012324)	0.12823 (89012324)	0.12822 (890
180.0	0.17863 (89012324)	0.17870 (89012324)	0.17876 (89012324)	0.17881 (89012324)	0.17886 (890
182.0	0.14157 (89012324)	0.14156 (89012324)	0.14155 (89012324)	0.14153 (89012324)	0.14151 (890
184.0	0.11271c(89041624)	0.11275c(89041624)	0.11280c(89041624)	0.11284c(89041624)	0.11288c(890
186.0	0.14344 (89120424)	0.14359 (89120424)	0.14373 (89120424)	0.14387 (89120424)	0.14401 (891
188.0	0.18972 (89120424)	0.18999 (89120424)	0.19025 (89120424)	0.19050 (89120424)	0.19075 (891

*** ISCST3 - VERSION 99155 *** *** 1989 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, PM 24 HR 50% LOAD 95 DEG. F *** 15:49:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE 1ST HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: LD5095 ***
INCLUDING SOURCE(S): LD5095A , LD5095B , LD5095C ,

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

** CONC OF GEN IN (MICROGRAMS/CUBIC-METER) **

DIRECTION (DEGREES)	DISTANCE (METERS) 15600.00	15700.00	15800.00	15900.00
172.0	0.06092 (89120324)	0.06095 (89120324)	0.06098 (89120324)	0.06101 (89120324)
174.0	0.07804c(89020824)	0.07800c(89020824)	0.07796c(89020824)	0.07792c(89020824)
176.0	0.10357c(89020824)	0.10359c(89020824)	0.10361c(89020824)	0.10362c(89020824)
178.0	0.12820 (89012324)	0.12818 (89012324)	0.12815 (89012324)	0.12812 (89012324)
180.0	0.17891 (89012324)	0.17895 (89012324)	0.17898 (89012324)	0.17901 (89012324)

```
     182.0 |     0.14148 (89012324)     0.14145 (89012324)     0.14141 (89012324)     0.14138 (89012324)
     184.0 |     0.11292c(89041624)     0.11296c(89041624)     0.11300c(89041624)     0.11304c(89041624)
     186.0 |     0.14414 (89120424)     0.14426 (89120424)     0.14439 (89120424)     0.14450 (89120424)
     188.0 |     0.19100 (89120424)     0.19124 (89120424)     0.19147 (89120424)     0.19169 (89120424)
 *** ISCST3 - VERSION 99155 ***    *** 1989 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE     10/9/99        ***      10/24
                                   *** FUEL OIL, PM 24 HR 50% LOAD 95 DEG. F                               ***      15:49:
**MODELOPTs:                                                                                                        PAGE
CONC                       RURAL  FLAT         DFAULT                                                     NOCMPL

                                             *** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

                                      ** CONC OF GEN      IN (MICROGRAMS/CUBIC-METER)               **

                                                      DATE                                                          NETWOR
GROUP ID                              AVERAGE CONC     (YYMMDDHH)          RECEPTOR  (XR, YR, ZELEV, ZFLAG)    OF TYPE  GRID-I
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

LD5095    HIGH  1ST HIGH VALUE IS      0.19169  ON 89120424: AT (   -2212.85,   -15745.26,       0.00,      0.00)  GP    POL

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
 *** ISCST3 - VERSION 99155 ***    *** 1989 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE     10/9/99        ***      10/24
                                   *** FUEL OIL, PM 24 HR 50% LOAD 95 DEG. F                               ***      15:49:
**MODELOPTs:                                                                                                        PAGE
CONC                       RURAL  FLAT         DFAULT                                                     NOCMPL

*** Message Summary : ISCST3 Model Execution ***

 --------- Summary of Total Messages --------

A Total of          0 Fatal Error Message(s)
A Total of          0 Warning Message(s)
A Total of        523 Informational Message(s)

A Total of        523 Calm Hours Identified

   ******** FATAL ERROR MESSAGES ********
              ***  NONE  ***

   ********   WARNING MESSAGES   ********
              ***  NONE  ***

   ************************************
   *** ISCST3 Finishes Successfully ***
   ************************************
```

```
CO STARTING
CO TITLEONE 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE      10/9/99
CO TITLETWO FUEL OIL, PM ANNUAL 50% LOAD 95 DEG. F
CO MODELOPT DFAULT CONC   RURAL NOCMPL
CO AVERTIME  PERIOD
CO POLLUTID GEN
CO DCAYCOEF    .000000
CO RUNORNOT RUN
CO FINISHED

SO STARTING

** Source Location Cards:
**          SRCID SRCTYP        XS             YS             ZS
** MODELING ORIGIN CT 2 STACK LOCATION
** LOCATION IS USED FOR POLAR DISCRETE RECEPTORS.
**  CT STACK NUMBER CODE
** -----------------------
**  A -  CT 1
**  B -  CT 2
**  C -  CT 3
** Source Location Cards:
**          SRCID SRCTYP      XS        YS        ZS
**   UTM                     (m)       (m)       (m)
**
**
SO LOCATION  LD5095A  POINT  -35.36    0.0       0.0
SO LOCATION  LD5095B  POINT    0.00    0.0       0.0
SO LOCATION  LD5095C  POINT   35.36    0.0       0.0
**
** Source Parameter Cards:
** POINT:   SRCID           QS       HS         TS         VS         DS
**                        (g/s)      (m)        (K)       (m/s)       (m)
**
SO SRCPARAM   LD5095A     2.14      18.3      922.0      24.84      6.71
SO SRCPARAM   LD5095B     2.14      18.3      922.0      24.84      6.71
SO SRCPARAM   LD5095C     2.14      18.3      922.0      24.84      6.71
**
**
SO BUILDHGT LD5032A-LD7595A     6.71     6.71     6.71    14.33     0.00     0.00
SO BUILDHGT LD5032A-LD7595A     0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT LD5032A-LD7595A     0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDHGT LD5032A-LD7595A    14.33    14.33    14.33    14.33    14.33    14.33
SO BUILDHGT LD5032A-LD7595A     6.71     6.71     0.00     0.00     0.00     0.00
SO BUILDHGT LD5032A-LD7595A     0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDWID LD5032A-LD7595A    11.23    12.97    14.32    15.46     0.00     0.00
SO BUILDWID LD5032A-LD7595A     0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID LD5032A-LD7595A     0.00    15.23    14.32    12.97    11.23     9.14
SO BUILDWID LD5032A-LD7595A    12.71    14.06    14.99    15.46    15.46    14.99
SO BUILDWID LD5032A-LD7595A    15.16    14.19     0.00     0.00     0.00     0.00
SO BUILDWID LD5032A-LD7595A     0.00    15.23    14.32    12.97    11.23     9.14
**
**
SO BUILDHGT LD5032B-LD7595B     6.71     6.71     6.71    14.33     0.00     0.00
SO BUILDHGT LD5032B-LD7595B     0.00     0.00     0.00     6.71     6.71     6.71
SO BUILDHGT LD5032B-LD7595B    14.33    14.33    14.33    14.33     6.71     6.71
SO BUILDHGT LD5032B-LD7595B    14.33    14.33    14.33    14.33    14.33    14.33
SO BUILDHGT LD5032B-LD7595B     6.71     6.71     0.00     0.00     0.00     0.00
SO BUILDHGT LD5032B-LD7595B     0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDWID LD5032B-LD7595B    11.23    12.97    14.32    15.46     0.00     0.00
SO BUILDWID LD5032B-LD7595B     0.00     0.00     0.00    14.19    15.16    15.66
SO BUILDWID LD5032B-LD7595B    15.46    15.46    14.99    14.06    11.23     9.14
SO BUILDWID LD5032B-LD7595B    12.71    14.06    14.99    15.46    15.46    14.99
SO BUILDWID LD5032B-LD7595B    15.16    14.19     0.00     0.00     0.00     0.00
SO BUILDWID LD5032B-LD7595B     0.00    15.23    14.32    12.97    11.23     9.14
**
**
SO BUILDHGT LD5032C-LD7595C     6.71     6.71     6.71    14.33     0.00     0.00
SO BUILDHGT LD5032C-LD7595C     0.00     0.00     0.00     6.71     6.71    14.33
SO BUILDHGT LD5032C-LD7595C    14.33    14.33    14.33    14.33     6.71     6.71
SO BUILDHGT LD5032C-LD7595C    14.33    14.33    14.33    14.33     0.00     0.00
SO BUILDHGT LD5032C-LD7595C     0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT LD5032C-LD7595C     0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDWID LD5032C-LD7595C    11.23    12.97    14.32    15.46     0.00     0.00
SO BUILDWID LD5032C-LD7595C     0.00     0.00     0.00    14.19    15.16    14.99
SO BUILDWID LD5032C-LD7595C    15.46    15.46    14.99    14.06    11.23     9.14
```

```
SO BUILDWID LD5032C-LD7595C    12.71   14.06   14.99   15.46    0.00    0.00
SO BUILDWID LD5032C-LD7595C     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID LD5032C-LD7595C     0.00   15.23   14.32   12.97   11.23    9.14
**
SO EMISUNIT    .100000E+07 (GRAMS/SEC)          (MICROGRAMS/CUBIC-METER)
SO SRCGROUP LD5095 LD5095A LD5095B LD5095C
**
SO FINISHED

RE STARTING
RE GRIDPOLR POL STA
RE GRIDPOLR POL ORIG  0.0   0.0
RE GRIDPOLR POL DIST  11100 11200 11300 11400 11500 11600 11700 11800 11900
RE GRIDPOLR POL DIST  12000 12100 12200 12300 12400 12500 12600 12700 12800
RE GRIDPOLR POL DIST  12900
RE GRIDPOLR POL GDIR  9  242.00  2.00
RE GRIDPOLR POL END
RE FINISHED

ME STARTING
ME INPUTFIL C:\DDIRMET\TPA90D.MET
ME ANEMHGHT    6.700 METERS
ME SURFDATA  12842  1990            TAMPA
ME UAIRDATA  12842  1990            RUSKIN
ME WINDCATS    1.54    3.09    5.14    8.23   10.80
ME FINISHED

OU STARTING
OU RECTABLE ALLAVE FIRST
OU FINISHED

*************************************
*** SETUP Finishes Successfully ***
*************************************

  *** ISCST3 - VERSION 99155 ***    *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE      10/9/99        ***       10/24
                                    *** FUEL OIL, PM ANNUAL 50% LOAD 95 DEG. F                               ***       15:49:
**MODELOPTs:                                                                                                           PAGE
CONC                        RURAL  FLAT        DFAULT                                                        NOCMPL

                                          ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Simple Terrain Model is Selected

**Model Is Setup For Calculation of Average CONCentration Values.

  --  SCAVENGING/DEPOSITION LOGIC --
**Model Uses NO DRY DEPLETION.  DDPLETE =  F
**Model Uses NO WET DEPLETION.  WDPLETE =  F
**NO WET SCAVENGING Data Provided.
**NO GAS DRY DEPOSITION Data Provided.
**Model Does NOT Use GRIDDED TERRAIN Data for Depletion Calculations

**Model Uses RURAL Dispersion.

**Model Uses Regulatory DEFAULT Options:
           1. Final Plume Rise.
           2. Stack-tip Downwash.
           3. Buoyancy-induced Dispersion.
           4. Use Calms Processing Routine.
           5. Not Use Missing Data Processing Routine.
           6. Default Wind Profile Exponents.
           7. Default Vertical Potential Temperature Gradients.
           8. "Upper Bound" Values for Supersquat Buildings.
           9. No Exponential Decay for RURAL Mode

**Model Assumes Receptors on FLAT Terrain.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates PERIOD Averages Only

**This Run Includes:     3 Source(s);     1 Source Group(s); and     171 Receptor(s)

**The Model Assumes A Pollutant Type of:  GEN
```

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
Model Outputs Tables of PERIOD Averages by Receptor
Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Anem. Hgt. (m) = 6.70 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = (GRAMS/SEC) ; Emission Rate Unit Factor = 0.10000E+07
Output Units = (MICROGRAMS/CUBIC-METER)

**Approximate Storage Requirements of Model = 1.2 MB of RAM.

**Input Runstream File: REFPMAN.I90
**Output Print File: REFPMAN.O90

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, PM ANNUAL 50% LOAD 95 DEG. F *** 15:49:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (USER UNITS)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
LD5095A	0	0.21400E+01	-35.4	0.0	0.0	18.30	922.00	24.84	6.71	YES	
LD5095B	0	0.21400E+01	0.0	0.0	0.0	18.30	922.00	24.84	6.71	YES	
LD5095C	0	0.21400E+01	35.4	0.0	0.0	18.30	922.00	24.84	6.71	YES	

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, PM ANNUAL 50% LOAD 95 DEG. F *** 15:49:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
LD5095	LD5095A , LD5095B , LD5095C ,

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, PM ANNUAL 50% LOAD 95 DEG. F *** 15:49:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: LD5095A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	6	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	12	0.0,	0
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	30	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	36	6.7,	9

SOURCE ID: LD5095B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	6	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	12	6.7,	15
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	30	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	36	6.7,	9

```
SOURCE ID: LD5095C
 IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH     B
   1   6.7,  11.2, 0      2   6.7,  13.0, 0      3   6.7,  14.3, 0      4  14.3,  15.5, 0      5   0.0,   0.0, 0      6   0.0,  0
   7   0.0,   0.0, 0      8   0.0,   0.0, 0      9   0.0,   0.0, 0     10   6.7,  14.2, 0     11   6.7,  15.2, 0     12  14.3, 15
  13  14.3,  15.5, 0     14  14.3,  15.5, 0     15  14.3,  15.0, 0     16  14.3,  14.1, 0     17   6.7,  11.2, 0     18   6.7,  9
  19  14.3,  12.7, 0     20  14.3,  14.1, 0     21  14.3,  15.0, 0     22  14.3,  15.5, 0     23   0.0,   0.0, 0     24   0.0,  0
  25   0.0,   0.0, 0     26   0.0,   0.0, 0     27   0.0,   0.0, 0     28   0.0,   0.0, 0     29   0.0,   0.0, 0     30   0.0,  0
  31   0.0,   0.0, 0     32   6.7,  15.2, 0     33   6.7,  14.3, 0     34   6.7,  13.0, 0     35   6.7,  11.2, 0     36   6.7,  9

  *** ISCST3 - VERSION 99155 ***    *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE      10/9/99        ***          10/24
                                   *** FUEL OIL, PM ANNUAL 50% LOAD 95 DEG. F                                 ***          15:49:
**MODELOPTs:                                                                                                               PAGE
CONC                          RURAL  FLAT          DFAULT                                                          NOCMPL

                                       *** GRIDDED RECEPTOR NETWORK SUMMARY ***

                                  *** NETWORK ID: POL       ;  NETWORK TYPE: GRIDPOLR ***

                                         *** ORIGIN FOR POLAR NETWORK ***
                               X-ORIG =       0.00 ;  Y-ORIG =       0.00  (METERS)

                                         *** DISTANCE RANGES OF NETWORK ***
                                                     (METERS)

        11100.0,    11200.0,    11300.0,    11400.0,    11500.0,    11600.0,    11700.0,    11800.0,    11900.0,    12000.0,
        12100.0,    12200.0,    12300.0,    12400.0,    12500.0,    12600.0,    12700.0,    12800.0,    12900.0,

                                         *** DIRECTION RADIALS OF NETWORK ***
                                                     (DEGREES)

          242.0,      244.0,      246.0,      248.0,      250.0,      252.0,      254.0,      256.0,      258.0,
  *** ISCST3 - VERSION 99155 ***    *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE      10/9/99        ***          10/24
                                   *** FUEL OIL, PM ANNUAL 50% LOAD 95 DEG. F                                 ***          15:49:
**MODELOPTs:                                                                                                               PAGE
CONC                          RURAL  FLAT          DFAULT                                                          NOCMPL

                                             *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                                (1=YES; 0=NO)

          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1

             NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

                                  *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                          (METERS/SEC)

                                                 1.54,    3.09,    5.14,    8.23,   10.80,

                                                 *** WIND PROFILE EXPONENTS ***

             STABILITY                                WIND SPEED CATEGORY
             CATEGORY          1              2              3              4              5              6
                 A        .70000E-01     .70000E-01     .70000E-01     .70000E-01     .70000E-01     .70000E-01
                 B        .70000E-01     .70000E-01     .70000E-01     .70000E-01     .70000E-01     .70000E-01
                 C        .10000E+00     .10000E+00     .10000E+00     .10000E+00     .10000E+00     .10000E+00
                 D        .15000E+00     .15000E+00     .15000E+00     .15000E+00     .15000E+00     .15000E+00
                 E        .35000E+00     .35000E+00     .35000E+00     .35000E+00     .35000E+00     .35000E+00
                 F        .55000E+00     .55000E+00     .55000E+00     .55000E+00     .55000E+00     .55000E+00
```

*** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***
(DEGREES KELVIN PER METER)

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
B	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
C	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
D	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
E	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01
F	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, PM ANNUAL 50% LOAD 95 DEG. F *** 15:49:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

FILE: C:\DDIRMET\TPA90D.MET
FORMAT: (4I2,2F9.4,F6.1,I2,2F7.1,f9.4,f10.1,f8.4,i4,f7.2)
SURFACE STATION NO.: 12842 UPPER AIR STATION NO.: 12842
NAME: TAMPA NAME: RUSKIN
YEAR: 1990 YEAR: 1990

YR MN DY HR	FLOW VECTOR	SPEED (M/S)	TEMP (K)	STAB CLASS	MIXING HEIGHT (M) RURAL	URBAN	USTAR (M/S)	M-O LENGTH (M)	Z-0 (M)	IPCODE	PRATE (mm/HR)
90 01 01 01	11.0	4.63	293.2	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 02	358.0	4.63	292.6	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 03	4.0	4.12	292.0	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 04	3.0	5.14	292.0	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 05	13.0	5.66	292.0	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 06	2.0	5.66	291.5	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 07	55.0	2.06	290.9	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 08	153.0	4.63	292.0	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 09	137.0	4.63	289.8	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 10	171.0	4.63	287.6	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 11	164.0	5.66	288.2	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 12	166.0	6.69	288.7	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 13	173.0	6.69	291.5	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 14	169.0	6.17	289.3	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 15	162.0	4.63	289.3	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 16	184.0	4.63	290.4	3	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 17	161.0	5.66	289.8	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90 01 01 18	167.0	5.14	287.0	5	1309.0	1257.3	0.0000	0.0	0.0000	0	0.00
90 01 01 19	184.0	3.60	285.4	5	1309.0	1092.1	0.0000	0.0	0.0000	0	0.00
90 01 01 20	187.0	3.09	284.3	6	1309.0	926.9	0.0000	0.0	0.0000	0	0.00
90 01 01 21	200.0	2.57	283.2	6	1309.0	761.6	0.0000	0.0	0.0000	0	0.00
90 01 01 22	192.0	4.12	283.2	5	1309.0	596.4	0.0000	0.0	0.0000	0	0.00
90 01 01 23	210.0	3.09	282.6	6	1309.0	431.2	0.0000	0.0	0.0000	0	0.00
90 01 01 24	190.0	3.09	282.0	6	1309.0	266.0	0.0000	0.0	0.0000	0	0.00

*** NOTES: STABILITY CLASS 1=A, 2=B, 3=C, 4=D, 5=E AND 6=F.
FLOW VECTOR IS DIRECTION TOWARD WHICH WIND IS BLOWING.

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, PM ANNUAL 50% LOAD 95 DEG. F *** 15:49:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE PERIOD (8760 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: LD5095 ***
INCLUDING SOURCE(S): LD5095A , LD5095B , LD5095C ,

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

** CONC OF GEN IN (MICROGRAMS/CUBIC-METER) **

DIRECTION (DEGREES)	DISTANCE (METERS) 11100.00	11200.00	11300.00	11400.00	11500.00	11600.00	11700.00	11800.00	11
242.00	0.01284	0.01284	0.01284	0.01284	0.01284	0.01284	0.01284	0.01284	0
244.00	0.01326	0.01326	0.01326	0.01326	0.01326	0.01326	0.01326	0.01326	0

246.00	0.01411	0.01411	0.01411	0.01411	0.01411	0.01412	0.01412	0.01412	0
248.00	0.01441	0.01441	0.01441	0.01441	0.01441	0.01441	0.01441	0.01441	0
250.00	0.01445	0.01445	0.01445	0.01445	0.01445	0.01445	0.01445	0.01445	0
252.00	0.01459	0.01459	0.01459	0.01459	0.01459	0.01459	0.01459	0.01459	0
254.00	0.01495	0.01496	0.01496	0.01496	0.01497	0.01497	0.01497	0.01497	0
256.00	0.01469	0.01470	0.01470	0.01470	0.01471	0.01471	0.01471	0.01471	0
258.00	0.01412	0.01413	0.01413	0.01413	0.01414	0.01414	0.01414	0.01414	0

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, PM ANNUAL 50% LOAD 95 DEG. F *** 15:49:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE PERIOD (8760 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: LD5095 ***
INCLUDING SOURCE(S): LD5095A , LD5095B , LD5095C ,

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

** CONC OF GEN IN (MICROGRAMS/CUBIC-METER) **

DIRECTION (DEGREES)	DISTANCE (METERS) 12000.00	12100.00	12200.00	12300.00	12400.00	12500.00	12600.00	12700.00	12
242.00	0.01284	0.01283	0.01283	0.01283	0.01283	0.01283	0.01282	0.01282	0
244.00	0.01326	0.01326	0.01326	0.01326	0.01326	0.01325	0.01325	0.01325	0
246.00	0.01412	0.01412	0.01412	0.01412	0.01412	0.01411	0.01411	0.01411	0
248.00	0.01441	0.01441	0.01440	0.01440	0.01440	0.01440	0.01439	0.01439	0
250.00	0.01444	0.01444	0.01444	0.01443	0.01443	0.01443	0.01442	0.01442	0
252.00	0.01458	0.01458	0.01458	0.01457	0.01457	0.01457	0.01456	0.01456	0
254.00	0.01497	0.01498	0.01498	0.01498	0.01498	0.01498	0.01497	0.01497	0
256.00	0.01471	0.01472	0.01472	0.01472	0.01472	0.01472	0.01471	0.01471	0
258.00	0.01414	0.01414	0.01414	0.01414	0.01414	0.01414	0.01414	0.01414	0

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, PM ANNUAL 50% LOAD 95 DEG. F *** 15:49:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE PERIOD (8760 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: LD5095 ***
INCLUDING SOURCE(S): LD5095A , LD5095B , LD5095C ,

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

** CONC OF GEN IN (MICROGRAMS/CUBIC-METER) **

DIRECTION (DEGREES)	DISTANCE (METERS) 12900.00
242.00	0.01282
244.00	0.01325
246.00	0.01411
248.00	0.01438
250.00	0.01441
252.00	0.01455
254.00	0.01497
256.00	0.01471
258.00	0.01414

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, PM ANNUAL 50% LOAD 95 DEG. F *** 15:49:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE SUMMARY OF MAXIMUM PERIOD (8760 HRS) RESULTS ***

** CONC OF GEN IN (MICROGRAMS/CUBIC-METER) **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWORK GRID-ID
LD5095	1ST HIGHEST VALUE IS	0.01498 AT (	-11823.52,	-3390.34,	0.00,	0.00)	GP	POL
	2ND HIGHEST VALUE IS	0.01498 AT (	-11727.39,	-3362.78,	0.00,	0.00)	GP	POL
	3RD HIGHEST VALUE IS	0.01498 AT (	-11919.64,	-3417.90,	0.00,	0.00)	GP	POL
	4TH HIGHEST VALUE IS	0.01498 AT (	-11631.27,	-3335.21,	0.00,	0.00)	GP	POL
	5TH HIGHEST VALUE IS	0.01498 AT (	-12015.77,	-3445.47,	0.00,	0.00)	GP	POL
	6TH HIGHEST VALUE IS	0.01497 AT (	-11535.14,	-3307.65,	0.00,	0.00)	GP	POL

```
        7TH HIGHEST VALUE IS       0.01497 AT (  -12111.90,    -3473.03,      0.00,      0.00)  GP    POL
        8TH HIGHEST VALUE IS       0.01497 AT (  -11439.01,    -3280.08,      0.00,      0.00)  GP    POL
        9TH HIGHEST VALUE IS       0.01497 AT (  -12208.02,    -3500.59,      0.00,      0.00)  GP    POL
       10TH HIGHEST VALUE IS       0.01497 AT (  -11342.89,    -3252.52,      0.00,      0.00)  GP    POL


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
  *** ISCST3 - VERSION 99155 ***    *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE       10/9/99          ***          10/24
                                    *** FUEL OIL, PM ANNUAL 50% LOAD 95 DEG. F                                  ***          15:49:
**MODELOPTs:                                                                                                                 PAGE
CONC                          RURAL  FLAT          DFAULT                                                            NOCMPL


*** Message Summary : ISCST3 Model Execution ***

 --------- Summary of Total Messages --------

A Total of           0 Fatal Error Message(s)
A Total of           0 Warning Message(s)
A Total of         509 Informational Message(s)

A Total of         509 Calm Hours Identified


   ******** FATAL ERROR MESSAGES ********
             ***  NONE  ***


   ********   WARNING MESSAGES   ********
             ***  NONE  ***


   ************************************
   *** ISCST3 Finishes Successfully ***
   ************************************
```

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CO STARTING
CO TITLEONE 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE      10/9/99
CO TITLETWO FUEL OIL, NO2 ANNUAL BASELOAD 32 DEG. F
CO MODELOPT DFAULT CONC   RURAL NOCMPL
CO AVERTIME  PERIOD
CO POLLUTID NO2
CO DCAYCOEF     .000000
CO RUNORNOT RUN
CO FINISHED

SO STARTING

** Source Location Cards:
**          SRCID SRCTYP        XS            YS            ZS
** MODELING ORIGIN CT 2 STACK LOCATION
** LOCATION IS USED FOR POLAR DISCRETE RECEPTORS.
**  CT STACK NUMBER CODE
** ------------------------
**  A -  CT 1
**  B -  CT 2
**  C -  CT 3
** Source Location Cards:
**          SRCID SRCTYP      XS        YS        ZS
**   UTM                     (m)       (m)       (m)
SO LOCATION  BASE32A  POINT  -35.36    0.0       0.0
SO LOCATION  BASE32B  POINT    0.00    0.0       0.0
SO LOCATION  BASE32C  POINT   35.36    0.0       0.0
**
**
** Source Parameter Cards:
** POINT:   SRCID           QS       HS        TS        VS       DS
**                         (g/s)     (m)       (K)      (m/s)     (m)
SO SRCPARAM   BASE32A     45.6      18.3      853.2     37.31     6.71
SO SRCPARAM   BASE32B     45.6      18.3      853.2     37.31     6.71
SO SRCPARAM   BASE32C     45.6      18.3      853.2     37.31     6.71
**
**
SO BUILDHGT BASE32A-BASE95A     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT BASE32A-BASE95A     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT BASE32A-BASE95A     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDHGT BASE32A-BASE95A    14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT BASE32A-BASE95A     6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT BASE32A-BASE95A     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID BASE32A-BASE95A    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID BASE32A-BASE95A     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID BASE32A-BASE95A     0.00   15.23   14.32   12.97   11.23    9.14
SO BUILDWID BASE32A-BASE95A    12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID BASE32A-BASE95A    15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID BASE32A-BASE95A     0.00   15.23   14.32   12.97   11.23    9.14
**
**
SO BUILDHGT BASE32B-BASE95B     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT BASE32B-BASE95B     0.00    0.00    0.00    6.71    6.71    6.71
SO BUILDHGT BASE32B-BASE95B    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT BASE32B-BASE95B    14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT BASE32B-BASE95B     6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT BASE32B-BASE95B     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID BASE32B-BASE95B    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID BASE32B-BASE95B     0.00    0.00    0.00   14.19   15.16   15.66
SO BUILDWID BASE32B-BASE95B    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID BASE32B-BASE95B    12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID BASE32B-BASE95B    15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID BASE32B-BASE95B     0.00   15.23   14.32   12.97   11.23    9.14
**
**
SO BUILDHGT BASE32C-BASE95C     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT BASE32C-BASE95C     0.00    0.00    0.00    6.71    6.71   14.33
SO BUILDHGT BASE32C-BASE95C    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT BASE32C-BASE95C    14.33   14.33   14.33   14.33    0.00    0.00
SO BUILDHGT BASE32C-BASE95C     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT BASE32C-BASE95C     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID BASE32C-BASE95C    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID BASE32C-BASE95C     0.00    0.00    0.00   14.19   15.16   14.99
SO BUILDWID BASE32C-BASE95C    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID BASE32C-BASE95C    12.71   14.06   14.99   15.46    0.00    0.00
SO BUILDWID BASE32C-BASE95C     0.00    0.00    0.00    0.00    0.00    0.00
```

```
SO BUILDWID BASE32C-BASE95C     0.00    15.23    14.32    12.97    11.23     9.14
**
**
SO EMISUNIT    .100000E+07 (GRAMS/SEC)          (MICROGRAMS/CUBIC-METER)
SO SRCGROUP BASE32 BASE32A BASE32B BASE32C
**
SO FINISHED

RE STARTING
RE GRIDPOLR POL STA
RE GRIDPOLR POL ORIG  0.0   0.0
RE GRIDPOLR POL DIST  14100 14200 14300 14400 14500 14600 14700 14800 14900
RE GRIDPOLR POL DIST  15000 15100 15200 15300 15400 15500 15600 15700 15800
RE GRIDPOLR POL DIST  15900
RE GRIDPOLR POL GDIR  9  242.00  2.00
RE GRIDPOLR POL END
RE FINISHED

ME STARTING
ME INPUTFIL C:\DDIRMET\TPA90D.MET
ME ANEMHGHT    6.700 METERS
ME SURFDATA  12842  1990            TAMPA
ME UAIRDATA  12842  1990            RUSKIN
ME WINDCATS    1.54    3.09    5.14    8.23    10.80
ME FINISHED

OU STARTING
OU RECTABLE ALLAVE FIRST
OU FINISHED

************************************
*** SETUP Finishes Successfully ***
************************************

  *** ISCST3 - VERSION 99155 ***    *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE      10/9/99        ***         10/24
                                   *** FUEL OIL, NO2 ANNUAL BASELOAD 32 DEG. F                                 ***         12:36:
**MODELOPTs:                                                                                                               PAGE
CONC                          RURAL  FLAT          DFAULT                                                          NOCMPL

                                            ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Simple Terrain Model is Selected

**Model Is Setup For Calculation of Average CONCentration Values.

  --  SCAVENGING/DEPOSITION LOGIC --
**Model Uses NO DRY DEPLETION.  DDPLETE =  F
**Model Uses NO WET DEPLETION.  WDPLETE =  F
**NO WET SCAVENGING Data Provided.
**NO GAS DRY DEPOSITION Data Provided.
**Model Does NOT Use GRIDDED TERRAIN Data for Depletion Calculations

**Model Uses RURAL Dispersion.

**Model Uses Regulatory DEFAULT Options:
           1. Final Plume Rise.
           2. Stack-tip Downwash.
           3. Buoyancy-induced Dispersion.
           4. Use Calms Processing Routine.
           5. Not Use Missing Data Processing Routine.
           6. Default Wind Profile Exponents.
           7. Default Vertical Potential Temperature Gradients.
           8. "Upper Bound" Values for Supersquat Buildings.
           9. No Exponential Decay for RURAL Mode

**Model Assumes Receptors on FLAT Terrain.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates PERIOD Averages Only

**This Run Includes:      3 Source(s);      1 Source Group(s); and     171 Receptor(s)

**The Model Assumes A Pollutant Type of:  NO2

**Model Set To Continue RUNning After the Setup Testing.
```

**Output Options Selected:
Model Outputs Tables of PERIOD Averages by Receptor
Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Anem. Hgt. (m) = 6.70 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = (GRAMS/SEC) ; Emission Rate Unit Factor = 0.10000E+07
Output Units = (MICROGRAMS/CUBIC-METER)

**Approximate Storage Requirements of Model = 1.2 MB of RAM.

**Input Runstream File: REFNO2AN.I90
**Output Print File: REFNO2AN.090

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, NO2 ANNUAL BASELOAD 32 DEG. F *** 12:36:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (USER UNITS)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
BASE32A	0	0.45600E+02	-35.4	0.0	0.0	18.30	853.20	37.31	6.71	YES	
BASE32B	0	0.45600E+02	0.0	0.0	0.0	18.30	853.20	37.31	6.71	YES	
BASE32C	0	0.45600E+02	35.4	0.0	0.0	18.30	853.20	37.31	6.71	YES	

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, NO2 ANNUAL BASELOAD 32 DEG. F *** 12:36:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
BASE32	BASE32A , BASE32B , BASE32C ,

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, NO2 ANNUAL BASELOAD 32 DEG. F *** 12:36:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: BASE32A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	6	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	12	0.0,	0
13	0.0,	0.0,	0	14	6.7,	15.2,	0	15	6.7,	14.3,	0	16	6.7,	13.0,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	30	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	36	6.7,	9

SOURCE ID: BASE32B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	6	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	12	6.7,	15
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	6.7,	15.2,	0	26	6.7,	14.2,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	30	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	36	6.7,	9

SOURCE ID: BASE32C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	6.7,	11.2,	0	2	6.7,	13.0,	0	3	6.7,	14.3,	0	4	14.3,	15.5,	0	5	0.0,	0.0,	0	6	0.0,	0
7	0.0,	0.0,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	6.7,	14.2,	0	11	6.7,	15.2,	0	12	14.3,	15
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	0.0,	0.0,	0	24	0.0,	0
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	30	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.2,	0	33	6.7,	14.3,	0	34	6.7,	13.0,	0	35	6.7,	11.2,	0	36	6.7,	9

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, NO2 ANNUAL BASELOAD 32 DEG. F *** 12:36:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** GRIDDED RECEPTOR NETWORK SUMMARY ***

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

*** ORIGIN FOR POLAR NETWORK ***
X-ORIG = 0.00 ; Y-ORIG = 0.00 (METERS)

*** DISTANCE RANGES OF NETWORK ***
(METERS)

14100.0, 14200.0, 14300.0, 14400.0, 14500.0, 14600.0, 14700.0, 14800.0, 14900.0, 15000.0,
15100.0, 15200.0, 15300.0, 15400.0, 15500.0, 15600.0, 15700.0, 15800.0, 15900.0,

*** DIRECTION RADIALS OF NETWORK ***
(DEGREES)

242.0, 244.0, 246.0, 248.0, 250.0, 252.0, 254.0, 256.0, 258.0,

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, NO2 ANNUAL BASELOAD 32 DEG. F *** 12:36:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** WIND PROFILE EXPONENTS ***

STABILITY	WIND SPEED CATEGORY					
CATEGORY	1	2	3	4	5	6
A	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
B	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
C	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00
D	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00
E	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00
F	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00

*** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***

(DEGREES KELVIN PER METER)

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
B	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
C	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
D	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
E	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01
F	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
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**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

FILE: C:\DDIRMET\TPA90D.MET
FORMAT: (4I2,2F9.4,F6.1,I2,2F7.1,f9.4,f10.1,f8.4,i4,f7.2)
SURFACE STATION NO.: 12842 UPPER AIR STATION NO.: 12842
NAME: TAMPA NAME: RUSKIN
YEAR: 1990 YEAR: 1990

YR	MN	DY	HR	FLOW VECTOR	SPEED (M/S)	TEMP (K)	STAB CLASS	MIXING HEIGHT (M) RURAL	URBAN	USTAR (M/S)	M-O LENGTH (M)	Z-0 (M)	IPCODE	PRATE (mm/HR)
90	01	01	01	11.0	4.63	293.2	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	02	358.0	4.63	292.6	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	03	4.0	4.12	292.0	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	04	3.0	5.14	292.0	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	05	13.0	5.66	292.0	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	06	2.0	5.66	291.5	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	07	55.0	2.06	290.9	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	08	153.0	4.63	292.0	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	09	137.0	4.63	289.8	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	10	171.0	4.63	287.6	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	11	164.0	5.66	288.2	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	12	166.0	6.69	288.7	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	13	173.0	6.69	291.5	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	14	169.0	6.17	289.3	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	15	162.0	4.63	289.3	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	16	184.0	4.63	290.4	3	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	17	161.0	5.66	289.8	4	1309.0	1309.0	0.0000	0.0	0.0000	0	0.00
90	01	01	18	167.0	5.14	287.0	5	1309.0	1257.3	0.0000	0.0	0.0000	0	0.00
90	01	01	19	184.0	3.60	285.4	5	1309.0	1092.1	0.0000	0.0	0.0000	0	0.00
90	01	01	20	187.0	3.09	284.3	6	1309.0	926.9	0.0000	0.0	0.0000	0	0.00
90	01	01	21	200.0	2.57	283.2	6	1309.0	761.6	0.0000	0.0	0.0000	0	0.00
90	01	01	22	192.0	4.12	283.2	5	1309.0	596.4	0.0000	0.0	0.0000	0	0.00
90	01	01	23	210.0	3.09	282.6	6	1309.0	431.2	0.0000	0.0	0.0000	0	0.00
90	01	01	24	190.0	3.09	282.0	6	1309.0	266.0	0.0000	0.0	0.0000	0	0.00

*** NOTES: STABILITY CLASS 1=A, 2=B, 3=C, 4=D, 5=E AND 6=F.
FLOW VECTOR IS DIRECTION TOWARD WHICH WIND IS BLOWING.

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**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE PERIOD (8760 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: BASE32 ***
INCLUDING SOURCE(S): BASE32A , BASE32B , BASE32C ,

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

** CONC OF NO2 IN (MICROGRAMS/CUBIC-METER) **

DIRECTION (DEGREES)	DISTANCE (METERS) 14100.00	14200.00	14300.00	14400.00	14500.00	14600.00	14700.00	14800.00	14
242.00	0.18205	0.18207	0.18210	0.18212	0.18214	0.18216	0.18217	0.18219	0
244.00	0.18890	0.18893	0.18897	0.18900	0.18903	0.18905	0.18908	0.18910	0
246.00	0.20187	0.20193	0.20198	0.20203	0.20208	0.20212	0.20216	0.20220	0

248.00	0.20612	0.20616	0.20620	0.20624	0.20627	0.20630	0.20632	0.20634	0
250.00	0.20660	0.20663	0.20665	0.20667	0.20669	0.20670	0.20671	0.20672	0
252.00	0.20852	0.20854	0.20857	0.20858	0.20860	0.20861	0.20862	0.20863	0
254.00	0.21431	0.21437	0.21444	0.21450	0.21455	0.21461	0.21465	0.21470	0
256.00	0.20927	0.20933	0.20940	0.20945	0.20951	0.20956	0.20960	0.20965	0
258.00	0.19937	0.19943	0.19948	0.19953	0.19958	0.19963	0.19967	0.19971	0

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
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**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE PERIOD (8760 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: BASE32 ***
INCLUDING SOURCE(S): BASE32A , BASE32B , BASE32C ,

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

** CONC OF NO2 IN (MICROGRAMS/CUBIC-METER) **

DIRECTION (DEGREES)	DISTANCE (METERS) 15000.00	15100.00	15200.00	15300.00	15400.00	15500.00	15600.00	15700.00	15
242.00	0.18220	0.18212	0.18203	0.18194	0.18185	0.18176	0.18167	0.18157	0
244.00	0.18912	0.18904	0.18895	0.18886	0.18876	0.18866	0.18857	0.18847	0
246.00	0.20226	0.20219	0.20211	0.20203	0.20194	0.20185	0.20176	0.20167	0
248.00	0.20637	0.20629	0.20620	0.20611	0.20602	0.20592	0.20582	0.20572	0
250.00	0.20671	0.20662	0.20652	0.20642	0.20632	0.20621	0.20611	0.20600	0
252.00	0.20862	0.20854	0.20844	0.20835	0.20825	0.20815	0.20805	0.20794	0
254.00	0.21477	0.21473	0.21468	0.21462	0.21456	0.21450	0.21444	0.21437	0
256.00	0.20971	0.20967	0.20961	0.20955	0.20949	0.20943	0.20936	0.20930	0
258.00	0.19977	0.19971	0.19965	0.19958	0.19951	0.19944	0.19937	0.19929	0

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
*** FUEL OIL, NO2 ANNUAL BASELOAD 32 DEG. F *** 12:36:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE PERIOD (8760 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: BASE32 ***
INCLUDING SOURCE(S): BASE32A , BASE32B , BASE32C ,

*** NETWORK ID: POL ; NETWORK TYPE: GRIDPOLR ***

** CONC OF NO2 IN (MICROGRAMS/CUBIC-METER) **

DIRECTION (DEGREES)	DISTANCE (METERS) 15900.00
242.00	0.18138
244.00	0.18826
246.00	0.20148
248.00	0.20551
250.00	0.20577
252.00	0.20772
254.00	0.21423
256.00	0.20915
258.00	0.19914

*** ISCST3 - VERSION 99155 *** *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE 10/9/99 *** 10/24
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**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT NOCMPL

*** THE SUMMARY OF MAXIMUM PERIOD (8760 HRS) RESULTS ***

** CONC OF NO2 IN (MICROGRAMS/CUBIC-METER) **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWORK GRID-ID
BASE32	1ST HIGHEST VALUE IS	0.21477 AT (	-14418.93,	-4134.56,	0.00,	0.00)	GP	POL
	2ND HIGHEST VALUE IS	0.21474 AT (	-14322.80,	-4107.00,	0.00,	0.00)	GP	POL
	3RD HIGHEST VALUE IS	0.21473 AT (	-14515.05,	-4162.12,	0.00,	0.00)	GP	POL
	4TH HIGHEST VALUE IS	0.21470 AT (	-14226.67,	-4079.43,	0.00,	0.00)	GP	POL
	5TH HIGHEST VALUE IS	0.21468 AT (	-14611.18,	-4189.69,	0.00,	0.00)	GP	POL
	6TH HIGHEST VALUE IS	0.21465 AT (	-14130.55,	-4051.87,	0.00,	0.00)	GP	POL
	7TH HIGHEST VALUE IS	0.21462 AT (	-14707.30,	-4217.25,	0.00,	0.00)	GP	POL

```
        8TH HIGHEST VALUE IS       0.21461 AT (  -14034.42,    -4024.31,      0.00,      0.00)  GP    POL
        9TH HIGHEST VALUE IS       0.21456 AT (  -14803.43,    -4244.82,      0.00,      0.00)  GP    POL
       10TH HIGHEST VALUE IS       0.21455 AT (  -13938.29,    -3996.74,      0.00,      0.00)  GP    POL

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
  *** ISCST3 - VERSION 99155 ***    *** 1990 SONAT PASCO COUNTY SITE 3 CTS/ SIMPLE CYCLE      10/9/99        ***        10/24
                                   *** FUEL OIL, NO2 ANNUAL BASELOAD 32 DEG. F                                ***       12:36:
**MODELOPTs:                                                                                                            PAGE
CONC                         RURAL  FLAT         DFAULT                                                         NOCMPL

*** Message Summary : ISCST3 Model Execution ***

 --------- Summary of Total Messages --------

A Total of           0 Fatal Error Message(s)
A Total of           0 Warning Message(s)
A Total of         509 Informational Message(s)

A Total of         509 Calm Hours Identified

   ******** FATAL ERROR MESSAGES ********
            ***  NONE  ***

   ********   WARNING MESSAGES   ********
            ***  NONE  ***

   ************************************
   *** ISCST3 Finishes Successfully ***
   ************************************
```

APPENDIX E

CALPUFF MODEL DESCRIPTION AND ASSUMPTIONS USED TO ASSESS PSD CLASS I INCREMENT CONSUMPTION IN THE CHASSAHOWITZKA NATIONAL WILDERNESS AREA

E.1 MODEL SELECTION AND SETTINGS

The California Puff (CALPUFF, Version 5.0) air modeling system was used to assess sulfur dioxide (SO_2) concentration in the PSD Class I area of the Chassahowitzka National Wilderness Area (NWA) since the Project's impacts were predicted to be greater than the PSD Class I significant impact levels. CALPUFF is a non-steady state Lagrangian Gaussian puff long-range transport model that includes algorithms for building downwash effects as well as chemical transformations (important for visibility controlling pollutants), and wet/dry deposition. The California Puff meteorological and geophysical data preprocessor (CALMET, Version 5), a preprocessor to CALPUFF, is a diagnostic meteorological model that produces a three-dimensional field of wind and temperature and a two-dimensional field of other meteorological parameters. CALMET was designed to process raw meteorological, terrain, and land-use databases to be used in the air modeling analysis. The CALPUFF modeling system uses a number of FORTRAN preprocessor programs that extract data from large databases and converts the data into formats suitable for input to CALMET. The processed data produced from CALMET was input to CALPUFF to assess the pollutant specific impact. Both CALMET and CALPUFF were used in a manner that is recommended by the IWAQM Phase 2 Report (EPA, 1998).

E.1.1 CALPUFF MODEL APPROACHES AND SETTINGS

The IWAQM has recommended approaches for performing Phase 2 refined modeling analyses that are presented in Table E-1. These approaches involve use of meteorological data, selection of receptors and dispersion conditions, and processing of model output.

The specific settings used in the CALPUFF model are presented in Table E-2.

E.1.2 BUILDING WAKE EFFECTS

The CALPUFF model included the Project's building dimensions to account for the effects of building-induced downwash on the emission sources. Dimensions for all significant building structures were processed with the Building Profile Input Program (BPIP), Version 95086, and were included in the CALPUFF model input. The PSD Analysis Report presents a listing of all structures included in the analysis.

E.2 RECEPTOR LOCATIONS

For the refined analyses, pollutant concentrations were predicted in an array of 13 discrete receptors located at the Chassahowitzka NWA. These receptors are the same as those used in the PSD Class I analysis performed Section 6 of the PSD Analysis Report.

E.3 METEOROLOGICAL DATA

E.3.1 REFINED ANALYSIS

CALMET was used to develop the gridded parameter fields required for the refined modeling analyses. The follow sections discuss the specific data used and processed in the CALMET model.

E.3.2 CALMET SETTINGS

The CALMET settings contained in Table E-3 were used for the refined modeling analysis. With the exception of hourly precipitation data files, all input data files need for CALMET were developed by the FDEP staff.

E.3.3 MODELING DOMAIN

A rectangular modeling domain extending 250 km in the east-west (x) direction and 280 km in the north-south (y) direction was used for the refined modeling analysis. The extent of the modeling domain was selected by the FDEP staff for predicting impacts at the Chassahowitzka NWA. The southwest corner of the domain is the origin and is located at 27 degrees north latitude and 83.5 degrees west longitude. This location is in the Gulf of Mexico approximately 110 km west of Venice, Florida. For the processing of meteorological and geophysical data, the domain contains 25 grid cells in the x-direction and 28 grid cells in the y-direction. The domain grid resolution is 10-km. The air modeling analysis was performed in the UTM coordinate system.

E.3.4 MESOSCALE MODEL - GENERATION 4 (MM4) DATA

Pennsylvania State University in conjunction with the NCAR Assessment Laboratory developed the MM4 data set, a prognostic wind field or "guess" field, for the United States. The hourly meteorological variables used to create this data set (wind, temperature, dew point depression, and geopotential height for eight standard levels and up to 15 significant levels) are extensive and only allow for one data base set for the year 1990. The analysis used the MM4 data to initialize the CALMET wind field. The MM4 data have a horizontal spacing of 80 km and are used to simulate atmospheric variables within the modeling domain.

The MM4 subset domain was provided by FDEP and consisted of a 6 x 6- cell rectangle, with 80 km grid resolution, extending from the MM4 grid points (49,10) to (54, 15). These data were processed to create a MM4.DAT file, for input to the CALMET model.

The MM4 data set used in the CALMET, although advanced, lacks the fine detail of specific temporal and spatial meteorological variables and geophysical data. These variables were processed into the appropriate format and introduced into the CALMET model through the additional data files obtained from the following sources.

E.3.5 SURFACE DATA STATIONS AND PROCESSING

The surface station data processed for the CALPUFF analyses consisted of data from five NWS stations or Federal Aviation Administration (FAA) Flight Service stations for Gainesville, Tampa, Daytona Beach, Vero Beach, Fort Myers and Orlando. A summary of the surface station information and locations are presented in Table E-4. The surface station parameters include wind speed, wind direction, cloud ceiling height, opaque cloud cover, dry bulb temperature, relative humidity, station pressure, and a precipitation code that is based on current weather conditions. The surface station data were processed by FDEP into a SURF.DAT file format for CALMET input.

Because the modeling domain extends largely over water, C-Man station data from Venice was obtained. These data were processed by FDEP into an over-water surface station format (i.e., SEA*.DAT) for input to CALMET. The over-water station data includes wind direction, wind speed and air temperature.

E.3.6 UPPER AIR DATA STATIONS AND PROCESSING

The analysis included three upper air NWS stations located in Ruskin, Apalachicola, and West Palm Beach. Data for each station were obtained from the FDEP in a format for CALMET input.

The data and locations for the upper air stations are presented in Table E-4.

E.3.7 PRECIPITATION DATA STATIONS AND PROCESSING

Precipitation data were processed from a network of hourly precipitation data files collected from primary and secondary NWS precipitation-recording stations located within the latitude and longitudinal limits of the modeling domain. Data for 14 stations were obtained in NCDC TD-3240 variable format and converted into a fixed-length format. The utility programs PXTRACT and PMERGE were then used to process the data into the format for the PRECIP.DAT file that is used by CALMET. A listing of the precipitation stations used for the modeling analysis is presented in Table E-5.

E.3.8 GEOPHYSICAL DATA PROCESSING

The land-use and terrain information data were developed by the FDEP for the modeling domain and were provided in a GEO.DAT file format for input to CALMET. Terrain elevations for each grid cell of the modeling domain were obtained from Digital Elevation Model (DEM) files obtained from US Geographical Survey (USGS). The DEM data was extracted for the modeling domain grid using the utility extraction program LCELEV. Land-use data was obtained from the USGS GIS.DAT which is based on the ARM3 data. The resolution of the GIS.DAT file is one-eighth of a degree in the east-west direction and one-twelfth of a degree in the north-south direction. Land-use values for the domain grid were obtained with the utility program CAL-LAND. Other parameters processed for the modeling domain by CAL-LAND include surface roughness, surface Albedo, Bowen ratio, soil heat flux, and leaf index field. The land-use parameter values were based on annual averaged values.

Table E-1. IWAQM Phase 2 Refined Modeling Analyses Recommendations [a]

Model Input/Output	Description
Meteorology	Use CALMET (minimum 6 to 10 layers in the vertical; top layer must extend above the maximum mixing depth expected); horizontal domain extends 50 to 80 km beyond outer receptors and sources being modeled; terrain elevation and land-use data is resolved for the situation.
Receptors	Within Class I area(s) of concern; obtain regulatory concurrence on coverage.
Dispersion	1. CALPUFF with default dispersion settings. 2. Use MESOPUFF II chemistry with wet and dry deposition. 3. Define background values for ozone and ammonia for area.
Processing	1. For PSD increments: Use highest, second highest 3-hour and 24-hour average SO_2 concentrations; highest, second highest 24-hour average PM_{10} concentrations; and highest annual average SO_2, PM_{10} and NO_2 concentrations. 2. For haze: process the 24-hour average SO_4, NO_3 and HNO_3 values; compute a 24-hour average relative humidity factor (f(RH)) for the day during which the highest concentration was predicted for each species; calculate extinction coefficients for each species; and compute percent change in extinction using the FLM supplied background extinction.

[a] *IWAQM Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts* (EPA, 1998)

Table E-2. CALPUFF Model Settings

Parameter	Setting
Pollutant Species	SO_2, SO_4, NO_x, HNO_3, and NO_3, and PM_{10}
Chemical Transformation	MESOPUFF II scheme
Deposition	Include both dry and wet deposition, plume depletion
Meteorological/Land Use Input	PCRAMMET (enhanced) for the screening analysis; CALMET for the refined analysis
Plume Rise	Transitional, Stack-tip downwash, Partial plume penetration
Dispersion	Puff plume element, PG /MP coefficients, rural mode, ISC building downwash scheme
Terrain Effects	Partial plume path adjustment
Output	Create binary concentration file including output species for SO_4, NO_3 and PM_{10}
Model Processing	Highest predicted 24-hour SO_4, NO_3 and PM_{10} concentrations for year
Background Values[a]	Ozone: 60 ppb; Ammonia: 10 ppb

[a] Recommended values by the FDEP.

Table E-3. CALMET Settings

Parameter	Setting
Horizontal Grid Dimensions	250 by 280 km, 10 km grid resolution
Vertical Grid	9 layers
Weather Station Data Inputs	6 surface, 3 upper air, 14 precipitation stations
Wind model options	Diagnostic wind model, no kinematic effects
Prognostic wind field model	MM4 data, 80 km resolution, 6 x 6 grid, used for wind field initialization
Output	Binary hourly gridded meteorological data file for CALPUFF input

Table E-4. Surface and Upper Air Stations Used in the CALPUFF Analysis

Station Name	Station Symbol	WBAN Number	UTM Coordinates Easting (km)	Northing (km)	Zone	Anemometer Height (m)
Surface Stations						
Tampa	TPA	12842	349.20	3094.25	17	6.7
Daytona Beach	DAB	12834	495.14	3228.05	17	9.1
Orlando	ORL	12815	468.96	3146.88	17	10.1
Gainesville	GNV	12816	377.40	3284.12	17	6.7
Vero Beach	VER	12843	557.52	3058.36	17	6.7
Fort Myers	FMY	12835	413.65	2940.38	17	6.1
Upper Air Stations						
Ruskin	TBW	12842	349.20	3094.28	17	NA
West Palm Beach	PBI	12844	587.87	2951.42	17	NA
Apalachicola	AQQ	12832	110.00[a]	3296.00	16	NA

[a] Equivalent coordinate for Zone 17; Zone 16 coordinate is 690.22 km.

Table E-5. Hourly Precipitation Stations Used in the CALPUFF Analysis

Station Name (Florida)	Station Number	UTM Coordinates		
		Easting (km)	Northing (km)	Zone
Brooksville 7 SSW	81048	358.03	3149.55	17
Daytona Beach WSO AP	82158	495.14	3228.09	17
Deland 1 SSE	82229	470.78	3209.66	17
Inglis 3 E	84273	342.63	3211.65	17
Lakeland	84797	409.87	3099.18	17
Lisbon	85076	423.59	3193.26	17
Lynne	85237	409.26	3230.30	17
Orlando WSO McCoy	86628	468.99	3146.88	17
Parrish	86880	366.99	3054.39	17
Saint Leo	87851	376.48	3135.09	17
St. Petersburg	87886	339.04	3072.21	17
Tampa WSCMO AP	88788	349.17	3094.25	17
Venice	89176	357.59	2998.18	17
Venus	89184	466.756	2996.09	17

APPENDIX F

MODELING PARAMETERS OF SOURCES INCLUDED IN PSD CLASS I INCREMENT ANALYSIS

Table F-1. Summary of Modeling Parameters for the SO2 PSD Class I Modeling Analysis at the Chassahowitzka National Wilderness Area

APIS Number	Facility Name	Facility Location (km) UTM E	UTM N	ISCST ID	APIS Src #	Stack Height (ft)	(m)	Stack Diam. (ft)	(m)	Exit Velocity (ft/s)	(m/s)	Temperature (°F)	(K)	Maximum SO2 Emissions (lb/hr)	(TPY)	(g/s)
40HIL290008	Cargill Fertilizer - Riverview	362.9	3,082.5	CGRVDAP5	55	133	40.4	7.0	2.13	52.7	16.1	109	316	20.3	89.0	2.56
		362.9	3,082.5	CGRVCAP7	04	150	45.7	6.3	1.91	80.8	24.6	154	341	466.7	2,044.0	58.8
		362.9	3,082.5	CGRVCAP8		150	45.7	8.0	2.44	43.9	13.4	151	339	416.7	1,825.0	52.5
		362.9	3,082.5	CGRVCAP9	06	150	45.7	9.0	2.74	41.5	12.7	170	350	533.3	2,336.0	67.2
		362.9	3,082.5	CGRVAFI1		136	41.5	6.0	1.83	56.0	17.1	151	339	47.0	205.8	5.92
		362.9	3,082.5	CGRVAFI2		136	41.5	6.0	1.83	50.1	15.3	151	339	47.0	205.8	5.92
		362.9	3,082.5	CGRVRK07		91.0	27.7	3.0	0.91	47.1	14.4	165	347	6.6	28.9	0.83
		362.9	3,082.5	CGRVCP46		74.1	22.6	5.0	1.52	23.0	7.0	194	363	-1,488.9	-6,521.3	-187.6
		362.9	3,082.5	CGRVCP7B		150	45.7	7.5	2.29	30.2	9.20	179	355	-575.1	-2,518.8	-72.46
		362.9	3,082.5	CGRVCP8B		150	45.7	8.0	2.44	27.5	8.38	151	339	-743.4	-3,256.1	-93.67
		362.9	3,082.5	CGRVCP9B		150	45.7	9.0	2.74	33.8	10.3	170	350	-433.3	-1,898.0	-54.6
40TPA530046	Cargill Fertilizer - Bartow	409.8	3,087.0	CGBRTC3	12,32,33	200	61.0	6.8	2.06	62.0	18.9	179	355	1,141.0	4,997.7	143.77
40TPA530052	C.F. Industries Bartow	408.4	3,082.4	CFBON05	05	206.04	62.8	7.0	2.13	35.7	10.9	190	361	400.0	1,752.0	50.4
	Bonnie Mine Rd	408.4	3,082.4	CFBON06	06	206.04	62.8	7.0	2.13	23.9	7.28	206	370	400.0	1,752.0	50.4
		408.4	3,082.4	CFBONAB	--	220	67.1	8.5	2.59	32.4	9.87	172	351	333.3	1,460.0	42
		408.4	3,082.4	CFBONAC	--	119	36.4	7.0	2.13	52.9	16.1	151	339	31.5	138.0	3.97
		408.4	3,082.4	CFBON1		100.03	30.5	4.5	1.37	40.0	12.2	170	350	-483.3	-2,117.0	-60.9
		408.4	3,082.4	CFBON2		100.03	30.5	5.5	1.68	34.0	10.4	170	350	-875.0	-3,832.5	-110.25
		408.4	3,082.4	CFBON3		100.03	30.5	9.0	2.74	14.0	4.3	196	364	-850.0	-3,723.0	-107.1
		408.4	3,082.4	CFBON4		100.03	30.5	7.0	2.13	26.0	7.9	185	358	-1,387.5	-6,077.4	-174.83
						206	62.8	7.0	2.13	35.0	10.7	185	358	-1,800.0	-7,884.0	-226.8
						206	62.8	7.0	2.13	34.0	10.4	187	359	-1,350.0	-5,913.0	-170.1
		408.4	3,082.4	CFBON56		206	62.8	7.0	2.13	34.0	10.4	187	359	-3,150.0	-13,797.0	-396.9
	CLM/Pacific Chloride	361.8	3,088.3	CLMPACCL		98.4	30.0	2.0	0.6096	65.6	20.0	215	375	166.8	730.7	21.02
	Estech/Swift Polk	411.5	3,074.2	ESTDRY1		60.0	18.3	9.7	2.95	27.8	8.47	151	339	-190.0	-832.2	-23.94
		411.5	3,074.2	ESTDRY2		61.5	18.8	9.7	2.95	16.6	5.06	152	340	-181.0	-792.6	-22.8
		411.5	3,074.2	ESTSAP		101	30.8	7.0	2.13	12.8	3.90	185	358	-737.1	-3,228.3	-92.87
40TPA530053	Farmland Industries	410.3	3,079.5	FARMLC2	03,04	100	30.5	7.5	2.286	39.4	12.0	179	355	701.3	3,071.6	88.36
	Green Bay Plant	410.3	3,079.5	FARML05	05	150	45.7	8.0	2.44	44.0	13.4	179	355	466.7	2,044.0	58.8
		410.3	3,079.5	FARML12		100	30.5	4.5	1.37	66.2	20.2	100	311	-666.5	-2,919.3	-83.98
40TPA270021	FL Crushed Stone Kiln 1	360.0	3,162.5	FCS1		320	97.5	21.3	6.48	54.6	16.6	323	435	806.3	3,531.8	101.6
	FPC Polk County Site					113	34.4	13.5	4.1148	133.0	40.5	260	400	98.0	429.3	12.35
						113	34.4	13.5	4.1	133.0	40.5	260	400	98.0	429.3	12.35
		414.3	3,073.9	FPCPKC2		113	34.4	13.5	4.1	133.0	40.5	260	400			24.7
NA	General Portland Cement #4	358.0	3,090.6	GPCEM4B		118	36.0	9.0	2.74	57.8	17.6	450	505			-62.99
NA	General Portland Cement #5	358.0	3,090.6	GPCEM5B		149	45.4	12.5	3.81	19.0	5.80	430	494			-69.3
40HIL290261	Hillsborough County RRF	368.2	3,092.7	HILRFC3		220	67.1	11.5	3.51	55.0	16.8	430	494			22.2

Table F-1. Summary of Modeling Parameters for the SO2 PSD Class I Modeling Analysis at the Chassahowitzka National Wilderness Area

APIS Number	Facility Name	Facility Location (km) UTM E	UTM N	ISCST ID	APIS Src #	Stack Height (ft)	(m)	Stack Diam. (ft)	(m)	Exit Velocity (ft/s)	(m/s)	Temperature (°F)	(K)	Maximum SO2 Emissions (lb/hr)	(TPY)	(g/s)
40TPA530057	IMC Agrico/Conserve	398.4	3,084.2	IANIC05	05	150	45.7	7.5	2.2866	33.8	10.3	174	352	333.3	1,459.9	42.0
	Nichols	398.4	3,084.2	IANIC		100	30.5	5.9	1.8	62.0	18.9	95	308			-15.2
		398.4	3,084.2	IANICDRY		80	24.4	5.0	1.52	42.3	12.9	151	339			-3.88
40TPA530059	IMC Agrico- New Wales				02	200	61.0	8.5	2.6	50.2	15.3	170	350	1,500.0	6,570.0	189
					42	199	60.7	8.5	2.6	50.2	15.3	170	350	1,000.0	4,380.0	126
		396.6	3,078.9	IAWALC2	02,42	199	60.7	8.5	2.6	50.2	15.3	170	350			315
		396.6	3,078.9	IAWAL27	27	172	52.4	7.9	2.3994	43.0	13.1	127	326	1.6	7.0	0.20
		396.6	3,078.9	IAWAL44	44	120	36.6	6.0	1.83	66.1	20.2	115	319	44.0	192.6	5.54
		396.6	3,078.9	IAWAL46	46	172	52.4	4.6	1.3996	51.8	15.8	106	314	38.1	166.9	4.8
		396.6	3,078.9	IAWALDY		69.0	21.0	7.0	2.13	61.0	18.6	165	347			-34.3
		396.6	3,078.9	IAWAL		200	61.0	8.5	2.6	46.9	14.3	170	350			-146
NA	IMC-Agrico Pierce	404.1	3,079.0	IAPRC12		80.0	24.4	5.0	1.52	42.5	12.9	151	339			-24.3
		404.1	3,079.0	IAPRC34		80.0	24.4	8.0	2.43	61.7	18.8	151	339			-23.0
40TPA530055	IMC Agrico -S. Pierce				04	145	44.2	9.0	2.74	48.5	14.8	170	350	500.0	2,190.0	63.0
					05	145	44.2	9.0	2.74	48.5	14.8	170	350	500.0	2,190.0	63.0
		407.5	3,071.3	IASOUC2	04,05	145	44.2	9.0	2.74	48.5	14.8	170	350			126
		407.5	3,071.3	IASOUC2B		150	45.7	5.2	1.6	86.6	26.4	170	350			-75.6
		407.5	3,071.3	IASOU10	10	125	38.1	10.2	3.1	47.9	14.6	130	328	35.0	153.3	4.41
40TPA530080	Imperial Phosphates (Brewer)	404.8	3,069.5	IMPRLX		90	27.4	7.5	2.29	50.0	15.3	151	339			-19.3
40TPA530003	Lakeland City Power Larsen	409.2	3,102.8	LAKLRAA	--	100	30.5	19.0	5.79	92.6	28.2	950	783	231.0	1,011.9	29.11
40TPA530004	Lakeland City Power McIntosh	408.5	3,105.8	LAKMC06	06	250	76.2	16.0	4.88	107.0	32.6	170	350	3,888.0	17,029.4	500.1
40TPA530060	Mobil Electrophos Division	405.6	3,079.4	MOBELE1		24.0	7.3	3.0	0.91	10.6	3.2	376	464			-6.53
		405.6	3,079.4	MOBELE2		20.0	6.1	3.0	0.91	25.3	7.7	376	464			-10.05
		405.6	3,079.4	MOBELE3		60.0	18.3	6.0	1.83	22.3	6.8	170	350			-21.81
		405.6	3,079.4	MOBELE4		84.0	25.6	7.0	2.13	22.9	7.0	91	306			-7.11
		405.6	3,079.4	MOBELE5		60.0	18.3	2.3	0.7	75.0	22.9	120	322			-3.17
		405.6	3,079.4	MOBELE6		96.0	29.3	7.0	2.13	28.0	8.5	106	314			-47.25
40TPA530047	Mobil Mining & Minerals Nichols	398.4	3,085.3	MBNIC04	04	85.0	25.9	7.5	2.2866	52.8	16.1	150	339	19.4	85.0	2.44
		398.4	3,085.3	MBNIC1		93.2	28.4	3.6	1.09	63.1	19.2	152	340			-13.9
		398.4	3,085.3	MBNIC2		13.0	4.0	2.6	0.8	5.9	1.8	480	522			-0.87
40HIL290102	Mobil Mining Big Four Mine	394.9	3,069.8	MBL#401	01	100	30.5	6.0	1.82	23.8	7.3	142	334	129.8	568.4	16.35
	(AMAX)	394.9	3,069.8	MBL#4AA		24.8	7.6	1.3	0.41	26.9	8.2	449	505	4.8	20.9	0.6
40TPA530048	Mulberry Phosphates (Royster)	406.8	3,085.1	MLPHS02	02	200	61.0	7.0	2.1341	32.5	9.9	200	366	283.3	1,240.9	35.7
		406.8	3,085.1	MULPHS1		167	51.0	7.0	2.13	32.5	9.9	181	356			-258
40PNL520117	Pinellas Co. RRF	335.2	3,084.1	PINEL03	03	161	49.1	9.0	2.7393	88.0	26.8	450	505			66.2
--	Seminole Electric Hardee 3	405.0	3,057.7	HARDEE3		90.0	27.4	19.0	5.7885	46.2	14.1	285	414			27.4

Table F-1. Summary of Modeling Parameters for the SO2 PSD Class I Modeling Analysis at the Chassahowitzka National Wilderness Area

APIS Number	Facility Name	Facility Location (km) UTM E	UTM N	ISCST ID	APIS Src #	Stack Height (ft)	(m)	Stack Diam. (ft)	(m)	Exit Velocity (ft/s)	(m/s)	Temperature (°F)	(K)	Maximum SO2 Emissions (lb/hr)	(TPY)	(g/s)
40PNL520042	Stauffer Shutdown	325.6	3,116.7	STAUFR1		24.0	7.3	3.0	0.91	10.6	3.2	376	464			-4.86
		325.6	3,116.7	STAUFR2		60.0	18.3	2.3	0.7	75.0	22.9	120	322			-1.50
		325.6	3,116.7	STAUFR3		161	49.0	3.9	1.2	11.8	3.6	143	335			-50.93
		325.6	3,116.7	STAUFR4		84.0	25.6	7.0	2.13	22.9	7.0	91	306			-7.36
		325.6	3,116.7	STAUFR5		84.0	25.6	3.0	0.91	22.9	7.0	120	322			-0.45
	Tampa City McKay Bay WTE	360.0	3,091.9	MCKAYC4	01-04	150	45.7	4.3	1.3	69.9	21.3	440	500			21.44
40HIL290039	TECO - Big Bend	361.9	3,075.0	TECBB04	04	499	152.1	24.0	7.3152	78.3	23.9	156	342	3,550.8	15,552.5	447.4
	(24-HR)	361.9	3,075.0	TECBB03		490	149.4	24.0	7.32	47.0	14.3	293	418			-1218
	(24-HR)	361.9	3,075.0	TECBB12		490	149.4	24.0	7.32	94.0	28.7	300	422			-2436
NA	TECO - Polk Power Station	402.5	3,067.4	TECPKAA	--	20.0	6.1	3.0	0.9	43.0	13.1	500	533	2.6	11.5	0.33
		402.5	3,067.4	TECPKAB	--	150	45.7	19.0	5.8	55.1	16.8	260	400	394.2	1,726.6	49.7
		402.5	3,067.4	TECPKAC	--	199	60.7	3.5	1.0668	30.0	9.1	1400	1033	62.1	272.0	7.82
40TPA250015	TPS - Hardee Power Station	404.8	3,057.3	HRDEX01	01	90.0	27.4	14.5	4.42	80.0	24.4	253	396	734.4	3,216.5	92.53
		404.8	3,057.3	HRDEX02	02	90.0	27.4	14.5	4.42	80.0	24.4	253	396	734.4	3,216.5	92.53
		404.8	3,057.3	HRDEX03	03	75.1	22.9	16.0	4.88	103.0	31.4	953	785	734.4	3,216.5	92.53
														2,203.1	9,649.6	
40TPA530051	US AgriChem - Fort Meade				16	175	53.3	8.5	2.59	32.9	10.0	180	355	367.0	1,607.4	46.24
					17	175	53.3	8.5	2.59	32.9	10.0	180	355	367.0	1,607.4	46.24
		416.0	3,069.0	UAFTMC2	16,17	175	53.3	8.5	2.59	32.9	10.0	180	355			92.48
	H2SO4 X	416.0	3,069.0	UAFTMX		95.0	29.0	9.9	3.02	22.2	6.8	106	314			-78.8
	GTSP	416.0	3,069.0	UAFTMGT		93.0	28.3	5.0	1.52	57.7	17.6	134	330			-18.3
40TPA530050	US Agri-Chem Bartow	413.2	3,086.3	UAGBAR1		51.8	15.8	6.0	1.83	32.8	10.0	138	332			-3.41
		413.2	3,086.3	UAGBAR2		95.0	29.0	7.0	2.12	24.6	7.5	89	305			-42.0
40TPA270024	Asphalt Pavers 3	359.9	3,162.4	ASPHALT3		40.0	12.2	4.5	1.37	34.7	10.6	219	377			2.25
40TPA270015	Asphalt Pavers 4	361.4	3,168.4	ASPHALT4		28.0	8.5	3.5	1.08	35.9	11.0	184	357			2.25
40TPA530221	Auburndale Cogeneration	420.8	3,103.3	AUBURN		160	48.8	18.0	5.5	46.9	14.3	280	411			6.40
NA	Borden Hillsborough	394.6	3,069.6	BORDHIL		100	30.5	6.0	1.82	48.5	14.8	160	344			-6.48
NA	Borden Polk	414.5	3,109.0	BORDPLK		56.0	17.1	7.7	2.34	27.1	8.3	140	333			-5.29
40HIL290005	CF Industries Zephyrhills															
	--	388.0	3,116.0	CFZEP1		110	33.5	4.9	1.5	64.0	19.5	109	316			88.2
	Proposed D					198	60.4	8.0	2.44	58.3	17.8	176	353			54.6
	Proposed C					198	60.4	8.0	2.44	58.3	17.8	176	353			54.6
		388.0	3,116.0	CFZEP		198	60.4	8.0	2.44	58.3	17.8	176	353			109.2
	Baseline C					198	60.4	8.0	2.44	53.8	16.4	176	353			-50.4

Table F-1. Summary of Modeling Parameters for the SO2 PSD Class I Modeling Analysis at the Chassahowitzka National Wilderness Area

APIS Number	Facility Name	Facility Location (km) UTM E	UTM N	ISCST ID	APIS Src #	Stack Height (ft)	(m)	Stack Diam. (ft)	(m)	Exit Velocity (ft/s)	(m/s)	Temperature (°F)	(K)	Maximum SO2 Emissions (lb/hr)	(TPY)	(g/s)
	Baseline D					198	60.4	8.0	2.44	53.8	16.4	176	353			-50.4
		388.0	3,116.0	CFZEPB		198	60.4	8.0	2.44	53.8	16.4	176	353			-100.8
	--	388.0	3,116.0	CFZEP2		61.7	18.8	5.0	1.52	61.7	18.8	109	316			-105
40TPA510066	Couch Const-Zephyrhills (Asphalt)	390.3	3,129.4	COUCHZEP		20.0	6.1	4.5	1.38	68.9	21.0	300	422			3.54
40TPA510041	Couch Const-Odessa (Asphalt)	340.7	3,119.5	COUCHODE		30.0	9.1	4.6	1.4	73.2	22.3	325	436			7.25
	Dris Paving (Asphalt)	340.6	3,119.2	DRIS		40.0	12.2	10.0	3.05	21.2	6.5	151	339			0.23
NA	Dolime															
	Dryers	404.8	3,069.5	DOLIMEDR		90.0	27.4	5.0	1.52	67.8	20.7	140	333			-5.68
	Boilers	404.8	3,069.5	DOLIMEBL		90.0	27.4	2.0	0.61	23.8	7.3	430	494			-4.52
NA	Evans Packing	383.3	3,135.8	EVANS		40.4	12.3	1.3	0.4	30.2	9.2	379	466			0.20
40TPA270017	E R Jahna (Lime Dryer)	386.7	3,155.8	ERJAHNA		35.0	10.7	6.0	1.83	29.5	9.0	129	327			0.82
NA	FDOC Boiler #3	382.2	3,166.1	FDOC		30.0	9.1	2.0	0.61	15.0	4.6	401	478			2.99
40TPA270010	FL Mining and Materials Kiln	356.2	3,169.9	FMM		105	32.0	14.0	4.27	32.5	9.9	250	394			1.45
40TPA090004	FPC - Crystal River															
	Crystal River 1	334.2	3,204.5	CRYRIV1B		499	152.0	15.0	4.57	138.1	42.1	300	422			-314
	Crystal River 2	334.2	3,204.5	CRYRIV2B		502	153.0	16.0	4.88	138.1	42.1	300	422			-1859
	Crystal River 4					585	178.2	25.5	7.77	68.9	21.0	253	396			1008.8
	Crystal River 5					585	178.2	25.5	7.77	68.9	21.0	253	396			1008.8
		334.2	3,204.5	CRYRIV45		585	178.2	25.5	7.77	68.9	21.0	253	396			2017.6
30ORL640028	FPC Debary	467.5	3,197.2	DEBARY		50.0	15.2	13.8	4.21	184.4	56.2	1016	820			466.4
30ORL490014	FPC Intercession City															
	07 4 CTs 7EA	446.3	3,126.0	FPCIN07		50.0	15.2	13.8	4.21	184.4	56.2	1016	820			124.4
	08 2 CTs 7FA	446.3	3,126.0	FPCIN08		50.0	15.2	23.1	7.04	105.2	32.1	1126	881			110.4
NA	Hospital Corp of America															
	Boiler #1					36.0	11.0	1.0	0.31	13.1	4.0	500	533			0.08
	Boiler #2					36.0	11.0	1.0	0.31	13.1	4.0	500	533			0.08
		333.4	3,141.0	HCOA12		36.0	11.0	1.0	0.31	13.1	4.0	500	533			0.16
NA	Kissimmee Utilities	447.7	3,127.9	KISSUT		40.0	12.2	10.0	3.05	95.5	29.1	718	654			29.4
30ORL490001	Kissimmee Utilites Exist	460.1	3,129.3	KISSEX		60.0	18.3	12.0	3.66	124.7	38.0	300	422			32.1
NA	Lake Cogen	434.0	3,198.8	LAKECOGN		100	30.5	11.0	3.35	56.2	17.1	232	384			5.04
NA	Mulberry Cogeneration															
	CT	413.6	3,080.6	MULCNAA		125	38.1	15.0	4.57	61.9	18.9	219	377			12.7
	Duct Burner	413.6	3,080.6	MULCNAB		125	38.1	6.5	1.98	30.5	9.3	300	422			0.65

Table F-1. Summary of Modeling Parameters for the SO2 PSD Class I Modeling Analysis at the Chassahowitzka National Wilderness Area

APIS Number	Facility Name	Facility Location (km) UTM E	UTM N	ISCST ID	APIS Src #	Stack Height (ft)	(m)	Stack Diam. (ft)	(m)	Exit Velocity (ft/s)	(m/s)	Temperature (°F)	(K)	Maximum SO2 Emissions (lb/hr)	(TPY)	(g/s)
NA	New Pt Richey Hospital															
	Boiler #1					36.0	11.0	1.0	0.31	12.7	3.9	520	544			0.06
	Boiler #2					36.0	11.0	1.0	0.31	12.7	3.9	520	544			0.03
		331.2	3,124.5	NEWPTR12		36.0	11.0	1.0	0.31	12.7	3.9	520	544			0.09
NA	Oman Construction	359.8	3,164.9	OMAN		25.0	7.6	6.0	1.83	20.6	6.3	165	347			2.09
30ORL480137	Orlando Utilities Commission - Stanton															
	Unit 1	483.5	3,150.6	OUC1		550	167.6	19.0	5.8	70.9	21.6	127	326			601
	Unit 2 (24-hour)	483.5	3,150.6	OUC2		550	167.6	19.0	5.8	77.1	23.5	124	324			91.8
40TPA510028	Overstreet Paving	355.9	3,143.7	OVERST		30	9.1	4.3	1.3	52.5	16.0	275	408			3.67
40TPA510056	Pasco Cty RRF	347.1	3,139.2	PASCORRF		275	83.8	10.0	3.05	51.0	15.5	250	394			14.1
NA	Pasco Cogen	385.6	3,139.0	PASCOGN		100	30.5	11.0	3.35	56.2	17.1	232	384			5.04
30ORL48109	Reedy Creek Energy Services- EPCOT															
	Generator 1					17.0	5.2	1.8	0.55	144.8	44.1	650	617			1.83
	Generator 2					17.0	5.2	1.8	0.55	144.8	44.1	650	617			1.83
		442.0	3,139.0	EPCOT12		17.0	5.2	1.8	0.55	144.8	44.1	650	617			3.66
30ORL480110	Reedy Creek Energy Services	443.1	3,144.3	REEDY		65.0	19.8	11.2	3.41	51.0	15.6	285	414			0.15
NA	Ridge Cogeneration	416.7	3,100.4	RIDGE		325	99.1	10.0	3.05	47.6	14.5	170	350			13.8

APPENDIX G

CALPUFF MODEL OUTPUT (CALPOST) OF PREDICTED SO_2 IMPACTS AT THE CLASS I AREA

```
******************************************************************************************************************
                                        CALPOST   Version 5.0          Level 990228
******************************************************************************************************************



 Run Title:
    SONAT POWER, PASCO CO PSD CLASS ISO2 REFINEMENT   10/12/99
    RECEPTORS AT CHASSAHOWITZKA NWA, 24-AND 3 HOUR AVERAGING TIME, CALPOST
    ALL PSD SOURCES

-------------------------------------------------------------------------------

INPUT GROUP: 1 -- General run control parameters
--------------

     Option to run all periods found
     in the met. file(s)  (METRUN)       Default: 0    ! METRUN =   0  !

         METRUN = 0 - Run period explicitly defined below
         METRUN = 1 - Run all periods in CALPUFF data file(s)

     Starting date:    Year  (ISYR) --    No default    ! ISYR  =  90   !
     (used only if     Month (ISMO) --    No default    ! ISMO  =  1   !
      METRUN = 0)      Day   (ISDY) --    No default    ! ISDY  =  6   !
                       Hour  (ISHR) --    No default    ! ISHR  =  0   !

     Number of hours to process (NHRS) -- No default    ! NHRS  =  8616  !

            Species to process (ASPEC) -- No default    ! ASPEC = SO2  !
            (ASPEC = VISIB for visibility processing)

     Process every hour of data?(NREP) -- Default: 1    ! NREP  =  1  !
      (1 = every hour processed,
       2 = every 2nd hour processed,
       5 = every 5th hour processed, etc.)

 Concentration and scaling factors
 --------------------------------

      Layer/deposition code (ILAYER)   -- Default: 1    ! ILAYER =  1  !
        '1'  for CALPUFF concentrations,
        '-1' for dry deposition fluxes,
        '-2' for wet deposition fluxes.

      Scaling factors of the form:     -- Defaults:     ! A =  0.0     !
            X(new) = X(old) * A + B         A = 0.0     ! B =  0.0     !
        (NOT applied if A = B = 0.0)        B = 0.0

      Add Hourly Background Concentrations?
                               (LBACK)  -- Default: F    ! LBACK =  F !

 Receptor information
 --------------------

   Gridded receptors processed?    (LG) -- Default: F    ! LG  = F  !
   Discrete receptors processed?   (LD) -- Default: F    ! LD  = T  !
   CTSG Complex terrain receptors processed?
                                  (LCT) -- Default: F    ! LCT = F  !

 --Select range of DISCRETE receptors (only used when LD = T):

   Select ALL DISCRETE receptors by setting NDRECP flag to -1;
                                  OR
   Select SPECIFIC DISCRETE receptors by entering a flag (0,1) for each
      0 = discrete receptor not processed
      1 = discrete receptor processed
   using repeated value notation to select blocks of receptors:
      23*1, 15*0, 12*1
   Flag for all receptors after the last one assigned is set to 0
   (NDRECP) -- Default: -1
                                                ! NDRECP =  -1  !


 --Select range of GRIDDED receptors (only used when LG = T):
```

```
       X index of LL corner (IBGRID) -- Default: -1     ! IBGRID = -1  !
           (-1 OR 1 <= IBGRID <= NX)

       Y index of LL corner (JBGRID) -- Default: -1     ! JBGRID = -1  !
           (-1 OR 1 <= JBGRID <= NY)

       X index of UR corner (IEGRID) -- Default: -1     ! IEGRID = -1  !
           (-1 OR 1 <= IEGRID <= NX)

       Y index of UR corner (JEGRID) -- Default: -1     ! JEGRID = -1  !
           (-1 OR 1 <= JEGRID <= NY)

   Note: Entire grid is processed if IBGRID=JBGRID=IEGRID=JEGRID=-1

 !END!
--------------------------------------------------------------------------------

INPUT GROUP: 2 -- Visibility Parameters (ASPEC = VISIB)
--------------

    Maximum relative humidity (%) used in particle growth curve
                             (RHMAX) -- Default: 98   ! RHMAX  = 0.0 !

    Modeled species to be included in computing the light extinction
     Include SULFATE?          (LVSO4) -- Default: T   ! LVSO4  = T  !
     Include NITRATE?          (LVNO3) -- Default: T   ! LVNO3  = T  !
     Include ORGANIC CARBON?   (LVOC)  -- Default: T   ! LVOC   = T  !
     Include COARSE PARTICLES? (LVPMC) -- Default: T   ! LVPMC  = T  !
     Include FINE PARTICLES?   (LVPMF) -- Default: T   ! LVPMF  = T  !

    And, when ranking for TOP-N, TOP-50, and Exceedance tables,
     Include BACKGROUND?       (LVBK)  -- Default: T   ! LVBK   = T  !

    Species name used for particulates in MODEL.DAT file
                   COARSE    (SPECPMC) -- Default: PMC ! SPECPMC = PMC !
                   FINE      (SPECPMF) -- Default: PMF ! SPECPMF = PMF !

Extinction Efficiency (1/Mm per ug/m**3)
----------------------------------------
    MODELED particulate species:
               PM  COARSE      (EEPMC) -- Default: 0.6 ! EEPMC  = 0.6 !
               PM  FINE        (EEPMF) -- Default: 1.0 ! EEPMF  = 1.0 !
    BACKGROUND particulate species:
               PM  COARSE    (EEPMCBK) -- Default: 0.6 ! EEPMCBK = 0.6 !
    Other species:
              AMMONIUM SULFATE (EESO4) -- Default: 3.0 ! EESO4  = 3.0 !
              AMMONIUM NITRATE (EENO3) -- Default: 3.0 ! EENO3  = 3.0 !
              ORGANIC CARBON   (EEOC)  -- Default: 4.0 ! EEOC   = 4.0 !
              SOIL             (EESOIL)-- Default: 1.0 ! EESOIL = 1.0 !
              ELEMENTAL CARBON (EEEC)  -- Default: 10. ! EEEC   = 10.0 !

Background Extinction Computation
---------------------------------

    Method used for background light extinction
                            (MVISBK) -- Default: 2   ! MVISBK =  2  !

         1 =  Supply single light extinction and hygroscopic fraction
              - IWAQM (1993) RH adjustment applied to hygroscopic background
                and modeled sulfate and nitrate
         2 =  Compute extinction from speciated PM measurements (A)
              - PATH RH adjustment applied to observed and modeled sulfate
                and nitrate
              - RH factor is capped at RHMAX
         3 =  Compute extinction from speciated PM measurements (B)
              - PATH RH adjustment applied to observed and modeled sulfate
                and nitrate
              - Receptor-hour excluded if RH>RHMAX
              - Receptor-day excluded if fewer than 6 valid receptor-hours
         4 =  Read hourly transmissometer background extinction measurements
              - PATH RH adjustment applied to modeled sulfate and nitrate
              - Hour excluded if measurement invalid (missing, interference,
                or large RH)
              - Receptor-hour excluded if RH>RHMAX
              - Receptor-day excluded if fewer than 6 valid receptor-hours
         5 =  Read hourly nephelometer background extinction measurements
              - Rayleigh extinction value (BEXTRAY) added to measurement
```

```
            - PATH RH adjustment applied to modeled sulfate and nitrate
            - Hour excluded if measurement invalid (missing, interference,
              or large RH)
            - Receptor-hour excluded if RH>RHMAX
            - Receptor-day excluded if fewer than 6 valid receptor-hours

    Additional inputs used for MVISBK = 1:
    --------------------------------------
     Background light extinction (1/Mm)
                               (BEXTBK) -- No default   ! BEXTBK = 0.0 !
     Percentage of particles affected by relative humidity
                               (RHFRAC) -- No default   ! RHFRAC = 0.0 !

    Additional inputs used for MVISBK = 2,3:
    ----------------------------------------
     Background extinction coefficients are computed from monthly
     CONCENTRATIONS of ammonium sulfate (BKSO4), ammonium nitrate (BKNO3),
     coarse particulates (BKPMC), organic carbon (BKOC), soil (BKSOIL), and
     elemental carbon (BKEC).  Month 1 is January.
     (ug/m**3)

     (BKSO4)  -- No default    ! BKSO4 = 0.0, 0.0, 0.0, 0.0,
                                         0.0, 0.0, 0.0, 0.0,
                                         0.0, 0.0, 0.0, 0.0 !
     (BKNO3)  -- No default    ! BKNO3 = 0.0, 0.0, 0.0, 0.0,
                                         0.0, 0.0, 0.0, 0.0,
                                         0.0, 0.0, 0.0, 0.0 !
     (BKPMC)  -- No default    ! BKPMC = 0.0, 0.0, 0.0, 0.0,
                                         0.0, 0.0, 0.0, 0.0,
                                         0.0, 0.0, 0.0, 0.0 !
     (BKOC)   -- No default    ! BKOC  = 0.0, 0.0, 0.0, 0.0,
                                         0.0, 0.0, 0.0, 0.0,
                                         0.0, 0.0, 0.0, 0.0 !
     (BKSOIL) -- No default    ! BKSOIL= 0.0, 0.0, 0.0, 0.0,
                                         0.0, 0.0, 0.0, 0.0,
                                         0.0, 0.0, 0.0, 0.0 !
     (BKEC)   -- No default    ! BKEC  = 0.0, 0.0, 0.0, 0.0,
                                         0.0, 0.0, 0.0, 0.0,
                                         0.0, 0.0, 0.0, 0.0 !

    Additional inputs used for MVISBK = 2,3,5:
    ------------------------------------------
     Extinction due to Rayleigh scattering is added (1/Mm)
                              (BEXTRAY) -- Default: 10.0 ! BEXTRAY = 0.0 !

!END!
-------------------------------------------------------------------------------

INPUT GROUP: 3 -- Processing options
--------------

Averaging time and TOP 50 Table control
----------------------------------------
    User-specified averaging time
                                  (NAVG) -- Default: 0   !   NAVG =  0  !
    Top 50 table for  1-hr averages
                                 (L1T50) -- Default: T   !  L1T50 = F  !
    Top 50 table for  3-hr averages
                                 (L3T50) -- Default: T   !  L3T50 = T  !
    Top 50 table for 24-hr averages
                                (L24T50) -- Default: T   ! L24T50 = T  !
    Top 50 table for NAVG-hr averages
                                 (LNT50) -- Default: F   !  LNT50 = F  !
    Top 50 table for length of run averages
                                 (LRT50) -- Default: T   !  LRT50 = F  !

TOP 'n' Table control
--------------------

    Number of 'Top' values at each receptor
                                  (NTOP) -- Default: 4   ! NTOP =  2   !
           (NTOP must be <= 4)

    Specific ranks of 'Top' values reported (NTOP values must be entered)
                         (ITOP(4) array) -- Default:     ! ITOP =  1 , 2   !
                                            1,2,3,4
```

```
    Top 'n' table for  1-hr averages
                             (L1TOPN) -- Default: F    !  L1TOPN = F  !
    Top 'n' table for  3-hr averages
                             (L3TOPN) -- Default: F    !  L3TOPN = T  !
    Top 'n' table for 24-hr averages
                            (L24TOPN) -- Default: F    ! L24TOPN = T  !
    Top 'n' table for NAVG-hr averages
                             (LNTOPN) -- Default: F    !  LNTOPN = F  !
    Top 'n' table for length of run averages
                              (LRAVG) -- Default: F    !   LRAVG = F  !


Output Units
------------
    Units for All Output      (IPRTU) -- Default: 1    ! IPRTU =  3   !
                     for              for
                Concentration    Deposition
       1 =         g/m**3         g/m**2/s
       2 =        mg/m**3        mg/m**2/s
       3 =        ug/m**3        ug/m**2/s
       4 =        ng/m**3        ng/m**2/s
       5 =      Odour Units

    Visibility: extinction expressed in 1/Mega-meters (IPRTU is ignored)


Threshold Exceedance control
---------------------------            -- Default: -1.0

    Counts will be tabulated for each average that
    exceeds a specified non-negative threshold (output units).


    Threshold for  1-hr averages   (THRESH1)     !  THRESH1 = -1.0  !
    Threshold for  3-hr averages   (THRESH3)     !  THRESH3 = -1.0  !
    Threshold for 24-hr averages  (THRESH24)     ! THRESH24 = -1.0  !
    Threshold for NAVG-hr averages (THRESHN)     !  THRESHN = -1.0  !


Selected Day (Echo) Output Control
---------------------------------      -- Default: F
    Output 1-hr averages for selected days (LECH1)      ! LECH1    = F !
    Output 3-hr averages for selected days (LECH3)      ! LECH3    = F !
    Output 24-hr averages for selected days (LECH24)    ! LECH24   = F !
    Output NAVG-hr averages for selected days (LECHN)   ! LECHN    = F !
    Output selected information for debugging (LDEBUG) ! LDEBUG   = F !

    Days selected for output IECHO(366)-- Default: 366*0
! IECHO  = 366*0  !
     (366 values must be entered)

Plot Output Options
------------------

     Plot files can be created for selected Top-n, Exceedance and Echo
     tables selected above.  Two formats for these files are available,
     DATA and GRID.  In the DATA format, results at all receptors are
     listed along with the receptor location [x,y,val1,val2,...].
     In the GRID format, results at only gridded receptors are written,
     using a compact representation.  The gridded values are written in
     rows (x varies), starting with the most southern row of the grid.
     The GRID format is given the .GRD extension, and includes headers
     compatible with the SURFER(R) plotting software.

     A plotting and analysis file is also created for the daily peak
     visibility summary output, in DATA format only.

     Generate Plot-File Output   (LPLT) -- Default: F   ! LPLT  = F !

     Write Top-n files in GRID format?
                               (LTGRD) -- Default: F   ! LTGRD = F !

     Write Exceedance files in GRID format?
                               (LXGRD) -- Default: F   ! LXGRD = F !
     Write Echo files in GRID format?
                               (LEGRD) -- Default: F   ! LEGRD = F !
```

```
!END!


 CALPOST Control File Input Summary ------------------------

    Replace run data with data in Puff file 1=Y:    0
                     Run starting date -- year:   90
                                         month:    1
                                           day:    6
                                    Julian day:    6
                           hour ending(0-23):      0
                           Run length (hours):     8616
                                       Species: SO2

Every hour of data processed -- NREP = 1


 Concentration & scaling factors
                        Layer of processed data:    1
      (>0 = concentrations, -1 = dry fluxes, -2 = wet fluxes)
                  Multiplicative scaling factor: 0.0000E+00
                        Additive scaling factor: 0.0000E+00
          Hourly background concentrations used?: F


 Receptor information
                    Gridded receptors processed?: F
                   Discrete receptors processed?: T
      CTSG Complex terrain receptors processed?: F

 Discrete Receptors Processed

 (All Discrete Receptors are Used)


 Visibility Processing is NOT Selected


 Averaging time & TOP 50 table control
     User-specified averaging time (NAVG hours):      0
                Top 50 table for  1-hr averages:      F
                Top 50 table for  3-hr averages:      T
                Top 50 table for 24-hr averages:      T
              Top 50 table for NAVG-hr averages:      F
        Top 50 table for length of run averages:      F


 Top "n" table control
        Number of "top" values at each receptor:      2
        Specific ranks of "top" values reported:    1   2

               Top "n" table for  1-hr averages: F
               Top "n" table for  3-hr averages: T
               Top "n" table for 24-hr averages: T
             Top "n" table for NAVG-hr averages: F
       Top "n" table for length of run averages: F


 Units requested for output:    (ug/m**3)


 Threshold Exceedance control
      Exceedances of a specified value will be counted for --


 Output options
                             Plot files created: F
      Output    1-hr averages for selected days: F
      Output    3-hr averages for selected days: F
      Output   24-hr averages for selected days: F
      Output NAVG-hr averages for selected days: F
      Output selected information for debugging: F


 Days selected for output tables
    0000000000  0000000000  0000000000  0000000000  0000000000  0000000000  0000000000  0000000000  0000000000  0000000000
    0000000000  0000000000  0000000000  0000000000  0000000000  0000000000  0000000000  0000000000  0000000000  0000000000
```

0000000000 0000000000 0000000000 0000000000 0000000000 0000000000 0000000000 0000000000 0000000000 0000000000
0000000000 0000000000 0000000000 0000000000 0000000000 0000000000 000000

IDENTIFICATION OF PROCESSED MODEL FILE ----------

CALPUFF 5.0 990228

REFINED SO2 PSD CLASS I INCREMENTAL ANALYSIS, SONAT PASCO CO 10/11/99
RECEPTORS AT CHASSAHOWITZKA NWA, OFFSETTING EMISSION SOURCES
FDEP CHASSAHOWITZKA CALMET DOMAIN WITH PRECIPITATION

Chemical species names for each layer in model:

SO2	1
SO4	1
NOX	1
HNO3	1
NO3	1
PM10	1

************** NOTICE ***************
NDRECP array reset to full range: all 1s

INPUT FILES

Default Name	Unit No.	File Name and Path
CALPOST.INP	5	calpost.inp
MODEL.DAT	4	c:\calmet\chass\bin

OUTPUT FILES

Default Name	Unit No.	File Name and Path
CALPOST.LST	7	calpost.lst

CALPOST Version 5.0 Level 990228

SO2 1

TOP-50 3-HOUR AVERAGE CONCENTRATION VALUES (ug/m**3)

YEAR	DAY	HOUR(0-23)	RECEPTOR	TYPE	CONCENTRATION	COORDINATES (km)	
90	138	11	(0, 2)	D	4.2487E+01	340.300	3167.700
90	138	11	(0, 3)	D	4.2076E+01	340.300	3169.800
90	138	11	(0, 1)	D	3.6919E+01	340.300	3165.700
90	112	11	(0, 12)	D	3.5727E+01	334.000	3183.400
90	138	11	(0, 4)	D	3.4482E+01	340.700	3171.900
90	143	11	(0, 12)	D	2.9561E+01	334.000	3183.400
90	143	11	(0, 11)	D	2.7508E+01	336.500	3183.400
90	143	11	(0, 7)	D	2.5162E+01	343.700	3178.300
90	158	11	(0, 4)	D	2.3495E+01	340.700	3171.900
90	158	11	(0, 3)	D	1.8426E+01	340.300	3169.800
90	85	11	(0, 6)	D	1.8395E+01	343.000	3176.200
90	143	11	(0, 6)	D	1.7843E+01	343.000	3176.200
90	260	20	(0, 12)	D	1.7737E+01	334.000	3183.400
90	260	20	(0, 11)	D	1.7225E+01	336.500	3183.400
90	85	11	(0, 7)	D	1.7073E+01	343.700	3178.300
90	240	11	(0, 5)	D	1.5679E+01	342.000	3174.000
90	260	17	(0, 12)	D	1.5077E+01	334.000	3183.400
90	260	20	(0, 13)	D	1.4799E+01	331.500	3183.400
90	260	17	(0, 13)	D	1.4705E+01	331.500	3183.400
90	260	20	(0, 10)	D	1.4297E+01	339.000	3183.400
90	151	11	(0, 5)	D	1.3338E+01	342.000	3174.000
90	252	11	(0, 7)	D	1.3274E+01	343.700	3178.300

90	135	8	(0, 2)	D	1.2996E+01	340.300	3167.700
90	88	8	(0, 5)	D	1.2975E+01	342.000	3174.000
90	252	11	(0, 8)	D	1.2579E+01	342.400	3180.600
90	323	17	(0, 10)	D	1.2558E+01	339.000	3183.400
90	170	11	(0, 6)	D	1.2498E+01	343.000	3176.200
90	211	23	(0, 9)	D	1.2337E+01	341.100	3183.400
90	250	23	(0, 12)	D	1.2327E+01	334.000	3183.400
90	250	23	(0, 11)	D	1.2315E+01	336.500	3183.400
90	85	11	(0, 8)	D	1.2242E+01	342.400	3180.600
90	219	11	(0, 9)	D	1.2210E+01	341.100	3183.400
90	112	14	(0, 9)	D	1.2208E+01	341.100	3183.400
90	250	23	(0, 13)	D	1.1967E+01	331.500	3183.400
90	143	14	(0, 13)	D	1.1963E+01	331.500	3183.400
90	250	23	(0, 10)	D	1.1897E+01	339.000	3183.400
90	356	8	(0, 1)	D	1.1755E+01	340.300	3165.700
90	253	11	(0, 5)	D	1.1688E+01	342.000	3174.000
90	221	23	(0, 9)	D	1.1569E+01	341.100	3183.400
90	170	11	(0, 2)	D	1.1533E+01	340.300	3167.700
90	135	5	(0, 2)	D	1.1515E+01	340.300	3167.700
90	88	8	(0, 6)	D	1.1436E+01	343.000	3176.200
90	135	8	(0, 4)	D	1.1427E+01	340.700	3171.900
90	135	5	(0, 1)	D	1.1407E+01	340.300	3165.700
90	88	8	(0, 7)	D	1.1314E+01	343.700	3178.300
90	250	23	(0, 9)	D	1.1236E+01	341.100	3183.400
90	170	11	(0, 1)	D	1.1204E+01	340.300	3165.700
90	260	17	(0, 11)	D	1.1135E+01	336.500	3183.400
90	88	8	(0, 12)	D	1.1129E+01	334.000	3183.400
90	88	8	(0, 11)	D	1.1125E+01	336.500	3183.400

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CALPOST Version 5.0 Level 990228

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SO2 1

TOP-50 24-HOUR AVERAGE CONCENTRATION VALUES (ug/m**3)

YEAR	DAY	HOUR(0-23)	RECEPTOR	TYPE	CONCENTRATION	COORDINATES (km)	
90	70	23	(0, 1)	D	5.4652E+00	340.300	3165.700
90	135	23	(0, 4)	D	5.3626E+00	340.700	3171.900
90	253	23	(0, 4)	D	5.3333E+00	340.700	3171.900
90	138	23	(0, 2)	D	5.2076E+00	340.300	3167.700
90	138	23	(0, 3)	D	5.1780E+00	340.300	3169.800
90	135	23	(0, 2)	D	5.0888E+00	340.300	3167.700
90	143	23	(0, 12)	D	5.0795E+00	334.000	3183.400
90	336	23	(0, 1)	D	5.0138E+00	340.300	3165.700
90	356	23	(0, 1)	D	4.7026E+00	340.300	3165.700
90	135	23	(0, 3)	D	4.5684E+00	340.300	3169.800
90	253	23	(0, 3)	D	4.5375E+00	340.300	3169.800
90	257	23	(0, 1)	D	4.5336E+00	340.300	3165.700
90	138	23	(0, 1)	D	4.5104E+00	340.300	3165.700
90	253	23	(0, 1)	D	4.5040E+00	340.300	3165.700
90	253	23	(0, 2)	D	4.4366E+00	340.300	3167.700
90	225	23	(0, 2)	D	4.3581E+00	340.300	3167.700
90	69	23	(0, 1)	D	4.3422E+00	340.300	3165.700
90	135	23	(0, 1)	D	4.3082E+00	340.300	3165.700
90	112	23	(0, 12)	D	4.2631E+00	334.000	3183.400
90	138	23	(0, 4)	D	4.2606E+00	340.700	3171.900
90	143	23	(0, 11)	D	4.2087E+00	336.500	3183.400
90	356	23	(0, 2)	D	4.2018E+00	340.300	3167.700
90	135	23	(0, 5)	D	4.1974E+00	342.000	3174.000
90	116	23	(0, 6)	D	4.1734E+00	343.000	3176.200
90	336	23	(0, 2)	D	4.0748E+00	340.300	3167.700
90	260	23	(0, 12)	D	4.0390E+00	334.000	3183.400
90	180	23	(0, 5)	D	4.0225E+00	342.000	3174.000
90	257	23	(0, 2)	D	4.0099E+00	340.300	3167.700
90	143	23	(0, 7)	D	4.0037E+00	343.700	3178.300
90	257	23	(0, 5)	D	3.9973E+00	342.000	3174.000
90	257	23	(0, 4)	D	3.9630E+00	340.700	3171.900
90	252	23	(0, 3)	D	3.9556E+00	340.300	3169.800
90	158	23	(0, 4)	D	3.9486E+00	340.700	3171.900
90	117	23	(0, 7)	D	3.8686E+00	343.700	3178.300
90	115	23	(0, 2)	D	3.8650E+00	340.300	3167.700
90	271	23	(0, 1)	D	3.8215E+00	340.300	3165.700
90	361	23	(0, 1)	D	3.8083E+00	340.300	3165.700

90	180	23	(0, 4)	D	3.8080E+00	340.700	3171.900
90	180	23	(0, 3)	D	3.8054E+00	340.300	3169.800
90	257	23	(0, 3)	D	3.7929E+00	340.300	3169.800
90	225	23	(0, 1)	D	3.7765E+00	340.300	3165.700
90	260	23	(0, 13)	D	3.7388E+00	331.500	3183.400
90	132	23	(0, 2)	D	3.7100E+00	340.300	3167.700
90	290	23	(0, 1)	D	3.6432E+00	340.300	3165.700
90	225	23	(0, 3)	D	3.6411E+00	340.300	3169.800
90	145	23	(0, 1)	D	3.6223E+00	340.300	3165.700
90	180	23	(0, 6)	D	3.5750E+00	343.000	3176.200
90	226	23	(0, 6)	D	3.5707E+00	343.000	3176.200
90	363	23	(0, 4)	D	3.5700E+00	340.700	3171.900
90	260	23	(0, 11)	D	3.5692E+00	336.500	3183.400

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SO2 1

2 RANKED 3-HOUR AVERAGE CONCENTRATION VALUES AT EACH DISCRETE RECEPTOR (YEAR,DAY,ENDING HOUR) (ug/m**3)

RECEPTOR	COORDINATES (km)		1 RANK	2 RANK
1	340.300	3165.700	3.6919E+01 (90,138,11)	1.1755E+01 (90,356, 8)
2	340.300	3167.700	4.2487E+01 (90,138,11)	1.2996E+01 (90,135, 8)
3	340.300	3169.800	4.2076E+01 (90,138,11)	1.8426E+01 (90,158,11)
4	340.700	3171.900	3.4482E+01 (90,138,11)	2.3495E+01 (90,158,11)
5	342.000	3174.000	1.5679E+01 (90,240,11)	1.3338E+01 (90,151,11)
6	343.000	3176.200	1.8395E+01 (90, 85,11)	1.7843E+01 (90,143,11)
7	343.700	3178.300	2.5162E+01 (90,143,11)	1.7073E+01 (90, 85,11)
8	342.400	3180.600	1.2579E+01 (90,252,11)	1.2242E+01 (90, 85,11)
9	341.100	3183.400	1.2337E+01 (90,211,23)	1.2210E+01 (90,219,11)
10	339.000	3183.400	1.4297E+01 (90,260,20)	1.2558E+01 (90,323,17)
11	336.500	3183.400	2.7508E+01 (90,143,11)	1.7225E+01 (90,260,20)
12	334.000	3183.400	3.5727E+01 (90,112,11)	2.9561E+01 (90,143,11)
13	331.500	3183.400	1.4799E+01 (90,260,20)	1.4705E+01 (90,260,17)

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SO2 1

2 RANKED 24-HOUR AVERAGE CONCENTRATION VALUES AT EACH DISCRETE RECEPTOR (YEAR,DAY,ENDING HOUR) (ug/m**3)

RECEPTOR	COORDINATES (km)		1 RANK	2 RANK
1	340.300	3165.700	5.4652E+00 (90, 70,23)	5.0138E+00 (90,336,23)
2	340.300	3167.700	5.2076E+00 (90,138,23)	5.0888E+00 (90,135,23)
3	340.300	3169.800	5.1780E+00 (90,138,23)	4.5684E+00 (90,135,23)
4	340.700	3171.900	5.3626E+00 (90,135,23)	5.3333E+00 (90,253,23)
5	342.000	3174.000	4.1974E+00 (90,135,23)	4.0225E+00 (90,180,23)
6	343.000	3176.200	4.1734E+00 (90,116,23)	3.5750E+00 (90,180,23)
7	343.700	3178.300	4.0037E+00 (90,143,23)	3.8686E+00 (90,117,23)
8	342.400	3180.600	3.3386E+00 (90,226,23)	3.2145E+00 (90,123,23)
9	341.100	3183.400	3.4812E+00 (90,123,23)	3.1857E+00 (90,290,23)
10	339.000	3183.400	3.1225E+00 (90,257,23)	3.1100E+00 (90,226,23)
11	336.500	3183.400	4.2087E+00 (90,143,23)	3.5692E+00 (90,260,23)
12	334.000	3183.400	5.0795E+00 (90,143,23)	4.2631E+00 (90,112,23)
13	331.500	3183.400	3.7388E+00 (90,260,23)	3.4507E+00 (90,180,23)

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SUMMARY SECTION

SO2 1

(ug/m**3)

RECEPTOR COORDINATES (km) TYPE PEAK (YEAR,DAY,ENDING HOUR) FOR RANK FOR AVERAGE PERIOD

2	340.300	3167.700	DISCRETE	4.2487E+01	(90,138,11)	RANK	1	3-HOUR
12	334.000	3183.400	DISCRETE	2.9561E+01	(90,143,11)	RANK	2	3-HOUR
1	340.300	3165.700	DISCRETE	5.4652E+00	(90, 70,23)	RANK	1	24-HOUR
4	340.700	3171.900	DISCRETE	5.3333E+00	(90,253,23)	RANK	2	24-HOUR

```
************************************************************************************************************************
                                         CALPOST  Version 5.0          Level 990228
************************************************************************************************************************



 Run Title:
    SONAT POWER, PASCO CO PSD CLASS 1SO2 REFINEMENT   10/12/99
    RECEPTORS AT CHASSAHOWITZKA NWA, 24-AND 3 HOUR AVERAGING TIME, CALPOST
    PROJECT ONLY

-------------------------------------------------------------------------------

INPUT GROUP: 1 -- General run control parameters
--------------

     Option to run all periods found
     in the met. file(s)  (METRUN)        Default: 0    ! METRUN =   0  !

         METRUN = 0 - Run period explicitly defined below
         METRUN = 1 - Run all periods in CALPUFF data file(s)

     Starting date:    Year  (ISYR) --    No default    ! ISYR  =  90   !
     (used only if     Month (ISMO) --    No default    ! ISMO  =  1   !
      METRUN = 0)      Day   (ISDY) --    No default    ! ISDY  =  6   !
                       Hour  (ISHR) --    No default    ! ISHR  =  0   !

     Number of hours to process (NHRS) -- No default    ! NHRS  =  8616  !

            Species to process (ASPEC) -- No default    ! ASPEC = SO2  !
            (ASPEC = VISIB for visibility processing)

     Process every hour of data?(NREP) -- Default: 1    ! NREP  =  1  !
      (1 = every hour processed,
       2 = every 2nd hour processed,
       5 = every 5th hour processed, etc.)

Concentration and scaling factors
---------------------------------

      Layer/deposition code (ILAYER)   -- Default: 1    ! ILAYER =  1  !
        '1'  for CALPUFF concentrations,
        '-1' for dry deposition fluxes,
        '-2' for wet deposition fluxes.

      Scaling factors of the form:     -- Defaults:     ! A =  0.0     !
            X(new) = X(old) * A + B        A = 0.0      ! B =  0.0     !
        (NOT applied if A = B = 0.0)       B = 0.0

      Add Hourly Background Concentrations?
                              (LBACK)  -- Default: F    ! LBACK =  F !

Receptor information
--------------------

  Gridded receptors processed?    (LG) -- Default: F    ! LG  = F  !
  Discrete receptors processed?   (LD) -- Default: F    ! LD  = T  !
  CTSG Complex terrain receptors processed?
                                 (LCT) -- Default: F    ! LCT = F  !

--Select range of DISCRETE receptors (only used when LD = T):

  Select ALL DISCRETE receptors by setting NDRECP flag to -1;
                                  OR
  Select SPECIFIC DISCRETE receptors by entering a flag (0,1) for each
     0 = discrete receptor not processed
     1 = discrete receptor processed
  using repeated value notation to select blocks of receptors:
     23*1, 15*0, 12*1
  Flag for all receptors after the last one assigned is set to 0
  (NDRECP) -- Default: -1
                                            ! NDRECP =  -1  !


--Select range of GRIDDED receptors (only used when LG = T):
```

```
      X index of LL corner (IBGRID) -- Default: -1     ! IBGRID = -1  !
          (-1 OR 1 <= IBGRID <= NX)

      Y index of LL corner (JBGRID) -- Default: -1     !.JBGRID = -1  !
          (-1 OR 1 <= JBGRID <= NY)

      X index of UR corner (IEGRID) -- Default: -1     ! IEGRID = -1  !
          (-1 OR 1 <= IEGRID <= NX)

      Y index of UR corner (JEGRID) -- Default: -1     ! JEGRID = -1  !
          (-1 OR 1 <= JEGRID <= NY)

  Note: Entire grid is processed if IBGRID=JBGRID=IEGRID=JEGRID=-1

!END!
-------------------------------------------------------------------------------

INPUT GROUP: 2 -- Visibility Parameters (ASPEC = VISIB)
--------------

    Maximum relative humidity (%) used in particle growth curve
                            (RHMAX) -- Default: 98    ! RHMAX  = 0.0 !

    Modeled species to be included in computing the light extinction
     Include SULFATE?           (LVSO4) -- Default: T    ! LVSO4   = T  !
     Include NITRATE?           (LVNO3) -- Default: T    ! LVNO3   = T  !
     Include ORGANIC CARBON?    (LVOC)  -- Default: T    ! LVOC    = T  !
     Include COARSE PARTICLES? (LVPMC) -- Default: T    ! LVPMC   = T  !
     Include FINE PARTICLES?    (LVPMF) -- Default: T    ! LVPMF   = T  !

    And, when ranking for TOP-N, TOP-50, and Exceedance tables,
     Include BACKGROUND?        (LVBK)  -- Default: T    ! LVBK    = T  !

    Species name used for particulates in MODEL.DAT file
                  COARSE     (SPECPMC) -- Default: PMC ! SPECPMC = PMC !
                  FINE       (SPECPMF) -- Default: PMF ! SPECPMF = PMF !

Extinction Efficiency (1/Mm per ug/m**3)
----------------------------------------
    MODELED particulate species:
              PM  COARSE      (EEPMC) -- Default: 0.6 ! EEPMC   = 0.6 !
              PM  FINE        (EEPMF) -- Default: 1.0 ! EEPMF   = 1.0 !
    BACKGROUND particulate species:
              PM  COARSE    (EEPMCBK) -- Default: 0.6 ! EEPMCBK = 0.6 !
    Other species:
             AMMONIUM SULFATE (EESO4) -- Default: 3.0 ! EESO4   = 3.0 !
             AMMONIUM NITRATE (EENO3) -- Default: 3.0 ! EENO3   = 3.0 !
             ORGANIC CARBON   (EEOC)  -- Default: 4.0 ! EEOC    = 4.0 !
             SOIL             (EESOIL)-- Default: 1.0 ! EESOIL  = 1.0 !
             ELEMENTAL CARBON (EEEC)  -- Default: 10. ! EEEC    = 10.0 !

Background Extinction Computation
---------------------------------

    Method used for background light extinction
                           (MVISBK) -- Default: 2    ! MVISBK =  2  !

         1 =  Supply single light extinction and hygroscopic fraction
              - IWAQM (1993) RH adjustment applied to hygroscopic background
                and modeled sulfate and nitrate
         2 =  Compute extinction from speciated PM measurements (A)
              - PATH RH adjustment applied to observed and modeled sulfate
                and nitrate
              - RH factor is capped at RHMAX
         3 =  Compute extinction from speciated PM measurements (B)
              - PATH RH adjustment applied to observed and modeled sulfate
                and nitrate
              - Receptor-hour excluded if RH>RHMAX
              - Receptor-day excluded if fewer than 6 valid receptor-hours
         4 =  Read hourly transmissometer background extinction measurements
              - PATH RH adjustment applied to modeled sulfate and nitrate
              - Hour excluded if measurement invalid (missing, interference,
                or large RH)
              - Receptor-hour excluded if RH>RHMAX
              - Receptor-day excluded if fewer than 6 valid receptor-hours
         5 =  Read hourly nephelometer background extinction measurements
              - Rayleigh extinction value (BEXTRAY) added to measurement
```

```
            - PATH RH adjustment applied to modeled sulfate and nitrate
            - Hour excluded if measurement invalid (missing, interference,
              or large RH)
            - Receptor-hour excluded if RH>RHMAX
            - Receptor-day excluded if fewer than 6 valid receptor-hours

    Additional inputs used for MVISBK = 1:
    --------------------------------------
     Background light extinction (1/Mm)
                             (BEXTBK) -- No default   ! BEXTBK = 0.0 !
     Percentage of particles affected by relative humidity
                             (RHFRAC) -- No default   ! RHFRAC = 0.0 !

    Additional inputs used for MVISBK = 2,3:
    ----------------------------------------
     Background extinction coefficients are computed from monthly
     CONCENTRATIONS of ammonium sulfate (BKSO4), ammonium nitrate (BKNO3),
     coarse particulates (BKPMC), organic carbon (BKOC), soil (BKSOIL), and
     elemental carbon (BKEC).  Month 1 is January.
     (ug/m**3)

     (BKSO4)  -- No default     ! BKSO4 = 0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0 !
     (BKNO3)  -- No default     ! BKNO3 = 0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0 !
     (BKPMC)  -- No default     ! BKPMC = 0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0 !
     (BKOC)   -- No default     ! BKOC  = 0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0 !
     (BKSOIL) -- No default     ! BKSOIL= 0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0 !
     (BKEC)   -- No default     ! BKEC  = 0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0 !

    Additional inputs used for MVISBK = 2,3,5:
    ------------------------------------------
     Extinction due to Rayleigh scattering is added (1/Mm)
                            (BEXTRAY) -- Default: 10.0 ! BEXTRAY = 0.0 !

!END!
---------------------------------------------------------------------------

INPUT GROUP: 3 -- Processing options
-------------

Averaging time and TOP 50 Table control
---------------------------------------
    User-specified averaging time
                               (NAVG) -- Default: 0    !   NAVG =  0  !
    Top 50 table for  1-hr averages
                              (L1T50) -- Default: T    !  L1T50 = F   !
    Top 50 table for  3-hr averages
                              (L3T50) -- Default: T    !  L3T50 = T   !
    Top 50 table for 24-hr averages
                             (L24T50) -- Default: T    ! L24T50 = T   !
    Top 50 table for NAVG-hr averages
                              (LNT50) -- Default: F    !  LNT50 = F   !
    Top 50 table for length of run averages
                              (LRT50) -- Default: T    !  LRT50 = F   !

TOP 'n' Table control
---------------------

    Number of 'Top' values at each receptor
                               (NTOP) -- Default: 4    ! NTOP =  2    !
             (NTOP must be <= 4)

    Specific ranks of 'Top' values reported (NTOP values must be entered)
                     (ITOP(4) array) -- Default:       ! ITOP =  1 , 2   !
                                        1,2,3,4
```

```
    Top 'n' table for  1-hr averages
                                (L1TOPN) -- Default: F   !  L1TOPN = F  !
    Top 'n' table for  3-hr averages
                                (L3TOPN) -- Default: F   !  L3TOPN = T  !
    Top 'n' table for 24-hr averages
                               (L24TOPN) -- Default: F   ! L24TOPN = T  !
    Top 'n' table for NAVG-hr averages
                                (LNTOPN) -- Default: F   !  LNTOPN = F  !
    Top 'n' table for length of run averages
                                 (LRAVG) -- Default: F   !   LRAVG = F  !


Output Units
------------
    Units for All Output      (IPRTU) -- Default: 1   ! IPRTU =  3   !
                  for             for
            Concentration     Deposition
       1 =       g/m**3         g/m**2/s
       2 =      mg/m**3        mg/m**2/s
       3 =      ug/m**3        ug/m**2/s
       4 =      ng/m**3        ng/m**2/s
       5 =     Odour Units

    Visibility: extinction expressed in 1/Mega-meters (IPRTU is ignored)


Threshold Exceedance control
----------------------------          -- Default: -1.0

    Counts will be tabulated for each average that
    exceeds a specified non-negative threshold (output units).


    Threshold for  1-hr averages   (THRESH1)     !  THRESH1 = -1.0  !
    Threshold for  3-hr averages   (THRESH3)     !  THRESH3 = -1.0  !
    Threshold for 24-hr averages  (THRESH24)     ! THRESH24 = -1.0  !
    Threshold for NAVG-hr averages (THRESHN)     !  THRESHN = -1.0  !


Selected Day (Echo) Output Control
---------------------------------       -- Default: F
    Output 1-hr averages for selected days (LECH1)     ! LECH1   = F !
    Output 3-hr averages for selected days (LECH3)     ! LECH3   = T !
    Output 24-hr averages for selected days (LECH24)   ! LECH24  = T !
    Output NAVG-hr averages for selected days (LECHN)  ! LECHN   = F !
    Output selected information for debugging (LDEBUG) ! LDEBUG  = F !

    Days selected for output IECHO(366)-- Default: 366*0
! IECHO  = 69*0,1*1,41*0,1*1,15*0,1*1,6*0,1*1,7*0,1*1,
14*0,1*1,94*0,1*1,82*0,1*1,30*0  !
     (366 values must be entered)

Plot Output Options
------------------

     Plot files can be created for selected Top-n, Exceedance and Echo
     tables selected above.  Two formats for these files are available,
     DATA and GRID.  In the DATA format, results at all receptors are
     listed along with the receptor location [x,y,val1,val2,...].
     In the GRID format, results at only gridded receptors are written,
     using a compact representation.  The gridded values are written in
     rows (x varies), starting with the most southern row of the grid.
     The GRID format is given the .GRD extension, and includes headers
     compatible with the SURFER(R) plotting software.

     A plotting and analysis file is also created for the daily peak
     visibility summary output, in DATA format only.

     Generate Plot-File Output    (LPLT) -- Default: F   ! LPLT   = F !

     Write Top-n files in GRID format?
                                 (LTGRD) -- Default: F   ! LTGRD = F !

     Write Exceedance files in GRID format?
                                 (LXGRD) -- Default: F   ! LXGRD = F !
     Write Echo files in GRID format?
                                 (LEGRD) -- Default: F   ! LEGRD = F !
```

```
!END!


 CALPOST Control File Input Summary ------------------------

    Replace run data with data in Puff file 1=Y:    0
                      Run starting date -- year:   90
                                          month:    1
                                            day:    6
                                     Julian day:    6
                             hour ending(0-23):    0
                             Run length (hours):    8616
                                       Species: SO2

Every hour of data processed -- NREP = 1


 Concentration & scaling factors
                       Layer of processed data:    1
      (>0 = concentrations, -1 = dry fluxes, -2 = wet fluxes)
                 Multiplicative scaling factor: 0.0000E+00
                       Additive scaling factor: 0.0000E+00
         Hourly background concentrations used?: F


 Receptor information
                  Gridded receptors processed?: F
                 Discrete receptors processed?: T
      CTSG Complex terrain receptors processed?: F

 Discrete Receptors Processed

 (All Discrete Receptors are Used)


 Visibility Processing is NOT Selected


 Averaging time & TOP 50 table control
     User-specified averaging time (NAVG hours):     0
                Top 50 table for  1-hr averages:     F
                Top 50 table for  3-hr averages:     T
                Top 50 table for 24-hr averages:     T
              Top 50 table for NAVG-hr averages:     F
       Top 50 table for length of run averages:     F


 Top "n" table control
       Number of "top" values at each receptor:     2
       Specific ranks of "top" values reported:   1   2

              Top "n" table for  1-hr averages: F
              Top "n" table for  3-hr averages: T
              Top "n" table for 24-hr averages: T
            Top "n" table for NAVG-hr averages: F
      Top "n" table for length of run averages: F


 Units requested for output:   (ug/m**3)


 Threshold Exceedance control
      Exceedances of a specified value will be counted for --


 Output options
                            Plot files created: F
      Output    1-hr averages for selected days: F
      Output    3-hr averages for selected days: T
      Output   24-hr averages for selected days: T
      Output NAVG-hr averages for selected days: F
      Output selected information for debugging: F


 Days selected for output tables
   0000000000  0000000000  0000000000  0000000000  0000000000  0000000000  0000000001  0000000000  0000000000  0000000000
```

```
0000000000  0100000000  0000000100  0000100000  0010000000  0000000100  0000000000  0000000000  0000000000  0000000000
0000000000  0000000000  0000000000  0000000000  0000000000  0010000000  0000000000  0000000000  0000000000  0000000000
0000000000  0000000000  0000000000  0000010000  0000000000  0000000000  000000
```

IDENTIFICATION OF PROCESSED MODEL FILE ----------

CALPUFF 5.0 990228

REFINED SO2 PSD CLASS I INCREMENTAL ANALYSIS, SONAT PASCO CO 10/12/99
RECEPTORS AT CHASSAHOWITZKA NWA, FUTURE EMISSION SOURCES
FDEP CHASSAHOWITZKA CALMET DOMAIN WITH PRECIPITATION, PROJECT ONLY

Chemical species names for each layer in model:

SO2	1
SO4	1
NOX	1
HNO3	1
NO3	1
PM10	1

************** NOTICE ***************
NDRECP array reset to full range: all 1s

INPUT FILES

Default Name	Unit No.	File Name and Path
CALPOST.INP	5	calpost.inp
MODEL.DAT	4	c:\calmet\chass\sonatpas\proj.con

OUTPUT FILES

Default Name	Unit No.	File Name and Path
CALPOST.LST	7	calpost.lst

ECHO OPTION -
CONCENTRATION AT EACH RECEPTOR IS PRINTED FOR THE FOLLOWING DAYS (0=NOT printed; 1=PRINTED):

```
0000000000  0000000000  0000000000  0000000000  0000000000  0000000000  0000000001  0000000000  0000000000  0000000
0000000000  0100000000  0000000100  0000100000  0010000000  0000000100  0000000000  0000000000  0000000000  0000000
0000000000  0000000000  0000000000  0000000000  0000000000  0010000000  0000000000  0000000000  0000000000  0000000
0000000000  0000000000  0000000000  0000010000  0000000000  0000000000  000000
```

AND FOR THE FOLLOWING AVERAGING PERIODS: (NOTE THAT THE AVERAGING PERIOD IN MODEL IS MAVG = 1 HR.)
3*MAVG-HOUR AVERAGES
24*MAVG-HOUR AVERAGES

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 70 HOUR(0-23): 2

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 70 HOUR(0-23): 5

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 70 HOUR(0-23): 8

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 70 HOUR(0-23): 11

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 70 HOUR(0-23): 14

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 70 HOUR(0-23): 17

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00

13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 70 HOUR(0-23): 20

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

24-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 70 HOUR(0-23): 23

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 70 HOUR(0-23): 23

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 112 HOUR(0-23): 2

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 112 HOUR(0-23): 5

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 112 HOUR(0-23): 8

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 112 HOUR(0-23): 11

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 112 HOUR(0-23): 14

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 112 HOUR(0-23): 17

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 112 HOUR(0-23): 20

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

24-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 112 HOUR(0-23): 23

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 112 HOUR(0-23) 23

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 128 HOUR(0-23): 2

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 128 HOUR(0-23): 5

DISCRETE RECEPTORS: SO2 1

RECEPTOR COORDINATES (km) CONCENTRATION RECEPTOR COORDINATES (km) CONCENTRATION

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 128 HOUR(0-23): 8

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 128 HOUR(0-23): 11

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 128 HOUR(0-23): 14

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 128 HOUR(0-23): 17

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 128 HOUR(0-23): 20

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

24-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 128 HOUR(0-23): 23

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 128 HOUR(0-23): 23

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 135 HOUR(0-23): 2

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	8.7697E-04	7	343.700	3178.300	6.6318E-04
2	340.300	3167.700	8.4374E-04	8	342.400	3180.600	6.3569E-04
3	340.300	3169.800	8.0940E-04	9	341.100	3183.400	6.0148E-04
4	340.700	3171.900	7.7377E-04	10	339.000	3183.400	6.0926E-04
5	342.000	3174.000	7.3484E-04	11	336.500	3183.400	6.1829E-04
6	343.000	3176.200	6.9701E-04	12	334.000	3183.400	6.2752E-04
				13	331.500	3183.400	6.3648E-04

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 135 HOUR(0-23): 5

DISCRETE RECEPTORS: SO2 1

RECEPTOR COORDINATES (km) CONCENTRATION RECEPTOR COORDINATES (km) CONCENTRATION

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	8.0987E-04	7	343.700	3178.300	6.6699E-04
2	340.300	3167.700	7.9094E-04	8	342.400	3180.600	6.5321E-04
3	340.300	3169.800	7.7083E-04	9	341.100	3183.400	6.3399E-04
4	340.700	3171.900	7.4785E-04	10	339.000	3183.400	6.4572E-04
5	342.000	3174.000	7.1893E-04	11	336.500	3183.400	6.5925E-04
6	343.000	3176.200	6.9137E-04	12	334.000	3183.400	6.7224E-04
				13	331.500	3183.400	6.8472E-04

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 135 HOUR(0-23): 8

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	6.1721E-04	7	343.700	3178.300	5.7358E-04
2	340.300	3167.700	6.1305E-04	8	342.400	3180.600	5.6990E-04
3	340.300	3169.800	6.0819E-04	9	341.100	3183.400	5.6360E-04
4	340.700	3171.900	6.0161E-04	10	339.000	3183.400	5.6920E-04
5	342.000	3174.000	5.9183E-04	11	336.500	3183.400	5.7540E-04
6	343.000	3176.200	5.8228E-04	12	334.000	3183.400	5.8110E-04
				13	331.500	3183.400	5.8627E-04

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 135 HOUR(0-23): 11

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	3.8107E-04	7	343.700	3178.300	3.7996E-04
2	340.300	3167.700	3.8286E-04	8	342.400	3180.600	3.8247E-04
3	340.300	3169.800	3.8439E-04	9	341.100	3183.400	3.8419E-04
4	340.700	3171.900	3.8476E-04	10	339.000	3183.400	3.8810E-04
5	342.000	3174.000	3.8291E-04	11	336.500	3183.400	3.9235E-04
6	343.000	3176.200	3.8132E-04	12	334.000	3183.400	3.9617E-04
				13	331.500	3183.400	3.9955E-04

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 135 HOUR(0-23): 14

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	1.8556E-04	7	343.700	3178.300	1.9589E-04
2	340.300	3167.700	1.8867E-04	8	342.400	3180.600	2.0091E-04
3	340.300	3169.800	1.9179E-04	9	341.100	3183.400	2.0608E-04
4	340.700	3171.900	1.9397E-04	10	339.000	3183.400	2.1004E-04
5	342.000	3174.000	1.9420E-04	11	336.500	3183.400	2.1454E-04
6	343.000	3176.200	1.9492E-04	12	334.000	3183.400	2.1878E-04
				13	331.500	3183.400	2.2275E-04

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 135 HOUR(0-23): 17

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	9.1617E-05	7	343.700	3178.300	1.0124E-04
2	340.300	3167.700	9.4094E-05	8	342.400	3180.600	1.0603E-04
3	340.300	3169.800	9.6685E-05	9	341.100	3183.400	1.1138E-04
4	340.700	3171.900	9.8633E-05	10	339.000	3183.400	1.1508E-04
5	342.000	3174.000	9.9082E-05	11	336.500	3183.400	1.1944E-04
6	343.000	3176.200	1.0002E-04	12	334.000	3183.400	1.2379E-04
				13	331.500	3183.400	1.2808E-04

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 135 HOUR(0-23): 20

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

24-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 135 HOUR(0-23): 23

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	3.7029E-04	7	343.700	3178.300	3.2261E-04
2	340.300	3167.700	3.6417E-04	8	342.400	3180.600	3.1853E-04
3	340.300	3169.800	3.5766E-04	9	341.100	3183.400	3.1259E-04
4	340.700	3171.900	3.5007E-04	10	339.000	3183.400	3.1717E-04
5	342.000	3174.000	3.4023E-04	11	336.500	3183.400	3.2241E-04
6	343.000	3176.200	3.3086E-04	12	334.000	3183.400	3.2745E-04
				13	331.500	3183.400	3.3223E-04

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 135 HOUR(0-23): 23

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 143 HOUR(0-23): 2

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 143 HOUR(0-23): 5

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00

2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 143 HOUR(0-23): 8

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 143 HOUR(0-23): 11

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 143 HOUR(0-23): 14

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 143 HOUR(0-23): 17

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	9.7377E-03	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	4.7836E-03	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	2.5244E-03	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	1.3237E-03	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 143 HOUR(0-23): 20

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	1.2759E-02	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	7.3630E-03	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	3.7163E-03	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	1.6137E-03	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

24-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 143 HOUR(0-23): 23

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	3.6814E-03	7	343.700	3178.300	2.0997E-04
2	340.300	3167.700	2.1909E-03	8	342.400	3180.600	1.5075E-04
3	340.300	3169.800	1.3209E-03	9	341.100	3183.400	9.3813E-05
4	340.700	3171.900	7.7625E-04	10	339.000	3183.400	8.5336E-05
5	342.000	3174.000	3.3520E-04	11	336.500	3183.400	7.9888E-05
6	343.000	3176.200	2.7040E-04	12	334.000	3183.400	7.0546E-05
				13	331.500	3183.400	6.3999E-05

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 143 HOUR(0-23): 23

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	6.9545E-03	7	343.700	3178.300	1.6798E-03
2	340.300	3167.700	5.3804E-03	8	342.400	3180.600	1.2060E-03
3	340.300	3169.800	4.3268E-03	9	341.100	3183.400	7.5050E-04
4	340.700	3171.900	3.2727E-03	10	339.000	3183.400	6.8269E-04
5	342.000	3174.000	2.6816E-03	11	336.500	3183.400	6.3910E-04
6	343.000	3176.200	2.1632E-03	12	334.000	3183.400	5.6437E-04
				13	331.500	3183.400	5.1199E-04

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 158 HOUR(0-23): 2

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	3.6725E-02	7	343.700	3178.300	2.6255E-02
2	340.300	3167.700	3.4531E-02	8	342.400	3180.600	2.3339E-02
3	340.300	3169.800	3.2279E-02	9	341.100	3183.400	2.0358E-02
4	340.700	3171.900	3.0452E-02	10	339.000	3183.400	1.8249E-02
5	342.000	3174.000	2.9386E-02	11	336.500	3183.400	1.6817E-02
6	343.000	3176.200	2.7843E-02	12	334.000	3183.400	1.5797E-02
				13	331.500	3183.400	1.4812E-02

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 158 HOUR(0-23): 5

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	4.2971E-02	7	343.700	3178.300	2.9604E-02
2	340.300	3167.700	4.0048E-02	8	342.400	3180.600	2.7009E-02

3	340.300	3169.800	3.7266E-02	9	341.100	3183.400	2.4236E-02
4	340.700	3171.900	3.5160E-02	10	339.000	3183.400	2.3661E-02
5	342.000	3174.000	3.3513E-02	11	336.500	3183.400	2.2885E-02
6	343.000	3176.200	3.1549E-02	12	334.000	3183.400	2.2055E-02
				13	331.500	3183.400	2.1200E-02

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 158 HOUR(0-23): 8

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	1.0207E-01	7	343.700	3178.300	7.1609E-02
2	340.300	3167.700	9.6999E-02	8	342.400	3180.600	6.7515E-02
3	340.300	3169.800	9.1721E-02	9	341.100	3183.400	6.2413E-02
4	340.700	3171.900	8.6504E-02	10	339.000	3183.400	6.2296E-02
5	342.000	3174.000	8.1360E-02	11	336.500	3183.400	6.1591E-02
6	343.000	3176.200	7.6119E-02	12	334.000	3183.400	6.0689E-02
				13	331.500	3183.400	5.9659E-02

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 158 HOUR(0-23): 11

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	2.9609E-01	7	343.700	3178.300	1.5351E-01
2	340.300	3167.700	2.7468E-01	8	342.400	3180.600	1.4753E-01
3	340.300	3169.800	2.5265E-01	9	341.100	3183.400	1.3617E-01
4	340.700	3171.900	2.2877E-01	10	339.000	3183.400	1.4543E-01
5	342.000	3174.000	1.9837E-01	11	336.500	3183.400	1.5537E-01
6	343.000	3176.200	1.7314E-01	12	334.000	3183.400	1.6421E-01
				13	331.500	3183.400	1.7176E-01

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 158 HOUR(0-23): 14

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	1.2560E-01	7	343.700	3178.300	1.0081E-01
2	340.300	3167.700	1.2781E-01	8	342.400	3180.600	1.0635E-01
3	340.300	3169.800	1.2893E-01	9	341.100	3183.400	1.0976E-01
4	340.700	3171.900	1.2568E-01	10	339.000	3183.400	1.2222E-01
5	342.000	3174.000	1.1513E-01	11	336.500	3183.400	1.3742E-01
6	343.000	3176.200	1.0692E-01	12	334.000	3183.400	1.5306E-01
				13	331.500	3183.400	1.6851E-01

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 158 HOUR(0-23): 17

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	2.4211E-02	7	343.700	3178.300	2.9757E-02
2	340.300	3167.700	2.6613E-02	8	342.400	3180.600	3.6003E-02
3	340.300	3169.800	2.7830E-02	9	341.100	3183.400	4.2753E-02
4	340.700	3171.900	2.9240E-02	10	339.000	3183.400	4.9228E-02
5	342.000	3174.000	2.8182E-02	11	336.500	3183.400	5.7543E-02
6	343.000	3176.200	2.8436E-02	12	334.000	3183.400	6.6316E-02
				13	331.500	3183.400	7.5720E-02

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 158 HOUR(0-23): 20

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	2.5978E-03	7	343.700	3178.300	3.0664E-03
2	340.300	3167.700	2.7871E-03	8	342.400	3180.600	3.5115E-03
3	340.300	3169.800	3.0020E-03	9	341.100	3183.400	4.0277E-03
4	340.700	3171.900	3.1354E-03	10	339.000	3183.400	4.6084E-03
5	342.000	3174.000	3.0721E-03	11	336.500	3183.400	5.3847E-03
6	343.000	3176.200	3.0537E-03	12	334.000	3183.400	6.2398E-03
				13	331.500	3183.400	7.2333E-03

24-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 158 HOUR(0-23): 23

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	7.8816E-02	7	343.700	3178.300	5.1870E-02
2	340.300	3167.700	7.5469E-02	8	342.400	3180.600	5.1461E-02
3	340.300	3169.800	7.1749E-02	9	341.100	3183.400	5.0027E-02
4	340.700	3171.900	6.7409E-02	10	339.000	3183.400	5.3284E-02
5	342.000	3174.000	6.1168E-02	11	336.500	3183.400	5.7210E-02
6	343.000	3176.200	5.5924E-02	12	334.000	3183.400	6.1144E-02
				13	331.500	3183.400	6.4976E-02

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 158 HOUR(0-23): 23

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	2.6051E-04	7	343.700	3178.300	3.5059E-04
2	340.300	3167.700	2.8651E-04	8	342.400	3180.600	4.2076E-04
3	340.300	3169.800	3.1256E-04	9	341.100	3183.400	5.0374E-04
4	340.700	3171.900	3.3036E-04	10	339.000	3183.400	5.7968E-04
5	342.000	3174.000	3.3025E-04	11	336.500	3183.400	6.7448E-04
6	343.000	3176.200	3.3552E-04	12	334.000	3183.400	7.8443E-04
				13	331.500	3183.400	9.0669E-04

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 253 HOUR(0-23): 2

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 253 HOUR(0-23): 5

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00

4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 253 HOUR(0-23): 8

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 253 HOUR(0-23): 11

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 253 HOUR(0-23): 14

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 253 HOUR(0-23): 17

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 253 HOUR(0-23): 20

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

24-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 253 HOUR(0-23): 23

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 253 HOUR(0-23): 23

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 336 HOUR(0-23): 2

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 336 HOUR(0-23): 5

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 336 HOUR(0-23): 8

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 336 HOUR(0-23): 11

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 336 HOUR(0-23): 14

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 336 HOUR(0-23): 17

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 336 HOUR(0-23): 20

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

24-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 336 HOUR(0-23): 23

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

3-HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 90 DAY: 336 HOUR(0-23): 23

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	0.0000E+00	7	343.700	3178.300	0.0000E+00
2	340.300	3167.700	0.0000E+00	8	342.400	3180.600	0.0000E+00
3	340.300	3169.800	0.0000E+00	9	341.100	3183.400	0.0000E+00
4	340.700	3171.900	0.0000E+00	10	339.000	3183.400	0.0000E+00
5	342.000	3174.000	0.0000E+00	11	336.500	3183.400	0.0000E+00
6	343.000	3176.200	0.0000E+00	12	334.000	3183.400	0.0000E+00
				13	331.500	3183.400	0.0000E+00

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SO2 1

TOP-50 3-HOUR AVERAGE CONCENTRATION VALUES (ug/m**3)

YEAR	DAY	HOUR(0-23)	RECEPTOR	TYPE	CONCENTRATION	COORDINATES (km)	
90	154	11	(0, 7)	D	2.5173E+00	343.700	3178.300
90	96	11	(0, 13)	D	2.4593E+00	331.500	3183.400
90	223	11	(0, 1)	D	2.3503E+00	340.300	3165.700
90	154	11	(0, 8)	D	2.1164E+00	342.400	3180.600
90	154	11	(0, 6)	D	2.0778E+00	343.000	3176.200
90	228	11	(0, 2)	D	1.9841E+00	340.300	3167.700
90	228	11	(0, 3)	D	1.8993E+00	340.300	3169.800
90	189	8	(0, 1)	D	1.8882E+00	340.300	3165.700
90	96	11	(0, 12)	D	1.7004E+00	334.000	3183.400
90	228	11	(0, 4)	D	1.6478E+00	340.700	3171.900
90	228	11	(0, 1)	D	1.5310E+00	340.300	3165.700
90	154	11	(0, 9)	D	1.4674E+00	341.100	3183.400
90	189	8	(0, 2)	D	1.4463E+00	340.300	3167.700
90	223	11	(0, 2)	D	1.3901E+00	340.300	3167.700
90	154	11	(0, 5)	D	1.3347E+00	342.000	3174.000
90	107	14	(0, 12)	D	1.3215E+00	334.000	3183.400
90	119	14	(0, 1)	D	1.2971E+00	340.300	3165.700
90	189	8	(0, 3)	D	1.2656E+00	340.300	3169.800
90	107	14	(0, 11)	D	1.2539E+00	336.500	3183.400
90	238	11	(0, 1)	D	1.1923E+00	340.300	3165.700

90	119	14	(0, 2)	D	1.1759E+00	340.300	3167.700
90	202	14	(0, 1)	D	1.1744E+00	340.300	3165.700
90	189	8	(0, 4)	D	1.1735E+00	340.700	3171.900
90	228	11	(0, 5)	D	1.1685E+00	342.000	3174.000
90	194	2	(0, 1)	D	1.1470E+00	340.300	3165.700
90	107	14	(0, 4)	D	1.1369E+00	340.700	3171.900
90	107	14	(0, 13)	D	1.1242E+00	331.500	3183.400
90	107	14	(0, 10)	D	1.1181E+00	339.000	3183.400
90	107	14	(0, 3)	D	1.1037E+00	340.300	3169.800
90	107	14	(0, 2)	D	1.0816E+00	340.300	3167.700
90	107	14	(0, 5)	D	1.0764E+00	342.000	3174.000
90	184	14	(0, 4)	D	1.0737E+00	340.700	3171.900
90	194	5	(0, 13)	D	1.0690E+00	331.500	3183.400
90	184	14	(0, 3)	D	1.0511E+00	340.300	3169.800
90	107	14	(0, 1)	D	1.0381E+00	340.300	3165.700
90	119	14	(0, 3)	D	1.0345E+00	340.300	3169.800
90	238	11	(0, 2)	D	1.0216E+00	340.300	3167.700
90	184	14	(0, 5)	D	1.0146E+00	342.000	3174.000
90	107	14	(0, 6)	D	1.0134E+00	343.000	3176.200
90	107	11	(0, 1)	D	1.0099E+00	340.300	3165.700
90	237	11	(0, 12)	D	1.0026E+00	334.000	3183.400
90	189	8	(0, 5)	D	1.0008E+00	342.000	3174.000
90	107	14	(0, 9)	D	9.9654E-01	341.100	3183.400
90	107	14	(0, 8)	D	9.8462E-01	342.400	3180.600
90	189	11	(0, 13)	D	9.7977E-01	331.500	3183.400
90	184	14	(0, 2)	D	9.7498E-01	340.300	3167.700
90	154	11	(0, 10)	D	9.6071E-01	339.000	3183.400
90	107	14	(0, 7)	D	9.5033E-01	343.700	3178.300
90	96	11	(0, 11)	D	9.4157E-01	336.500	3183.400
90	151	14	(0, 1)	D	9.3851E-01	340.300	3165.700

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SO2 1

TOP-50 24-HOUR AVERAGE CONCENTRATION VALUES (ug/m**3)

YEAR	DAY	HOUR(0-23)	RECEPTOR	TYPE	CONCENTRATION	COORDINATES (km)	
90	223	23	(0, 1)	D	4.7861E-01	340.300	3165.700
90	228	23	(0, 2)	D	4.4733E-01	340.300	3167.700
90	228	23	(0, 3)	D	4.3000E-01	340.300	3169.800
90	154	23	(0, 7)	D	4.2407E-01	343.700	3178.300
90	228	23	(0, 1)	D	4.0536E-01	340.300	3165.700
90	228	23	(0, 4)	D	3.9809E-01	340.700	3171.900
90	154	23	(0, 6)	D	3.5643E-01	343.000	3176.200
90	154	23	(0, 8)	D	3.4822E-01	342.400	3180.600
90	243	23	(0, 1)	D	3.4171E-01	340.300	3165.700
90	96	23	(0, 13)	D	3.4102E-01	331.500	3183.400
90	228	23	(0, 5)	D	3.3772E-01	342.000	3174.000
90	223	23	(0, 2)	D	3.2908E-01	340.300	3167.700
90	194	23	(0, 13)	D	3.1632E-01	331.500	3183.400
90	243	23	(0, 2)	D	2.9723E-01	340.300	3167.700
90	228	23	(0, 11)	D	2.8597E-01	336.500	3183.400
90	107	23	(0, 1)	D	2.8510E-01	340.300	3165.700
90	107	23	(0, 2)	D	2.8446E-01	340.300	3167.700
90	228	23	(0, 12)	D	2.8416E-01	334.000	3183.400
90	228	23	(0, 6)	D	2.7784E-01	343.000	3176.200
90	107	23	(0, 12)	D	2.7195E-01	334.000	3183.400
90	107	23	(0, 3)	D	2.7194E-01	340.300	3169.800
90	189	23	(0, 1)	D	2.7145E-01	340.300	3165.700
90	151	23	(0, 1)	D	2.6826E-01	340.300	3165.700
90	107	23	(0, 4)	D	2.6681E-01	340.700	3171.900
90	228	23	(0, 10)	D	2.6368E-01	339.000	3183.400
90	228	23	(0, 13)	D	2.6187E-01	331.500	3183.400
90	107	23	(0, 11)	D	2.5999E-01	336.500	3183.400
90	194	23	(0, 12)	D	2.5299E-01	334.000	3183.400
90	96	23	(0, 12)	D	2.5244E-01	334.000	3183.400
90	243	23	(0, 3)	D	2.5153E-01	340.300	3169.800
90	202	23	(0, 1)	D	2.4947E-01	340.300	3165.700
90	107	23	(0, 13)	D	2.4928E-01	331.500	3183.400
90	181	23	(0, 1)	D	2.4801E-01	340.300	3165.700
90	154	23	(0, 9)	D	2.4715E-01	341.100	3183.400
90	107	23	(0, 5)	D	2.4446E-01	342.000	3174.000

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         90   154      23     (  0,    5)  D       2.4304E-01       342.000  3174.000
         90   107      23     (  0,   10)  D       2.3994E-01       339.000  3183.400
         90   228      23     (  0,    8)  D       2.3726E-01       342.400  3180.600
         90   228      23     (  0,    9)  D       2.3556E-01       341.100  3183.400
         90   228      23     (  0,    7)  D       2.3433E-01       343.700  3178.300
         90   107      23     (  0,    6)  D       2.3122E-01       343.000  3176.200
         90   223      23     (  0,    3)  D       2.3011E-01       340.300  3169.800
         90   202      23     (  0,    2)  D       2.2622E-01       340.300  3167.700
         90   107      23     (  0,    8)  D       2.2522E-01       342.400  3180.600
         90    85      23     (  0,    1)  D       2.2472E-01       340.300  3165.700
         90   107      23     (  0,    9)  D       2.2391E-01       341.100  3183.400
         90   189      23     (  0,    2)  D       2.2350E-01       340.300  3167.700
         90   181      23     (  0,    2)  D       2.2284E-01       340.300  3167.700
         90   151      23     (  0,    2)  D       2.2169E-01       340.300  3167.700
         90   107      23     (  0,    7)  D       2.2168E-01       343.700  3178.300

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                                                   SO2            1

 2 RANKED        3-HOUR AVERAGE  CONCENTRATION VALUES AT EACH DISCRETE RECEPTOR  (YEAR,DAY,ENDING HOUR)  (ug/m**3)

RECEPTOR      COORDINATES (km)          1 RANK                   2 RANK
     1      340.300  3165.700    2.3503E+00 (90,223,11)   1.8882E+00 (90,189, 8)
     2      340.300  3167.700    1.9841E+00 (90,228,11)   1.4463E+00 (90,189, 8)
     3      340.300  3169.800    1.8993E+00 (90,228,11)   1.2656E+00 (90,189, 8)
     4      340.700  3171.900    1.6478E+00 (90,228,11)   1.1735E+00 (90,189, 8)
     5      342.000  3174.000    1.3347E+00 (90,154,11)   1.1685E+00 (90,228,11)
     6      343.000  3176.200    2.0778E+00 (90,154,11)   1.0134E+00 (90,107,14)
     7      343.700  3178.300    2.5173E+00 (90,154,11)   9.5033E-01 (90,107,14)
     8      342.400  3180.600    2.1164E+00 (90,154,11)   9.8462E-01 (90,107,14)
     9      341.100  3183.400    1.4674E+00 (90,154,11)   9.9654E-01 (90,107,14)
    10      339.000  3183.400    1.1181E+00 (90,107,14)   9.6071E-01 (90,154,11)
    11      336.500  3183.400    1.2539E+00 (90,107,14)   9.4157E-01 (90, 96,11)
    12      334.000  3183.400    1.7004E+00 (90, 96,11)   1.3215E+00 (90,107,14)
    13      331.500  3183.400    2.4593E+00 (90, 96,11)   1.1242E+00 (90,107,14)

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                                                   SO2            1

 2 RANKED       24-HOUR AVERAGE  CONCENTRATION VALUES AT EACH DISCRETE RECEPTOR  (YEAR,DAY,ENDING HOUR)  (ug/m**3)

RECEPTOR      COORDINATES (km)          1 RANK                   2 RANK
     1      340.300  3165.700    4.7861E-01 (90,223,23)   4.0536E-01 (90,228,23)
     2      340.300  3167.700    4.4733E-01 (90,228,23)   3.2908E-01 (90,223,23)
     3      340.300  3169.800    4.3000E-01 (90,228,23)   2.7194E-01 (90,107,23)
     4      340.700  3171.900    3.9809E-01 (90,228,23)   2.6681E-01 (90,107,23)
     5      342.000  3174.000    3.3772E-01 (90,228,23)   2.4446E-01 (90,107,23)
     6      343.000  3176.200    3.5643E-01 (90,154,23)   2.7784E-01 (90,228,23)
     7      343.700  3178.300    4.2407E-01 (90,154,23)   2.3433E-01 (90,228,23)
     8      342.400  3180.600    3.4822E-01 (90,154,23)   2.3726E-01 (90,228,23)
     9      341.100  3183.400    2.4715E-01 (90,154,23)   2.3556E-01 (90,228,23)
    10      339.000  3183.400    2.6368E-01 (90,228,23)   2.3994E-01 (90,107,23)
    11      336.500  3183.400    2.8597E-01 (90,228,23)   2.5999E-01 (90,107,23)
    12      334.000  3183.400    2.8416E-01 (90,228,23)   2.7195E-01 (90,107,23)
    13      331.500  3183.400    3.4102E-01 (90, 96,23)   3.1632E-01 (90,194,23)

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                                              SUMMARY SECTION


                                                   SO2            1


                                                 (ug/m**3)
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RECEPTOR	COORDINATES (km)		TYPE	PEAK (YEAR,DAY,ENDING HOUR)	FOR RANK	FOR AVERAGE PERIOD
7	343.700	3178.300	DISCRETE	2.5173E+00 (90,154,11)	RANK 1	3-HOUR
1	340.300	3165.700	DISCRETE	1.8882E+00 (90,189, 8)	RANK 2	3-HOUR
1	340.300	3165.700	DISCRETE	4.7861E-01 (90,223,23)	RANK 1	24-HOUR
1	340.300	3165.700	DISCRETE	4.0536E-01 (90,228,23)	RANK 2	24-HOUR

7099 3400 0000 1449 4758

U.S. Postal Service
CERTIFIED MAIL RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

Article Sent To:
Mr. John S. Ellis, IPS Avon Park

Postage	$	Postmark Here
Certified Fee		
Return Receipt Fee (Endorsement Required)		
Restricted Delivery Fee (Endorsement Required)		
Total Postage & Fees	$	

Name (Please Print Clearly) (to be completed by mailer)
Mr. John S. Ellis
Street, Apt. No.; or PO Box No.
1560 Gulf Blvd., #701
City, State, ZIP+4
Clearwater, FL 32767

PS Form 3800, July 1999 — See Reverse for Instructions

SENDER: *COMPLETE THIS SECTION*

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

1. Article Addressed to:

Mr. John S. Ellis
IPS Avon Park Corp.
1560 Gulf Boulevard, #701
Clearwater, FL [redacted]

COMPLETE THIS SECTION ON DELIVERY

A. Received by *(Please Print Clearly)* N McIntyre
B. Date of Delivery 10/24

C. Signature
X N McCarthy
☐ Agent
☐ Addressee

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

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

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number *(Copy from service label)*
7099 3400 0000 1449 4758

PS Form 3811, July 1999 — Domestic Return Receipt — 102595-99-M-1789

7099 3400 0000 1449 4727

U.S. Postal Service
CERTIFIED MAIL RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

Article Sent To:

Jon C. Stroble, Project Mgr.

Shady Hills Power Co.

Postage	$
Certified Fee	
Return Receipt Fee (Endorsement Required)	
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$

Postmark Here

Name (Please Print Clearly) (to be completed by mailer)
Jon C. Stroble

Street, Apt. No.; or PO Box No.
1001 Louisiana St.

City, State, ZIP+4
Houston, TX 77002

PS Form 3800, July 1999 — *See Reverse for Instructions*

SENDER: *COMPLETE THIS SECTION*

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

1. Article Addressed to:

Jon C. Stroble, Project Mgr.
Shady Hills Power Co., L.L.C.
1001 Louisiana St.
Houston, TX 77002

COMPLETE THIS SECTION ON DELIVERY

A. Received by *(Please Print Clearly)* B. Date of Delivery OCT 25 2000

C. Signature
X [signature] 10/25 ☐ Agent ☐ Addressee

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number *(Copy from service label)*
7099 3400 000 1449 4727

PS Form 3811, July 1999 — Domestic Return Receipt — 102595-99-M-1789

Z 031 391 918

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to John Ellis	
Street & Number IPS Shady Hills	
Post Office, State, & ZIP Code Clearwater Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 1-13-99 1010373-001-AC 050-Fl-280	

PS Form **3800**, April 1995

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
John J. Ellis
IPS Avon Park Corp.
1560 Gulf Blvd
Clearwater, Fl
32767

4a. Article Number
Z 031 391 918

4b. Service Type
☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
1-18-00

5. Received By: *(Print Name)*
Linda Ellis

6. Signature: *(Addressee or Agent)*
X Linda Ellis

8. Addressee's Address *(Only if requested and fee is paid)*

Is your RETURN ADDRESS completed on the reverse side?

Thank you for using Return Receipt Service.

PS Form **3811**, December 1994 102595-98-B-0229 Domestic Return Receipt

THE TAMPA TRIBUNE
Published Daily
Tampa, Hillsborough County, Florida

RECEIVED

DEC 23 1999

BUREAU OF AIR REGULATION

State of Florida }
County of Hillsborough } ss.

Before the undersigned authority personally appeared J. Rosenthal, who on oath says that she is Classified Billing Manager of The Tampa Tribune, a daily newspaper published at Tampa in Hillsborough County, Florida; that the attached copy of advertisement being a

LEGAL NOTICE (PASCO)

in the matter of

PUBLIC NOTICE OF INTENT

was published in said newspaper in the issues of

DECEMBER 14, 1999

Affiant further says that the said The Tampa Tribune is a newspaper published at Tampa in said Hillsborough County, Florida, and that the said newspaper has heretofore been continuously published in said Hillsborough County, Florida, each day and has been entered as second class mail matter at the post office in Tampa, in said Hillsborough County, Florida for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that she has neither paid nor promised any person, this advertisement for publication in the said newspaper.

J Rosenthal

Sworn to and subscribed before me, this 14 day of DECEMBER, A.D. 1999

Personally Known ____ or Product Identification ______
Type of Identification Produced ______

NOTARY PUBLIC

CHARLOTTE A. OFFNER
Notary Public, State of Florida
My comm. expires April 21, 2000
No. CC548844

(SEAL)

Charlotte A. Offner

CC: SWD
EPA
NPS

PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT
STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
DEP File No. 1010373-001-AC (PSD-FL-280)
Shady Hills Generating Station - Units 1-3
Pasco County

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit under the requirements for the Prevention of Significant Deterioration (PSD) of Air Quality to IPS Avon Park Corporation. The permit is to construct three nominal 170 megawatt (MW) natural gas and distillate fuel oil-fired combustion turbine-electrical generators with 60-foot stacks and one 2.8 million gallon fuel oil storage tank for the proposed Shady Hills Generating Station East of Hudson in unincorporated Pasco County. A Best Available Control Technology (BACT) determination was required for sulfur dioxide (SO2), particulate matter (PM/PM10), nitrogen oxides (NOx), sulfuric acid mist (SAM), and carbon monoxide (CO) pursuant to Rule 62-212.400, F.A.C. The applicant's name and address are IPS Avon Park Corporation, 1560 Gulf Boulevard, #701, Clearwater, Florida 33767.

The new units will be General Electric nominal 170 MW PG7241FA combustion turbines-electrical generators. The units will operate in simple cycle mode and intermittent duty. The units will operate primarily on natural gas and will be permitted to operate 3,390 hours per year of which no more than 1000 hours per year will be using 0.05 percent sulfur distillate fuel oil.

NOx emissions will be controlled by Dry Low NOx (DLN-2.6) combustors. The units must meet a continuous emission limit of 9 parts per million by volume at 15 percent oxygen (ppm). NOx will be controlled to 42 ppm by wet injection when firing fuel oil. Sulfuric acid mist, SO2, and PM/PM10 will be limited by use of clean fuels. Emissions of VOC and CO will be controlled by good combustion practices.

The maximum emissions from the combustion turbines in tons per year based on the original application are summarized below. There will be minor emissions of VOC from the fuel oil storage tank. However total VOC emissions will still be less than significant for PSD purposes.

Pollutant	Maximum Potential Emissions	PSD Significant Emission Rate
PM/PM10	61	25/15
CO	259	100
NOx	756	40
VOC	34	40
SO2	166	40
Sulfuric Acid Mist	25	7

Air quality and regional haze impact analyses were conducted. Maximum predicted impacts due to proposed emissions from the project are less than the applicable PSD Class I and Class II significant impact levels. There will be insignificant impacts on visibility in the Class I Chassahowitzka National Wildlife Area. Based on the required analyses, the Department has reasonable assurance that the proposed project will not cause or significantly contribute to a violation of any AAQS or PSD increment.

The Department will issue the FINAL Permit, in accordance with the conditions of the DRAFT Permit, unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments and requests for public meetings concerning the proposed permit issuance action for a period of 30 (thirty) days from the date of publication of this Public Notice of Intent to Issue Air Construction Permit. Written comments and requests for public meetings should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit and require, if applicable, another Public Notice.

The Department will issue the permit with the attached conditions unless a timely petition for an administrative hearing is filed pursuant to sections 120.569 and 120.57 F.S., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below. Mediation is not available in this proceeding.

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

A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner, the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action; and (g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the agency to take with respect to the agency's proposed action.

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

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

A complete project file is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environmental Protection
Bureau of Air Regulation
111 S. Magnolia Drive, Suite 4
Tallahassee, Florida 32301
Telephone: 850/488-0114
Fax: 850/922-6979

Department Environmental Protection
Southwest District Office
3804 Coconut Palm Drive
Tampa, Florida 33619-8218
Telephone: 813/744-6100
Fax: 813/744-6084

The complete project file includes the application, technical evaluations, Draft Permit, and the information submitted by the responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Administrator, New Resource Review Section at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-0114, for additional information.

Z 031 392 024

US Postal Service

Receipt for Certified Mail

No Insurance Coverage Provided.

Do not use for International Mail *(See reverse)*

Sent to Gregg Worley	
Street & Number EPA	
Post Office, State, & ZIP Code Atlanta GA	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 11-29-99 1010373-001-AC PSD-FI-280	

PS Form **3800**, April 1995

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Mr. Gregg Worley, Chief
Air, Radiation Technology Branch
Preconstruction/HAP Section
U.S. EPA - Region IV
61 Forsyth Street
Atlanta, GA 30303

4a. Article Number Z 031 392 024

4b. Service Type
☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery

5. Received By: *(Print Name)* JOYCE EVANS

6. Signature: *(Addressee or Agent)*
X DEC -2 1999

8. Addressee's Address *(Only if requested and fee is paid)*

Thank you for using Return Receipt Service.

PS Form **3811**, December 1994 102595-98-B-0229 Domestic Return Receipt

Z 031 392 025

US Postal Service

Receipt for Certified Mail

No Insurance Coverage Provided.

Do not use for International Mail (*See reverse*)

Sent to John Ellis	
Street & Number IPS	
Post Office, State, & ZIP Code Shady Hills	
Postage Clearwater	$ Fl
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 1010373-001-AC PSD-Fl-280	11-29-99

PS Form **3800**, April 1995

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
John Ellis
IPS Avm Park Corp.
1560 Gulf Blvd, # 701
Clearwater, Fl
32767

4a. Article Number
Z 031 392 025

4b. Service Type
☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
12 · 2 · 99

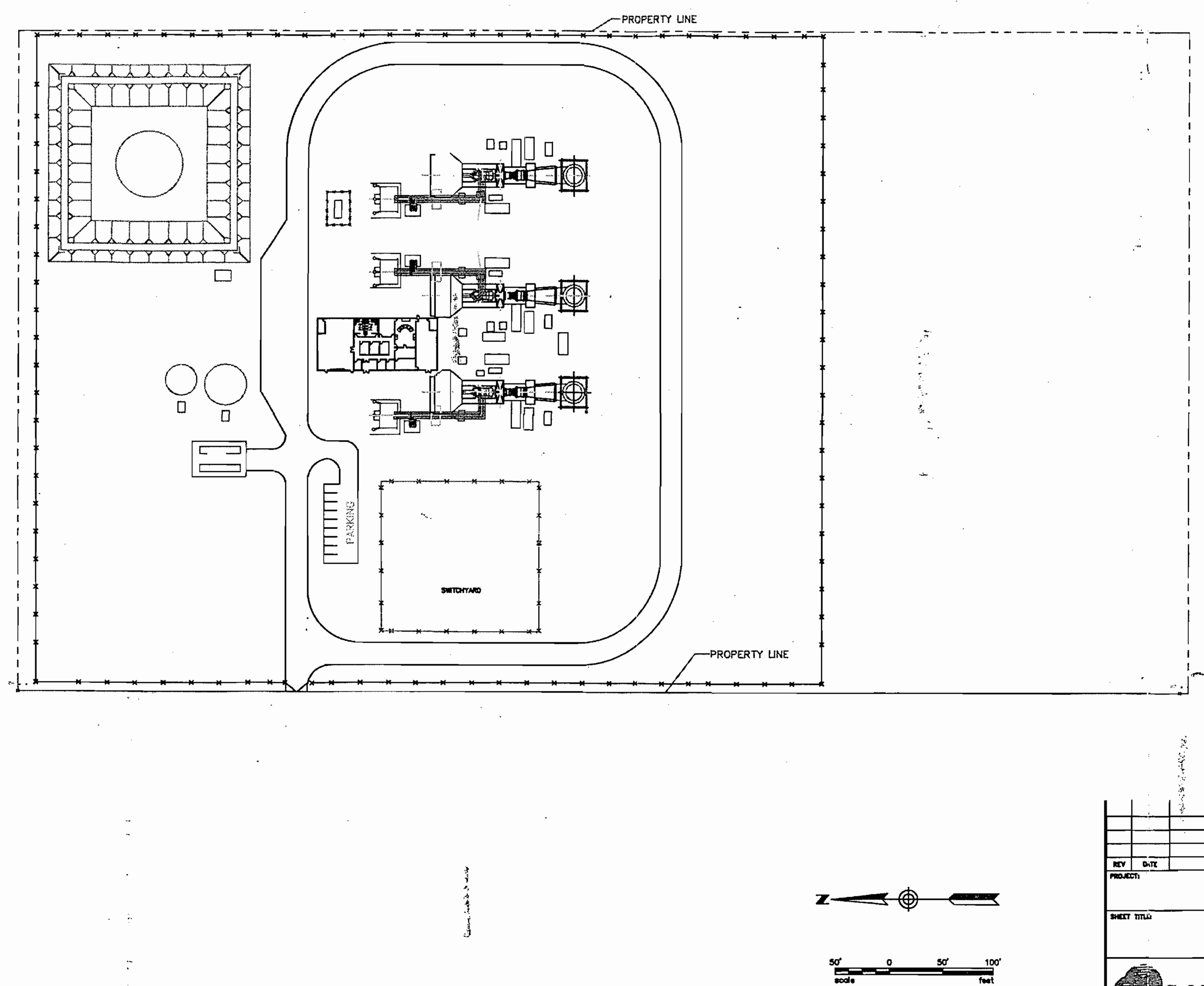
5. Received By: (*Print Name*)
John Ellis

8. Addressee's Address (*Only if requested and fee is paid*)

6. Signature: (*Addressee or Agent*)
X John S. Ellis

PS Form **3811**, December 1994 102595-98-B-0229 Domestic Return Receipt

Thank you for using Return Receipt Service.



REV	DATE	DESCRIPTION	CAD BY	CHK BY	RVW BY

PROJECT: Sanat Power Incorporated
–
Pasco County

SHEET TITLE:
Layout Plan

Golder Associates
Tampa, Florida

PROJECT No.	993-9525		FILE No.:	Pasco.dwg
CLIENT PROJ. No.	–		DRAFTING SUBTITLE:	–
DES BY	–	9/23/99	SCALE:	1"=50'
CAD BY	CDT	9/23/99		2-5
CHK BY				
RVW BY				

AIR PERMIT APPLICATION AND PREVENTION OF SIGNIFICANT DETERIORATION ANALYSIS FOR THE IPS AVON PARK CORPORATION, HARDEE COUNTY, FLORIDA

Prepared For:

IPS Avon Park Corporation
1560 Gulf Blvd., #701
Clearwater, Florida 32767

Prepared By:

Golder Associates Inc.
6241 NW 23rd Street, Suite 500
Gainesville, Florida 32653-1500

August 1999
9939558Y/F1/WP

Rec'd 8/31/99

DISTRIBUTION:
4 Copies - FDEP
2 Copies - IPS Avon Park Corporation
2 Copies - Golder Associates Inc.

0490043-001-AC
PSD-FL-275

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PART A

AIR PERMIT APPLICATION

Department of
Environmental Protection

Division of Air Resources Management

APPLICATION FOR AIR PERMIT - TITLE V SOURCE

See Instructions for Form No. 62-210.900(1)

I. APPLICATION INFORMATION

Identification of Facility

1. Facility Owner/Company Name: **IPS Avon Park Corporation**	
2. Site Name: **IPS Vandolah Power Project**	
3. Facility Identification Number:	[X] Unknown
4. Facility Location: Street Address or Other Locator: **2394 Vandolah Road** City: **Wauchula** County: **Hardee** Zip Code: **33873**	
5. Relocatable Facility? [ ] Yes [X] No	6. Existing Permitted Facility? [ ] Yes [X] No

Application Contact

1. Name and Title of Application Contact: **John S. Ellis**
2. Application Contact Mailing Address: Organization/Firm: **IPS Avon Corporation** Street Address: **1560 Gulf Blvd., #701** City: **Clearwater** State: **FL** Zip Code: **32767**
3. Application Contact Telephone Numbers: Telephone: (**727**) **517 - 7140** Fax: (**727**) **517 - 1255**

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	
2. Permit Number:	
3. PSD Number (if applicable):	
4. Siting Number (if applicable):	

Purpose of Application

Air Operation Permit Application

This Application for Air Permit is submitted to obtain: (Check one)

[ ] Initial Title V air operation permit for an existing facility which is classified as a Title V source.

[ ] Initial Title V air operation permit for a facility which, upon start up of one or more newly constructed or modified emissions units addressed in this application, would become classified as a Title V source.

Current construction permit number: ______________________

[ ] Title V air operation permit revision to address one or more newly constructed or modified emissions units addressed in this application.

Current construction permit number: ______________________

Operation permit number to be revised: ______________________

[ ] Title V air operation permit revision or administrative correction to address one or more proposed new or modified emissions units and to be processed concurrently with the air construction permit application. (Also check Air Construction Permit Application below.)

Operation permit number to be revised/corrected: ______________________

[ ] Title V air operation permit revision for reasons other than construction or modification of an emissions unit. Give reason for the revision; e.g., to comply with a new applicable requirement or to request approval of an "Early Reductions" proposal.

Operation permit number to be revised: ______________________

Reason for revision: ______________________

Air Construction Permit Application

This Application for Air Permit is submitted to obtain: (Check one)

[X] Air construction permit to construct or modify one or more emissions units.

[ ] Air construction permit to make federally enforceable an assumed restriction on the potential emissions of one or more existing, permitted emissions units.

[ ] Air construction permit for one or more existing, but unpermitted, emissions units.

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official: **John S. Ellis**	
2. Owner/Authorized Representative or Responsible Official Mailing Address: Organization/Firm: **IPS Avon Park Corporation** Street Address: **1560 Gulf Blvd., #701** City: **Clearwater** State: **FL** Zip Code: **33767**	
3. Owner/Authorized Representative or Responsible Official Telephone Numbers: Telephone: (**727**) **517 - 7140**	Fax: (**727**) **517 - 1255**

4. Owner/Authorized Representative or Responsible Official Statement:

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

See Attached
Signature   Date

* Attach letter of authorization if not currently on file.

Professional Engineer Certification

1. Professional Engineer Name: **Kennard F. Kosky** Registration Number: **14996**	
2. Professional Engineer Mailing Address: Organization/Firm: **Golder Associates Inc.** Street Address: **6241 NW 23rd Street, Suite 500** City: **Gainesville** State: **FL** Zip Code: **32653-1500**	
3. Professional Engineer Telephone Numbers: Telephone: (**352**) **336 - 5600**	Fax: (**352**) **336 - 6603**

4. Professional Engineer Statement:

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

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

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

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

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

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

Signature ____________________ Date ____________________

(seal)

* Attach any exception to certification statement.

Scope of Application

Emissions Unit ID	Description of Emissions Unit	Permit Type	Processing Fee
1R	GE Frame 7FA Combustion Turbine	AC1A	
2R	GE Frame 7FA Combustion Turbine	AC1A	
3R	GE Frame 7FA Combustion Turbine	AC1A	
4R	GE Frame 7FA Combustion Turbine	AC1A	
5	Unregulated Emissions	AC1A	

Application Processing Fee

Check one: [X] Attached - Amount: $: 7,500 [ ] Not Applicable

Construction/Modification Information

1. Description of Proposed Project or Alterations: **Construction of 4 170-MW 'F' Class combustion turbines. See Attachment PSD-IPS.**
2. Projected or Actual Date of Commencement of Construction: **1 Jul 2000**
3. Projected Date of Completion of Construction: **1 Jan 2002**

Application Comment

See Attachment PSD-IPS

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates: Zone: **17** East (km): **408.75** North (km): **3044.5**			
2. Facility Latitude/Longitude: Latitude (DD/MM/SS): **27 / 31 / 22** Longitude (DD/MM/SS): **81 / 55 / 28**			
3. Governmental Facility Code: **0**	4. Facility Status Code: **C**	5. Facility Major Group SIC Code: **49**	6. Facility SIC(s): **4911**
7. Facility Comment (limit to 500 characters): **Project consists of four 170-MW dual-fuel, General Electric Frame 7FA combustion turbines that will use dry low-nitrogen oxide combustion technology when firing natural gas and water injection when firing distillate fuel oil. Each CT will operate up to 3,390 hours per year.**			

Facility Contact

1. Name and Title of Facility Contact: **Mr. John S. Ellis, President**
2. Facility Contact Mailing Address: Organization/Firm: **IPS Avon Park Corporation** Street Address: **1560 Gulf Blvd., #701** City: **Clearwater** State: **FL** Zip Code: **33767**
3. Facility Contact Telephone Numbers: Telephone: (**727**) **517 - 7140** Fax: (**727**) **517 - 1255**

Facility Regulatory Classifications

Check all that apply:

1. [ ] Small Business Stationary Source?	[ ] Unknown
2. [X] Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)?	
3. [ ] Synthetic Minor Source of Pollutants Other than HAPs?	
4. [ ] Major Source of Hazardous Air Pollutants (HAPs)?	
5. [ ] Synthetic Minor Source of HAPs?	
6. [X] One or More Emissions Units Subject to NSPS?	
7. [ ] One or More Emission Units Subject to NESHAP?	
8. [X] Title V Source by EPA Designation?	
9. Facility Regulatory Classifications Comment (limit to 200 characters): **CT is subject to NSPS Subpart GG. The tanks are subject to Subpart Kb.**	

List of Applicable Regulations

Not Applicable	

B. FACILITY POLLUTANTS

List of Pollutants Emitted

1. Pollutant Emitted	2. Pollutant Classif.	3. Requested Emissions Cap		4. Basis for Emissions Cap	5. Pollutant Comment
		lb/hour	tons/year		
PM	**A**				**Particulate Matter-Total**
VOC	**A**				**Volatile Organic Compounds**
SO_2	**A**				**Sulfur Dioxide**
NO_x	**A**				**Nitrogen Oxides**
CO	**A**	-			**Carbon Monoxides**
PM_{10}	**A**				**Particulate Matter-PM_{10}**

C. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements

1. Area Map Showing Facility Location: [X] Attached, Document ID: PSD-IPS [ ] Not Applicable [ ] Waiver Requested
2. Facility Plot Plan: [X] Attached, Document ID: PSD-IPS [ ] Not Applicable [ ] Waiver Requested
3. Process Flow Diagram(s): [X] Attached, Document ID: PSD-IPS [ ] Not Applicable [ ] Waiver Requested
4. Precautions to Prevent Emissions of Unconfined Particulate Matter: [ ] Attached, Document ID: ______ [X] Not Applicable [ ] Waiver Requested
5. Fugitive Emissions Identification: [ ] Attached, Document ID: ______ [X] Not Applicable [ ] Waiver Requested
6. Supplemental Information for Construction Permit Application: [X] Attached, Document ID: PSD-IPS [ ] Not Applicable
7. Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

8. List of Proposed Insignificant Activities: [ ] Attached, Document ID:________ [ ] Not Applicable
9. List of Equipment/Activities Regulated under Title VI: [ ] Attached, Document ID:________ [ ] Equipment/Activities On site but Not Required to be Individually Listed [ ] Not Applicable
10. Alternative Methods of Operation: [ ] Attached, Document ID:________ [ ] Not Applicable
11. Alternative Modes of Operation (Emissions Trading): [ ] Attached, Document ID:________ [ ] Not Applicable
12. Identification of Additional Applicable Requirements: [ ] Attached, Document ID:________ [ ] Not Applicable
13. Risk Management Plan Verification: [ ] Plan previously submitted to Chemical Emergency Preparedness and Prevention Office (CEPPO). Verification of submittal attached (Document ID:________) or previously submitted to DEP (Date and DEP Office:________________________) [ ] Plan to be submitted to CEPPO (Date required:____________________________) [ ] Not Applicable
14. Compliance Report and Plan: [ ] Attached, Document ID:________ [ ] Not Applicable
15. Compliance Certification (Hard-copy Required): [ ] Attached, Document ID:________ [ ] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)

Emissions Unit Description and Status

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

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

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

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

2. Regulated or Unregulated Emissions Unit? (Check one)

[X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

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

3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):
GE Frame 7FA Combustion Turbine

4. Emissions Unit Identification Number: [ ] No ID
ID: [X] ID Unknown

5. Emissions Unit Status Code: **C**	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code: **49**	8. Acid Rain Unit? [X]

9. Emissions Unit Comment: (Limit to 500 Characters)
This emission unit is a GE Frame 7FA combustion turbine operating in simple cycle mode. See Attachment PSD-IPS.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Dry Low NO_x combustion - Natural gas firing**
2. Control Device or Method Code(s): **25**

Emissions Unit Details

1. Package Unit: Manufacturer: **General Electric**	Model Number: **7FA**
2. Generator Nameplate Rating:	**172** MW
3. Incinerator Information: Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:	 °F seconds °F

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Water injection - distillate oil firing**
2. Control Device or Method Code(s): **28**

Emissions Unit Details

1. Package Unit: Manufacturer: **General Electric**	Model Number: **7FA**	
2. Generator Nameplate Rating:	**172** MW	
3. Incinerator Information: Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:		 °F seconds °F

B. EMISSIONS UNIT CAPACITY INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:		**1,612**	mmBtu/hr
2. Maximum Incineration Rate:	lb/hr		tons/day
3. Maximum Process or Throughput Rate:			
4. Maximum Production Rate:			
5. Requested Maximum Operating Schedule:			
	hours/day		days/week
	weeks/year	**3,390**	hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters): **Maximum heat input at ISO conditions and natural gas firing (LHV); maximum for oil firing is 1,806 MMBtu/hr (ISO-LHV) and 182 MW.**			

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

See Attachment IPS-EU1-D for operational requirements	
See Attachment PSD-IPS for permitting requirements	

ATTACHMENT IPS-EU1-D

Applicable Requirements Listing

EMISSION UNIT ID: EU1

FDEP Rules:

Air Pollution Control-General Provisions:

62-204.800(7)(b)37. (State Only)	- NSPS Subpart GG
62-204.800(7)(c) (State Only)	- NSPS authority
62-204.800(7)(d)(State Only)	- NSPS General Provisions
62-204.800(12) (State Only)	- Acid Rain Program
62-204.800(13) (State Only)	- Allowances
62-204.800(14) (State Only)	- Acid Rain Program Monitoring
62-204.800(16) (State Only)	- Excess Emissions (Potentially applicable over term of permit)

Stationary Sources-General:

62-210.650	- Circumvention; EUs with control device
62-210.700(1)	- Excess Emissions;
62-210.700(4)	- Excess Emissions; poor maintenance
62-210.700(6)	- Excess Emissions; notification

Acid Rain:

62-214.300	- All Acid Rain Units (Applicability)
62-214.320(1)(a),(2)	- All Acid Rain Units (Application Shield)
62-214.330(1)(a)1.	- Compliance Options (if 214.430)
62-214.340	- Exemptions (new units, retired units)
62-214.350(2);(3);(6)	- All Acid Rain Units (Certification)
62-214.370	- All Acid Rain Units (Revisions; correction; potentially applicable if a need arises)
62-214.430	- All Acid Rain Units (Compliance Options-if required)

Stationary Sources-Emission Standards:

62-296.320(4)(b)(State Only)	- CTs/Diesel Units

Stationary Sources-Emission Monitoring (where stack test is required):

62-297.310(1)	- All Units (Test Runs-Mass Emission)
62-297.310(2)(b)	- All Units (Operating Rate; other than CTs;no CT)
62-297.310(3)	- All Units (Calculation of Emission)
62-297.310(4)(a)	- All Units (Applicable Test Procedures;Sampling time)
62-297.310(4)(b)	- All Units (Sample Volume)
62-297.310(4)(c)	- All Units (Required Flow Rate Range-PM/H2SO4/F)
62-297.310(4)(d)	- All Units (Calibration)
62-297.310(4)(e)	- All Units (EPA Method 5-only)

62-297.310(5)	- All Units (Determination of Process Variables)
62-297.310(6)(a)	- All Units (Permanent Test Facilities-general)
62-297.310(6)(c)	- All Units (Sampling Ports)
62-297.310(6)(d)	- All Units (Work Platforms)
62-297.310(6)(e)	- All Units (Access)
62-297.310(6)(f)	- All Units (Electrical Power)
62-297.310(6)(g)	- All Units (Equipment Support)
62-297.310(7)(a)1.	- Applies mainly to CTs/Diesels
62-297.310(7)(a)2.	- FFSG excess emissions
62-297.310(7)(a)3.	- Permit Renewal Test Required
62-297.310(7)(a)4.a	- Annual Test
62-297.310(7)(a)5.	- PM exemption if <400 hrs/yr
62-297.310(7)(a)6.	- PM FFSG semi annual test required if >200 hrs/yr
62-297.310(7)(a)7.	- PM quarterly monitoring if >100 hrs/yr
62-297.310(7)(a)9.	- FDEP Notification - 15 days
62-297.310(7)(c)	- Waiver of Compliance Tests (Fuel Sampling)
62-297.310(8)	- Test Reports

Federal Rules:

NSPS Subpart GG:	
40 CFR 60.332(a)(1)	- NOx for Electric Utility CTs
40 CFR 60.332(a)(3)	- NOx for Electric Utility CTs
40 CFR 60.333	- SO2 limits
40 CFR 60.334	- Monitoring of Operations (Custom Monitoring for Gas)
40 CFR 60.335	- Test Methods

NSPS General Requirements:	
40 CFR 60.7(a)(1)	- Notification of Construction
40 CFR 60.7(a)(2)	- Notification of Initial Start-Up
40 CFR 60.7(a)(3)	- Notification of Actual Start-Up
40 CFR 60.7(a)(4)	- Notification and Recordkeeping (Physical/Operational Cycle)
40 CFR 60.7(a)(5)	- Notification of CEM Demonstration
40 CFR 60.7(b) (startup/shutdown/malfunction)	- Notification and Recordkeeping
40 CFR 60.7(c) (startup/shutdown/malfunction)	- Notification and Recordkeeping
40 CFR 60.7(d) (startup/shutdown/malfunction)	- Notification and Recordkeeping
40 CFR 60.7(f)	- Notification and Recordkeeping (maintain records-2 yrs)
40 CFR 60.8(a)	- Performance Test Requirements
40 CFR 60.8(b)	- Performance Test Notification
40 CFR 60.8(c)	- Performance Tests (representative conditions)
40 CFR 60.8(e)	- Provide Stack Sampling Facilities
40 CFR 60.8(f)	- Test Runs

40 CFR 60.11(a)	- Compliance (ref. S. 60.8 or Subpart; other than opacity)
40 CFR 60.11(b)	- Compliance (opacity determined EPA Method 9)
40 CFR 60.11(c)	- Compliance (opacity; excludes
startup/shutdown/malfunction)	
40 CFR 60.11(d)	- Compliance (maintain air pollution control equip.)
40 CFR 60.11(e)(2)	- Compliance (opacity; ref. S. 60.8)
40 CFR 60.12	- Circumvention
40 CFR 60.13(a)	- Monitoring (Appendix B; Appendix F)
40 CFR 60.13(c)	- Monitoring (Opacity COMS)
40 CFR 60.13(d)(1)	- Monitoring (CEMS; span, drift, etc.)
40 CFR 60.13(d)(2)	- Monitoring (COMS; span, system check)
40 CFR 60.13(e)	- Monitoring (frequency of operation)
40 CFR 60.13(f)	- Monitoring (frequency of operation)
40 CFR 60.13(h)	- Monitoring (COMS; data requirements)

Acid Rain-Permits:

40 CFR 72.9(a)	- Permit Requirements
40 CFR 72.9(b)	- Monitoring Requirements
40 CFR 72.9(c)(1)	- SO2 Allowances-hold allowances
40 CFR 72.9(c)(2)	- SO2 Allowances-violation
40 CFR 72.9(c)(3)(iii)	- SO2 Allowances-Phase II Units (listed)
40 CFR 72.9(c)(4)	- SO2 Allowances-allowances held in ATS
40 CFR 72.9(c)(5)	- SO2 Allowances-no deduction for 72.9(c)(1)(i)
40 CFR 72.9(d)	- NOx Requirements
40 CFR 72.9(e)	- Excess Emission Requirements
40 CFR 72.9(f)	- Recordkeeping and Reporting
40 CFR 72.9(g)	- Liability
40 CFR 72.20(a)	- Designated Representative; required
40 CFR 72.20(b)	- Designated Representative; legally binding
40 CFR 72.20(c)	- Designated Representative; certification requirements
40 CFR 72.21	- Submissions
40 CFR 72.22	- Alternate Designated Representative
40 CFR 72.23	- Changing representatives; owners
40 CFR 72.24	- Certificate of representation
40 CFR 72.30(a)	- Requirements to Apply (operate)
40 CFR 72.30(b)(2)	- Requirements to Apply (Phase II-Complete)
40 CFR 72.30(c)	- Requirements to Apply (reapply before expiration)
40 CFR 72.30(d)	- Requirements to Apply (submittal requirements)
40 CFR 72.31	- Information Requirements; Acid Rain Applications
40 CFR 72.32	- Permit Application Shield
40 CFR 72.33(b)	- Dispatch System ID;unit/system ID
40 CFR 72.33(c)	- Dispatch System ID;ID requirements
40 CFR 72.33(d)	- Dispatch System ID;ID change
40 CFR 72.40(a)	- General; compliance plan
40 CFR 72.40(b)	- General; multi-unit compliance options
40 CFR 72.40(c)	- General; conditional approval

40 CFR 72.40(d)	- General; termination of compliance options
40 CFR 72.51	- Permit Shield
40 CFR 72.90	- Annual Compliance Certification
Allowances:	
40 CFR 73.33(a),(c)	- Authorized account representative
40 CFR 73.35(c)(1)	- Compliance: ID of allowances by serial number
Monitoring Part 75:	
40 CFR 75.4	- Compliance Dates;
40 CFR 75.5	- Prohibitions
40 CFR 75.10(a)(1)	- Primary Measurement; SO2;
40 CFR 75.10(a)(2)	- Primary Measurement; NOx;
40 CFR 75.10(a)(3)(iii)	- Primary Measurement; CO2; O2 monitor
40 CFR 75.10(b)	- Primary Measurement; Performance Requirements
40 CFR 75.10(c)	- Primary Measurement; Heat Input; Appendix F
40 CFR 75.10(e)	- Primary Measurement; Optional Backup Monitor
40 CFR 75.10(f)	- Primary Measurement; Minimum Measurement
40 CFR 75.10(g)	- Primary Measurement; Minimum Recording
40 CFR 75.11(d)	- SO2 Monitoring; Gas- and Oil-fired units
40 CFR 75.11(e)	- SO2 Monitoring; Gaseous firing
40 CFR 75.12(a)	- NOx Monitoring; Coal; Non-peaking oil/gas units
40 CFR 75.12(b)	- NOx Monitoring; Determination of NOx emission rate; Appendix F
40 CFR 75.13(b)	- CO2 Monitoring; Appendix G
40 CFR 75.13(c)	- CO2 Monitoring; Appendix F
40 CFR 75.14(c)	- Opacity Monitoring; Gas units; exemption
40 CFR 75.20(a) Certification	- Initial Certification Approval Process; Loss of
40 CFR 75.20(b)	- Recertification Procedures (if recertification necessary)
40 CFR 75.20(c)	- Certification Procedures (if recertification necessary)
40 CFR 75.20(d)	- Recertification Backup/portable monitor
40 CFR 75.20(f)	- Alternate Monitoring system
40 CFR 75.21(a) 12/31/96)	- QA/QC; CEMS; Appendix B (Suspended 7/17/95-
40 CFR 75.21(c)	- QA/QC; Calibration Gases
40 CFR 75.21(d)	- QA/QC; Notification of RATA
40 CFR 75.21(e)	- QA/QC; Audits
40 CFR 75.21(f)	- QA/QC; CEMS (Effective 7/17/96-12/31/96)
40 CFR 75.22	- Reference Methods
40 CFR 75.24	- Out-of-Control Periods; CEMS
40 CFR 75.30(a)(3)	- General Missing Data Procedures; NOx
40 CFR 75.30(a)(4)	- General Missing Data Procedures; SO2
40 CFR 75.30(b) monitor	- General Missing Data Procedures; certified backup
40 CFR 75.30(c) monitor	- General Missing Data Procedures; certified backup

40 CFR 75.30(d)	- General Missing Data Procedures; SO2 (optional before 1/1/97)
40 CFR 75.30(e) stacks	- General Missing Data Procedures; bypass/multiple
40 CFR 75.31	- Initial Missing Data Procedures (new/re-certified CMS)
40 CFR 75.32	- Monitoring Data Availability for Missing Data
40 CFR 75.33	- Standard Missing Data Procedures
40 CFR 75.36	- Missing Data for Heat Input
40 CFR 75.40	- Alternate Monitoring Systems-General
40 CFR 75.41	- Alternate Monitoring Systems-Precision Criteria
40 CFR 75.42	- Alternate Monitoring Systems-Reliability Criteria
40 CFR 75.43	- Alternate Monitoring Systems-Accessability Criteria
40 CFR 75.44	- Alternate Monitoring Systems-Timeliness Criteria
40 CFR 75.45	- Alternate Monitoring Systems-Daily QA
40 CFR 75.46	- Alternate Monitoring Systems-Missing data
40 CFR 75.47	- Alternate Monitoring Systems-Criteria for Class
40 CFR 75.48	- Alternate Monitoring Systems-Petition
40 CFR 75.53	- Monitoring Plan ; revisions
40 CFR 75.54(a)	- Recordkeeping-general
40 CFR 75.54(b)	- Recordkeeping-operating parameter
40 CFR 75.54(c)	- Recordkeeping-SO2
40 CFR 75.54(d)	- Recordkeeping-NOx
40 CFR 75.54(e)	- Recordkeeping-CO2
40 CFR 75.54(f)	- Recordkeeping-Opacity
40 CFR 75.55(c)	- General Recordkeeping (Specific Situations)
40 CFR 75.55(e)	- General Recordkeeping (Specific Situations)
40 CFR 75.56	- Certification; QA/QC Provisions
40 CFR 75.60	- Reporting Requirements-General
40 CFR 75.61	- Reporting Requirements-Notification cert/recertification
40 CFR 75.62	- Reporting Requirements-Monitoring Plan
40 CFR 75.63	- Reporting Requirements-Certification/Recertification
40 CFR 75.64(a)	- Reporting Requirements-Quarterly reports; submission
40 CFR 75.64(b) statement	- Reporting Requirements-Quarterly reports; DR
40 CFR 75.64(c)	- Rep. Req.; Quarterly reports; Compliance Certification
40 CFR 75.64(d)	- Rep. Req.; Quarterly reports; Electronic format
40 CFR 75.66	- Petitions to the Administrator (if required)
Appendix A-1	- Installation and Measurement Locations
Appendix A-2.	- Equipment Specifications
Appendix A-3.	- Performance Specifications
Appendix A-4.	- Data Handling and Acquisition Systems
Appendix A-5.	- Calibration Gases
Appendix A-6.	- Certification Tests and Procedures
Appendix A-7.	- Calculations
Appendix B	- QA/QC Procedures
Appendix C-1.	- Missing Data; SO2/NOx for controlled sources
Appendix C-2.	- Missing Data; Load-Based Procedure; NOx & flow

Appendix D	- Optional SO_2; Oil-/gas-fired units
Appendix F	- Conversion Procedures
Appendix H	- Traceability Protocol

Acid Rain Program-Excess Emissions (these are future requirements):

40 CFR 77.3	- Offset Plans (future)
40 CFR 77.5(b)	- Deductions of Allowances (future)
40 CFR 77.6	- Excess Emissions Penalties (SO_2 and NO_x;future)

D. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? **See Att. PSD-IPS**	2. Emission Point Type Code: **1**

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point):

Exhausts through a single stack.

4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:

5. Discharge Type Code: **V**	6. Stack Height: **60** feet	7. Exit Diameter: **22** feet
8. Exit Temperature: **1,113** °F	9. Actual Volumetric Flow Rate: **2,645,000** acfm	10. Water Vapor: **8.6** %

11. Maximum Dry Standard Flow Rate: **800,000** dscfm	12. Nonstack Emission Point Height: feet

13. Emission Point UTM Coordinates:

Zone: **17** East (km): **408.75** North (km): **3044.50**

14. Emission Point Comment (limit to 200 characters):

Stack parameters for ISO operating condition firing natural gas; for oil 1,094°F and 2,731,000 ACFM.

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Distillate (No. 2) Fuel Oil**		
2. Source Classification Code (SCC): **20100101**	3. SCC Units: **1,000 gallons used**	
4. Maximum Hourly Rate: **13.9**	5. Maximum Annual Rate: **13,900**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.05**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **132**
10. Segment Comment (limit to 200 characters): **Million Btu per SCC Unit = 131.8 (rounded to 132). Based on 7.1 lb/gal; LHV of 18,560 Btu/lb, - ISO conditions, 1,000 hrs/yr operation.**		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Natural Gas**		
2. Source Classification Code (SCC): **20100201**	3. SCC Units: **Million Cubic Feet**	
4. Maximum Hourly Rate: **1.70**	5. Maximum Annual Rate: **5,752**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **950**
10. Segment Comment (limit to 200 characters): **Based on 950 Btu/cf (LHV); ISO conditions and 3,390 hrs/yr operation.**		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM			EL
SO_2			EL
NO_x	026	028	EL
CO			EL
VOC			EL
PM_{10}			EL

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **17** lb/hour **20.5** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing, all loads. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **17 lb/hr**	4. Equivalent Allowable Emissions: **17** lb/hour **8.5** tons/year
5. Method of Compliance (limit to 60 characters): **Annual stack test; EPA Methods 5 or 17; if < 400 hours**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing - all loads; 1,000 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **17** lb/hour **20.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; all loads. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions
Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **10 lb/hr**	4. Equivalent Allowable Emissions: **10** lb/hour **17** tons/year
5. Method of Compliance (limit to 60 characters): **VE Test < 20% opacity**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing - all loads; 3,390 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **101.5** lb/hour **55.3** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Emission Factor: 1 grain S per 100 CF gas; 0.05% S oil lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **See Comment**	4. Equivalent Allowable Emissions: **5.1** lb/hour **8.4** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel Sampling**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested allowable emissions and units: Pipeline Natural Gas. Gas firing, 1 gram/100 cf - 32°F, 100% load; 3,390 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **101.5** lb/hour **55.3** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Emission Factor: 1 grain S per 100 CF gas; 0.05% S oil lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.05% Sulfur Oil**	4. Equivalent Allowable Emissions: **101.5** lb/hour **49.3** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel Sampling**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing - 32°F; 100% load; 1,000 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **NO_x**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **362** lb/hour **252** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **42 ppmvd**	4. Equivalent Allowable Emissions: **362.0** lb/hour **175.4** tons/year
5. Method of Compliance (limit to 60 characters): **CEM - 30 Day Rolling Average**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested Allowable Emissions is at 15% O_2-100% load. Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 1,000 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: NO_x	2. Total Percent Efficiency of Control:
3. Potential Emissions: 362 lb/hour 252 tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: GE, 1998; Golder	7. Emissions Method Code: 2
8. Calculation of Emissions (limit to 600 characters): See Attachment PSD-IPS; Section 2.0; Appendix A.	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: OTHER	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: 9 ppmvd	4. Equivalent Allowable Emissions: 66.7 lb/hour 108.6 tons/year
5. Method of Compliance (limit to 60 characters): CEM - 30 Day Rolling Average	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): Requested Allowable Emissions and Units is at 15% O_2-100% load. Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **74.4** lb/hour **86.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **20 ppmvd**	4. Equivalent Allowable Emissions: **74.4** lb/hour **34.7** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 1,000 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **CO**

2. Total Percent Efficiency of Control:

3. Potential Emissions: **74.4** lb/hour **86.5** tons/year

4. Synthetically Limited? [X]

5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year

6. Emission Factor:
   Reference: **GE, 1998; Golder**

7. Emissions Method Code: **2**

8. Calculation of Emissions (limit to 600 characters):

See Attachment PSD-IPS; Section 2.0; Appendix A.

9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):

Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**

2. Future Effective Date of Allowable Emissions:

3. Requested Allowable Emissions and Units: **12 ppmvd**

4. Equivalent Allowable Emissions: **44.2** lb/hour **72.0** tons/year

5. Method of Compliance (limit to 60 characters):

EPA Method 10; high and low load

6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):

Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **17** lb/hour **20.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 59°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **17 lb/hr**	4. Equivalent Allowable Emissions: **17** lb/hour **8.5** tons/year
5. Method of Compliance (limit to 60 characters): **Annual stack test; EPA Method 5 or 17; if <400 hours**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing - all loads; 1,000 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **17** lb/hour **20.5** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 59°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **10 lb/hr**	4. Equivalent Allowable Emissions: **10** lb/hour **17.0** tons/year
5. Method of Compliance (limit to 60 characters): **VE Test < 20% opacity**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing; all loads; 3,390 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 1 of 2

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **Annual VE Test EPA Method 9**	
5. Visible Emissions Comment (limit to 200 characters): **Maximum for oil firing.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 1 of 2

1. Parameter Code: **EM**	2. Pollutant(s): **NO_x**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: **Not yet determined** Manufacturer: Model Number:	Serial Number:
5. Installation Date: **01 Jan 2002**	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **NO_x CEM proposed to meet requirements of 40 CFR Part 75.**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 2 of 2

1. Visible Emissions Subtype: **VE99**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: % Exceptional Conditions: **100** % Maximum Period of Excess Opacity Allowed: **6** min/hour	
4. Method of Compliance: **None**	
5. Visible Emissions Comment (limit to 200 characters): **FDEP Rule 62-201.700(1), Allowed for 2 hours (120 minutes) per 24 hours for start up, shutdown and malfunction.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 2 of 2

1. Parameter Code: **EM**	2. Pollutant(s): **NO_x**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: **Not yet determined** Manufacturer: Model Number:	Serial Number:
5. Installation Date: **01 Jan 2002**	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Parameter Code: WTF. Required by 40 CFR Part 60; subpart GG; 60.334.**	

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements

1. Process Flow Diagram [X] Attached, Document ID: PSD-IPS [ ] Not Applicable [ ] Waiver Requested	
2. Fuel Analysis or Specification [X] Attached, Document ID: PSD-IPS [ ] Not Applicable [ ] Waiver Requested	
3. Detailed Description of Control Equipment [X] Attached, Document ID: PSD-IPS [ ] Not Applicable [ ] Waiver Requested	
4. Description of Stack Sampling Facilities [X] Attached, Document ID: PSD-IPS [ ] Not Applicable [ ] Waiver Requested	
5. Compliance Test Report [ ] Attached, Document ID:________ [ ] Previously submitted, Date:______________ [X] Not Applicable	
6. Procedures for Startup and Shutdown [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested	
7. Operation and Maintenance Plan [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested	
8. Supplemental Information for Construction Permit Application [X] Attached, Document ID: PSD-IPS [ ] Not Applicable	
9. Other Information Required by Rule or Statute [X] Attached, Document ID: PSD-IPS [ ] Not Applicable	
10. Supplemental Requirements Comment:	

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation [ ] Attached, Document ID:________ [ ] Not Applicable
12. Alternative Modes of Operation (Emissions Trading) [ ] Attached, Document ID:________ [ ] Not Applicable
13. Identification of Additional Applicable Requirements [ ] Attached, Document ID:________ [ ] Not Applicable
14. Compliance Assurance Monitoring Plan [ ] Attached, Document ID:________ [ ] Not Applicable
15. Acid Rain Part Application (Hard-copy Required) [ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID:________ [ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID:________ [ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID:________ [ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID:________ [ ] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) Attached, Document ID:________ [ ] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) Attached, Document ID:________ [ ] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)

Emissions Unit Description and Status

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

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

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

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

2. Regulated or Unregulated Emissions Unit? (Check one)

[X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

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

3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):
GE Frame 7FA Combustion Turbine

4. Emissions Unit Identification Number: [ ] No ID
ID: [X] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
C		49	[X]

9. Emissions Unit Comment: (Limit to 500 Characters)
This emission unit is a GE Frame 7FA combustion turbine operating in simple cycle mode. See Attachment PSD-IPS.

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **16.7** lb/hour **11.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **1.4 ppmvd**	4. Equivalent Allowable Emissions: **3** lb/hour **4.8** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 25A; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Additional requested allowable emissions and units: Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **16.7** lb/hour **11.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **7 ppmvw**	4. Equivalent Allowable Emissions: **16.7** lb/hour **8.1** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 25A; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 1,000 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method):   **Dry Low NO_x combustion - Natural gas firing**
2. Control Device or Method Code(s): **25**

Emissions Unit Details

1. Package Unit: Manufacturer: **General Electric**	Model Number: **7FA**	
2. Generator Nameplate Rating:	**172** MW	
3. Incinerator Information: Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:		 °F seconds °F

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Water injection - distillate oil firing**	
2. Control Device or Method Code(s): **28**	

Emissions Unit Details

1. Package Unit: Manufacturer: **General Electric**	Model Number: **7FA**	
2. Generator Nameplate Rating:	**172** MW	
3. Incinerator Information: Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:		°F seconds °F

B. EMISSIONS UNIT CAPACITY INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:		**1,612**	mmBtu/hr
2. Maximum Incineration Rate:	lb/hr		tons/day
3. Maximum Process or Throughput Rate:			
4. Maximum Production Rate:			
5. Requested Maximum Operating Schedule:			
	hours/day		days/week
	weeks/year	**3,390**	hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters): **Maximum heat input at ISO conditions and natural gas firing (LHV); maximum for oil firing is 1,806 MMBtu/hr (ISO-LHV) and 182 MW.**			

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

See Attachment IPS-EU1-D for operational requirements	
See Attachment PSD-IPS for permitting requirements	

D. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? **See Att. PSD-IPS**	2. Emission Point Type Code: **1**
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): **Exhausts through a single stack.**	
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: -	

5. Discharge Type Code: **V**	6. Stack Height: **60** feet	7. Exit Diameter: **22** feet
8. Exit Temperature: **1,113** °F	9. Actual Volumetric Flow Rate: **2,645,000** acfm	10. Water Vapor: **8.6** %

11. Maximum Dry Standard Flow Rate: **800,000** dscfm	12. Nonstack Emission Point Height: feet
13. Emission Point UTM Coordinates: Zone: **17** East (km): **408.75** North (km): **3044.50**	
14. Emission Point Comment (limit to 200 characters): **Stack parameters for ISO operating condition firing natural gas; for oil 1,094°F and 2,731,000 ACFM.**	

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters):

Distillate (No. 2) Fuel Oil

2. Source Classification Code (SCC): **20100101**	3. SCC Units: **1,000 gallons used**	
4. Maximum Hourly Rate: **13.9**	5. Maximum Annual Rate: **13,900**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.05**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **132**

10. Segment Comment (limit to 200 characters):

Million Btu per SCC Unit = 131.8 (rounded to 132). Based on 7.1 lb/gal; LHV of 18,560 Btu/lb, - ISO conditions, 1,000 hrs/yr operation.

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters):

Natural Gas

2. Source Classification Code (SCC): **20100201**	3. SCC Units: **Million Cubic Feet**	
4. Maximum Hourly Rate: **1.70**	5. Maximum Annual Rate: **5,752**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **950**

10. Segment Comment (limit to 200 characters):

Based on 950 Btu/cf (LHV); ISO conditions and 3,390 hrs/yr operation.

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM			EL
SO_2			EL
NO_x	026	028	EL
CO			EL
VOC			EL
PM_{10}			EL

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **17** lb/hour **20.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing, all loads. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **17 lb/hr**	4. Equivalent Allowable Emissions: **17** lb/hour **8.5** tons/year
5. Method of Compliance (limit to 60 characters): **Annual stack test; EPA Methods 5 or 17; if < 400 hours**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing - all loads; 1,000 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **17** lb/hour **20.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; all loads. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **10 lb/hr**	4. Equivalent Allowable Emissions: **10** lb/hour **17** tons/year
5. Method of Compliance (limit to 60 characters): **VE Test < 20% opacity**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing - all loads; 3,390 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: SO_2	2. Total Percent Efficiency of Control:
3. Potential Emissions: 101.5 lb/hour 55.3 tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: GE, 1998; Golder	7. Emissions Method Code: 2
8. Calculation of Emissions (limit to 600 characters): See Attachment PSD-IPS; Section 2.0; Appendix A.	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Emission Factor: 1 grain S per 100 CF gas; 0.05% S oil lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.	

Allowable Emissions

Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: OTHER	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: 0.05% Sulfur Oil	4. Equivalent Allowable Emissions: 101.5 lb/hour 49.3 tons/year
5. Method of Compliance (limit to 60 characters): Fuel Sampling	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): Oil firing - 32°F; 100% load; 1,000 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **101.5** lb/hour **55.3** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Emission Factor: 1 grain S per 100 CF gas; 0.05% S oil lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **See Comment**	4. Equivalent Allowable Emissions: **5.1** lb/hour **8.4** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel Sampling**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested allowable emissions and units: Pipeline Natural Gas. Gas firing, 1 gram/100 cf - 32°F, 100% load; 3,390 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **NO_x**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **362** lb/hour **252** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **42 ppmvd**	4. Equivalent Allowable Emissions: **362.0** lb/hour **175.4** tons/year
5. Method of Compliance (limit to 60 characters): **CEM - 30 Day Rolling Average**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested Allowable Emissions is at 15% O_2-100% load. Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 1,000 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **NO_x**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **362** lb/hour **252** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **9 ppmvd**	4. Equivalent Allowable Emissions: **66.7** lb/hour **108.6** tons/year
5. Method of Compliance (limit to 60 characters): **CEM - 30 Day Rolling Average**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested Allowable Emissions and Units is at 15% O_2-100% load. Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **74.4** lb/hour **86.5** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **20 ppmvd**	4. Equivalent Allowable Emissions: **74.4** lb/hour **34.7** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 1,000 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **74.4** lb/hour **86.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **12 ppmvd**	4. Equivalent Allowable Emissions: **44.2** lb/hour **72.0** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **16.7** lb/hour **11.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **7 ppmvw**	4. Equivalent Allowable Emissions: **16.7** lb/hour **8.1** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 25A; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 1,000 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **16.7** lb/hour **11.5** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **1.4 ppmvd**	4. Equivalent Allowable Emissions: **3** lb/hour **4.8** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 25A; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Additional requested allowable emissions and units: Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **17** lb/hour **20.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 59°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **17 lb/hr**	4. Equivalent Allowable Emissions: **17** lb/hour **8.5** tons/year
5. Method of Compliance (limit to 60 characters): **Annual stack test; EPA Method 5 or 17; if <400 hours**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing - all loads; 1,000 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **17** lb/hour **20.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 59°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **10 lb/hr**	4. Equivalent Allowable Emissions: **10** lb/hour **17.0** tons/year
5. Method of Compliance (limit to 60 characters): **VE Test < 20% opacity**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing; all loads; 3,390 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 1 of 2

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **Annual VE Test EPA Method 9**	
5. Visible Emissions Comment (limit to 200 characters): **Maximum for oil firing.** -	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 1 of 2

1. Parameter Code: **EM**	2. Pollutant(s): **NO_x**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: **Not yet determined** Manufacturer: Model Number:	Serial Number:
5. Installation Date: **01 Jan 2002**	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **NO_x CEM proposed to meet requirements of 40 CFR Part 75.**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 2 of 2

1. Visible Emissions Subtype: **VE99**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: % Exceptional Conditions: **100** % Maximum Period of Excess Opacity Allowed: **6** min/hour	
4. Method of Compliance: **None**	
5. Visible Emissions Comment (limit to 200 characters): **FDEP Rule 62-201.700(1), Allowed for 2 hours (120 minutes) per 24 hours for start up, shutdown and malfunction.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 2 of 2

1. Parameter Code: **EM**	2. Pollutant(s): **NO_x**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: **Not yet determined** Manufacturer: Model Number: Serial Number:	
5. Installation Date: **01 Jan 2002**	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Parameter Code: WTF. Required by 40 CFR Part 60; subpart GG; 60.334.**	

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements

1.	Process Flow Diagram [X] Attached, Document ID: PSD-IPS [ ] Not Applicable [ ] Waiver Requested
2.	Fuel Analysis or Specification [X] Attached, Document ID: PSD-IPS [ ] Not Applicable [ ] Waiver Requested
3.	Detailed Description of Control Equipment [X] Attached, Document ID: PSD-IPS [ ] Not Applicable [ ] Waiver Requested
4.	Description of Stack Sampling Facilities [X] Attached, Document ID: PSD-IPS [ ] Not Applicable [ ] Waiver Requested
5.	Compliance Test Report [ ] Attached, Document ID:________ [ ] Previously submitted, Date:______________ [X] Not Applicable
6.	Procedures for Startup and Shutdown [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested
7.	Operation and Maintenance Plan [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested
8.	Supplemental Information for Construction Permit Application [X] Attached, Document ID: PSD-IPS [ ] Not Applicable
9.	Other Information Required by Rule or Statute [X] Attached, Document ID: PSD-IPS [ ] Not Applicable
10.	Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation [ ] Attached, Document ID:________ [ ] Not Applicable
12. Alternative Modes of Operation (Emissions Trading) [ ] Attached, Document ID:________ [ ] Not Applicable
13. Identification of Additional Applicable Requirements [ ] Attached, Document ID:________ [ ] Not Applicable
14. Compliance Assurance Monitoring Plan [ ] Attached, Document ID:________ [ ] Not Applicable
15. Acid Rain Part Application (Hard-copy Required) [ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID:________ [ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID:________ [ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID:________ [ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID:________ [ ] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) Attached, Document ID:________ [ ] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) Attached, Document ID:________ [ ] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)

Emissions Unit Description and Status

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

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

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

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

2. Regulated or Unregulated Emissions Unit? (Check one)

[X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

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

3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):
GE Frame 7FA Combustion Turbine

4. Emissions Unit Identification Number: [ ] No ID
ID: [X] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
C		**49**	[X]

9. Emissions Unit Comment: (Limit to 500 Characters)
This emission unit is a GE Frame 7FA combustion turbine operating in simple cycle mode. See Attachment PSD-IPS.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Dry Low NO_x combustion - Natural gas firing**	
2. Control Device or Method Code(s): **25**	

Emissions Unit Details

1. Package Unit: Manufacturer: **General Electric**	Model Number: **7FA**	
2. Generator Nameplate Rating:	**172** MW	
3. Incinerator Information: Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:		 °F seconds °F

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Water injection - distillate oil firing**
2. Control Device or Method Code(s): **28**

Emissions Unit Details

1. Package Unit: Manufacturer: **General Electric**	Model Number: **7FA**
2. Generator Nameplate Rating: **172** MW	
3. Incinerator Information: Dwell Temperature: °F Dwell Time: seconds Incinerator Afterburner Temperature: °F	

B. EMISSIONS UNIT CAPACITY INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:		1,612	mmBtu/hr
2. Maximum Incineration Rate:	lb/hr		tons/day
3. Maximum Process or Throughput Rate:			
4. Maximum Production Rate:			
5. Requested Maximum Operating Schedule:			
	hours/day		days/week
	weeks/year	3,390	hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters):			

Maximum heat input at ISO conditions and natural gas firing (LHV); maximum for oil firing is 1,806 MMBtu/hr (ISO-LHV) and 182 MW.

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

See Attachment IPS-EU1-D for operational requirements	
See Attachment PSD-IPS for permitting requirements	

D. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? **See Att. PSD-IPS**		2. Emission Point Type Code: **1**
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): **Exhausts through a single stack.**		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: **V**	6. Stack Height: **60** feet	7. Exit Diameter: **22** feet
8. Exit Temperature: **1,113** °F	9. Actual Volumetric Flow Rate: **2,645,000** acfm	10. Water Vapor: **8.6** %
11. Maximum Dry Standard Flow Rate: **800,000** dscfm		12. Nonstack Emission Point Height: feet
13. Emission Point UTM Coordinates: Zone: **17** East (km): **408.75** North (km): **3044.50**		
14. Emission Point Comment (limit to 200 characters): **Stack parameters for ISO operating condition firing natural gas; for oil 1,094°F and 2,731,000 ACFM.**		

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters):

Distillate (No. 2) Fuel Oil

2. Source Classification Code (SCC): **20100101**		3. SCC Units: **1,000 gallons used**
4. Maximum Hourly Rate: **13.9**	5. Maximum Annual Rate: **13,900**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.05**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **132**

10. Segment Comment (limit to 200 characters):

Million Btu per SCC Unit = 131.8 (rounded to 132). Based on 7.1 lb/gal; LHV of 18,560 Btu/lb, - ISO conditions, 1,000 hrs/yr operation.

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters):

Natural Gas

2. Source Classification Code (SCC): **20100201**		3. SCC Units: **Million Cubic Feet**
4. Maximum Hourly Rate: **1.70**	5. Maximum Annual Rate: **5,752**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **950**

10. Segment Comment (limit to 200 characters):

Based on 950 Btu/cf (LHV); ISO conditions and 3,390 hrs/yr operation.

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM			EL
SO_2			EL
NO_x	026	028	EL
CO			EL
VOC			EL
PM_{10}			EL

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **17** lb/hour **20.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing, all loads. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **17 lb/hr**	4. Equivalent Allowable Emissions: **17** lb/hour **8.5** tons/year
5. Method of Compliance (limit to 60 characters): **Annual stack test; EPA Methods 5 or 17; if < 400 hours**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing - all loads; 1,000 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **17** lb/hour **20.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; all loads. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **10 lb/hr**	4. Equivalent Allowable Emissions: **10** lb/hour **17** tons/year
5. Method of Compliance (limit to 60 characters): **VE Test < 20% opacity**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing - all loads; 3,390 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: SO_2	2. Total Percent Efficiency of Control:
3. Potential Emissions: 101.5 lb/hour 55.3 tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: GE, 1998; Golder	7. Emissions Method Code: 2
8. Calculation of Emissions (limit to 600 characters): See Attachment PSD-IPS; Section 2.0; Appendix A.	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Emission Factor: 1 grain S per 100 CF gas; 0.05% S oil lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: OTHER	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: 0.05% Sulfur Oil	4. Equivalent Allowable Emissions: 101.5 lb/hour 49.3 tons/year
5. Method of Compliance (limit to 60 characters): Fuel Sampling	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): Oil firing - 32°F; 100% load; 1,000 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **101.5** lb/hour **55.3** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Emission Factor: 1 grain S per 100 CF gas; 0.05% S oil lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **See Comment**	4. Equivalent Allowable Emissions: **5.1** lb/hour **8.4** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel Sampling**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested allowable emissions and units: Pipeline Natural Gas. Gas firing, 1 gram/100 cf - 32°F, 100% load; 3,390 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **NO_x**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **362** lb/hour **252** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions **1** of **2**

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **42 ppmvd**	4. Equivalent Allowable Emissions: **362.0** lb/hour **175.4** tons/year
5. Method of Compliance (limit to 60 characters): **CEM - 30 Day Rolling Average**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested Allowable Emissions is at 15% O_2-100% load. Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 1,000 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **NO_x**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **362** lb/hour **252** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **9 ppmvd**	4. Equivalent Allowable Emissions: **66.7** lb/hour **108.6** tons/year
5. Method of Compliance (limit to 60 characters): **CEM - 30 Day Rolling Average**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested Allowable Emissions and Units is at 15% O_2-100% load. Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **74.4** lb/hour **86.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **20 ppmvd**	4. Equivalent Allowable Emissions: **74.4** lb/hour **34.7** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 1,000 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **74.4** lb/hour **86.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **12 ppmvd**	4. Equivalent Allowable Emissions: **44.2** lb/hour **72.0** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **16.7** lb/hour **11.5** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **7 ppmvw**	4. Equivalent Allowable Emissions: **16.7** lb/hour **8.1** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 25A; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 1,000 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G: EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **16.7** lb/hour **11.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **1.4 ppmvd**	4. Equivalent Allowable Emissions: **3** lb/hour **4.8** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 25A; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Additional requested allowable emissions and units: Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **17** lb/hour **20.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 59°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **17 lb/hr**	4. Equivalent Allowable Emissions: **17** lb/hour **8.5** tons/year
5. Method of Compliance (limit to 60 characters): **Annual stack test; EPA Method 5 or 17; if <400 hours**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing - all loads; 1,000 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **17** lb/hour **20.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 59°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions **2** of **2**

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **10 lb/hr**	4. Equivalent Allowable Emissions: **10** lb/hour **17.0** tons/year
5. Method of Compliance (limit to 60 characters): **VE Test < 20% opacity**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing; all loads; 3,390 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 1 of 2

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **Annual VE Test EPA Method 9**	
5. Visible Emissions Comment (limit to 200 characters): **Maximum for oil firing.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 1 of 2

1. Parameter Code: **EM**	2. Pollutant(s): **NO_x**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: **Not yet determined** Manufacturer: Model Number: Serial Number:	
5. Installation Date: **01 Jan 2002**	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **NO_x CEM proposed to meet requirements of 40 CFR Part 75.**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 2 of 2

1. Visible Emissions Subtype: **VE99**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: % Exceptional Conditions: **100** % Maximum Period of Excess Opacity Allowed: **6** min/hour	
4. Method of Compliance: **None**	
5. Visible Emissions Comment (limit to 200 characters): **FDEP Rule 62-201.700(1), Allowed for 2 hours (120 minutes) per 24 hours for start up, shutdown and malfunction.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 2 of 2

1. Parameter Code: **EM**	2. Pollutant(s): **NO_x**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: **Not yet determined** Manufacturer: Model Number: Serial Number:	
5. Installation Date: **01 Jan 2002**	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Parameter Code: WTF. Required by 40 CFR Part 60; subpart GG; 60.334.**	

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements

1. Process Flow Diagram [X] Attached, Document ID: PSD-IPS [ ] Not Applicable [ ] Waiver Requested
2. Fuel Analysis or Specification [X] Attached, Document ID: PSD-IPS [ ] Not Applicable [ ] Waiver Requested
3. Detailed Description of Control Equipment [X] Attached, Document ID: PSD-IPS [ ] Not Applicable [ ] Waiver Requested
4. Description of Stack Sampling Facilities [X] Attached, Document ID: PSD-IPS [ ] Not Applicable [ ] Waiver Requested
5. Compliance Test Report [ ] Attached, Document ID:________ [ ] Previously submitted, Date:______________ [X] Not Applicable
6. Procedures for Startup and Shutdown [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested
7. Operation and Maintenance Plan [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested
8. Supplemental Information for Construction Permit Application [X] Attached, Document ID: PSD-IPS [ ] Not Applicable
9. Other Information Required by Rule or Statute [X] Attached, Document ID: PSD-IPS [ ] Not Applicable
10. Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation [ ] Attached, Document ID:________ [ ] Not Applicable
12. Alternative Modes of Operation (Emissions Trading) [ ] Attached, Document ID:________ [ ] Not Applicable
13. Identification of Additional Applicable Requirements [ ] Attached, Document ID:________ [ ] Not Applicable
14. Compliance Assurance Monitoring Plan [ ] Attached, Document ID:________ [ ] Not Applicable
15. Acid Rain Part Application (Hard-copy Required) [ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID:________ [ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID:________ [ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID:________ [ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID:________ [ ] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) Attached, Document ID:________ [ ] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) Attached, Document ID:________ [ ] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)

Emissions Unit Description and Status

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

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

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

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

2. Regulated or Unregulated Emissions Unit? (Check one)

[X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

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

3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):
GE Frame 7FA Combustion Turbine

4. Emissions Unit Identification Number: [ ] No ID
ID: [X] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
C		**49**	[X]

9. Emissions Unit Comment: (Limit to 500 Characters)
This emission unit is a GE Frame 7FA combustion turbine operating in simple cycle mode. See Attachment PSD-IPS.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Dry Low NO_x combustion - Natural gas firing**
2. Control Device or Method Code(s): **25**

Emissions Unit Details

1. Package Unit: Manufacturer: **General Electric**	Model Number: **7FA**
2. Generator Nameplate Rating: **172** MW	
3. Incinerator Information: Dwell Temperature: °F Dwell Time: seconds Incinerator Afterburner Temperature: °F	

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Water injection - distillate oil firing**
2. Control Device or Method Code(s): **28**

Emissions Unit Details

1. Package Unit: Manufacturer: **General Electric**	Model Number: **7FA**	
2. Generator Nameplate Rating:	**172** MW	
3. Incinerator Information: Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:		 °F seconds °F

B. EMISSIONS UNIT CAPACITY INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:		1,612	mmBtu/hr
2. Maximum Incineration Rate:	lb/hr		tons/day
3. Maximum Process or Throughput Rate:			
4. Maximum Production Rate:			
5. Requested Maximum Operating Schedule:			
	hours/day		days/week
	weeks/year	3,390	hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters):			
Maximum heat input at ISO conditions and natural gas firing (LHV); maximum for oil firing is 1,806 MMBtu/hr (ISO-LHV) and 182 MW.			

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

See Attachment IPS-EU1-D for operational requirements	
See Attachment PSD-IPS for permitting requirements	

D. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? **See Att. PSD-IPS**	2. Emission Point Type Code: **1**

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point):

Exhausts through a single stack.

4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:

5. Discharge Type Code: **V**	6. Stack Height: **60** feet	7. Exit Diameter: **22** feet
8. Exit Temperature: **1,113** °F	9. Actual Volumetric Flow Rate: **2,645,000** acfm	10. Water Vapor: **8.6** %

11. Maximum Dry Standard Flow Rate: **800,000** dscfm	12. Nonstack Emission Point Height: feet

13. Emission Point UTM Coordinates:

Zone: **17** East (km): **408.75** North (km): **3044.50**

14. Emission Point Comment (limit to 200 characters):

Stack parameters for ISO operating condition firing natural gas; for oil 1,094°F and 2,731,000 ACFM.

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Distillate (No. 2) Fuel Oil**		
2. Source Classification Code (SCC): **20100101**	3. SCC Units: **1,000 gallons used**	
4. Maximum Hourly Rate: **13.9**	5. Maximum Annual Rate: **13,900**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.05**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **132**
10. Segment Comment (limit to 200 characters): **Million Btu per SCC Unit = 131.8 (rounded to 132). Based on 7.1 lb/gal; LHV of 18,560 Btu/lb, - ISO conditions, 1,000 hrs/yr operation.**		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Natural Gas**		
2. Source Classification Code (SCC): **20100201**	3. SCC Units: **Million Cubic Feet**	
4. Maximum Hourly Rate: **1.70**	5. Maximum Annual Rate: **5,752**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **950**
10. Segment Comment (limit to 200 characters): **Based on 950 Btu/cf (LHV); ISO conditions and 3,390 hrs/yr operation.**		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM			EL
SO_2			EL
NO_x	026	028	EL
CO			EL
VOC			EL
PM_{10}			EL

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **17** lb/hour **20.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing, all loads. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **17 lb/hr**	4. Equivalent Allowable Emissions: **17** lb/hour **8.5** tons/year
5. Method of Compliance (limit to 60 characters): **Annual stack test; EPA Methods 5 or 17; if < 400 hours**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing - all loads; 1,000 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **17** lb/hour **20.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; all loads. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **10 lb/hr**	4. Equivalent Allowable Emissions: **10** lb/hour **17** tons/year
5. Method of Compliance (limit to 60 characters): **VE Test < 20% opacity**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing - all loads; 3,390 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units -
Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **101.5** lb/hour **55.3** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Emission Factor: 1 grain S per 100 CF gas; 0.05% S oil lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.05% Sulfur Oil**	4. Equivalent Allowable Emissions: **101.5** lb/hour **49.3** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel Sampling**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing - 32°F; 100% load; 1,000 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **101.5** lb/hour **55.3** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Emission Factor: 1 grain S per 100 CF gas; 0.05% S oil lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **See Comment**	4. Equivalent Allowable Emissions: **5.1** lb/hour **8.4** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel Sampling**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested allowable emissions and units: Pipeline Natural Gas. Gas firing, 1 gram/100 cf - 32°F, 100% load; 3,390 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units -
Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **NO_x**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **362** lb/hour **252** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **42 ppmvd**	4. Equivalent Allowable Emissions: **362.0** lb/hour **175.4** tons/year
5. Method of Compliance (limit to 60 characters): **CEM - 30 Day Rolling Average**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested Allowable Emissions is at 15% O_2-100% load. Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 1,000 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units -
Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **NO_x**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **362** lb/hour **252** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **9 ppmvd**	4. Equivalent Allowable Emissions: **66.7** lb/hour **108.6** tons/year
5. Method of Compliance (limit to 60 characters): **CEM - 30 Day Rolling Average**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested Allowable Emissions and Units is at 15% O_2-100% load. Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **CO**
2. Total Percent Efficiency of Control:
3. Potential Emissions: **74.4** lb/hour **86.5** tons/year
4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year
6. Emission Factor:
   Reference: **GE, 1998; Golder**
7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters):

   See Attachment PSD-IPS; Section 2.0; Appendix A.

9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):

   Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**
2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **20 ppmvd**
4. Equivalent Allowable Emissions: **74.4** lb/hour **34.7** tons/year
5. Method of Compliance (limit to 60 characters):

   EPA Method 10; high and low load

6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):

   Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 1,000 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **74.4** lb/hour **86.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **12 ppmvd**	4. Equivalent Allowable Emissions: **44.2** lb/hour **72.0** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **16.7** lb/hour **11.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **7 ppmvw**	4. Equivalent Allowable Emissions: **16.7** lb/hour **8.1** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 25A; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 1,000 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC**
2. Total Percent Efficiency of Control:
3. Potential Emissions: **16.7** lb/hour **11.5** tons/year
4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year
6. Emission Factor:
   Reference: **GE, 1998; Golder**
7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters):

   See Attachment PSD-IPS; Section 2.0; Appendix A.
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):

   Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**
2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **1.4 ppmvd**
4. Equivalent Allowable Emissions: **3** lb/hour **4.8** tons/year
5. Method of Compliance (limit to 60 characters):

   EPA Method 25A; high and low load
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):

   Additional requested allowable emissions and units: Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: PM_{10}	2. Total Percent Efficiency of Control:
3. Potential Emissions: 17 lb/hour 20.5 tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: GE, 1998; Golder	7. Emissions Method Code: 2
8. Calculation of Emissions (limit to 600 characters): See Attachment PSD-IPS; Section 2.0; Appendix A.	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Lb/hr based on oil firing; 100% load; 59°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: OTHER	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: 17 lb/hr	4. Equivalent Allowable Emissions: 17 lb/hour 8.5 tons/year
5. Method of Compliance (limit to 60 characters): Annual stack test; EPA Method 5 or 17; if <400 hours	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): Oil firing - all loads; 1,000 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **17** lb/hour **20.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 1998; Golder**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-IPS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 59°F. Tons/yr based on 2,390 hrs/yr gas firing and 1,000 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **10 lb/hr**	4. Equivalent Allowable Emissions: **10** lb/hour **17.0** tons/year
5. Method of Compliance (limit to 60 characters): **VE Test < 20% opacity**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing; all loads; 3,390 hrs/yr. See Attachment PSD-IPS; Section 2.0; Appendix A.**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 1 of 2

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **Annual VE Test EPA Method 9**	
5. Visible Emissions Comment (limit to 200 characters): **Maximum for oil firing.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 1 of 2

1. Parameter Code: **EM**	2. Pollutant(s): **NO_x**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: **Not yet determined** Manufacturer: Model Number: Serial Number:	
5. Installation Date: **01 Jan 2002**	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **NO_x CEM proposed to meet requirements of 40 CFR Part 75.**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 2 of 2

1. Visible Emissions Subtype: **VE99**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: % Exceptional Conditions: **100** % Maximum Period of Excess Opacity Allowed: **6** min/hour	
4. Method of Compliance: **None**	
5. Visible Emissions Comment (limit to 200 characters): **FDEP Rule 62-201.700(1), Allowed for 2 hours (120 minutes) per 24 hours for start up, shutdown and malfunction.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 2 of 2

1. Parameter Code: **EM**	2. Pollutant(s): **NO_x**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: **Not yet determined** Manufacturer: Model Number: Serial Number:	
5. Installation Date: **01 Jan 2002**	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Parameter Code: WTF. Required by 40 CFR Part 60; subpart GG; 60.334.**	

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements

1. Process Flow Diagram [X] Attached, Document ID: PSD-IPS [ ] Not Applicable [ ] Waiver Requested
2. Fuel Analysis or Specification [X] Attached, Document ID: PSD-IPS [ ] Not Applicable [ ] Waiver Requested
3. Detailed Description of Control Equipment [X] Attached, Document ID: PSD-IPS [ ] Not Applicable [ ] Waiver Requested
4. Description of Stack Sampling Facilities [X] Attached, Document ID: PSD-IPS [ ] Not Applicable [ ] Waiver Requested
5. Compliance Test Report [ ] Attached, Document ID:________ [ ] Previously submitted, Date:______________ [X] Not Applicable
6. Procedures for Startup and Shutdown [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested
7. Operation and Maintenance Plan [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested
8. Supplemental Information for Construction Permit Application [X] Attached, Document ID: PSD-IPS [ ] Not Applicable
9. Other Information Required by Rule or Statute [X] Attached, Document ID: PSD-IPS [ ] Not Applicable
10. Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation
[ ] Attached, Document ID:________ [ ] Not Applicable

12. Alternative Modes of Operation (Emissions Trading)
[ ] Attached, Document ID:________ [ ] Not Applicable

13. Identification of Additional Applicable Requirements
[ ] Attached, Document ID:________ [ ] Not Applicable

14. Compliance Assurance Monitoring Plan
[ ] Attached, Document ID:________ [ ] Not Applicable

15. Acid Rain Part Application (Hard-copy Required)

[ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a))
Attached, Document ID:________

[ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)
Attached, Document ID:________

[ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.)
Attached, Document ID:________

[ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)
Attached, Document ID:________

[ ] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.)
Attached, Document ID:________

[ ] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.)
Attached, Document ID:________

[ ] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)

Emissions Unit Description and Status

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

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

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

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

2. Regulated or Unregulated Emissions Unit? (Check one)

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

[X] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):

Unreg. Emissions Activities - 2 Tanks 2.8 M gallons each

4. Emissions Unit Identification Number: [ ] No ID
ID: [X] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
C		**49**	[ ]

9. Emissions Unit Comment: (Limit to 500 Characters)

This emission unit information section addresses two 2.8 million gallon tanks as unregulated emission units. NSPS Subpart Kb recordkeeping requirements are applicable; there is no emission limiting or work practice standards. See Attachment PSD-IPS.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method):
2. Control Device or Method Code(s):

Emissions Unit Details

1. Package Unit: Manufacturer:	Model Number:
2. Generator Nameplate Rating:	MW
3. Incinerator Information: Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:	 °F seconds °F

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **No. 2 Distillate Oil/Diesel**		
2. Source Classification Code (SCC): **A2505030090**	3. SCC Units: **1,000 gallons used**	
4. Maximum Hourly Rate:	5. Maximum Annual Rate: **55,600**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **131.8**
10. Segment Comment (limit to 200 characters): **Annual rate combined for both tanks based on inputs to CTs; 18,560 Btu/lb (LHV); and 7.1 lb/gal at 59°F.**		

Segment Description and Rate: Segment ____ of ____

1. Segment Description (Process/Fuel Type) (limit to 500 characters):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

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

PART B

REPORT

1.0 INTRODUCTION

IPS Avon Park Corporation proposes to license, construct, and operate a nominal 680-megawatt (MW) independent power production facility, referred to as the IPS Vandolah Power Project, in an unincorporated area of Hardee County, Florida (Figure 1-1). The site will be located on an about 20-acre tract near Vandolah, Florida. The project consists of four 170-MW dual-duel, General Electric Frame 7FA combustion turbines (CTs) that will use dry low-nitrogen oxide (NO_x) (DLN) combustion technology when operating on natural gas and water injection (for NO_x control) when operating on distillate fuel oil. The facility is designed for peaking service. The primary fuel fo the combustion turbines will be natural gas with distillate fuel oil used as backup fuel. Fuel oil will contain a maximum sulfur content of 0.05 percent.

The permitting of the project in Florida requires an air construction permit and prevention of significant deterioration (PSD) review approval. To assist in performing the necessary licensing activities, IPS Avon Park Corporation has contracted Golder Associates Inc. (Golder) to perform the necessary air quality assessments for determining the project's compliance with state and federal new source review (NSR) regulation, including PSD and nonattainment review requirements. The critical aspects of these assessments include the air quality impact analyses performed using an air dispersion model and the best available control technology (BACT) analyses performed to evaluate the selected emission control technology.

The proposed project will be a new air pollution source that will result in increases in air emissions in Hardee County. The U.S. Environmental Protection Agency (EPA) has implemented regulations requiring a PSD review. PSD regulations are promulgated under 10 Code of Federal Regulations (CFR) Part 52.21 and implemented through delegation to the Florida Department of Environmental Protection (DEP). Florida's PSD regulations are codified in Rules 62-212.400, F.A.C. These regulations incorporate the EPA PSD regulations.

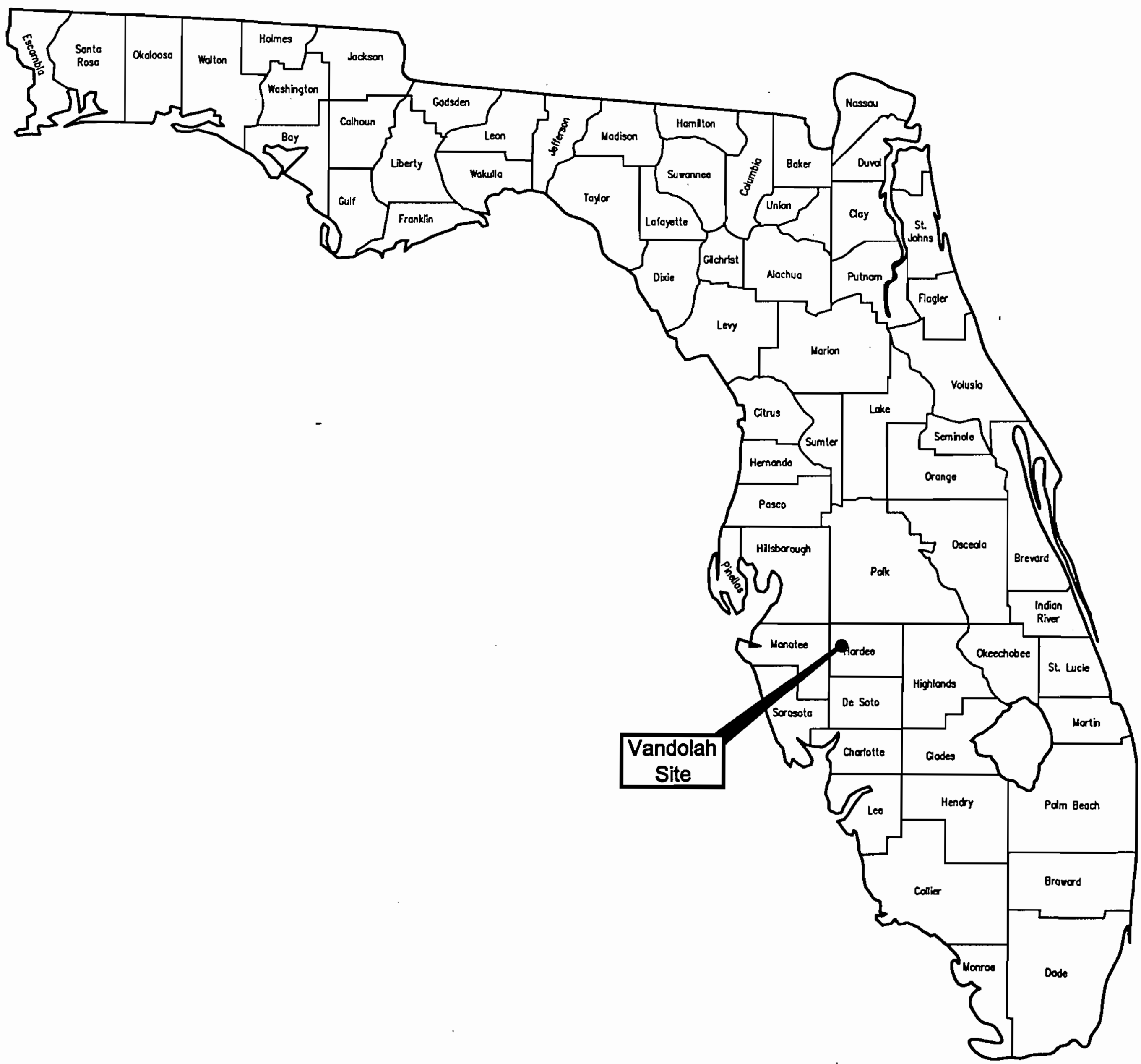
Based on the emissions from the proposed project, a PSD review is required for each of the following regulated pollutants:

- Particulate matter (PM) as total suspended particulate matter (TSP),
- Particulate matter with aerodynamic diameter of 10 microns or less (PM_{10}),
- Nitrogen dioxide (NO_2),
- Sulfur dioxide (SO_2),
- Carbon monoxide (CO), and
- Volatile organic compounds (VOC).

Hardee County has been designated as an attainment or unclassifiable area for all criteria pollutants [i.e., attainment: ozone (O_3), PM_{10}, SO_2, CO, and NO_2; unclassifiable: lead] and is classified as a PSD Class II area for PM_{10}, SO_2, and NO_2; therefore, the PSD review will follow regulations pertaining to such designations.

The air permit application is divided into seven major sections.

- Section 2.0 presents a description of the facility, including air emissions and stack parameters.
- Section 3.0 provides a review of the PSD and nonattainment requirements applicable to the proposed project.
- Section 4.0 includes the control technology review with discussions on BACT.
- Section 5.0 discusses the ambient air monitoring analysis (pre-construction monitoring) required by PSD regulations.
- Section 6.0 presents a summary of the air modeling approach and results used in assessing compliance of the proposed project with ambient air quality standards (AAQS), PSD increments, and good engineering practice (GEP) stack height regulations.
- Section 7.0 provides the additional impact analyses for soils, vegetation, and visibility.



JOB No.: 993-9551	SCALE: NTS	General Location of IPS Vandolah Power Project	
CAD BY: CDT	DATE: 7/26/99		
CHK BY:	FILE No.: gen-loc-1-1.dwg		
REV BY:	DR SUBTITLE: –		
Golder Associates		IPS Avon Park Corp.	FIGURE 1-1

2.0 PROJECT DESCRIPTION

2.1 SITE DESCRIPTION

The project site, shown in Figure 2-1, consists of about 20 acres that are currently agricultural. There is minimal industrial, commercial, and residential development within a 3-km radius of the site. The plant elevation will be approximately 100 feet above sea level. The terrain surrounding the site is flat.

Natural gas will be supplied by a lateral pipeline connected to the Florida Gas Transmission (FGT) natural gas pipeline located north of the site. The site has access to transmission facilities from a 230 kV transmission line and electrical substation that is located to the west of the site. Water for the evaporative cooler, and NO_x control when firing oil, will be supplied by nearby groundwater or surface water sources. Potable water and additional fire protection supply water will be served from groundwater wells.

2.2 POWER PLANT

The proposed project will consist of four General Electric Frame 7FA CTs and associated facilities. The annual maximum capacity factor of the plant will be 39 percent, which is equivalent to operating 3,390 hours/year at full load. Natural gas will be used as the primary fuel, and fuel oil will be used as a backup fuel. Fuel oil usage will be limited to the equivalent of 1,000 hours/year at full load.

Plant performance with General Electric 7FA combustion turbines was developed for natural gas and oil; at 50-, 75-, and 100-percent load; and at 32°F, 59°F, and 95°F turbine inlet temperatures. Combustion turbine performance is based on a performance envelope developed from General Electric and has been adjusted to reflect degradation and performance improvements. In particular, the combustion turbine emission estimates accounts for 5 percent higher power output and a 6 percent degradation (see Appendix A). This 11 percent was used to increase mass flow of the turbine.

The CTs will be capable of operating from 50 to 100 percent of baseload. The efficiency of the CTs decreases at part load. As a result, the economic incentive is to dispatch the plant to keep the units operating as near baseload as possible.

Natural gas will be transported to the site via pipeline and fuel oil will be trucked to the site. The distillate fuel oil, which will have a maximum sulfur content of 0.05 percent, will be stored onsite in two aboveground storage tanks, each sized to hold approximately 67,000 barrels (2.8 million gallons).

Air emissions control will consist of using state-of-the-art dry low-NO_x burners in the CTs when firing natural gas. The General Electric Frame 7FA will be equipped with the General Electric dry low- 2.6 (DLN- NO_x) combustion system that regulates the distribution of fuel delivery to a multi-nozzle, total premix combustor arrangement. The fuel flow distribution to each combustion system fuel nozzle is regulated to maintain unit load and optimum turbine emissions. The DLN-2.6 combustion system consists of six fuel nozzles per combustion can, with each operating as a fully premixed combustor. Of the six nozzles, five are located radically and one is in the center. The fuel system is fully automated and sequences the DLN-2.6 combustion system through a number of staging modes prior to reaching full load. The General Electric Frame 7FA has 14 combustors per turbine. Water injection will be used for NO_x control when firing distillate fuel oil. The SO2 emissions will be controlled by the use of low-sulfur fuels. Good combustion practices and clean fuels will also minimize potential emissions of PM, CO, VOC, and other pollutants (e.g., trace metals). These engineering and environmental designs maximize control of air emissions while minimizing economic, environmental, and energy impacts (see Section 4.0 for the BACT evaluation).

2.3 PROPOSED SOURCE EMISSIONS AND STACK PARAMETERS

The estimated maximum hourly emissions and exhaust information representative of the proposed CT design operating at baseload conditions (100-percent load), 75-percent load and 50-percent load conditions are presented in Tables 2-1 through 2-6. The information is presented in these tables for one unit simple cycle operation based on natural gas combustion and fuel oil combustion. The data are presented for turbine inlet temperatures of 32°F, 59°F, and 95°F. These temperatures represent the range of ambient temperatures that the CTs are most likely to experience.

The performance calculations for the operating conditions are given in Appendix A.

The pollutant gaseous emission concentrations and PM_{10} emission rates for the proposed CTs are as follows:

Pollutant	Natural Gas	Distillate Oil
NO_x, ppmvd @ 15% O_2	9	42
CO, ppmvd (ppmvd @ 15% O_2)	12 (16)	20
VOC as CH_4, ppmvd (gas), ppmvw (oil)	1.44 (32)	7
SO_x as SO_2	Calculated Based on Fuel (1.0 grains S/100 SCF)	Calculated Based on Fuel (0.05% sulfur)
PM_{10} lb/hr (dry filterable)	10	17

The maximum short-term emission rates (lb/hr) generally occur at baseload, 32°F operation, where the CT has the greatest output and greatest fuel consumption.

Based on a turbine inlet temperature of 59°F, the emission rates used to calculate maximum potential annual emissions for the proposed facility for regulated air pollutants are presented in Table 2-7 for 1 and 4 CTs. To produce the maximum annual emissions, the CTs are assumed to operate at baseload for 3,390 hours (39 percent capacity factor) firing natural gas for 2,390 hours and fuel oil for 1,000 hours. The potential emissions are based on the 59°F turbine inlet air condition since it represents a nominal average between the higher emission levels at the 32°F turbine inlet condition (winter) and the infrequent 95°F turbine inlet condition (summer).

Process flow diagrams of the turbine operating at turbine inlet temperature of 95°F, 59°F, and 32°F are presented in Figures 2-2 and 2-4, respectively for the "F" Class CT.

Based on a review of the emission rates for natural gas and fuel oil combustion, the highest emission rates for the regulated pollutants generally occur when firing fuel oil. Combustion of natural gas and fuel oil result in slightly different exhaust flow gas rates and stack exit temperatures; however, the differences are minor. As a result of the higher emissions when firing oil, the air modeling analyses were based on determining maximum ground-level impacts with fuel oil.

As discussed in Section 6.0, the air modeling analyses that addressed compliance with ambient standards were based on modeling the CTs for the operating load and ambient temperature which produced the maximum impacts from the load impact analysis that was performed. Although the highest emission rates occur with low turbine inlet temperatures (i.e., 32°F) and baseload conditions, the lowest exhaust gas flow rates occur with a turbine inlet temperature of 95°F and 50 percent operating load. Since this low exhaust flow condition can result in potentially higher impacts due to lower plume rise (i.e., due to lower exit velocity and temperature), the load analysis included modeling the CTs for the following four scenarios designed to determine the maximum impacts for the project:

- Base operating load for the turbine inlet temperature of 32°F;
- Base operating load for the turbine inlet temperature of 95°F;
- A 50-percent operating load for the turbine inlet temperature of 32°F; and
- A 50-percent operating load for the turbine inlet temperature of 95°F.

2.4 SITE LAYOUT, STRUCTURES, AND STACK SAMPLING FACILITIES

Plot plan of the proposed facility is presented in Figure 2-5. The dimensions of the buildings and structures are presented in Section 6.0. Stack sampling facilities will be constructed in accordance to Rule 62-297.310(6) F.A.C.

Table 2-1. Stack, Operating, and Emission Data for the Proposed GE 7FA Combustion Turbine with Dry Low-NO_x Combustors Firing Natural Gas-- Baseload for Simple Cycle Operation

Parameter		Operating and Emission Data[a] for Ambient Temperature 32°F	59°F	95°F
Stack Data (ft)				
Height		60	60	60
Diameter		22	22	22
Operating Data				
Temperature (°F)		1,097	1,113	1,135
Velocity (ft/sec)		118.7	116.0	111.1
Maximum Hourly Emission per Unit[b]				
SO_2	lb/hr	5.1	5.0	4.6
	Basis	1.0 grain S/100CF	1.0 grain S/100CF	1.0 grain S/100CF
PM/PM10	lb/hr	10	10	10
	Basis	Dry filterables	Dry filterables	Dry filterables
NO_x	lb/hr	66.7	64.1	59.9
	Basis	9 ppmvd at 15% O_2	9 ppmvd at 15% O_2	9 ppmvd at 15% O_2
CO	lb/hr	44.2	42.5	39.3
	Basis	12 ppmvd	12 ppmvd	12 ppmvd
VOC (as methane)	lb/hr	2.95	2.83	2.62
	Basis	1.4 ppmvd	1.4 ppmvd	1.4 ppmvd

Note: ppmvd = parts per million volume dry; O_2 = oxygen; S = sulfur; CF = cubic feet

[a] Refer to Appendix A for detailed information.

[b] Other regulated pollutants are assumed to have negligible emissions. These pollutants include lead, reduced sulfur compounds, hydrogen sulfide, fluorides, beryllium, mercury, arsenic, asbestos, vinyl chloride, and radionuclides.

Table 2-2. Stack, Operating, and Emission Data for the Proposed GE 7FA Combustion Turbine with Dry Low-NO_x Combustors Firing Natural Gas-- 75 Percent Load for Simple Cycle Operation

Parameter		Operating and Emission Data[a] for Ambient Temperature 32°F	59°F	95°F
Stack Data (ft)				
Height		60	60	60
Diameter		22	22	22
Operating Data				
Temperature (°F)		1,170	1,179	1,193
Velocity (ft/sec)		100.5	98.2	95.0
Maximum Hourly Emission per Unit[b]				
SO_2	lb/hr	4.2	4.0	3.7
	Basis	1.0 grain S/100CF	1.0 grain S/100CF	1.0 grain S/100CF
PM/PM10	lb/hr	10	10	10
	Basis	Dry filterables	Dry filterables	Dry filterables
NO_x	lb/hr	54.4	52.4	48.3
	Basis	9 ppmvd at 15% O_2	9 ppmvd at 15% O_2	9 ppmvd at 15% O_2
CO	lb/hr	35.7	34.6	32.7
	Basis	12 ppmvd	12 ppmvd	12 ppmvd
VOC (as methane)	lb/hr	2.38	2.31	2.18
	Basis	1.4 ppmvd	1.4 ppmvd	1.4 ppmvd

Note: ppmvd = parts per million volume dry; O_2 = oxygen; S = sulfur; CF = cubic feet

[a] Refer to Appendix A for detailed information.

[b] Other regulated pollutants are assumed to have negligible emissions. These pollutants include lead, reduced sulfur compounds, hydrogen sulfide, fluorides, beryllium, mercury, arsenic, asbestos, vinyl chloride, and radionuclides.

Table 2-3. Stack, Operating, and Emission Data for the Proposed GE 7FA Combustion Turbine with Dry Low-NO_x Combustors Firing Natural Gas-- 50 Percent Load for Simple Cycle Operation

Parameter		Operating and Emission Data[a] for Ambient Temperature 32°F	59°F	95°F
Stack Data (ft)				
Height		60	60	60
Diameter		22	22	22
Operating Data				
Temperature (°F)		1,171	1,186	1,200
Velocity (ft/sec)		84.2	82.0	80.5
Maximum Hourly Emission per Unit[b]				
SO_2	lb/hr	3.4	3.2	2.9
	Basis	1.0 grain S/100CF	1.0 grain S/100CF	1.0 grain S/100CF
PM/PM10	lb/hr	10	10	10
	Basis	Dry filterables	Dry filterables	Dry filterables
NO_x	lb/hr	43.4	40.8	38.3
	Basis	9 ppmvd at 15% O_2	9 ppmvd at 15% O_2	9 ppmvd at 15% O_2
CO	lb/hr	30.0	28.9	27.8
	Basis	12 ppmvd	12 ppmvd	12 ppmvd
VOC (as methane)	lb/hr	2.00	1.90	1.85
	Basis	1.4 ppmvd	1.4 ppmvd	1.4 ppmvd

Note: ppmvd = parts per million volume dry; O_2 = oxygen; S = sulfur; CF = cubic feet

[a] Refer to Appendix A for detailed information.

[b] Other regulated pollutants are assumed to have negligible emissions. These pollutants include lead, reduced sulfur compounds, hydrogen sulfide, fluorides, beryllium, mercury, arsenic, asbestos, vinyl chloride, and radionuclides.

Table 2-4. Stack, Operating, and Emission Data for the Proposed GE 7FA Combustion Turbine with Water Injection Firing Distillate Fuel Oil-- Baseload for Simple Cycle Operation

Parameter		Operating and Emission Data[a] for Ambient Temperature 32°F	59°F	95°F
Stack Data (ft)				
Height		60	60	60
Diameter		22	22	22
Operating Data				
Temperature (°F)		1,076	1,094	1,121
Velocity (ft/sec)		122.4	119.7	115.0
Maximum Hourly Emission per Unit[b]				
SO_2	lb/hr	101.5	98.7	93.4
	Basis	0.05 % S	0.05 % S	0.05 % S
PM/PM10	lb/hr	17.0	17.0	17.0
	Basis	Dry filterables	Dry filterables	Dry filterables
NO_x	lb/hr	362.0	350.8	335.8
	Basis	42 ppmvd at 15% O_2	42 ppmvd at 15% O_2	42 ppmvd at 15% O_2
CO	lb/hr	74.4	71.4	66.2
	Basis	20 ppmvd	20.3 ppmvd	20.2 ppmvd
VOC (as methane)	lb/hr	16.7	16.2	15.3
	Basis	7 ppmvw	7 ppmvw	7 ppmvw

Note: ppmvd = parts per million volume dry; O_2 = oxygen; S = sulfur; CF = cubic feet; ppmvw = parts per million volume wet

[a] Refer to Appendix A for detailed information.

[b] Other regulated pollutants are assumed to have negligible emissions. These pollutants include lead, reduced sulfur compounds, hydrogen sulfide, fluorides, beryllium, mercury, arsenic, asbestos, vinyl chloride, and radionuclides.

Table 2-5. Stack, Operating, and Emission Data for the Proposed GE 7FA Combustion Turbine with Water Injection Firing Distillate Fuel Oil-- 75 Percent Load for Simple Cycle Operation

Parameter		Operating and Emission Data[a] for Ambient Temperature		
		32°F	59°F	95°F
Stack Data (ft)				
Height		60	60	60
Diameter		22	22	22
Operating Data				
Temperature (°F)		1,170	1,176	1,186
Velocity (ft/sec)		101.0	99.6	97.0
Maximum Hourly Emission per Unit[b]				
SO_2	lb/hr	82.6	80.1	74.8
	Basis	0.05 % S	0.05 % S	0.05 % S
PM/PM10	lb/hr	17	17	17
	Basis	Dry filterables	Dry filterables	Dry filterables
NO_x	lb/hr	296.7	285.0	267.8
	Basis	42 ppmvd at 15% O_2	42 ppmvd at 15% O_2	42 ppmvd at 15% O_2
CO	lb/hr	57.6	56.4	53.9
	Basis	20 ppmvd	20 ppmvd	20 ppmvd
VOC (as methane)	lb/hr	13.0	12.8	12.4
	Basis	7 ppmvw	5.4 ppmvw	5.5 ppmvw
Sulfuric Acid Mist	lb/hr	13.8	13.0	11.9
	Basis	10% SO_2	10% SO_2	10% SO_2

Note: ppmvd = parts per million volume dry; O_2 = oxygen; S = sulfur; CF = cubic feet; ppmvw = parts per million volume wet

[a] Refer to Appendix A for detailed information.

[b] Other regulated pollutants are assumed to have negligible emissions. These pollutants include lead, reduced sulfur compounds, hydrogen sulfide, fluorides, beryllium, mercury, arsenic, asbestos, vinyl chloride, and radionuclides.

Table 2-6. Stack, Operating, and Emission Data for the Proposed GE 7FA Combustion Turbine with Water Injection Firing Distillate Fuel Oil-- 50 Percent Load for Simple Cycle Operation

Parameter		Operating and Emission Data[a] for Ambient Temperature 32°F	59°F	95°F
Stack Data (ft)				
Height		60	60	60
Diameter		22	22	22
Operating Data				
Temperature (°F)		1,200	1,200	1,200
Velocity (ft/sec)		85.7	83.3	81.5
Maximum Hourly Emission per Unit[b]				
SO_2	lb/hr	65.6	62.8	58.9
	Basis	0.05 % S	0.05 % S	0.05 % S
PM/PM10	lb/hr	17	17	17
	Basis	Dry filterables	Dry filterables	Dry filterables
NO_x	lb/hr	236.4	224.0	209.3
	Basis	42 ppmvd at 15% O_2	42 ppmvd at 15% O_2	42 ppmvd at 15% O_2
CO	lb/hr	72.2	69.8	67.5
	Basis	30 ppmvd	30 ppmvd	30 ppmvd
VOC (as methane)	lb/hr	10.8	10.5	10.3
	Basis	7 ppmvw	7 ppmvw	7 ppmvw

Note: ppmvd = parts per million volume dry; O_2 = oxygen; S = sulfur; CF = cubic feet; ppmvw = parts per million volume wet

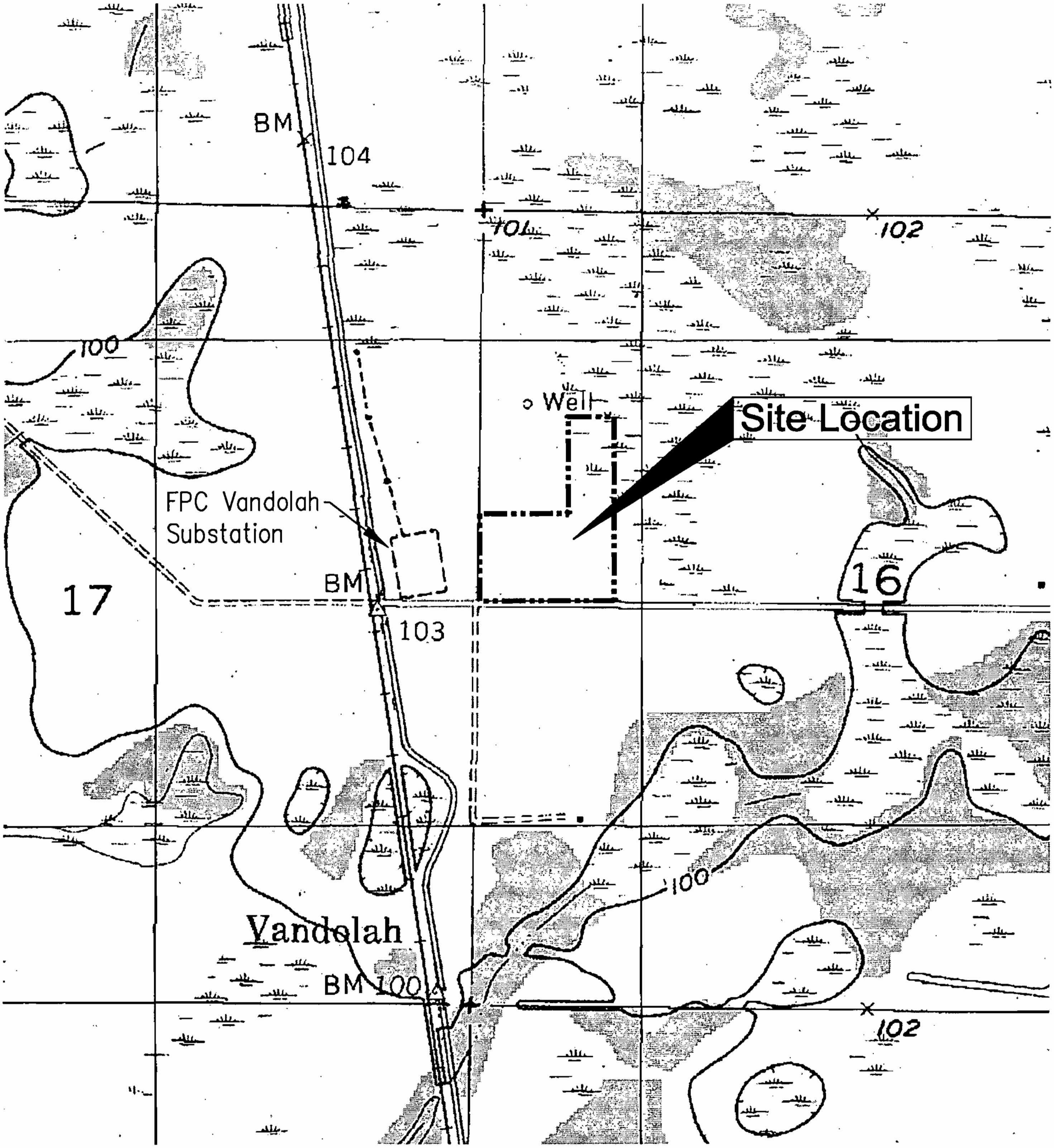
[a] Refer to Appendix A for detailed information.

[b] Other regulated pollutants are assumed to have negligible emissions. These pollutants include lead, reduced sulfur compounds, hydrogen sulfide, fluorides, beryllium, mercury, arsenic, asbestos, vinyl chloride, and radionuclides.

Table 2-7. Maximum Potential Emissions for the IPS Vandolah Power Project - Tons/Year

		Natural Gas Firing[a] Load at 59 °F Turbine Inlet				Distillate Oil Firing[b] Load at 59 °F Turbine Inlet			Maximum Emissions
Pollutant	Units	100%	75%	50%	Units	100%	75%	50%	w/ oil-firing[c]
PM	1	17.0	17.0	17.0	1	8.5	8.5	8.5	20.5
SO_2	1	8.4	6.8	5.4	1	49.3	40.0	31.4	55.3
NO_x	1	108.6	88.8	69.2	1	175.4	142.6	112.0	252.0
CO	1	72.0	58.6	49.0	1	35.7	28.2	34.9	86.5
VOC	1	4.8	3.9	3.3	1	8.1	6.4	5.3	11.5
PM	4	67.8	67.8	67.8	4	34.0	34.0	34.0	81.8
SO_2	4	33.6	27.4	21.6	4	197.4	160.1	125.6	221.1
NO_x	4	434.4	355.3	276.8	4	701.6	570.5	448.1	1007.8
CO	4	287.9	234.5	195.8	4	142.9	112.7	139.6	345.9
VOC	4	19.2	15.6	13.1	4	32.4	25.6	21.1	45.9

Notes: [a] 3,390 hours per year operation.
[b] 1,000 hours per year operation.
[c] 2,390 hours of gas firing and 1,000 hours of oil firing.



REFERENCE

USGS 7.5 Minute Topographic Quadrangle Map, Ft. Green, Florida

JOB No.:	993-9551	SCALE:	As Noted
AD BY:	CDT	DATE:	8/26/99
HK BY:		FILE No.:	hardee-site-3-1.dwg
REV BY:		DR SUBTITLE:	-

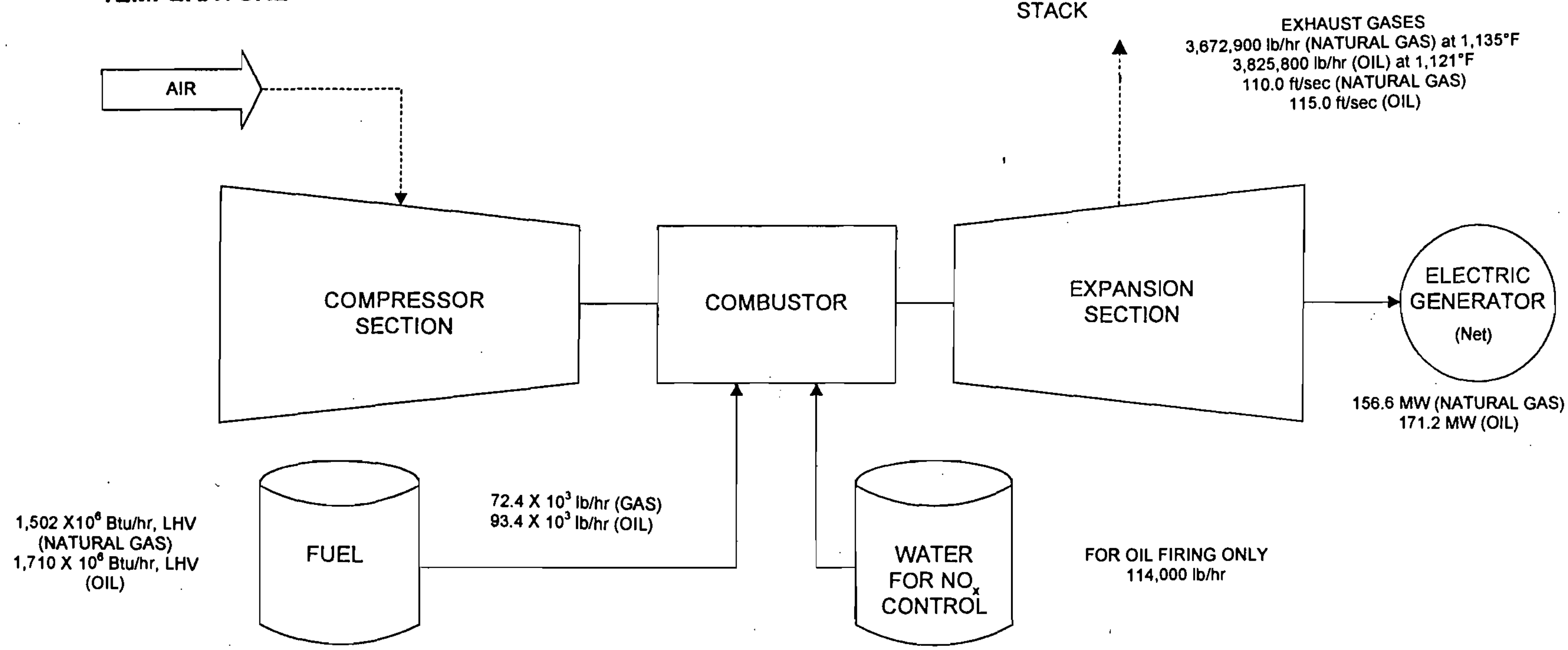
IPS Vandolah Power Project
Site Topographic Map

Golder Associates

IPS Avon Park Corp.

FIGURE 2-1

95°F TURBINE INLET TEMPERATURE CONDITIONS:



NOTE: SEE APPENDIX A FOR DESIGN INFORMATION AND STACK PARAMETERS FOR EACH FUEL.

Figure 2-2
Simplified Flow Diagram of Proposed "F" Class Combustion Turbine
Baseload, Summer Design Conditions

Process Flow Legend

Solid/Liquid	————▶
Gas	- - - - -▶
Steam	··········▶

Filename: TO-KAH/FIGURE.VSD

Date: 10/13/98

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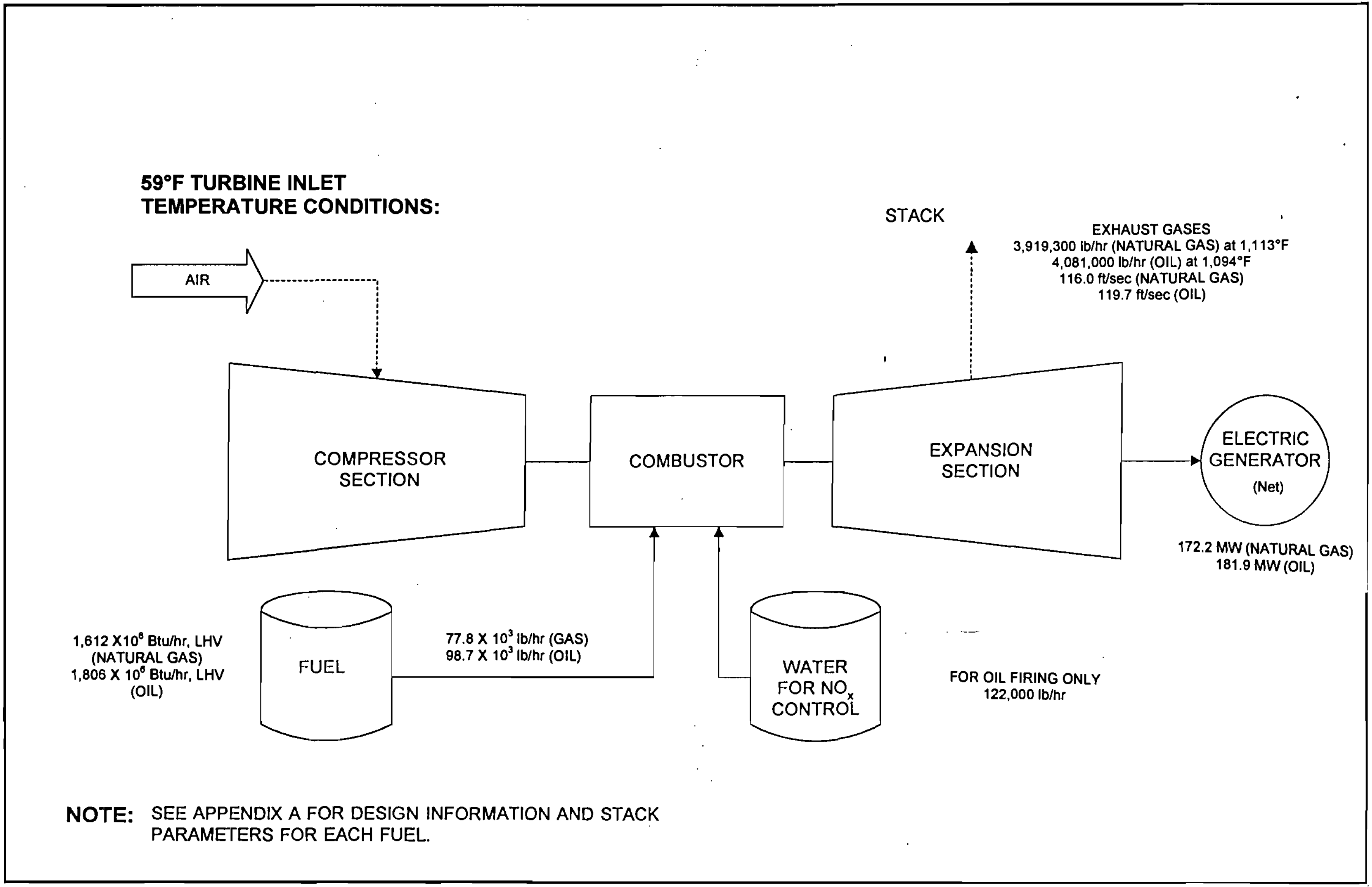

Figure 2-3
Simplified Flow Diagram of Proposed "F" Class Combustion Turbine
Baseload, Annual Design Conditions

Process Flow Legend
Solid/Liquid
Gas
Steam

Filename: TO-KAH/FIGURE.VSD
Date: 10/13/98

Golder Associates

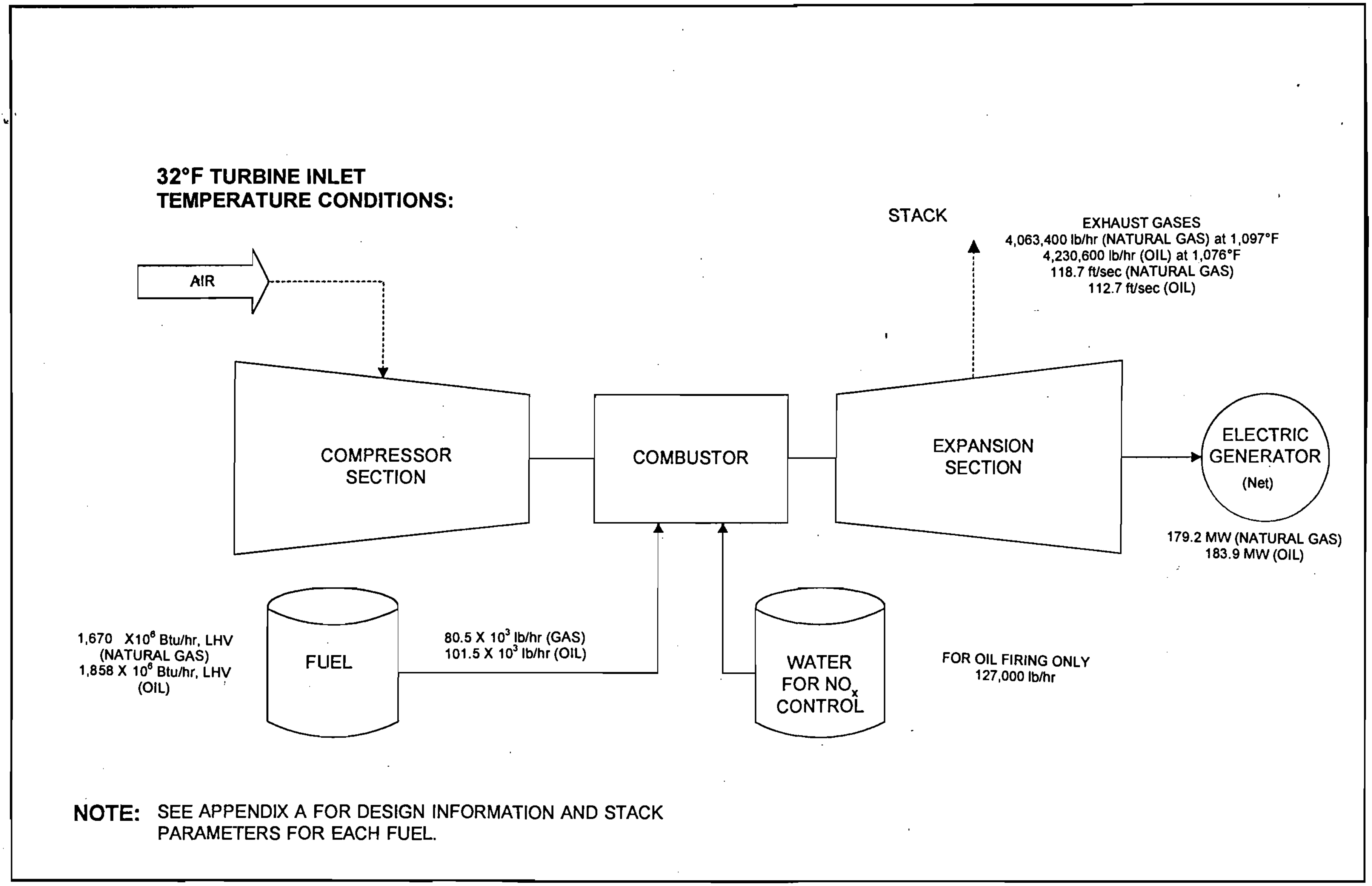

Figure 2-4
Simplified Flow Diagram of Proposed "F" Class Combustion Turbine
Baseload, Winter Design Conditions

Process Flow Legend
Solid/Liquid
Gas
Steam

Filename: TO-KAH/FIGURE.VSD
Date: 10/13/98

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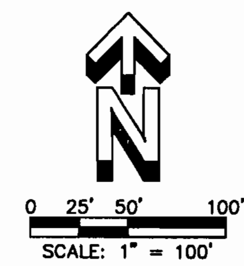
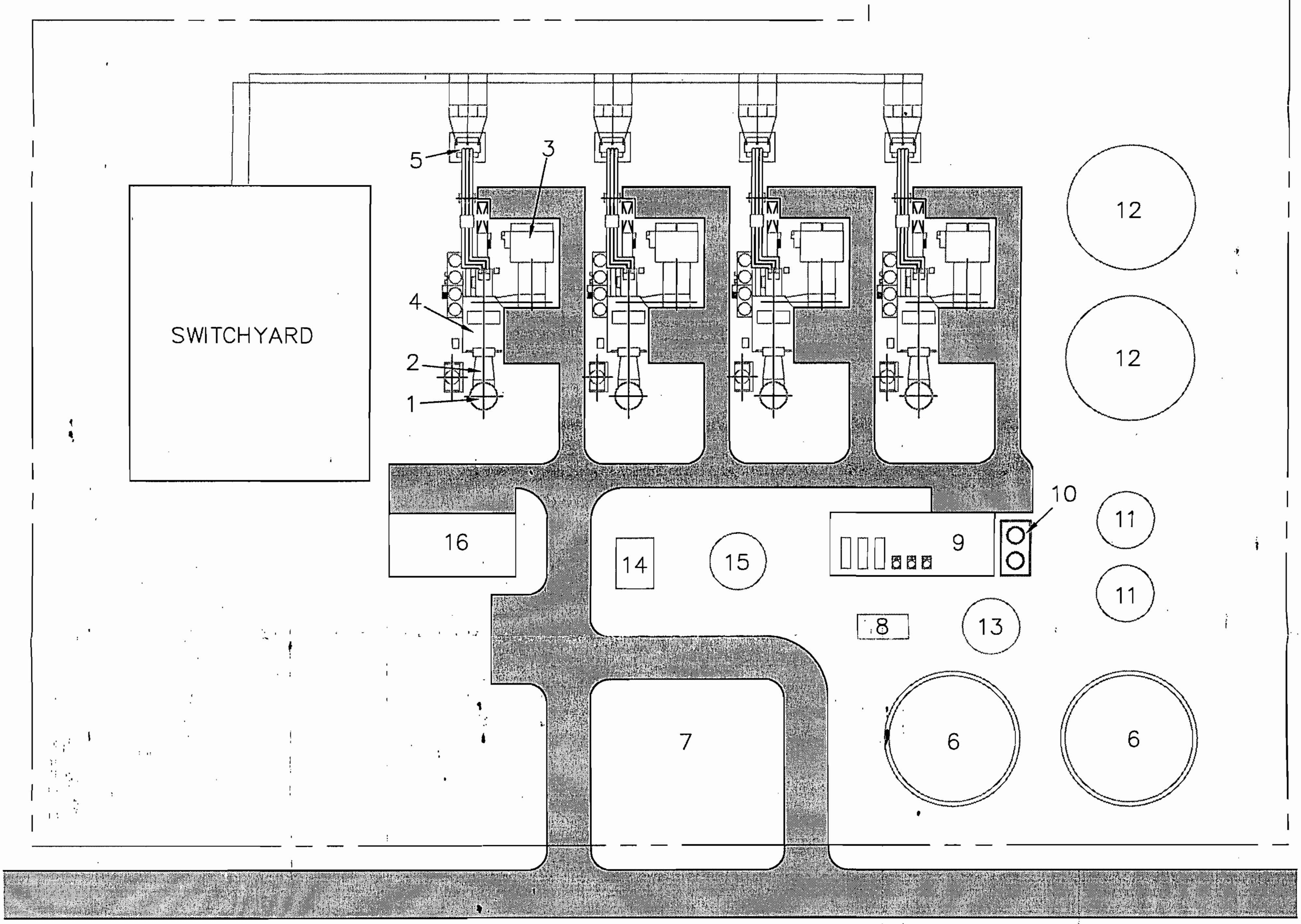
LIST OF MAJOR COMPONENTS

1. STACK
2. COMBUSTION TURBINE
3. INLET AIR FILTER
4. GENERATOR
5. TRANSFORMER
6. FUEL OIL STORAGE TANKS
7. FUEL UNLOADING AREA
8. OIL / WATER SEPARATOR
9. WATER TREATMENT
10. CHEMICAL STORAGE
11. RAW / TREATED WATER TANKS
12. DEMINERALIZED WATER TANKS
13. WASTEWATER TANK
14. FIRE PROTECTION PUMP
15. FIRE PROTECTION TANK
16. OPERATION / MAINTENANCE BUILDING





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CAD BY:	CDT	DATE:	8/27/99	
CHK BY:	KFK	FILE No.:	site.dwg	
REV BY:	KFK	DR SUBTITLE:		
Golder Associates				IPS Avon Park Corp.
			FIGURE	2-5

3.0 AIR QUALITY REVIEW REQUIREMENTS AND APPLICABILITY

The following discussion pertains to the federal and state air regulatory requirements and their applicability to the proposed IPS Vandolah Power Project. These regulations must be satisfied before the proposed project can begin operation.

3.1 NATIONAL AND STATE AAQS

The existing applicable national and Florida AAQS are presented in Table 3-1. Primary national AAQS were promulgated to protect the public health, and secondary national AAQS were promulgated to protect the public welfare from any known or anticipated adverse effects associated with the presence of pollutants in the ambient air. Areas of the country in violation of AAQS are designated as nonattainment areas, and new sources to be located in or near these areas may be subject to more stringent air permitting requirements.

3.2 PSD REQUIREMENTS

3.2.1 GENERAL REQUIREMENTS

Under federal and State of Florida PSD review requirements, all major new or modified sources of air pollutants regulated under the Clean Air Act (CAA) must be reviewed and a pre-construction permit issued. Florida's State Implementation Plan (SIP), which contains PSD regulations, has been approved by EPA; therefore, PSD approval authority has been granted to DEP.

A "major facility" is defined as any one of 28 named source categories that have the potential to emit 100 tons per year (TPY) or more or any other stationary facility that has the potential to emit 250 TPY or more of any pollutant regulated under CAA. "Potential to emit" means the capability, at maximum design capacity, to emit a pollutant after the application of control equipment.

A "major modification" is defined under PSD regulations as a change at an existing major facility that increases emissions by greater than significant amounts. PSD significant emission rates are shown in Table 3-2.

EPA has promulgated as regulations certain increases above an air quality baseline concentration level of SO_2, PM_{10}, and NO_2 concentrations that would constitute significant deterioration. The EPA class designations and allowable PSD increments are presented in Table 3-1. The State of Florida has adopted the EPA class designations and allowable PSD increments for SO_2, PM_{10}, and NO_2 increments.

PSD review is used to determine whether significant air quality deterioration will result from the new or modified facility. Federal PSD requirements are contained in 40 CFR 52.21, Prevention of Significant Deterioration of Air Quality. The State of Florida has adopted PSD regulations by reference [Rule 62-212.400 F.A.C.]. Major facilities and major modifications are required to undergo the following analysis related to PSD for each pollutant emitted in significant amounts:

1. Control technology review,
2. Source impact analysis,
3. Air quality analysis (monitoring),
4. Source information, and
5. Additional impact analyses.

In addition to these analyses, a new facility also must be reviewed with respect to GEP stack height regulations. Discussions concerning each of these requirements are presented in the following sections.

3.2.2 CONTROL TECHNOLOGY REVIEW

The control technology review requirements of the federal and state PSD regulations require that all applicable federal and state emission-limiting standards be met, and that BACT be applied to control emissions from the source (Rule 62-212.410, F.A.C.). The BACT requirements are applicable to all regulated pollutants for which the increase in emissions from the facility or modification exceeds the significant emission rate (see Table 3-2).

BACT is defined in 52.21 (b)(12) and Rule 62-210.200(40), F.A.C., as:

> An emissions limitation (including a visible emission standard) based on the maximum degree of reduction of each pollutant subject to regulation under the Act which would be emitted by any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts, and other costs, 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 such pollutant. 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 and 61. If the Administrator determines that technological or economic limitations on the application of measurement methodology to a particular part of a source 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 and shall provide for compliance by means which achieve equivalent results.

BACT was promulgated within the framework of the PSD requirements in the 1977 amendments of the CAA [Public Law 95-95; Part C, Section 165(a)(4)]. The primary purpose of BACT is to optimize consumption of PSD air quality increments and thereby enlarge the potential for future economic growth without significantly degrading air quality (EPA, 1978; 1980). Guidelines for the evaluation of BACT can be found in EPA's *Guidelines for Determining Best Available Control Technology (BACT)* (EPA, 1978) and in the *PSD Workshop Manual* (EPA, 1980). These guidelines were promulgated by EPA to provide a consistent approach to BACT and to ensure that the impacts of alternative emission control systems are measured by the same set of parameters. In addition, through implementation of these guidelines, BACT in one area may not be identical to BACT in another area. According to EPA (1980), "BACT analyses for the same types of emissions unit and the same pollutants in different locations or situations may determine that different control strategies should be applied to the different sites, depending on site-specific factors. Therefore, BACT analyses must be conducted on a case-by-case basis."

The BACT requirements are intended to ensure that the control systems incorporated in the design of a proposed facility reflect the latest in control technologies used in a particular industry and take into consideration existing and future air quality in the vicinity of the proposed facility. BACT must, as a minimum, demonstrate compliance with new source performance standards (NSPS) for a source (if applicable). An evaluation of the air pollution control techniques and systems, including a cost-benefit analysis of alternative control technologies capable of achieving a higher degree of emission reduction than the proposed control technology, is required. The cost-benefit analysis requires the documentation of the materials, energy, and economic penalties associated with the proposed and alternative control systems, as well as the environmental benefits derived from these systems. A decision on BACT is to be based on sound judgment, balancing environmental benefits with energy, economic, and other impacts (EPA, 1978).

Historically, a "bottom-up" approach consistent with the BACT Guidelines and PSD Workshop Manual has been used. With this approach, an initial control level, which is usually NSPS, is evaluated against successively more stringent controls until a BACT level is selected. However, EPA developed a concern that the bottom-up approach was not providing the level of BACT decisions originally intended. As a result, in December 1987, the EPA Assistant Administrator for Air and Radiation mandated changes in the implementation of the PSD program, including the adoption of a new "top-down" approach to BACT decision making.

The top-down BACT approach essentially starts with the most stringent (or top) technology and emissions limit that have been applied elsewhere to the same or a similar source category. The applicant must next provide a basis for rejecting this technology in favor of the next most stringent technology or propose to use it. Rejection of control alternatives may be based on technical or economic infeasibility. Such decisions are made on the basis of physical differences (e.g., fuel type), locational differences (e.g., availability of water), or significant differences that may exist in the environmental, economic, or energy impacts. The differences between the proposed facility and the facility on which the control technique was applied previously must be justified. EPA has issued a draft guidance document on the top-down approach entitled *Top-Down Best Available Control Technology Guidance Document* (EPA, 1990).

3.2.3 SOURCE IMPACT ANALYSIS

A source impact analysis must be performed for a proposed major source subject to PSD review for each pollutant for which the increase in emissions exceeds the significant emission rate (Table 3-2). The PSD regulations specifically provide for the use of atmospheric dispersion models in performing impact analyses, estimating baseline and future air quality levels, and determining compliance with AAQS and allowable PSD increments. Designated EPA models normally must be used in performing the impact analysis. Specific applications for other than EPA-approved models require EPA's consultation and prior approval. Guidance for the use and application of dispersion models is presented in the EPA publication Guideline on Air Quality Models (Revised). The source impact analysis for criteria pollutants to address compliance with AAQS and PSD Class II increments may be limited to the new or modified source if the net increase in impacts as a result of the new or modified source is above significance levels, as presented in Table 3-1.

The EPA has proposed significant impact levels (SILs) for Class I areas. The National Park Service (NPS) as the designated agency for oversight in air quality impacts to Class I areas has also recommended significant impact levels for PSD Class I areas. The EPA proposed Class I SILs are as follows:

Pollutant	Averaging Time	Proposed EPA PSD Class I Significant Impact Levels (μg/m³)
SO_2	3-hour	1
	24-hour	0.2
	Annual	0.1
PM_{10}	24-hour	0.3
	Annual	0.2
NO_2	Annual	0.1

[a] μg/m³ = micrograms per cubic meter.

Although these levels have not been officially promulgated as part of the PSD review process and may not be binding for states in performing PSD review, the proposed levels serve as a guideline in assessing a source's impact in a Class I area. The EPA action to incorporate Class I significant impact levels in the PSD process is part of implementing NSR provisions of the 1990 CAA Amendments. Because the process of developing the regulations will be lengthy, EPA believes that the proposed rules concerning the significant impact levels is appropriate in order to assist states in implementing the PSD permit process.

Various lengths of record for meteorological data can be used for impact analysis. A 5-year period can be used with corresponding evaluation of highest, second-highest short-term concentrations for comparison to AAQS or PSD increments. The term "highest, second-highest" (HSH) refers to the highest of the second-highest concentrations at all receptors (i.e., the highest concentration at each receptor is discarded). The second-highest concentration is significant because short-term AAQS specify that the standard should not be exceeded at any location more than once a year. If fewer than 5 years of meteorological data are used in the modeling analysis, the highest concentration at each receptor normally must be used for comparison to air quality standards.

The term "baseline concentration" evolves from federal and state PSD regulations and refers to a concentration level corresponding to a specified baseline date and certain additional baseline sources. By definition, in the PSD regulations as amended August 7, 1980, baseline concentration means the ambient concentration level that exists in the baseline area at the time of the applicable baseline date. A baseline concentration is determined for each pollutant for which a baseline date is established and includes:

1. The actual emissions representative of facilities in existence on the applicable baseline date; and
2. The allowable emissions of major stationary facilities that commenced construction before January 6, 1975, for SO_2 and PM(TSP) concentrations, or February 8, 1988, for NO_2 concentrations, but that were not in operation by the applicable baseline date.

The following emissions are not included in the baseline concentration and therefore affect PSD increment consumption:

1. Actual emissions from any major stationary facility on which construction commenced after January 6, 1975, for SO_2 and PM(TSP) concentrations, and after February 8, 1988, for NO_2 concentrations; and
2. Actual emission increases and decreases at any stationary facility occurring after the baseline date.

In reference to the baseline concentration, the term "baseline date" actually includes three different dates:

1. The major facility baseline date, which is January 6, 1975, in the cases of SO_2 and PM(TSP), and February 8, 1988, in the case of NO_2.
2. The minor facility baseline date, which is the earliest date after the trigger date on which a major stationary facility or major modification subject to PSD regulations submits a complete PSD application.
3. The trigger date, which is August 7, 1977, for SO_2 and PM(TSP), and February 8, 1988, for NO_2.

The minor source baseline date for SO_2 and PM(TSP) has been set as December 27, 1977, for the entire State of Florida (Rule 62-275.700(1)(a), F.A.C.). The minor source baseline for NO_2 has been set as March 28, 1988 (Rule 62-275.700(3)(a), F.A.C). It should be noted that references to PM (TSP) are also applicable to PM_{10}.

3.2.4 AIR QUALITY MONITORING REQUIREMENTS

In accordance with requirements of 40 CFR 52.21(m) and Rule 62-212.400(5)(f), F.A.C,, any application for a PSD permit must contain an analysis of continuous ambient air quality data in the area affected by the proposed major stationary facility or major modification. For a new major facility, the affected pollutants are those that the facility potentially would emit in significant amounts. For a major modification, the pollutants are those for which the net emissions increase exceeds the significant emission rate (see Table 3-2).

Ambient air monitoring for a period of up to 1 year generally is appropriate to satisfy the PSD monitoring requirements. A minimum of 4 months of data is required. Existing data from the vicinity of the proposed source may be used if the data meet certain quality assurance requirements; otherwise, additional data may need to be gathered. Guidance in designing a PSD monitoring network is provided in EPA's *Ambient Monitoring Guidelines for Prevention of Significant Deterioration* (EPA, 1987a).

The regulations include an exemption that excludes or limits the pollutants for which an air quality analysis must be conducted. This exemption states that Florida DEP may exempt a proposed major stationary facility or major modification from the monitoring requirements with respect to a particular pollutant if the emissions increase of the pollutant from the facility or modification would cause, in any area, air quality impacts less than the *de minimis* levels presented in Table 3-2 (Rule 62-212.400-3, F.A.C.).

3.2.5 SOURCE INFORMATION/GOOD ENGINEERING PRACTICE STACK HEIGHT

Source information must be provided to adequately describe the proposed project. The general type of information required for this project is presented in Section 2.0.

The 1977 CAA Amendments require that the degree of emission limitation required for control of any pollutant not be affected by a stack height that exceeds GEP or any other dispersion technique. On July 8, 1985, EPA promulgated final stack height regulations (EPA, 1985a). Identical regulations have been adopted by Florida DEP (Rule 62-210.550, F.A.C.). GEP stack height is defined as the highest of:

1. 65 meters (m); or
2. A height established by applying the formula:

   Hg = H + 1.5L

   where: Hg = GEP stack height,

   H = Height of the structure or nearby structure, and

   L = Lesser dimension (height or projected width) of nearby structure(s); or
3. A height demonstrated by a fluid model or field study.

"Nearby" is defined as a distance up to five times the lesser of the height or width dimensions of a structure or terrain feature, but not greater than 0.8 km. Although GEP stack height regulations require that the stack height used in modeling for determining compliance with AAQS and PSD increments not exceed the GEP stack height, the actual stack height may be greater.

The stack height regulations also allow increased GEP stack height beyond that resulting from the above formula in cases where plume impaction occurs. Plume impaction is defined as concentrations measured or predicted to occur when the plume interacts with elevated terrain. Elevated terrain is defined as terrain that exceeds the height calculated by the GEP stack height formula.

3.2.6 ADDITIONAL IMPACT ANALYSIS

In addition to air quality impact analyses, federal and State of Florida PSD regulations require analyses of the impairment to visibility and the impacts on soils and vegetation that would occur as a result of the proposed source [40 CFR 52.21(o); Rule 62-212.400(5)(e), F.A.C.]. These analyses are to be conducted primarily for PSD Class I areas. Impacts as a result of general commercial, residential, industrial, and other growth associated with the source also must be addressed. These analyses are required for each pollutant emitted in significant amounts (Table 3-2).

3.3 NONATTAINMENT RULES

Based on the current nonattainment provisions (Rule 62-212.500, F.A.C.), all major new facilities and modifications to existing major facilities located in a nonattainment area must undergo nonattainment review. A new major facility is required to undergo this review if the proposed pieces of equipment have the potential to emit 100 TPY or more of the nonattainment pollutant. A major modification at a major facility is required to undergo review if it results in a significant net emission increase of 40 TPY or more of the nonattainment pollutant or if the modification is major (i.e., 100 TPY or more).

For major facilities or major modifications that locate in an attainment or unclassifiable area, the nonattainment review procedures apply if the source or modification is located within the area of influence of a nonattainment area. The area of influence is defined as an area that is outside the boundary of a nonattainment area but within the locus of all points that are 50 km outside the boundary of the nonattainment area. Based on Rule 62-2.500(2)(c)2.a., F.A.C., all VOC sources that are located within an area of influence are exempt from the provisions of NSR for nonattainment areas. Sources that emit other nonattainment pollutants and are located within the area of influence are subject to nonattainment review unless the maximum allowable emissions from the proposed source do not have a significant impact within the nonattainment area.

3.4 EMISSION STANDARDS

3.4.1 NEW SOURCE PERFORMANCE STANDARDS

The NSPS are a set of national emission standards that apply to specific categories of new sources. As stated in the CAA Amendments of 1977, these standards "shall reflect the degree of emission limitation and the percentage reduction achievable through application of the best technological system of continuous emission reduction the Administrator determines has been adequately demonstrated."

The proposed project will be subject to one or more NSPS. The CTs will be subject to 40 CFR Part 60, Subpart GG, and each fuel oil storage tank (2.8 million gallon capacity) will be subject to 40 CFR Part 60, Subpart Kb.

3.4.1.1 Combustion Turbine

The CTs will be subject to emission limitations covered under Subpart GG, which limits NO_x and SO_2 emissions from all stationary combustion turbines with a heat input at peak load equal to 10.7 gigajoules per hour (10 MMBtu/hr), based on the lower heating value of the fuel fired.

NO_x emissions are limited to 75 ppmvd corrected to 15 percent oxygen and heat rate while sulfur dioxide emissions are limited to using a fuel with a sulfur content of 0.8 percent. In addition to emission limitations, there are requirements for notification, record keeping, reporting, performance testing and monitoring. These are summarized below:

40 CFR 60.7 Notification and Record Keeping

(a)(1) Notification of the date of construction - 30 days after such date.

(a)(2) Notification of the date of initial start-up - no more than 60 days or less than 30 days prior to date.

(a)(3) Notification of actual date of initial start-up - within 15 days after such date.

(a)(5) Notification of date which demonstrates CEM - not less than 30 days prior to date.

60.7 (b) Maintain records of the start-up, shutdown, and malfunction quarterly.

(c) Excess emissions reports - by the 30th day following end of quarter. (required even if no excess emissions occur)

(d) Maintain file of all measurements for two years.

60.8 Performance Tests

(a) must be performed within 60 days after achieving maximum production rate but no later than 180 days after initial start-up.

(d) Notification of Performance tests at least 30 days prior to them occurring.

40 CFR Subpart GG

60.334 Monitoring of Operations

(a) continuous monitoring system required for water-to-fuel ratio to meet NSPS; system must be accurate within ±5 percent.

(b) Monitor sulfur and nitrogen content of fuel.

Oil - (1): each occasion that fuel is transferred to bulk storage tank.

Gas - (2): daily monitoring required

3.4.1.2 Fuel Oil Storage Tank

The applicable NSPS is 40 CFR Part 60, Subpart Kb--Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels for which Construction, Reconstruction, or Modification Commenced after July 23, 1984). The storage tank will contain distillate fuel oil, a volatile organic liquid as defined in Subpart Kb. There are no emission limiting or control requirements under Subpart Kb for the use of distillate fuel oil. The facility, however, must perform record keeping of the type of organic liquid in the tank.

3.4.2 FLORIDA RULES

The Florida DEP regulations for new stationary sources are covered in the F.A.C. The Florida DEP has adopted the EPA NSPS by reference in Rule 62-204.800(7); subsection (b)38 for stationary gas turbines and (b)15 for volatile organic liquid storage vessels. Therefore, the project is required to meet the same emissions, performance testings, monitoring, reporting, and record keeping as those described in Section 3.4.1. DEP has authority for implementing NSPS requirements in Florida.

3.4.3 FLORIDA AIR PERMITTING REQUIREMENTS

The Florida DEP regulations require any new source to obtain an air permit prior to construction. Major new sources must meet the appropriate PSD and nonattainment requirements as discussed previously. Required permits and approvals for air pollution sources include NSR for nonattainment areas, PSD, NSPS, National Emission Standards for Hazardous Air Pollutants (NESHAP), Permit to Construct, and Permit to Operate. The requirements for construction permits and approvals are contained in Rules 62-4.030, 62-4.050, 62-4.052, 62-4.210, and 62-210.300(1), F.A.C. Specific emission standards are set forth in Chapter 62-296, F.A.C.

3.4.4 HAZARDOUS POLLUTANT REVIEW

The Florida DEP has published guidelines (DEP, 1995) to determine whether any emission of a potentially hazardous or toxic pollutant can pose a possible health risk to the public. Maximum concentrations for all regulated pollutants for which an ambient standard does not exist and all nonregulated hazardous pollutants can be compared to ambient reference concentrations (ARCs) for each applicable pollutant. If the maximum predicted concentrations for any hazardous pollutant is less than the corresponding ARC for each applicable averaging time, that emission is considered not to pose a significant health risk. The ARCs are not environmental standards but, rather, evaluation tools to determine if an apparent threat to the public health may exist. These levels are not used in permitting new sources.

3.4.5 LOCAL AIR REGULATIONS

Hardee County does not have specific air regulations.

3.5 SOURCE APPLICABILITY

3.5.1 AREA CLASSIFICATION

The project site is located in Hardee County, which has been designated by EPA and DEP as an attainment area for all criteria pollutants. Hardee County and surrounding counties are designated as PSD Class II areas for SO_2, PM(TSP) , and NO_2. The nearest Class I areas to the site is the Chassahowitzka National Wilderness Area which is about 140 km (88 miles) from the site.

3.5.2 PSD REVIEW

3.5.2.1 Pollutant Applicability

The proposed project is considered to be a major facility because the emissions of several regulated pollutants are estimated to exceed 250 TPY; therefore, PSD review is required for any pollutant for which the emissions are considered major or exceed the PSD significant emission rates. As shown in Table 3-3, potential emissions from the proposed project will be major for PM (TSP), PM_{10}, SO_2, NO_x, CO, VOC, and sulfuric acid mist. Because the proposed project impacts for these pollutants are predicted to be below the significant impact levels, a modeling analysis incorporating the impacts from other sources is not required. (Note: EPA has promulgated changes to the PSD Rules to eliminate hazardous air pollutants (HAPs) from PSD review. The pollutants, vinyl chloride, mercury, asbestos, and beryllium, are no longer evaluated in PSD review.)

As part of the PSD review, a PSD Class I increment analysis is required if the proposed project's impacts are greater than the proposed EPA Class I significant impact levels. The nearest Class I areas to the plant site is about 140 km from the site. A PSD Class I increment-consumption analysis is required.

3.5.2.2 Emission Standards

The applicable NSPS for the CTs is 40 CFR Part 60, Subpart GG. The proposed emissions for the turbines will be well below the specified limits (see Section 4.0). Each fuel oil storage tank will have a maximum storage capacity of 2.8 million gallons of No. 2 fuel oil. Since the storage tank has a capacity greater than 40 cubic meters (m^3) [approximately 10,568 gallons], the applicable NSPS is 40 CFR Part 60, Subpart Kb. The storage tank will contain distillate fuel oil, a volatile organic liquid as defined in Subpart Kb, with a true vapor pressure of 0.022 pound per square inch (psi) at 100 F. Because the fuel oil is expected to have a maximum true vapor pressure of less than 3.5 kilopascals (kPa) or 0.51 psi, only the minor monitoring of operating requirements specified in 40 CFR 60 116b(a) and (b) will apply.

3.5.2.3 Ambient Monitoring

Based on the estimated pollutant emissions from the proposed plant (see Table 3-4), a pre-construction ambient monitoring analysis is required for PM_{10}, SO_2, NO_2, CO, and O_3 (based on VOC emissions). If the net increase in impact of other pollutants is less than the applicable *de minimis* monitoring concentration (100 TPY in the case of VOC), then an exemption from the pre-construction ambient monitoring requirement may be obtained [52.21(i)(8)]. In addition, if an acceptable ambient monitoring method for the pollutant has not been established by EPA, monitoring is not required.

If pre-construction monitoring data are required to be submitted, data collected at or near the project site can be submitted, based on existing air quality data or the collection of onsite data.

As shown in Table 3-4, the proposed plant's impacts are predicted to be below the applicable *de minimis* monitoring concentration levels and criteria.

3.5.2.4 GEP Stack Height Impact Analysis

The GEP stack height regulations allow any stack to be at least 65 m [213 feet (ft)] high. The CT stacks for the project will be 60 ft. This stack height does not exceed the GEP stack height. However, as discussed in Section 6.0, Air Quality Modeling Approach, since the stack height is less than GEP, building downwash effects must be considered in the modeling analysis. As a result, the potential for downwash of the CTs' emissions caused by nearby structures are included in the modeling analysis.

3.5.3 NONATTAINMENT REVIEW

The project site is located in Hardee County, which is classified as an attainment area for all criteria pollutants. Therefore, nonattainment requirements are not applicable.

3.5.4 OTHER CLEAN AIR ACT REQUIREMENTS

The 1990 CAA Amendments established a program to reduce potential precursors of acidic deposition. The Acid Rain Program was delineated in Title IV of the CAA Amendments and required EPA to develop the program. EPA's final regulations were promulgated on January 11, 1993, and included permit provisions (40 CFR Part 72), allowance system (Part 73), continuous emission monitoring (Part 75), excess emission procedures (Part 77), and appeal procedures (Part 78).

EPA's Acid Rain Program applies to all existing and new utility units except those serving a generator less than 25 MW, existing simple cycle CTs, and certain non-utility facilities; units which fall under the program are referred to as affected units. The EPA regulations would be applicable to the proposed project for the purposes for obtaining a permit and allowances, as well as emission monitoring. New units are required to obtain permits under the program by submitting a complete application 24 months before the later of January 1, 2000, or the date on which the unit begins serving an electric generator (greater than 25 MW).

The permit would provide SO_2 and NO_x emission limitations and the requirement to hold emission allowances. Emission limitations established in the Acid Rain Program are presumed to be less stringent than BACT or lowest achievable emission rate (LAER) for new units. An allowance is a market-based financial instrument that is equivalent to 1 ton of SO_2 emissions. Allowances can be sold, purchased, or traded. For the proposed project, SO_2 allowances will be obtained from the market.

Continuous emission monitoring (CEM) for SO_2 and NO_x is required for gas-fired and oil-fired affected units. When an SO_2 CEM is selected to monitor SO_2 mass emissions, a flow monitor is also required. Alternately, SO_2 emissions may be determined using procedures established in Appendix D, 40 CFR Part 75 (flow proportional oil sampling or manual daily oil sampling). CO_2 emissions must also be determined either through a CEM (e.g., as a diluent for NO_X monitoring) or calculation. Alternate procedures, test methods, and quality assurance/quality control (QA/QC) procedures for CEM are specified (Part 75 Appendices A through I). The CEM requirements including QA/QC procedures are, in general, more stringent than those specified in the NSPS for Subpart GG. New units are required to meet the requirements by the later of January 1, 1995, or not later than 90 days after the unit commences commercial operation.

Table 3-1. National and State AAQS, Allowable PSD Increments, and Significant Impact Levels

Pollutant	Averaging Time	AAQS ($\mu g/m^3$) Primary Standard	AAQS ($\mu g/m^3$) Secondary Standard	AAQS ($\mu g/m^3$) Florida	PSD Increments ($\mu g/m^3$) Class I	PSD Increments ($\mu g/m^3$) Class II	Significant Impact Levels ($\mu g/m^3$) [b]
Particulate Matter[c] (PM_{10})	Annual Arithmetic Mean	50	50	50	4	17	1
	24-Hour Maximum	150	150	150	8	30	5
Sulfur Dioxide	Annual Arithmetic Mean	80	NA	60	2	20	1
	24-Hour Maximum	365	NA	260	5	91	5
	3-Hour Maximum	NA	1,300	1,300	25	512	25
Carbon Monoxide	8-Hour Maximum	10,000	10,000	10,000	NA	NA	500
	1-Hour Maximum	40,000	40,000	40,000	NA	NA	2,000
Nitrogen Dioxide	Annual Arithmetic Mean	100	100	100	2.5	25	1
Ozone[c]	8-Hour Maximum[d]	157	157	157	NA	NA	NA
Lead	Calendar Quarter Arithmetic Mean	1.5	1.5	1.5	NA	NA	NA

Note: Particulate matter (PM_{10}) = particulate matter with aerodynamic diameter less than or equal to 10 micrometers.
NA = Not applicable, i.e., no standard exists.

[a] Short-term maximum concentrations are not to be exceeded more than once per year.

[b] Maximum concentrations are not to be exceeded.

[c] On July 18, 1997, EPA promulgated revised AAQS for particulate matter and ozone. For particulate matter, PM2.5 standards were introduced with a 24-hour standard g/m³ (3-year average of 98th percentile) and an annual standard of 15 g/m³ (3-year average at community monitors). These standards have been stayed by a court case ag EPA and implementation of these standards are many years away pending EPA appeal.

[d] 0.08 ppm; achieved when 3-year average of 99th percentile is 0.08 ppm or less. These have been stayed by a courtcase against EPA. EPA is appealing. The 1-hour standar 0.12ppm is still applicable. FDEP has not yet adopted the new standards.

Sources: Federal Register, Vol. 43, No. 118, June 19, 1978.
40 CFR 50; 40 CFR 52.21.
Chapter 62-272, F.A.C.

Table 3-2. PSD Significant Emission Rates and *De Minimis* Monitoring Concentrations

Pollutant	Regulated Under	Significant Emission Rate (TPY)	*De Minimis* Monitoring Concentration[a] (μg/m3)
Sulfur Dioxide	NAAQS, NSPS	40	13, 24-hour
Particulate Matter [PM(TSP)]	NSPS	25	10, 24-hour
Particulate Matter (PM_{10})	NAAQS	15	10, 24-hour
Nitrogen Dioxide	NAAQS, NSPS	40	14, annual
Carbon Monoxide	NAAQS, NSPS	100	575, 8-hour
Volatile Organic Compounds (Ozone)	NAAQS, NSPS	40	100 TPY[b]
Lead	NAAQS	0.6	0.1, 3-month
Sulfuric Acid Mist	NSPS	7	NM
Total Fluorides	NSPS	3	0.25, 24-hour
Total Reduced Sulfur	NSPS	10	10, 1-hour
Reduced Sulfur Compounds	NSPS	10	10, 1-hour
Hydrogen Sulfide	NSPS	10	0.2, 1-hour
Mercury	NESHAP	0.1	0.25, 24-hour
MWC Organics	NSPS	$3.5x10^{-6}$	NM
MWC Metals	NSPS	15	NM
MWC Acid Gases	NSPS	40	NM
MSW Landfill Gases	NSPS	50	NM

Note: Ambient monitoring requirements for any pollutant may be exempted if the impact of the increase in emissions is below *de minimis* monitoring concentrations.

NAAQS = National Ambient Air Quality Standards.
NM = No ambient measurement method established; therefore, no *de minimis* concentration has been established.
NSPS = New Source Performance Standards.
NESHAP = National Emission Standards for Hazardous Air Pollutants.
g/m^3 = micrograms per cubic meter.
MWC = Municipal waste combustor
MSW = Municipal solid waste

[a] Short-term concentrations are not to be exceeded.
[b] No *de minimis* concentration; an increase in VOC emissions of 100 TPY or more will require monitoring analysis for ozone.
[c] Any emission rate of these pollutants.

Sources: 40 CFR 52.21.
Rule 62-212.400

Table 3-3. Maximum Emissions Due to the Proposed IPS Vandolah Power Project Compared to the PSD Significant Emission Rates

Pollutant	Pollutant Emissions (TPY)		PSD Review
	Potential Emissions from Proposed Facility[a]	Significant Emission Rate	
Sulfur Dioxide	221.1	40	Yes
Particulate Matter [PM(TSP)]	81.8	25	Yes
Particulate Matter (PM_{10})	81.8	15	Yes
Nitrogen Dioxide	1,007.8	40	Yes
Carbon Monoxide	345.9	100	Yes
Volatile Organic Compounds	45.9	40	Yes
Lead	0.04	0.6	No
Sulfuric Acid Mist	33.9	7	Yes
Total Fluorides	0.12	3	No
Total Reduced Sulfur	NEG	10	No
Reduced Sulfur Compounds	NEG	10	No
Hydrogen Sulfide	NEG	10	No
Mercury	0.002	0.1	No
MWC Organics (as 2,3,7,8-TCDD)	$1.3X10^{-6}$	$3.5x10^{-6}$	No
MWC Metals (as Be, Cd)	0.014	15	No
MWC Acid Gaser (as HCl)	0.8	40	No

Note: NEG = Negligible.

[a] Based on emissions from operating at baseload at 59°F; firing natural gas and distillate fuel oil for 1,390 and 2,000 hours per year per turbine for a total of four CTs, respectively (Refer to Table 2-7).

Table 3-4. Predicted Net Increase in Impacts Due to the Proposed IPS Vandolah Power Project Compared to PSD *De Minimis* Monitoring Concentrations

	Concentration (μg/m3)	
Pollutant	Predicted Increase in Impacts[a]	*De Minimis* Monitoring Concentration
Sulfur Dioxide	1.0	13, 24-hour
Particulate Matter (PM_{10})	0.2	10, 24-hour
Nitrogen Dioxide	0.3	14, annual
Carbon Monoxide	49	575, 8-hour
Volatile Organic Compounds	45.9 TPY	100 TPY

Note: NA = not applicable.
NM = no ambient measurement method.
TPY = tons per year.

[a] See Section 6.0 for air dispersion modeling results.

4.0 CONTROL TECHNOLOGY REVIEW

4.1 APPLICABILITY

The PSD regulations require new major stationary sources to undergo a control technology review for each pollutant that may potentially be emitted above significant amounts. The control technology review requirements of the PSD regulations are applicable to emissions of NO_x, SO_2, CO, VOC, and PM/PM_{10} (see Section 3.0). The maximum potential annual emissions of these pollutants from the proposed GE 7FA CTs are summarized below (see Table 2-7):

Pollutant Emissions (TPY)

Pollutant	4 GE 7FA CTs
NO_x	1,007.8
SO_2	221.1
CO	345.9
VOC	45.9
PM/PM_{10}	81.8

[a] Maximum emissions based on firing natural gas for 2,390 hours and distillate fuel oil for 1,000 hours at baseload conditions and 59°F.

This section presents the applicable NSPS and the proposed BACT for these pollutants. The approach to the BACT analysis is based on the regulatory definitions of BACT, as well as EPA's current policy guidelines requiring a top-down approach. A BACT determination requires an analysis of the economic, environmental, and energy impacts of the proposed and alternative control technologies [see 40 CFR 52.21(b)(12); and Rule 62-212.200(40), and Rule 62-214.410, F.A.C.]. The analysis must, by definition, be specific to the project (i.e., case-by-case).

4.2 NEW SOURCE PERFORMANCE STANDARDS

The applicable NSPS for CTs are codified in 40 CFR 60, Subpart GG and summarized in Appendix B. The applicable NSPS emission limit for NO_x is 75 parts per million by volume dry (ppmvd) corrected for heat rate and 15 percent oxygen. For the CTs being considered for the project, the NSPS emission limit NO_x with the NSPS heat rate correction is 109.4 parts per million (ppm) on gas and 103.1 ppm on oil (corrected to 15 percent oxygen at a fuel-bound nitrogen content of 0.015 percent. The proposed NO_x emission limits for the project will be much lower than the NSPS.

4.3 BEST AVAILABLE CONTROL TECHNOLOGY

4.3.1 PROPOSED BACT

In recent permitting actions, FDEP has established BACT for heavy-duty industrial gas turbines. These decisions have included the use of advanced dry low-NO_x combustors for limiting NO_x and CO emissions and clean fuels (natural gas and distillate oil) for control of other emissions, including SO_2. The BACT proposed for the CTs is consistent with these FDEP permits. The proposed project will have two modes of operation (see Section 2.3) for which a BACT analysis has been performed. The results of the analysis have concluded the following controls as BACT for the project.

1. Natural Gas Fired. The CTs will utilize state-of-the-art dry low-NO_x combustion technology which will achieve gas turbine exhaust NO_x levels of no greater than 9ppmvd corrected to 15 percent O_2. CO emissions will be limited to 12 ppmvd at baseload.
2. Fuel Oil Fired. The CT will utilize water injection to achieve gas turbine exhaust NO_x levels of no greater than 42 ppmvd corrected to 15 percent O_2. CO emissions will be limited to 20 ppmvd at baseload.

4.3.2 NITROGEN OXIDES

4.3.2.1 Introduction

The BACT analysis was performed for the following alternatives:

1. Advanced dry low-NO_x combustors at an emission rate of 9 ppmvd corrected to 15 percent O_2 when firing gas and 42 ppmvd (corrected) when firing oil.
2. Selective catalytic reduction (SCR) and advanced dry low-NO_x combustors at an emission rate of approximately 3.6 ppmvd corrected to 15 percent O_2 when firing natural gas and 16.8 ppmvd when firing oil.

Appendix B presents a discussion of NO_x control technologies and their feasibility for the project.

Dry low-NO_x combustor technology has recently been offered and installed by manufacturers to reduce NO_x emissions by inhibiting thermal NO_x formation through premixing fuel and air prior to combustion and providing staged combustion to reduce flame temperatures. NO_x emissions from 25 ppmvd (corrected to 15-percent O_2) and less has been offered by manufacturers for advanced combustion turbines. Advanced in this context is the larger (over 150 MW) and more efficient (higher initial firing temperatures and lower heat rate) combustion turbines. This technology is truly pollution prevention since NO_x emissions are inhibited from forming.

SCR is a post-combustion process where NO_x in the gas stream is reacted with ammonia in the presence of a catalyst to form nitrogen and water. The reaction occurs typically between 600°F and 750°F, which has limited SCR application to combined cycle units where such temperatures occur in the HRSG. Exhausts from simple cycle operation up to 1,200°F, thus limiting SCR application for this mode of operation. With the higher cost ceramic catalyst, temperatures up to 1,050°F are possible. Such SCR systems are referred to as "hot" SCR. To accommodate "hot" SCR in the "F" Class gas turbine, some gas cooling would be required to maintain temperatures below 1,050°F. In-duct cooling using about 110,000 acfm of ambient air would maintain temperatures at below 1,050°F with turbine flow of about 2,600,000 acfm and up to 1,200°F . This could be accomplished with an electric powered fan rated at about 200 kW. While such modifications are theoretically possible, such gas cooling and its effectiveness has not been demonstrated on a "F" Class simple cycle gas turbine. SCR has been primarily installed and operated on combined cycle facilities using catalysts with temperature ranges from 600-750°F and generally achieving 9 ppmvd (corrected to 15-percent O_2) or less while burning only natural gas.

Applications of SCR with oil firing are limited. Where oil firing has been attempted, catalyst poisoning and ammonium salt formation has occurred. Ammonium salts (ammonium sulfate and ammonium bisulfate) are formed by the reaction of sulfur oxides in the gas stream and ammonia. These salts are highly acidic, and special precautions in materials and ammonia injection rates must be implemented to minimize their formation. Ammonia injected in the SCR system that does not react with NO_x is emitted directly and referred to as ammonia slip. In general, SCR manufacturers guarantee ammonia slip to be no more than 10 ppmvd; however, permitted limits in some applications have exceeded 25 ppmvd. While SCR is technically feasible for the project, SCR has not been applied to a simple cycle advanced combustion turbine of the size proposed for this project or to the amount of oil firing that may occur.

The recent permitting trend for advanced combustion turbines, even with combined cycle configuration, is the use of dry low-NO_x combustors. Indeed, most of the recent Florida projects have been permitted with this technology, including five projects in Florida (Florida Power & Light Martin Units 3 and 4; Central Florida Cogeneration Project; Hardee Unit 3 Project, and City of Tallahassee Project), and FPL Fort Myers Repowering Project.

As discussed in Section 2.1, the proposed CTs will be fired primarily with natural gas. Distillate oil will be used as backup fuel not to exceed 1,000 hours per year. Table 4-1 presents a summary of emissions with dry low-NO_x combustors and with dry low-NO_x combustors and SCR assuming 39 percent operating capacity at an ambient temperature of 59°F. The NO_x removed using SCR would be 151 TPY when firing oil and natural gas. The NO_x removed when firing oil is based on 1,000 hours per year. The NO_x removed when firing natural gas is based on 2,390 hours of operation.

4.3.2.2 Proposed BACT and Rationale

The proposed BACT for the project is advanced dry low-NO_x combustion technology. The proposed NO_x emissions level using this technology is 9 ppmvd (corrected to 15 percent oxygen) when firing natural gas under baseload conditions. NO_x from oil firing will be controlled using water injection (42 ppmvd corrected to 15 percent oxygen). This combination of control technologies is proposed for the following reasons:

1. SCR was rejected based on technical, economic, environmental, and energy grounds. Table 4-2 summarizes these considerations which favor the dry low-NO_x pollution prevention technology.
2. The estimated incremental cost of SCR is approximately 14,900 per ton of NO_x removed and is similar to cost for other projects that have rejected SCER as being unreasonable. This is even more apparent if additional pollutant emissions due to SCR are considered.
3. Additional environmental impacts would result from SCR operation, including emissions of ammonia; from secondary emissions (to replace the lost generation); and from the generation of hazardous waste (i.e., spent catalyst replacement). While NO_x emissions would be reduced by about 151 TPY per unit with SCR, the net emissions reduction would not be as great. There are three additional factors that must be considered:
   a. Ammonia slip would occur, and it may be as high as 40.4 TPY per unit.
   b. Additional particulate matter may be formed through the reaction of ammonia and sulfur oxides forming ammonium salts. As much as 17.1 TPY per unit additional particulate matter may be formed.
   c. SCR will require energy for system operation and reduce the efficiency of the combustion turbine. This lost energy would have to be replaced since the proposed project would be an efficient peaking power plant while operating. Any peaking power plants replacing this lost energy would be lower on the dispatch list and inevitably more polluting. Conservatively, this lost energy would result in the emissions of an additional 4.7 TPY of criteria pollutants. Additional emissions of carbon dioxide would also result.
   d. The "net" cost effectiveness cold be a high as $25,300 per ton of pollutant removed.
4. The energy impacts of SCR will reduce potential electrical power generation by more than 3.9 million kilowatt hours (kWh) per year. This amount of energy is sufficient to provide the monthly electrical needs of 1,200 residential customers.
5. The proposed BACT (i.e., dry low-NO_x combustion) provides the most cost effective control alternative, is pollution preventing, and results in low

environmental impacts (less than the significant impact levels). Dry low-NO_x combustion at the proposed emissions levels has been adopted previously in BACT determinations. Indeed, compared to conventional CTs, the proposed BACT will result in 10 to 15 percent less NO_x emission from the same amount of generation.

The analyses of economic, environmental, and energy impacts follow.

4.3.2.3 Impact Analysis

Economic--The total capital costs of SCR for the proposed plant are $5,263,200 per CT. The total annualized cost of applying SCR with dry low-NO_x combustion is $2,250,700. Appendix B contains the detailed cost estimates for the capital and annualized costs. The incremental cost effectiveness of adding SCR to the dry low-NO_x combustors and water injection (for oil firing) is estimated at $14,900 per ton of NO_x removed.

Environmental--The maximum predicted NO_x impacts using the dry low-NO_x technology are all considerably below the NO_2 PSD Class II increment of 25 $\mu g/m^3$, annual average, and the AAQS of 100 $\mu g/m^3$, annual average. Indeed, the maximum annual impact for the project is 0.3 $\mu g/m^3$, which is about 30 percent of the significant impact level. While additional controls beyond dry low-NO_x combustors (i.e., SCR and SCR with water injection) would reduce emissions, the effect will not be significant and much less than 1 percent of the PSD increment and the AAQS for the project.

The use of dry low-NO_x combustor technology is truly "pollution prevention". In contrast, use of SCR on the proposed project will cause emissions of ammonia and ammonium salts, such as ammonium sulfate and bisulfate. Ammonia emissions associated with SCR are expected to be up to 10 ppm based on reported experience; previous permit conditions have specified this level. Indeed, ammonia emissions could be as high as 40.4 TPY/ per unit for the project. Potential emissions of ammonium sulfate and bisulfate will increase emissions of PM_{10}; up to 17.1 TPY/per unit could be emitted.

The electrical energy required to run the SCR system and the back pressure from the turbine will reduce the available power from the project. This power, which would otherwise be available to the electrical system, will have to be replaced by other less efficient units. The replacement power will cause air pollutant emissions that would not have occurred without SCR. These "secondary" emissions, coupled with potential emissions of ammonia and ammonium salts, are presented in Table 4-3. This table shows the emissions balance for the project with and without SCR. As shown, the net reduction in emissions with SCR when all criteria pollutants are considered will be 89 TPY. In addition to criteria pollutants, additional secondary emissions of carbon dioxide would be emitted and were included in Table 4-3. As noted from this table, the emissions including CO_2 would be greater with SCR than that proposed using dry low-NO_x combustion technology.

The replacement of the SCR catalyst will create additional economic and environmental impacts since certain catalysts contain materials that are listed as hazardous chemical wastes under Resource Conservation and Recovery Act (RCRA) regulations (40 CFR 261). In addition, SCR will require the construction and maintenance of storage vessels of anhydrous or aqueous ammonia for use in the reaction. Ammonia has potential health effects, and the construction of ammonia storage facilities triggers the application of at least three major standards: Clean Air Act (section 112), Occupational Safety and Health Administration (OSHA) 29 CFR 1910.1000, and OSHA 29 CFR 1910.119.

Energy--Significant energy penalties occur with SCR. With SCR, the output of the CT may be reduced by about 0.50 percent over that of advanced low-NO_x combustors. This penalty is the result of the SCR pressure drop, which would be about 2.5 inches of water and would amount to about 2,967,290 kWh per year in potential lost generation. The energy required by the SCR equipment would be about 949,200 kWh per yr. Taken together, the total lost generation and energy requirements of SCR of 3,916,490 kWh per year could supply the monthly electrical needs of about 326 residential customers. To replace this lost energy, an additional 41 x 10^{10} British thermal units per year (Btu/yr) or about 41 million cubic feet per year (ft^3/yr) of natural gas would be required.

Technology Comparison--The proposed project will use an advanced heavy-duty industrial gas turbine with advanced dry low-NO_x combustors. This type of machine advances the state-of-the-art for CTs by being more efficient and less polluting than previous CTs. Integral to the machine's design is dry low-NO_x combustors that prevent the formation of air pollutants within the combustion process, thereby eliminating the need for add-on controls that can have detrimental effects on the environment. An analogy of this technology is a more efficient automotive engine that gives better mileage and reduces pollutant formation without the need of a catalytic converter.

An advanced gas turbine is unique from an engineering perspective in two ways. First, the advanced machine is larger and has higher initial firing (i.e., combustion) temperatures than conventional turbines. This results in a larger, more thermally efficient machine. For example, the electrical generating capability of the proposed GE Frame 7 FA advanced machine is about 170 MW compared to the 70 MW to 120 MW conventional machines. The higher initial firing temperature (i.e., 2,600°F) results in about 20 percent more electrical energy produced for the same amount of fossil fuel used in conventional machines. This has the added advantage of producing lower air pollutant emissions (e.g., NO_x, PM, and CO) for each MW generated. While the increased firing temperature increases the thermal NO_x generated, this NO_x increase is controlled through combustor design.

The second unique attribute of the advanced machine is the use of dry low-NO_x combustors that will reduce NO_x emissions to 9 ppmvd when firing natural gas. Thermal NO_x formation is inhibited by using staged combustion techniques where the natural gas and combustion air are premixed prior to ignition. This level of control will result in NO_x emissions of about 0.04 lb/10^6 Btu, which is less than half of the emissions generated from conventional fossil fuel-fired steam generators.

Since the purpose of the project is to produce electrical energy, and CT technology is rapidly advancing, it is appropriate to compare the proposed emissions on an equivalent generation basis to that of a conventional CT. The heat rate of the GE 7FA machines will be about 9,360 Btu/kWh (LHV, 59°F, natural gas). In contrast, the heat rate for a new conventional CT is about 11,000 Btu/kWh. Therefore, the amount of total NO_x from the advanced CT will be more than 10-percent lower than a conventional turbine for the same amount of generation.

Also, the amount of NO_x control achieved by the dry low-NO_x combustor on an advanced CT is considerably higher than that achieved by a conventional CT. Because of the higher firing initial temperatures, the advanced CT results in greater NO_x emission formation. Since the advanced machine has higher firing temperatures, the NO_x emissions without the use of dry low-NO_x combustion technology are much higher than a conventional CT (greater than 180 ppmvd vs. 150 ppmvd). This results in an overall greater NO_x reduction on the advanced CT.

4.3.3 CARBON MONOXIDE

4.3.3.1 Introduction

Emissions of CO are dependent upon the combustion design, which is a result of the manufacturer's operating specifications, including the air-to-fuel ratio, staging of combustion, and the amount of water injected (i.e., for oil firing). The CTs proposed for the project have designs to optimize combustion efficiency and minimize CO as well as NO_x emissions.

For the project, the following alternatives were evaluated as BACT:

1. Combustion controls at 12 ppmvd when firing natural gas (at baseload) and 20 ppmvd when firing oil (at baseload); and
2. Oxidation catalyst at 80% removal; maximum annual CO emissions are 17 TPY per unit.

4.3.3.2 Proposed BACT and Rationale

Combustion design is proposed as BACT, as there are adverse technical and economic consequences of using catalytic oxidation on CTs. The proposed BACT emission rates for CO will not exceed 12 ppmvd when firing natural gas and 20 ppmvd when firing distillate oil at baseload conditions. Catalytic oxidation is considered unreasonable for the following reasons:

1. Catalytic oxidation will not produce measurable reduction in the air quality impacts;
2. The economic impacts are significant (i.e., the capital cost is about $1.7 million per unit, with an analyzed cost of $466,000 per year per unit); and
3. Recent projects in Florida have been authorized with BACT emission limits of 25 ppmvd on gas and 90 ppmvd on oil.

Combustion design is proposed as BACT as a result of the technical and economic consequences of using catalytic oxidation on CTs. Catalytic oxidation is considered unreasonable since it will not produce a measurable reduction in the air quality impacts. Indeed, recent BACT decisions for similar advanced CTs have set limits in the 30 ppmvd range and higher. Even the Northeast States for Coordinated Air Use Management (NESCAUM) has recognized a BACT level of 50 ppmvd for CO emissions. The cost of an oxidation catalyst would be significant and not be cost effective given the maximum proposed emission limits.

4.3.3.3 Impact Analysis

<u>Economic</u>--The estimated annualized cost of a CO oxidation catalyst is $466,000 per unit, resulting in a cost effectiveness of greater than $9,000 per ton of CO removed. The cost effectiveness is based on 2,390 hours per year on natural gas and 1,000 hours per year of operation on oil. No costs are associated with combustion techniques since they are inherent in the design.

<u>Environmental</u>--The air quality impacts of both oxidation catalyst control and combustion design control techniques are below the significant impact levels for CO. Therefore, no significant environmental benefit would be realized by the installation of a CO catalyst. Moreover, the air quality impacts at the proposed CT emission rate are predicted to be much less than the PSD significant impact levels. The maximum CO impacts are less than 0.1 percent of the applicable ambient air quality standards. There would also be no secondary benefits, such as reductions in acidic deposition, to reducing CO.

Energy--An energy penalty would result from the pressure drop across the catalyst bed. A pressure drop of about 2 inches water gauge would be expected. At a catalyst back pressure of about 2 inches, an energy penalty of about 1,186,900 kWh/yr would result at 100 percent load. This energy penalty is sufficient to supply the electrical needs of about 99 residential customers for a year. To replace this lost energy, about 1.2×10^{10} Btu/yr or about 12 million ft^3/yr of natural gas would be required.

4.3.4 VOLATILE ORGANIC COMPOUNDS

VOCs will be emitted by the CT as a result of incomplete combustion. The proposed BACT for VOC emissions will be the use of combustion technology and the use of clean fuels so that emissions will not exceed 1.4 ppmvd when firing natural gas and 7.0 ppmvw when firing distillate oil. These emission levels are similar to the BACT emission levels established for other similar sources. Combustion controls and the use of clean fuels have been overwhelmingly approved as BACT for CTs. The environmental effect of further reducing emissions would not be significant.

4.3.5 PM/PM_{10}, SO_2 AND OTHER REGULATED AND NONREGULATED POLLUTANT EMISSIONS

The PM/PM_{10} emissions from the CTs are a result of incomplete combustion and trace elements in the fuel. The design of the CT ensures that particulate emissions will be minimized by combustion controls and the use of clean fuels. A review of EPA's BACT/LAER Clearinghouse Documents did not reveal any post-combustion particulate control technologies being used on gas- or oil-fired CTs.

The maximum particulate emissions from the CT will be lower in concentration than that normally specified for fabric filter designs {i.e., the grain loading associated with the maximum particulate emissions [about 10 pounds per hour (lb/hr) when firing natural gas]} is less than 0.01 grain per standard cubic foot (gr/scf), which is a typical design specification for a baghouse. This further demonstrates that no further particulate controls are necessary for the proposed project.

There are no technically feasible methods for controlling the emissions of these pollutants from CTs, other than the inherent quality of the fuel. Clean fuels, natural gas and distillate oil represent BACT for these pollutants. The use of natural gas and very low sulfur (0.05%) fuel oil will limit emissions of SO_2.

For the nonregulated pollutants, none of the control technologies evaluated for other pollutants (i.e., SCR) would reduce such emissions; thus, natural gas and distillate oil represent BACT because of their inherently low contaminant content.

Table 4-1. NO_x Emission Estimates (TPY) of BACT Alternative Technologies (per Unit)

Alternative BACT Control Technologies	Operating Mode[a] Oil	Gas	Total
NO$_x$ Emission (TPY)			
Dry Low-NO_x (DLN) only	175.4	76.6	252.0
DLN with SCR[b]	70.2	30.6	100.8
Reduction	(105.2)	(46.0)	(151.2)
Basis of Emissions (ppmvd)			
DLN only	42	9	
DLN with SCR	16.8	3.6	
Hours of Operation	1,000	2,390	3,390

Note: DLN = Dry low-NO_x.
SCR = selective catalytic reduction.
TPY = tons per year.

[a] Emission rates were based on a "F" class combustion turbine operating at 100-percent capacity and firing natural gas for 2,390 hours and distillate fuel oil for 1,000 hours. Emission data are based on an ambient temperature of 50°F at maximum emission rates.

[b] Based on primary emissions with SCR; no account is made for additional emissions (secondary) due to lost energy from heat rate penalty and electrical usage for SCR operation (see Table 4-3).

Table 4-2. Comparison of Alternative BACT Control Technologies for NO_x (per Unit)

	Alternative BACT Control Technologies	
	DLN Only	SCR
Technical Feasibility	Feasible	Feasible for gas
Economic Impact[a]		
Capital Costs	included	$5,263,200
Annualized Costs	included	$2,250,700
Cost Effectiveness		
NO_x Removed (per ton of NO_x)	NA	$14,886
NO_x Removed (per ton of total pollutants)	NA	25,267
Environmental Impact[b]		
Total NO_x (TPY)	252	101
NO_x Reduction (TPY)	NA	(151.2)
Ammonia Emissions (TPY)	0	40.4
PM Emissions (TPY)	0	17.1
Secondary Emissions (TPY)	0	4.7
Net Emission Reduction (TPY)	NA	(89.1)
Energy Impacts[c]		
Energy Use (kWh/yr)	0	3,916,490
Energy Use (mmBtu/yr) at 10,000 Btu/kWh	0	40,696
Energy Use (mmcf/yr) at 1,000 Btu/cf for natural gas	0	41
Energy Use (residential customers)	0	326

[a] See Appendix B for detailed development of capital costs (including recurring costs) and annualized costs.

[b] See emission data presented in Table 4-3.

[c] Energy impacts are estimated due to the lost energy from heat rate penalty and electrical usage for the SCR operation at 3,390 hours per year. Lost energy is based on 0.5 percent of 175.06 MW. SCR electrical usage is based on 0.080 MWh per SCR system and 0.20 MWh for cooling fan.

Table 4-3. Maximum Potential Incremental Emissions (TPY) with Selective Catalytic Reduction

Pollutants		Incremental Emissions (tons/year) of SCR Primary	Secondary	Total
Particulate		17.10	0.15	17.25
Sulfur Dioxide			0.06	0.06
Nitrogen Oxides		-151.20	2.71	-148.49
Carbon Monoxide			1.63	1.63
Volatile Organic Compounds			0.11	0.11
Ammonia		40.37		
	Total:	-93.73	4.65	-89.08
Carbon Dioxide (additional from gas firing)			2,577.43	2,577.43

Basis:

Lost Energy (mmBtu/year)	40,696

Secondary Emissions (lb/mmBtu): Assumes natural gas firing in NO_x controlled steam unit.

Particulate	0.0072
Sulfur Dioxide	0.0027
Nitrogen Oxides w/LNB	0.1333
Carbon Monoxide	0.0800
Volatile Organic Compounds	0.0052

Reference: Table 1.4-1 and 1.4-2, AP-42, Version 2/98

5.0 AMBIENT MONITORING ANALYSIS

The CAA requires that an air quality analysis be conducted for each criteria and noncriteria pollutant subject to regulation under the act before a major stationary source is constructed. Criteria pollutants are those pollutants for which AAQS have been established. Noncriteria pollutants are those pollutants that may be regulated by emission standards, but no AAQS have been established. This analysis may be performed by the use of modeling and/or by monitoring the air quality.

A major source may waive the ambient monitoring analysis requirement if it can be demonstrated that the proposed source's maximum air quality impacts will not exceed the PSD *de minimis* concentration levels. The maximum impacts of the proposed source are compared with the PSD *de minimis* concentrations in Table 3-4. As can be seen from Table 3-4, the proposed plant's maximum air quality impacts will be well below the *de minimis* concentrations for all applicable pollutants. For VOCs, the potential emission from the project are less than the *de minimis* criteria of 100 TPY; therefore, monitoring for ozone is not required.

6.0 AIR QUALITY IMPACT ANALYSIS

6.1 SIGNIFICANT IMPACT ANALYSIS APPROACH

The general modeling approach in this case followed EPA and Florida DEP modeling guidelines for determining compliance with AAQS and PSD increments. For all applicable pollutants that have emission increases that will exceed the PSD significant emission rate due to a proposed project, a significant impact analysis is performed to determine whether the project alone will result in predicted impacts that will exceed the EPA significant impact levels at any off-plant property areas in the vicinity of the plant.

If the project's impacts are above the significant impact levels, then a more detailed air modeling analysis that includes background sources is performed. Current Florida DEP policies stipulate that the highest annual average and highest short-term (i.e., 24 hours or less) concentrations are to be compared to the applicable significant impact levels. Based on the screening modeling analysis results, additional modeling refinements with a denser receptor grid are performed, as necessary, to obtain the maximum concentration. Modeling refinements are performed with a receptor grid spacing of 100 meters (m) or less.

For this project, the significant impacts levels were estimated in the vicinity of the plant following Florida DEP policies.

Generally, if a new project also is within 150 km of a PSD Class I area, then a significant impact analysis is also performed for the PSD Class I area. Currently, the National Park Service (NPS) has recommended significant impact levels for PSD Class I areas. The recommended levels have not been promulgated as rules. EPA also has proposed PSD Class I significant impact levels that have not been finalized as of this report.

Because the proposed project site is approximately 139 km from the Chassahowitzka National Wildlife Refuge (CNWR) PSD Class I area, a significant impact modeling analysis has been performed.

6.2 PRECONSTRUCTION MONITORING ANALYSIS APPROACH

The general modeling approach in this case followed EPA and Florida DEP modeling guidelines for evaluating a project's impacts relative to the *de minimis* monitoring levels to determine the need to submit continuous monitoring data prior to construction. For all applicable pollutants that have emission increases that will exceed the PSD significant emission rate due to a proposed project, a *de minimis* impact analysis is performed to determine whether the project alone will result in predicted impacts that will exceed the EPA *de minimis* levels at any off-plant property areas in the vicinity of the plant. Current Florida DEP policies stipulate that the highest annual average and highest short-term concentrations are to be compared to the applicable *de minimis* monitoring levels.

A proposed major stationary facility or major modification may be exempt from the monitoring requirements with respect to a particular pollutant if the emissions increase of the pollutant from the facility or modification would cause, in any area, air quality impacts less than the *de minimis* levels.

For this project, the project's impacts were estimated in the vicinity of the plant for comparison to *de minimis* levels following Florida DEP policies. As presented in Section 5.0, since the estimated project's VOC emissions are lower than the *de minimis* VOC emission level, the project is exempt from preconstruction ambient monitoring requirements.

6.3 AIR MODELING ANALYSIS APPROACH

6.3.1 GENERAL PROCEDURES

As stated in the previous sections, for each pollutant which is emitted above the significant emission rate, air modeling analyses are required to determine if the project's impacts are predicted to be greater than the significant impact levels and *de minimis* monitoring levels. These analyses consider the project's impacts alone. Air quality impacts are predicted using 5 years of meteorological data and selecting the highest annual and the highest short-term concentrations for comparison are compared to the significant impact levels and *de minimis* levels.

If the project's impacts are greater than the significant impact levels, the air modeling analyses must consider other nearby sources and background concentrations, and predict concentration for comparison to ambient standards. In general, when 5 years of meteorological data are used in the analysis, the highest annual and the highest, second-highest (HSH) short-term concentrations are compared to the applicable AAQS and allowable PSD increments. The HSH concentration is calculated for a receptor field by:

1. Eliminating the highest concentration predicted at each receptor,
2. Identifying the second-highest concentration at each receptor, and
3. Selecting the highest concentration among these second-highest concentrations.

This approach is consistent with air quality standards and allowable PSD increments, which permit a short-term average concentration to be exceeded once per year at each receptor.

To develop the maximum short-term concentrations for the proposed project, the modeling approach was divided into screening and refined phases to reduce the computation time required to perform the modeling analysis. For this study, the only difference between the two modeling phases is the density of the receptor grid spacing employed when predicting concentrations. Concentrations are predicted for the screening phase using a coarse receptor grid and a 5-year meteorological data record.

Refinements of the maximum predicted concentrations are typically performed for the receptors of the screening receptor grid at which the highest and/or HSH concentrations occurred over the 5-year period. Generally, if the maximum concentration from other years in the screening analysis are within 10 percent of the overall maximum concentration, then those other concentrations are refined as well. Typically, if the highest and HSH concentrations are in different locations, concentrations in both areas are refined.

Modeling refinements are performed for short-term averaging times by using a denser receptor grid, centered on the screening receptor at which the maximum concentration was predicted. The angular spacing between radials is 2 degrees and the radial distance interval between receptors is 100 m. Annual modeling refinements employ an angular spacing between radials of 2 degrees and a distance interval from 100 to 300 m, depending on the concentration gradient in the vicinity of the screening receptor to be refined. If the maximum screening concentration is located on the plant property boundary, additional plant boundary receptors are input, spaced at a 2-degree angular interval and centered on the screening receptor. The domain of the refinement grid will extend to all adjacent screening receptors. The air dispersion model is then executed with the refined grid for the entire year of meteorology during which the screening concentration occurred. This approach is used to ensure that a valid highest concentration is obtained. A more detailed description of the model, along with the emission inventory, meteorological data, and screening receptor grids are presented in the following sections.

6.3.2 MODEL SELECTION

The Industrial Source Complex Short-term (ISCST3, Version 98356) dispersion model (EPA, 1997) was used to evaluate the pollutant impacts due to the proposed CTs. This model is maintained by the EPA on its Internet website, Support Center for Regulatory Air Models (SCRAM), within the Technical Transfer Network (TTN). A listing of ISCST3 model features is presented in Table 6-1. The ISCST3 model is designed to calculate hourly concentrations based on hourly meteorological data (i.e., wind direction, wind speed, atmospheric stability, ambient temperature, and mixing heights). The ISCST3 model is applicable to sources located in either flat or rolling terrain where terrain heights do not exceed stack heights. These areas are referred to as simple terrain. The model can also be applied in areas where the terrain exceeds the stack heights. These areas are referred to as complex terrain.

In this analysis, the EPA regulatory default options were used to predict all maximum impacts. The ISCST3 model can run in the rural or urban land use mode which affects stability dispersion coefficients, wind speed profiles, and mixing heights. Land use can be characterized based on a scheme recommended by EPA (Auer, 1978). If more than 50 percent land use within a 3-km radius around a project is classified as industrial or commercial, or high-density residential, then the urban option should be selected. Otherwise, the rural option is appropriate. Based on the land-use within a 3-km radius of the proposed plant site (see Figure 2-1), the rural dispersion coefficients were used in the modeling analysis.

The ISCST3 model was used to provide maximum concentrations for the annual and 24-, 8-, 3-, and 1-hour averaging times. A generic emission rate of 10 grams per second (g/s) was used as emissions for the proposed source. Maximum pollutant-specific air impacts were determined by multiplying the maximum pollutant-specific emission rate in pounds per hour (lb/hr) to the maximum predicted generic impact divided by 79.365 lb/hr (10 g/s).

6.3.3 METEOROLOGICAL DATA

Meteorological data used in the ISCST3 model to determine air quality impacts consisted of a concurrent 5-year period of hourly surface weather observations and twice-daily upper air soundings from the National Weather Service (NWS) stations at the Tampa International Airport in Tampa, Florida, and at Ruskin, Florida, respectively. The 5-year period of meteorological data was from 1987 through 1991. The NWS station at Tampa is located approximately 74 km (46 miles) to the north of the proposed plant site while the NWS station at Ruskin is located approximately 56 km (35 miles) wset-northwest of the proposed plant site. The surface meteorological data from Tampa are assumed to be representative of the project site because both the project site and the weather station are located in similar topographical areas and are situated in central Florida to experience similar weather conditions, such as frontal passages.

6.3.4 EMISSION INVENTORY

A summary of the criteria pollutant emission rates, physical stack and stack operating parameters for the proposed CTs used in the air modeling analysis is presented in Tables 2-1 through 2-6. The emission and stack operating parameters presented for 32°F and 95°F ambient temperatures for both natural gas and distillate fuel oil were used in the modeling to determine the maximum air quality impacts for a range of possible operating conditions.

Six modeling scenarios per fuel type were considered:

1. base operating load for the ambient temperature of 32°F;
2. base operating load for the ambient temperature of 95°F;
3. 75 percent operating load for the ambient temperature of 32°F;
4. 75 percent operating load for the ambient temperature of 95°F;
5. 50 percent operating load for the ambient temperature of 32°F; and

6. 50 percent operating load for the ambient temperature of 95°F.

The proposed CTs will have a stack height of 60 feet and an inner stack diameter of 22 ft.

6.3.5 RECEPTOR LOCATIONS

For predicting maximum concentrations in the vicinity of the plant, a polar receptor grid comprised of 578 grid receptors was used. These receptors included 36 receptors located on radials extending out from the proposed CTs' stack locations. Along each radial, receptors were located at the plant property and distances of 0.1, 0.2, 0.3, 0.5, 0.7, 1.0, 1.5, 2.0, 2.5, 3.0, 4.0, 5.0, 7.0, 10.0, 12.0, and 15.0 km from the proposed CT No 2 stack location. Because of the proximity of the nearest property boundary, the innermost receptor ring distance of 100 m was considered as being ambient air in all directions. In reality, the plant property will extend beyond 100 m in all directions.

Modeling refinements were performed, as needed, by employing a polar receptor grid with a maximum spacing of 100 m along each radial and an angular spacing between radials of 2 degrees.

Since the terrain surrounding the proposed plant site varies little from the stack base elevation of 25 ft above MSL, the terrain was assumed to be flat and receptor elevations were set equal to the stack base elevation.

6.3.6 BUILDING DOWNWASH EFFECTS

The only significant structures in the vicinity of the proposed CT stacks are the proposed CT air filter inlets, CT structure, fuel oil storage tank, and demineralizer water tanks. The height and widths of these structures are as follows:

Structure	Height (ft)	Width (ft)	Length (ft)	
CT air inlet	47	24	36	
CT structure	22	30	42	
Fuel oil tanks	50	100 (diameter)	Not applicable	
Demin. water tank		50	100 (diameter)	Not applicable

Building dimensions for the project's structures were entered into the EPA's Building Profile Input Program (BPIP, Version 95086) for the purpose of obtaining direction-specific building heights and widths for all downwash-affected sources. The direction-specific building dimensions were then input to the ISCST3 model as the building height and width for each of 36 ten-degree wind sectors. A summary of the direction-specific building dimensions used in the modeling is presented in Appendix C.

6.4 CALPUFF

6.4.1 GENERAL

The CALPUFF long-range transport model was used for refinements in the CNWR for refinements in the significant impact analysis for SO_2. The CNWR is located approximately 139 kilometers (km) to the northwest of the proposed project site. At distances beyond 50 km, the ISCST3 model is considered to overpredict air quality impacts because it is a steady-state model. To provide a more realistic assessment of the project's air quality impacts at the CNWR, a significant impact analysis at the PSD Class I area was performed using the long-range transport model, California Puff model (CALPUFF, Version 5.0).

CALPUFF is not currently a recommended model in EPA's Guideline on Air Quality Models (40 CFR Part 51, Appendix W). However, EPA is planning to formally propose incorporating CALPUFF into Appendix W at the 7th Conference on Air Quality Modeling currently planned for the fall of 1999. In the interim, the Federal Land Managers (FLM) and the Interagency Workgroup on Air Quality Modeling (IWAQM) are recommending the use of CALPUFF for all long-range transport assessments at PSD Class I areas.

A discussion of the CALPUFF model and modeling methodology used for this analysis and the air modeling results is presented in the following sections.

6.4.2 MODEL SELECTION

CALPUFF is a non-steady-state Lagrangian, Gaussian puff model appropriate for simulating air quality impacts over large distances. The model features includes algorithms for simulating plume behavior over complex (i.e., terrain above stack plume height) terrain, plume transport over water bodies, coastal (i.e., land-sea air) interaction, chemical transformation, and wet and dry deposition and removal. CALPUFF can also incorporate the same building downwash effects, currently used within the ISCST3 model. The model can be used in a screening mode by processing an "enhanced" ISCST3 meteorological data set, or in a refined mode by inputting a three-dimensional meteorological parameter data set generated by the meteorological preprocessor program CALMET. The "enhanced" meteorological data refers to the additional parameters used by the model. These parameters include relative humidity, precipitation, and solar radiation. CALMET produces this data set by inputting various surface, upper air, precipitation, land use, and terrain data over a region and processes this data for a predetermined modeling domain. A postprocessor program called CALPOST processes the CALPUFF-generated concentration or deposition data and produces output of pollutant species concentrations and depositions for various averaging times.

For this analysis, CALPUFF was used in a screening analysis mode, as recommended by the IWAQM Phase 2 Summary Report (12/98). The CALPUFF screening analysis is also referred to as the IWAQM Level II screening analysis or a CALPUFF "light" analysis. The following modeling procedures were used for the Phase II screening analysis.

- Five years of ISCST preprocessed meteorological data. The data set includes the standard ISCST model parameters of wind direction, wind speed, temperature, mixing height and atmospheric stability class, and additional parameters used for dry and wet deposition. These additional parameters include relative humidity, precipitation, and solar radiation.
- Location of receptors in a circle at radials separated by 2-degree intervals. The receptors are located on each radial at a distance that passes through the PSD Class I area. For this analysis, a radius of 139 km was used which is the closest distance from the project site to the CNWR.
- SO_2, use two pollutant species of SO_2 and SO_4
- MESOPUFF II scheme for chemical transformation with CALPUFF default background concentrations of 80 and 10 ppb for ozone and ammonia, respectively
- Both dry and wet deposition and plume depletion
- Modeling domain extends 80 km beyond receptor grid

- Agricultural, unirrigated land use; minimum mixing height of 50 m
- Transitional plume rise, stack-tip downwash, and partial plume penetration
- Puff plume element dispersion (Pasquill-Gifford), rural mode, and ISC building downwash scheme
- Partial plume path adjustment terrain effects
- Highest concentrations predicted in 5 years compared to allowable PSD increments.

6.4.3 BUILDING WAKE EFFECTS

The air modeling analysis included the proposed project's building dimensions to account for the effects of building-induced downwash on the emission sources. The building's dimensions were processed using the Building Profile Input Program (BPIP), Version 95086 and were included in the preliminary ISCST3 modeling analysis.

6.4.4 RECEPTOR LOCATIONS

Receptors were located along a circle that was centered over the project site with a radius equal to the minimum distance to the CNWR (i.e., 139.2 km). The circle contained 180 receptors, equally spaced at 2-degree intervals. A second modeling analysis was performed with 13 receptors located only at the CNWR. Results for both sets of receptors are presented.

6.4.5 METEOROLOGICAL DATA

A 5-year data record was used which consisted of hourly surface observations taken from the National Weather Service (NWS) station at the Tampa International Airport (TPA), coupled with twice-daily mixing height data from the NWS station in Ruskin. The data record was for the years 1987 to 1991. The surface and upper data were preprocessed into an ASCII modeling format by EPA 's PCRAMMET meteorological preprocessing program. An anemometer height of 6.7 m was used for the modeling analysis.

Additional meteorological parameters were added to the meteorological data records for use with the CALPUFF model. The addition parameters include:

1. Friction velocity,

2. Monin-Obukhov length,
3. Surface roughness used for calculating dry deposition,
4. Precipitation type code and precipitation rate used for calculating wet deposition,
5. Short-wave solar radiation, and
6. Relative humidity use for calculating chemical transformation rates.

The dry deposition parameters were added to the meteorological data records using the PCRAMMET model in dry deposition mode. Using the guidance provided in Section 3.1 of the PCRAMMET User's Manual (8/98), the following input values were selected:

1. Surface roughness at application site: 0.5 m
2. Surface roughness at the measurement site: 0.03 m,
3. Noontime Albedo: .15,
4. Bowen Ratio: 1.0,
5. Anthropogenic Heat flux: 0,
6. Minimum Monin-Obukhov Length: 25 m, and
7. Fraction of Net Radiation Absorbed by Ground: 0.22.

Hourly precipitation data were obtained from TPA from 1987 to 1991. A precipitation code value was determined for each hour, based on the precipitation classification scheme provided in Table 2-11 of the CALPUFF Users' Manual (7/95). An hour during which no precipitation occurred received a precipitation code value of zero. An hour with precipitation amounts of zero, 0.01 to 0.1, inches, greater than 0.1 to 0.3 inches and greater than 0.3 inches, received precipitation codes of 0, 1, 2, or 3, respectively. These codes are indicative of no, slight, moderate and heavy rain, respectively. Hourly relative humidity and short-wave radiation data were added to the meteorological data record for each of the 5 years. The relative humidity and radiation data were obtained TPA for all years. The addition parameters were obtained from the National Climatic Data Center's Solar and Meteorological Surface Observation Network (SAMSON) and Hourly United States Weather Observations (HUSWO) CDs.

6.4.6 EMISSION INVENTORY

Source parameter and emission rate data used for the CALPUFF modeling analysis are identical to that used in the ISCST3 air modeling analysis.

6.5 AIR MODELING RESULTS

6.5.1 SITE VICINITY

The modeling analysis results for the proposed CTs alone in the vicinity of the plant are summarized in Tables 6-2 through 6-5. The maximum pollutant concentrations predicted in the screening analysis for a single CT and four CTs firing natural gas are presented in Tables 6-2 and 6-3, respectively. Similarly, the maximum pollutant concentrations predicted for one and four CTs firing distillate fuel oil are presented in Tables 6-4 and 6-5, respectively.

As shown in the tables, the maximum predicted PM, SO_2, NO_x, and CO impacts due to the proposed CTs are all below the significant impact levels. Because the proposed source will not have a significant impact upon the air quality in the vicinity of the plant site, more detailed modeling analyses for determining compliance with the AAQS and PSD Class II increments are not required.

The maximum predicted PM, SO_2, NO_x, and CO impacts due to the proposed CTs are also below the *de minimis* monitoring levels. Because the proposed source will not have predicted impacts greater than *de minimis* levels, preconstruction monitoring data are not required to be submitted as part of the PSD review.

6.5.2 ISCST3 AT THE CHASSAHOWITZKA NWR PSD CLASS I AREA

The modeling analysis results for the proposed CTs alone at the Chassahowitzka NWR are summarized in Tables 6-6 through 6-9. The maximum pollutant concentrations predicted in the screening analysis for a single CT and four CTs firing natural gas are presented in Tables 6-6 and 6-7, respectively. Similarly, the maximum pollutant concentrations predicted for one and four CTs firing distillate fuel oil are presented in Tables 6-8 and 6-9, respectively.

As shown in the tables, the maximum predicted PM and NO_2 impacts due to the proposed CTs are all below EPA's proposed PSD Class I significant impact levels. Therefore, more detailed modeling analyses for determining compliance with the AAQS and PSD Class II increments are not required for these pollutants. For SO_2, the maximum predicted impact from the CTs is above the proposed EPA significant impact levels using the ISCST. Because the proposed plant is approximately 139 km from the PSD Class I area, a more refined dispersion modeling analysis with the CALPUFF long-range transport model is presented to address in greater detail the significance of this pollutant at the PSD Class I area.

A summary of the ISCST3 model results for each year is presented in Appendix D. An example of the model input file is also provided in Appendix D.

6.5.3 CALPUFF AT THE CHASSAHOWITZKA NWR PSD CLASS I AREA

6.5.3.1 Full Circle Receptor Grid

The results of the Level II screening analysis are summarized in Table 6-10. The highest predicted 24-hour concentration is 0.28 ug/m^3. This concentration occurs in a southerly direction, opposite the direction of the Chassahowitzka NWR. Reviewing the receptors within a 45 degree direction of the Class I area indicated that impacts wer less than 0.20 ug/m^3. Since these impacts occur for the worst-case back-up fuel oil, an evaluation of specific receptors in the Chassahowitzka NWR was performed.

6.5.3.2 Chassahowitzka NWR Receptors

The results of the analysis of specific receptors in the PSD Class I area are summarized in Table 6-10. The highest predicted 24-hour concentration is 0.018 ug/m^3, which is below the proposed EPA Class I significant impact level of 0.2 ug/m^3. Taking together, the full circle impacts in the direction fo the PSD Class I area, the Class I receptor specific impacts and worst-case nature of the emissions (i.e., fuel oil at a maximum of 1,000 hours), it is concluded that impacts of the proposed are less than the PSD significant impact levels for SO_2.

Table 6-1. Major Features of the ISCST3 Model

ISCST3 Model Features
• Polar or Cartesian coordinate systems for receptor locations
• Rural or one of three urban options which affect wind speed profile exponent, dispersion rates, and mixing height calculations
• Plume rise due to momentum and buoyancy as a function of downwind distance for stack emissions (Briggs, 1969, 1971, 1972, and 1975; Bowers, et al., 1979).
• Procedures suggested by Huber and Snyder (1976); Huber (1977); and Schulman and Scire (1980) for evaluating building wake effects
• Procedures suggested by Briggs (1974) for evaluating stack-tip downwash
• Separation of multiple emission sources
• Consideration of the effects of gravitational settling and dry deposition on ambient particulate concentrations
• Capability of simulating point, line, volume, area, and open pit sources
• Capability to calculate dry and wet deposition, including both gaseous and particulate precipitation scavenging for wet deposition
• Variation of wind speed with height (wind speed-profile exponent law)
• Concentration estimates for 1-hour to annual average times
• Terrain-adjustment procedures for elevated terrain including a terrain truncation algorithm for ISCST3; a built-in algorithm for predicting concentrations in complex terrain
• Consideration of time-dependent exponential decay of pollutants
• The method of Pasquill (1976) to account for buoyancy-induced dispersion
• A regulatory default option to set various model options and parameters to EPA recommended values (see text for regulatory options used)
• Procedure for calm-wind processing including setting wind speeds less than 1 m/s to 1 m/s.

Note: ISCST3 = Industrial Source Complex Short-Term.
Source: EPA, 1995.

Table 6.2. Maximum Pollutant Concentrations Predicted for One Proposed Combustion Turbine on Natural Gas at Site Vicinity

	Maximum Emission Rates (lb/hr) by Operating Load and Air Temperature							Maximum Predicted Concentrations (ug/m^3) by Operating Load and Air Temperature (1)					
	Base Load		75% Load		50% Load		Averaging	Base Load		75% Load		50% Load	
Pollutant	32°F	95°F	32°F	95°F	32°F	95°F	Time	32°F	95°F	32°F	95°F	32°F	95°F
Generic (10 g/s)	79.37	79.37	79.37	79.37	79.37	79.37	Annual	0.0155	0.0139	0.0180	0.0188	0.0211	0.0219
							24-Hour	0.2010	0.1869	0.2282	0.2431	0.2721	0.2816
							8-Hour	0.4346	0.4019	0.4967	0.5194	0.5811	0.6021
							3-Hour	0.8272	0.8152	0.9713	0.9781	1.1805	1.1894
							1-Hour	1.7828	1.6189	2.1076	2.1854	2.5523	2.5655
SO_2	5.1	4.6	4.2	3.7	3.4	2.9	Annual	0.001	0.001	0.001	0.001	0.001	0.001
							24-Hour	0.01	0.01	0.01	0.01	0.01	0.01
							3-Hour	0.05	0.05	0.05	0.05	0.05	0.04
NO_x	66.7	59.9	54.4	48.3	43.4	38.3	Annual	0.01	0.01	0.01	0.01	0.01	0.01
PM10	10.0	10.0	10.0	10.0	10.0	10.0	Annual	0.002	0.002	0.002	0.002	0.003	0.003
							24-Hour	0.03	0.02	0.03	0.03	0.03	0.04
CO	44.2	39.3	35.7	32.7	30.0	27.8	8-Hour	0.2	0.2	0.2	0.2	0.2	0.2
							1-Hour	1.0	0.8	0.9	0.9	1.0	0.9

(1) Concentrations are based on highest predicted concentrations using five years of meteorological for 1987 to 1991 of surface and upper air data from the National Weather Service stations at Tampa International Airport and Ruskin, respectively.

Table 6-3. Maximum Pollutant Concentrations Predicted for Four Simple-Cycle Combustion Turbines on Natural Gas Compared to EPA Significant Impact Levels

Pollutant	Averaging Time	Maximum Predicted Concentrations (ug/m^3) by Operating Load and Air Temperature (1)						EPA Significant Impact Levels (ug/m^3)
		Base Load		75% Load		50% Load		
		32°F	95°F	32°F	95°F	32°F	95°F	
SO_2	Annual	0.004	0.003	0.004	0.004	0.004	0.003	1
	24-Hour	0.05	0.04	0.05	0.05	0.05	0.04	5
	3-Hour	0.21	0.19	0.21	0.18	0.20	0.17	25
NO_x	Annual	0.052	0.042	0.049	0.046	0.046	0.042	1
PM10	Annual	0.008	0.007	0.009	0.009	0.011	0.011	1
	24-Hour	0.10	0.09	0.12	0.12	0.14	0.14	5
CO	8-Hour	1	1	1	1	1	1	500
	1-Hour	4	3	4	4	4	4	2,000

(1) Concentrations are based on highest predicted concentrations using five years of meteorological for 1987 to 1991 of surface and upper air data from the National Weather Service stations at Tampa International Airport and Ruskin, respectively.

Table 6-4. Maximum Pollutant Concentrations Predicted for One Proposed Combustion Turbine on Fuel Oil at Site Vicinity

	Maximum Emission Rates (lb/hr) by Operating Load and Air Temperature							Maximum Predicted Concentrations (ug/m^3) by Operating Load and Air Temperature (1)					
	Base Load		75% Load		50% Load		Averaging	Base Load		75% Load		50% Load	
Pollutant	32°F	95°F	32°F	95°F	32°F	95°F	Time	32°F	95°F	32°F	95°F	32°F	95°F
Generic (10 g/s)	79.37	79.37	79.37	79.37	79.37	79.37	Annual	0.0151	0.0159	0.0179	0.0186	0.0207	0.0216
							24-Hour	0.1968	0.2053	0.2272	0.2393	0.2657	0.2784
							8-Hour	0.4249	0.4446	0.4945	0.5107	0.5682	0.5951
							3-Hour	0.8239	0.9546	0.9706	0.9755	1.1742	1.1863
							1-Hour	1.7308	1.8362	2.1061	2.1679	2.5098	2.5609
SO_2	101.5	93.4	82.6	74.8	65.6	58.9	Annual	0.019	0.019	0.019	0.018	0.017	0.016
							24-Hour	0.25	0.24	0.24	0.23	0.22	0.21
							3-Hour	1.05	1.12	1.01	0.92	0.97	0.88
NO_x	362.0	335.8	296.7	267.8	236.4	209.3	Annual	0.07	0.07	0.07	0.06	0.06	0.06
PM10	17.0	17.0	17.0	17.0	17.0	17.0	Annual	0.003	0.003	0.004	0.004	0.004	0.005
							24-Hour	0.04	0.04	0.05	0.05	0.06	0.06
CO	74.4	66.2	57.6	53.9	72.2	67.5	8-Hour	0.4	0.4	0.4	0.3	0.5	0.5
							1-Hour	1.6	1.5	1.5	1.5	2.3	2.2

(1) Concentrations are based on highest predicted concentrations using five years of meteorological for 1987 to 1991 of surface and upper air data from the National Weather Service stations at Tampa International Airport and Ruskin, respectively.

Pollutant concentrations were based on a modeled or generic concentration predicted using a modeled emission rate of 79.37 lb/hr (10 g/s Specific pollutant concentrations were estimated by multiplying the modeled concentration (at 10 g/s) by the ratio of the specific pollutan to the modeled emission rate of 10 g/s.

Table 6-5. Maximum Pollutant Concentrations Predicted for Four Simple-Cycle Combustion Turbines on Fuel Oil Compared to EPA Significant Impact Levels

Pollutant	Averaging Time	Maximum Predicted Concentrations (ug/m^3) by Operating Load and Air Temperature (1): Base Load 32°F	Base Load 95°F	75% Load 32°F	75% Load 95°F	50% Load 32°F	50% Load 95°F	EPA Significant Impact Levels (ug/m^3)
SO_2	Annual	0.08	0.07	0.07	0.07	0.07	0.06'	1
	24-Hour	1.0	1.0	0.9	0.9	0.9	0.8	5
	3-Hour	4	4	4	4	4	4	25
NO_x	Annual	0.3	0.3	0.3	0.3	0.2	0.2	1
PM10	Annual	0.01	0.01	0.02	0.02	0.02	0.02	1
	24-Hour	0.2	0.2	0.2	0.2	0.2	0.2	5
CO	8-Hour	2	1	1	1	2	2	500
	1-Hour	6	6	6	6	9	9	2,000

(1) Concentrations are based on highest predicted concentrations using five years of meteorological for 1987 to 1991 of surface and upper air data from the National Weather Service stations at Tampa International Airport and Ruskin, respecti

Table 6-6. Maximum Pollutant Concentrations Predicted for One Proposed Combustion Turbine on Natural Gas at Chassahowitzka NWA PSD Class I Area Using ISCST3

	Maximum Emission Rates (lb/hr) by Operating Load and Air Temperature							Maximum Predicted Concentrations (ug/m^3) by Operating Load and Air Temperature (1)					
	Base Load		75% Load		50% Load		Averaging	Base Load		75% Load		50% Load	
Pollutant	32°F	95°F	32°F	95°F	32°F	95°F	Time	32°F	95°F	32°F	95°F	32°F	95°F
Generic (10 g/s)	79.37	79.37	79.37	79.37	79.37	79.37	Annual	0.0026	0.0024	0.0029	0.0030	0.0035	0.0035
							24-Hour	0.0521	0.0485	0.0589	0.0613	0.0679	0.0698
							8-Hour	0.1563	0.1452	0.1766	0.1840	0.2036	0.2094
							3-Hour	0.2511	0.2410	0.2682	0.2740	0.3014	0.3115
							1-Hour	0.5120	0.4852	0.5586	0.5748	0.6173	0.6294
SO_2	5.1	4.6	4.2	3.7	3.4	2.9	Annual	0.0002	0.0001	0.0002	0.0001	0.0001	0.0001
							24-Hour	0.003	0.003	0.003	0.003	0.003	0.003
							3-Hour	0.02	0.01	0.01	0.01	0.01	0.01
NO_x	66.7	59.9	54.4	48.3	43.4	38.3	Annual	0.002	0.002	0.002	0.002	0.002	0.002
PM10	10.0	10.0	10.0	10.0	10.0	10.0	Annual	0.0003	0.0003	0.0004	0.0004	0.0004	0.0004
							24-Hour	0.01	0.01	0.01	0.01	0.01	0.01
CO	44.2	39.3	35.7	32.7	30.0	27.8	8-Hour	0.1	0.1	0.1	0.1	0.1	0.1
							1-Hour	0.3	0.2	0.3	0.2	0.2	0.2

(1) Concentrations are based on highest predicted concentrations using five years of meteorological for 1987 to 1991 of surface and upper air data from the National Weather Service stations at Tampa International Airport and Ruskin, respectively.

Pollutant concentrations were based on a modeled or generic concentration predicted using a modeled emission rate of 79.37 lb/hr (10 g/s). Specific pollutant concentrations were estimated by multiplying the modeled concentration (at 10 g/s) by the ratio of the specific pollutant emission rate to the modeled emission rate of 10 g/s.

Table 6-7. Maximum Pollutant Concentrations Predicted for Four Simple-Cycle Combustion Turbines on Natural Gas Compared to Proposed EPA PSD Class I Significant Impact Levels Using ISCST3

		Maximum Predicted Concentrations (ug/m^3) by Operating Load and Air Temperature (1)						Proposed EPA Class I Significant Impact Levels
	Averaging	Base Load		75% Load		50% Load		
Pollutant	Time	32°F	95°F	32°F	95°F	32°F	95°F	(ug/m^3)
SO_2	Annual	0.0007	0.0006	0.0006	0.0006	0.0006	0.0005	0.1
	24-Hour	0.013	0.011	0.012	0.011	0.012	0.010	0.2
	3-Hour	0	0.1	0.1	0.1	0.1	0.0	1.0
NO_x	Annual	0.01	0.007	0.008	0.007	0.008	0.007	0.1
PM10	Annual	0.00	0.001	0.001	0.002	0.002	0.002	0.2
	24-Hour	0.0	0.02	0.03	0.03	0.03	0.04	0.3

(1) Concentrations are based on highest predicted concentrations using five years of meteorological for 1987 to 1991 of surface and upper air data from the National Weather Service stations at Tampa International Airport and Ruskin, respecti

Table 6-8. Maximum Pollutant Concentrations Predicted for One Proposed Combustion Turbine on Fuel Oil at the Chassahowitzka PSD Class I Area Using ISCST3

	Maximum Emission Rates (lb/hr) by Operating Load and Air Temperature							Maximum Predicted Concentrations (ug/m^3) by Operating Load and Air Temperature (1)					
	Base Load		75% Load		50% Load		Averaging	Base Load		75% Load		50% Load	
Pollutant	32°F	95°F	32°F	95°F	32°F	95°F	Time	32°F	95°F	32°F	95°F	32°F	95°F
Generic (10 g/s)	79.37	79.37	79.37	79.37	79.37	79.37	Annual	0.0025	0.0026	0.0029	0.0030	0.0034	0.0035
							24-Hour	0.0510	0.0532	0.0586	0.0604	0.0665	0.0692
							8-Hour	0.1531	0.1506	0.1759	0.1812	0.1995	0.2075
							3-Hour	0.2482	0.2539	0.2676	0.2718	0.2942	0.3081
							1-Hour	0.5044	0.5196	0.5570	0.5686	0.6085	0.6253
SO_2	101.5	93.4	82.6	74.8	65.6	58.9	Annual	0.003	0.003	0.003	0.003	0.003	0.003
							24-Hour	0.07	0.06	0.06	0.06	0.05	0.05
							3-Hour	0.32	0.30	0.28	0.26	0.24	0.23
NO_x	362.0	335.8	296.7	267.8	236.4	209.3	Annual	0.01	0.01	0.01	0.01	0.01	0.01
PM10	17.0	17.0	17.0	17.0	17.0	17.0	Annual	0.001	0.001	0.001	0.001	0.001	0.001
							24-Hour	0.01	0.01	0.01	0.01	0.01	0.01
CO	74.4	66.2	57.6	53.9	72.2	67.5	8-Hour	0.1	0.1	0.1	0.1	0.2	0.2
							1-Hour	0.5	0.4	0.4	0.4	0.6	0.5

(1) Concentrations are based on highest predicted concentrations using five years of meteorological for 1987 to 1991 of surface and upper air data from the National Weather Service stations at Tampa International Airport and Ruskin, respectively.

Pollutant concentrations were based on a modeled or generic concentration predicted using a modeled emission rate of 79.37 lb/hr (10 g/s).
Specific pollutant concentrations were estimated by multiplying the modeled concentration (at 10 g/s) by the ratio of the specific pollutant emission rate to the modeled emission rate of 10 g/s.

Table 6-9. Maximum Pollutant Concentrations Predicted for Four Simple-Cycle Combustion Turbines on Fuel Oil Compared to Proposed EPA PSD Class I Significant Impact Levels Using ISCST3

Pollutant	Averaging Time	Maximum Predicted Concentrations (ug/m^3) by Operating Load and Air Temperature (1): Base Load		75% Load		50% Load		Proposed EPA Class I Significant Impact Levels (ug/m^3)
		32°F	95°F	32°F	95°F	32°F	95°F	
SO_2	Annual	0.013	0.012	0.012	0.011	0.011	0.010	0.1
	24-Hour	0.26	0.25	0.24	0.23	0.22	0.21	0.2
	3-Hour	1.3	1.2	1.1	1.0	1.0	0.9	1.0
NO_x	Annual	0.05	0.04	0.04	0.04	0.04	0.04	0.1
PM10	Annual	0.002	0.002	0.002	0.003	0.003	0.003	0.2
	24-Hour	0.04	0.05	0.05	0.05	0.06	0.06	0.3

(1) Concentrations are based on highest predicted concentrations using five years of meteorological for 1987 to 1991 of surface and upper air data from the National Weather Service stations at Tampa International Airport and Ruskin, respectively.

Table 6-10. Maximum 24-Hour SO_2 Concentration Predicted for the Four Combustion Turbines at the Chassahowitzka National Wildlife Refuge (NWR), Refined SO_2 Significant Impact Analysis Using CALPUFF

Concentration Rank	Year	eptor Distance at 139 km Ring Concentration (ug/m³)	Julian Day	hassahowitzka NWR (Concentratio (ug/m³)	Julian Day	Proposed EPA PSD Class I Significant Impact Level (ug/m³)
High	1987	0.25	285	0.122	229	0.2
	1988	0.26	281	0.132	21	0.2
	1989	0.28	338	0.153	343	0.2
	1990	0.24	263	0.177	47	0.2
	1991	0.24	351	0.095	73	0.2

(1) Concentrations predicted with CALPUFF model with ISCST meteorological data from the National Weather Service (NWS) stations from Tampa and Tampa (surface) and Ruskin (upper air) for 1987 to 1991. See text for details.

For receptor distance at 139 km ring, concentrations were predicted along a circle with a radius equal to the minimum disctance to the Class I area (i.e., 139 km). The circle contained 180 receptors, spaced at 2-degree intervals.
Concentrations were also predicted at 13 receptors located at the Chassahowitzka NWR.

7.0 ADDITIONAL IMPACT ANALYSIS

7.1 IMPACTS DUE TO DIRECT GROWTH

The proposed project is being constructed to meet peaking electric demands. Additional growth as a direct result of the additional electric power provided by the project is not expected. The project will be constructed and operated with minimum labor and associated facilities and is not expected to significantly affect growth in the area. As a result, air pollution impacts from additional growth are not anticipated.

7.2 IMPACT ON SOILS, VEGETATION AND WILDLIFE

Because the proposed project's impacts on the local air quality are predicted to be less than the significant impact levels for PSD Class II areas, the project's impacts on soils, vegetation, and wildlife are also not expected to be significant.

7.3 IMPACTS UPON PSD CLASS I AREAS

The proposed project is located approximately 139 km from the Chassahowitzka NWR, the nearest PSD Class I area. The air quality impact evaluation for the project indicate that pollutant concentrations will not be significant at the distance of the Class I area. Because the proposed CTs will be fired primarily with natural gas, a clean fuel, it is expected that the project's impacts for SO_2, NO_2, and PM_{10} will be minimal and not significantly affect or impair visibility or soils and vegetation at the Class I areas.

APPENDIX A

EXPECTED PERFORMANCE AND EMISSION INFORMATION ON "F" CLASS COMBUSTION TURBINE

(Note: SO_2 based on 0.2 gr/100 cf of H_2S. Actual total sulfur based on 1 gr/100 cf to account for odorant (mercaptans) in pipeline gas.)

Table A-1. Design Information and Stack Parameters for IPS - Vandolah
GE Frame 7FA, Dry Low NOx Combustor, Natural Gas, Base Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Combustion Turbine Performance			
Net power output (MW)	179.2	172.2	156.6
Net heat rate (Btu/kWh, LHV)	9,319	9,361	9,591
(Btu/kWh, HHV)	10,344	10,391	10,646
Heat Input (MMBtu/hr, LHV)	1,670	1,612	1,502
(MMBtu/hr, HHV)	1,854	1,789	1,667
Fuel heating value (Btu/lb, LHV)	20,751	20,751	20,751
(Btu/lb, HHV)	23,006	23,006	23,006
(HHV/LHV)	1.110	1.110	1.110
CT Exhaust Flow			
Mass Flow (lb/hr)- with margin of 10%	4,063,400	3,919,300	3,672,900
- provided	3,694,000	3,563,000	3,339,000
Temperature (°F)	1,097	1,113	1,135
Moisture (% Vol.)	7.9	8.6	10.3
Oxygen (% Vol.)	12.60	12.50	12.20
Molecular Weight	28.44	28.34	28.16
Fuel Usage			
Fuel usage (lb/hr) = Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))			
Heat input (MMBtu/hr, LHV)	1,670	1,612	1,502
Heat content (Btu/lb, LHV)	20,751	20,751	20,751
Fuel usage (lb/hr)- calculated	80,478	77,683	72,382
CT Stack			
CT- Stack height (ft)	60	60	60
Diameter (ft)	22	22	22
Turbine Flow Conditions (CT Stack-Unit 4 only)			
Turbine Flow (acfm) = [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F)+ 460°F)] / [Molecular weight x 2116.8] / 60 min/hr			
Mass flow (lb/hr)	4,063,400	3,919,300	3,672,900
Temperature (°F)	1,097	1,113	1,135
Molecular weight	28.44	28.34	28.16
Volume flow (acfm)- calculated	2,706,395	2,645,986	2,530,918
(ft3/s)- calculated	45,107	44,100	42,182
Velocity (ft/sec)	118.7	116.0	111.0

Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft²; 14.7 lb/ft^3

Source: GE, 1998.

Table A-2. Maximum Emissions for Criteria Pollutants for IPS - Vandolah
GE Frame 7FA, Dry Low NOx Combustor, Natural Gas, Base Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	3,390	3,390	3,390
Particulate (lb/hr) = Emission rate (lb/hr) from manufacturer			
Basis (excludes H_2SO_4), lb/hr	10	10	10
Emission rate (lb/hr)- provided	10.0	10.0	10.0
(TPY)	17.0	17.0	17.0
Sulfur Dioxide (lb/hr) = Natural gas (cf/hr) x sulfur content(gr/100 cf) x 1 lb/7000 gr x (lb SO_2/lb S) /100			
Fuel density (lb/ft^3)	0.0448	0.0448	0.0448
Fuel use (cf/hr)	1,797,031	1,734,619	1,616,252
Sulfur content (grains/ 100 cf)	1	1	1
lb SO_2/lb S (64/32)	2	2	2
Emission rate (lb/hr)	5.1	5.0	4.6
(TPY)	8.70	8.40	7.83
Nitrogen Oxides (lb/hr) = NOx(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 x Volume flow (acfm) x 46 (mole. wgt NOx) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 5.9 x 1,000,000 (adj. for ppm)]			
Basis, ppmvd @15% O_2	9	9	9
Moisture (%)	7.9	8.6	10.3
Oxygen (%)	12.6	12.5	12.2
Turbine Flow (acfm)	2,706,395	2,645,986	2,530,918
Turbine Exhaust Temperature (°F)	1,097	1,113	1,135
Emission rate (lb/hr)	66.7	64.1	59.9
(TPY)	113.0	108.6	101.6
Carbon Monoxide (lb/hr) = CO(ppm) x [1 - Moisture(%)/100] x 2116.8 lb/ft2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]			
Basis, ppmvd	12	12	12
Moisture (%)	7.9	8.6	10.3
Turbine Flow (acfm)	2,706,395	2,645,986	2,530,918
Turbine Exhaust Temperature (°F)	1,097	1,113	1,135
Emission rate (lb/hr)	44.2	42.5	39.3
(TPY)	75.0	72.0	66.6
VOCs (lb/hr) = VOC(ppmvd) x [1-Moisture(%)/100] x 2116.8 lb/ft2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]			
Basis, ppmvd	1.4	1.4	1.4
Moisture (%)	7.9	8.6	10.3
Turbine Flow (acfm)	2,706,395	2,645,986	2,530,918
Turbine Exhaust Temperature (°F)	1,097	1,113	1,135
Emission rate (lb/hr)	2.95	2.83	2.62
(TPY)	5.0	4.8	4.4
Lead (lb/hr)= NA			
Emission Rate Basis	NA	NA	NA
Emission rate (lb/hr)	NA	NA	NA
(TPY)	NA	NA	NA

Note: ppmvd = parts per million, volume dry; O_2 = oxygen.

Source: GE, 1998; Golder Associates, 1998; EPA, 1996

Table A-3. Maximum Emissions for Other Regulated PSD Pollutants for IPS - Vandolah
GE Frame 7FA, Dry Low NOx Combustor, Natural Gas, Base Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	3,390	3,390	3,390
2,3,7,8 TCDD Equivalents (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	1.20E-06	1.20E-06	0.00E+00
Heat Input Rate (MMBtu/hr)	1.85E+03	1.79E+03	1.67E+03
Emission Rate (lb/hr)	2.22E-09	2.15E-09	0.00E+00
(TPY)	3.77E-09	3.64E-09	0.00E+00
Beryllium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Fluoride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Mercury (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	7.48E-04	7.48E-04	7.48E-04
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	1.39E-06	1.34E-06	1.25E-06
(TPY)	2.35E-06	2.27E-06	2.11E-06
Sulfuric Acid Mist = Fuel Use (lb/hr) x sulfur (S) content (fraction) x conversion of S to H_2SO_4 (%) x MW H_2SO_4 /MW S (98/32)			
Fuel Usage (cf/hr)	1,797,031	1,734,619	1,616,252
Sulfur (lb/hr)	2.57	2.48	2.31
lb H_2SO_4 /lb S (98/32)	3.0625	3.0625	3.0625
Conversion to H_2SO_4 (%) (c)	10	10	10
Emission Rate (lb/hr)	0.79	0.76	0.71
(TPY)	1.33	1.29	1.20

Sources: (a) Golder Associates, 1998; (b) EPA, 1981; (c) Assumed.

Note: No Emission Factors for Hydrogen chloride (HCl) from natural gas firing.

Table A-4. Maximum Emissions for Hazardous Air Pollutants for IPS - Vandolah
GE Frame 7FA, Dry Low NOx Combustor, Natural Gas, Base Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	3,390	3,390	3,390
Antimony (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0.00E+00	0.00E+00	0.00E+00
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Benzene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0.8	0.8	0.8
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	1.48E-03	1.43E-03	1.33E-03
(TPY)	2.51E-03	2.43E-03	2.26E-03
Cadmium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	0	0	0
(TPY)	0.00E+00	0.00E+00	0.00E+00
Chromium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Formaldehyde (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	34	34	34
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	6.30E-02	6.08E-02	5.67E-02
(TPY)	1.07E-01	1.03E-01	9.61E-02
Cobalt (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1.85E+03	1.79E+03	1.67E+03
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00
(TPY)	0	0	0
Manganese (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Nickel (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Phosphorous (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b), lb/10^{12} Btu	0.00E+00	0.00E+00	0.00E+00
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Selenium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Toluene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	10	10	10
Heat Input Rate (MMBtu/hr)	1,854	1,789	1,667
Emission Rate (lb/hr)	1.85E-02	1.79E-02	1.67E-02
(TPY)	3.14E-02	3.03E-02	2.83E-02

Sources: (a) Golder Associates, 1998; (b) EPA,1996 (AP-42,Table 3.1-4)

Table A-5. Design Information and Stack Parameters for IPS - Vandolah
GE Frame 7FA, Dry Low NOx Combustor, Natural Gas, 75% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Combustion Turbine Performance			
Net power output (MW)	134.2	126.4	111.1
Net heat rate (Btu/kWh, LHV)	10,261	10,396	10,882
(Btu/kWh, HHV)	11,045	11,289	11,765
Heat Input (MMBtu/hr, LHV)	1,377	1,314	1,209
(MMBtu/hr, HHV)	1,482	1,427	1,307
Fuel heating value (Btu/lb, LHV)	20,751	20,751	20,751
(Btu/lb, HHV)	23,006	23,006	23,006
(HHV/LHV)	1.110	1.110	1.110
CT Exhaust Flow			
Mass Flow (lb/hr)- with margin of 10%	3,285,700	3,190,000	3,039,300
- provided	2,987,000	2,900,000	2,763,000
Temperature (°F)	1,170	1,179	1,193
Moisture (% Vol.)	8.1	8.4	9.6
Oxygen (% Vol.)	12.50	12.50	12.50
Molecular Weight	28.41	28.38	28.21
Fuel Usage			
Fuel usage (lb/hr) = Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))			
Heat input (MMBtu/hr, LHV)	1,377	1,314	1,209
Heat content (Btu/lb, LHV)	20,751	20,751	20,751
Fuel usage (lb/hr)- calculated	66,358	63,322	58,262
CT Stack			
CT- Stack height (ft)	60	60	60
Diameter (ft)	22	22	22
Turbine Flow Conditions (CT Stack-Unit 4 only)			
Turbine Flow (acfm) = [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F) + 460°F)] / [Molecular weight x 2116.8] / 60 min/hr			
Mass flow (lb/hr)	3,285,700	3,190,000	3,039,300
Temperature (°F)	1,170	1,179	1,193
Molecular weight	28.41	28.38	28.21
Volume flow (acfm)- calculated	2,292,951	2,240,823	2,166,041
(ft3/s)- calculated	38,216	37,347	36,101
Velocity (ft/sec)	100.5	98.2	95.0

Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft^2; 14.7 lb/ft^3

Source: GE, 1998.

Table A-6. Maximum Emissions for Criteria Pollutants for IPS - Vandolah
GE Frame 7FA, Dry Low NOx Combustor, Natural Gas, 75% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	3,390	3,390	3,390
Particulate (lb/hr) = Emission rate (lb/hr) from manufacturer			
Basis (excludes H_2SO_4), lb/hr	10	10	10
Emission rate (lb/hr)- provided	10.0	10.0	10.0
(TPY)	17.0	17.0	17.0
Sulfur Dioxide (lb/hr) = Natural gas (cf/hr) x sulfur content(gr/100 cf) x 1 lb/7000 gr x (lb SO_2/lb S) /100			
Fuel density (lb/ft^3)	0.0448	0.0448	0.0448
Fuel use (cf/hr)	1,481,744	1,413,951	1,300,964
Sulfur content (grains/ 100 cf)	1	1	1
lb SO_2/lb S (64/32)	2	2	2
Emission rate (lb/hr)	4.2	4.0	3.7
(TPY)	7.18	6.85	6.30
Nitrogen Oxides (lb/hr) = NOx(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 x Volume flow (acfm) x 46 (mole. wgt NOx) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 5.9 x 1,000,000 (adj. for ppm)]			
Basis, ppmvd @15% O_2	9	9	9
Moisture (%)	8.1	8.4	9.6
Oxygen (%)	12.5	12.5	12.5
Turbine Flow (acfm)	2,292,951	2,240,823	2,166,041
Turbine Exhaust Temperature (°F)	1,170	1,179	1,193
Emission rate (lb/hr)	54.4	52.4	48.3
(TPY)	92.2	88.8	81.9
Carbon Monoxide (lb/hr) = CO(ppm) x [1 - Moisture(%)/100] x 2116.8 lb/ft2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]			
Basis, ppmvd	12	12	12
Moisture (%)	8.1	8.4	9.6
Turbine Flow (acfm)	2,292,951	2,240,823	2,166,041
Turbine Exhaust Temperature (°F)	1,170	1,179	1,193
Emission rate (lb/hr)	35.7	34.6	32.7
(TPY)	60.5	58.6	55.5
VOCs (lb/hr) = VOC(ppmvd) x [1-Moisture(%)/100] x 2116.8 lb/ft2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]			
Basis, ppmvd	1.4	1.4	1.4
Moisture (%)	8.1	8.4	9.6
Turbine Flow (acfm)	2,292,951	2,240,823	2,166,041
Turbine Exhaust Temperature (°F)	1,170	1,179	1,193
Emission rate (lb/hr)	2.38	2.31	2.18
(TPY)	4.0	3.9	3.7
Lead (lb/hr)= NA			
Emission Rate Basis	NA	NA	NA
Emission rate (lb/hr)	NA	NA	NA
(TPY)	NA	NA	NA

Note: ppmvd = parts per million, volume dry; O_2 = oxygen.

Source: GE, 1998; Golder Associates, 1998; EPA, 1996

Table A-7. Maximum Emissions for Other Regulated PSD Pollutants for IPS - Vandolah
GE Frame 7FA, Dry Low NOx Combustor, Natural Gas, 75% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	3,390	3,390	3,390
2,3,7,8-TCDD Equivalents (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	1.20E-06	1.20E-06	1.20E-06
Heat Input Rate (MMBtu/hr)	1.48E+03	1.43E+03	1.31E+03
Emission Rate (lb/hr)	1.78E-09	1.71E-09	1.57E-09
(TPY)	3.01E-09	2.90E-09	2.66E-09
Beryllium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Fluoride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Mercury (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	7.48E-04	7.48E-04	7.48E-04
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	1.11E-06	1.07E-06	9.78E-07
(TPY)	1.88E-06	1.81E-06	1.66E-06
Sulfuric Acid Mist = Fuel Use (lb/hr) x sulfur (S) content (fraction) x conversion of S to H_2SO_4 (%) x MW H_2SO_4 /MW S (98/32)			
Fuel Usage (cf/hr)	1,481,744	1,413,951	1,300,964
Sulfur (lb/hr)	2.12	2.02	1.86
lb H_2SO_4 /lb S (98/32)	3.0625	3.0625	3.0625
Conversion to H_2SO_4 (%) (c)	10	10	10
Emission Rate (lb/hr)	0.65	0.62	0.57
(TPY)	1.10	1.05	0.96

Sources: (a) Golder Associates, 1998; (b) EPA, 1981; (c) Assumed.

Table A-8. Maximum Emissions for Hazardous Air Pollutants for IPS - Vandolah
GE Frame 7FA, Dry Low NOx Combustor, Natural Gas, 75% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	3,390	3,390	3,390
Antimony (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0.00E+00	0.00E+00	0.00E+00
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Benzene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0.8	0.8	0.8
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	1.19E-03	1.14E-03	1.05E-03
(TPY)	2.01E-03	1.93E-03	1.77E-03
Cadmium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	0	0	0
(TPY)	0.00E+00	0.00E+00	0.00E+00
Chromium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Formaldehyde (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	34	34	34
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	5.04E-02	4.85E-02	4.44E-02
(TPY)	8.54E-02	8.22E-02	7.53E-02
Cobalt (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1.48E+03	1.43E+03	1.31E+03
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00
(TPY)	0	0	0
Manganese (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Nickel (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Phosphorous (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b), lb/10^{12} Btu	0.00E+00	0.00E+00	0.00E+00
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Selenium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Toluene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	10	10	10
Heat Input Rate (MMBtu/hr)	1,482	1,427	1,307
Emission Rate (lb/hr)	1.48E-02	1.43E-02	1.31E-02
(TPY)	2.51E-02	2.42E-02	2.22E-02

Sources: (a) Golder Associates, 1998; (b) EPA, 1996 (AP-42, Table 3.1-4)

Table A-9. Design Information and Stack Parameters for IPS - Vandolah
GE Frame 7FA, Dry Low NOx Combustor, Natural Gas, 50% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Combustion Turbine Performance			
Net power output (MW)	90.76	85.55	74.6
Net heat rate (Btu/kWh, LHV)	12,054	12,086	12,842
(Btu/kWh, HHV)	13,380	13,416	14,254
Heat Input (MMBtu/hr, LHV)	1,094	1,034	958
(MMBtu/hr, HHV)	1,214	1,148	1,063
Fuel heating value (Btu/lb, LHV)	20,751	20,751	20,751
(Btu/lb, HHV)	23,006	23,006	23,006
(HHV/LHV)	1.110	1.110	1.110
CT Exhaust Flow			
Mass Flow (lb/hr)- with margin of 10%	2,754,400	2,654,300	2,570,700
- provided	2,504,000	2,413,000	2,337,000
Temperature (°F)	1,171	1,186	1,200
Moisture (% Vol.)	7.7	8	9.1
Oxygen (% Vol.)	12.90	13.00	13.00
Molecular Weight	28.44	28.41	28.26
Fuel Usage			
Fuel usage (lb/hr) = Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))			
Heat input (MMBtu/hr, LHV)	1,094	1,034	958
Heat content (Btu/lb, LHV)	20,751	20,751	20,751
Fuel usage (lb/hr)- calculated	52,720	49,829	46,166
CT Stack			
CT- Stack height (ft)	60	60	60
Diameter (ft)	22	22	22
Turbine Flow Conditions (CT Stack-Unit 4 only)			
Turbine Flow (acfm) = [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F) + 460°F)] / [Molecular weight x 2116.8] / 60 min/hr			
Mass flow (lb/hr)	2,754,400	2,654,300	2,570,700
Temperature (°F)	1,171	1,186	1,200
Molecular weight	28.44	28.41	28.26
Volume flow (acfm)- calculated	1,921,470	1,870,642	1,836,829
(ft3/s)- calculated	32,024	31,177	30,614
Velocity (ft/sec)	84.2	82.0	80.5

Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft^2; 14.7 lb/ft^3

Source: GE, 1998.

Table A-10. Maximum Emissions for Criteria Pollutants for IPS - Vandolah
GE Frame 7FA, Dry Low NOx Combustor, Natural Gas, 50% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	3,390	3,390	3,390
Particulate (lb/hr) = Emission rate (lb/hr) from manufacturer			
Basis (excludes H_2SO_4), lb/hr	10	10	10
Emission rate (lb/hr)- provided	10.0	10.0	10.0
(TPY)	17.0	17.0	17.0
Sulfur Dioxide (lb/hr) = Natural gas (cf/hr) x sulfur content(gr/100 cf) x 1 lb/7000 gr x (lb SO_2/lb S) /100			
Fuel density (lb/ft^3)	0.0448	0.0448	0.0448
Fuel use (cf/hr)	1,177,217	1,112,653	1,030,872
Sulfur content (grains/ 100 cf)	1	1	1
lb SO_2/lb S (64/32)	2	2	2
Emission rate (lb/hr)	3.4	3.2	2.9
(TPY)	5.70	5.39	4.99
Nitrogen Oxides (lb/hr) = NOx(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 x Volume flow (acfm) x 46 (mole. wgt NOx) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 5.9 x 1,000,000 (adj. for ppm)]			
Basis, ppmvd @15% O_2	9	9	9
Moisture (%)	7.7	8	9.1
Oxygen (%)	12.9	13	13
Turbine Flow (acfm)	1,921,470	1,870,642	1,836,829
Turbine Exhaust Temperature (°F)	1,171	1,186	1,200
Emission rate (lb/hr)	43.4	40.8	38.3
(TPY)	73.6	69.2	64.9
Carbon Monoxide (lb/hr) = CO(ppm) x [1 - Moisture(%)/100] x 2116.8 lb/ft2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]			
Basis, ppmvd	12	12	12
Moisture (%)	7.7	8	9.1
Turbine Flow (acfm)	1,921,470	1,870,642	1,836,829
Turbine Exhaust Temperature (°F)	1,171	1,186	1,200
Emission rate (lb/hr)	30.0	28.9	27.8
(TPY)	50.9	49.0	47.1
VOCs (lb/hr) = VOC(ppmvd) x [1-Moisture(%)/100] x 2116.8 lb/ft2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]			
Basis, ppmvd	1.4	1.4	1.4
Moisture (%)	7.7	8	9.1
Turbine Flow (acfm)	1,921,470	1,870,642	1,836,829
Turbine Exhaust Temperature (°F)	1,171	1,186	1,200
Emission rate (lb/hr)	2.00	1.93	1.85
(TPY)	3.4	3.3	3.1
Lead (lb/hr)= NA			
Emission Rate Basis	NA	NA	NA
Emission rate (lb/hr)	NA	NA	NA
(TPY)	NA	NA	NA

Note: ppmvd= parts per million, volume dry; O_2= oxygen.

Source: GE, 1998; Golder Associates, 1998; EPA, 1996

Table A-11. Maximum Emissions for Other Regulated PSD Pollutants for IPS - Vandolah
GE Frame 7FA, Dry Low NOx Combustor, Natural Gas, 50% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	3,390	3,390	3,390
2,3,7,8-TCDD Equivalents (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	1.20E-06	1.20E-06	1.20E-06
Heat Input Rate (MMBtu/hr)	1.21E+03	1.15E+03	1.06E+03
Emission Rate (lb/hr)	1.46E-09	1.38E-09	1.28E-09
(TPY)	2.47E-09	2.33E-09	2.16E-09
Beryllium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Fluoride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Mercury (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	7.48E-04	7.48E-04	7.48E-04
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	9.08E-07	8.59E-07	7.95E-07
(TPY)	1.54E-06	1.46E-06	1.35E-06
Sulfuric Acid Mist = Fuel Use (lb/hr) x sulfur (S) content (fraction) x conversion of S to H_2SO_4 (%) x MW H_2SO_4 /MW S (98/32)			
Fuel Usage (cf/hr)	1,177,217	1,112,653	1,030,872
Sulfur (lb/hr)	1.68	1.59	1.47
lb H_2SO_4 /lb S (98/32)	3.0625	3.0625	3.0625
Conversion to H_2SO_4 (%) (c)	10	10	10
Emission Rate (lb/hr)	0.52	0.49	0.45
(TPY)	0.87	0.83	0.76

Sources: (a) Golder Associates, 1998; (b) EPA, 1981; (c) Assumed.

Table A-12. Maximum Emissions for Hazardous Air Pollutants for IPS - Vandolah
GE Frame 7FA, Dry Low NOx Combustor, Natural Gas, 50% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	3,390	3,390	3,390
Antimony (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0.00E+00	0.00E+00	0.00E+00
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Benzene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0.8	0.8	0.8
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	9.71E-04	9.18E-04	8.51E-04
(TPY)	1.65E-03	1.56E-03	1.44E-03
Cadmium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	0	0	0
(TPY)	0.00E+00	0.00E+00	0.00E+00
Chromium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Formaldehyde (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	34	34	34
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	4.13E-02	3.90E-02	3.62E-02
(TPY)	7.00E-02	6.61E-02	6.13E-02
Cobalt (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1.21E+03	1.15E+03	1.06E+03
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00
(TPY)	0	0	0
Manganese (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Nickel (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Phosphorous (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b), lb/10^{12} Btu	0.00E+00	0.00E+00	0.00E+00
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Selenium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0	0	0
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	0	0	0
(TPY)	0	0	0
Toluene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	10	10	10
Heat Input Rate (MMBtu/hr)	1,214	1,148	1,063
Emission Rate (lb/hr)	1.21E-02	1.15E-02	1.06E-02
(TPY)	2.06E-02	1.95E-02	1.80E-02

Sources: (a) Golder Associates, 1998; (b) EPA,1996 (AP-42,Table 3.1-4)

Table A-13. Design Information and Stack Parameters for IPS - Vandolah
GE Frame 7FA, Dry Low NOx Combustor, Distillate Oil, Base Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Combustion Turbine Performance			
Net power output (MW)	183.9	181.9	171.2
Net heat rate (Btu/kWh, LHV)	10,103	9,929	9,988
(Btu/kWh, HHV)	10,710	10,524	10,588
Heat Input (MMBtu/hr, LHV)	1,858	1,806	1,710
(MMBtu/hr, HHV)	1,969	1,914	1,813
Fuel heating value (Btu/lb, LHV)	18,300	18,300	18,300
(Btu/lb, HHV)	19,398	19,398	19,398
(HHV/LHV)	1.060	1.060	1.060
CT Exhaust Flow			
Mass Flow (lb/hr)- with margin of 10%	4,230,600	4,081,000	3,825,800
- provided	3,846,000	3,710,000	3,478,000
Temperature (°F)	1,076	1,094	1,121
Moisture (% Vol.)	11	11.7	13.3
Oxygen (% Vol.)	11.20	11.04	10.60
Molecular Weight	28.33	28.25	28.06
Fuel Usage			
Fuel usage (lb/hr) = Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))			
Heat input (MMBtu/hr, LHV)	1,858	1,806	1,710
Heat content (Btu/lb, LHV)	18,300	18,300	18,300
Fuel usage (lb/hr)- calculated	101,530	98,689	93,443
CT Stack			
Stack height (ft)	60	60	60
Diameter (ft)	22	22	22
Turbine Flow Conditions			
Turbine Flow (acfm) = [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F) + 460°F)] / [Molecular weight x 2116.8] / 60 min/hr			
Mass flow (lb/hr)	4,230,600	4,081,000	3,825,800
Temperature (°F)	1,076	1,094	1,121
Molecular weight	28.33	28.25	28.06
Volume flow (acfm)- calculated	2,790,601	2,731,215	2,622,427
(ft3/s)- calculated	46,510	45,520	43,707
Velocity (ft/sec)	122.4	119.7	115.0

Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft^2; 14.7 lb/ft^3

Source: GE, 1999; Golder Associates, 1999

Table A-14. Maximum Emissions for Criteria Pollutants for IPS - Vandolah
GE Frame 7FA, Dry Low NOx Combustor, Distillate Oil, Base Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	1,000	1,000	1,000
Particulate (lb/hr) = Emission rate (lb/hr) from manufacturer			
Basis (excludes H_2SO_4), lb/hr	17	17	17
Emission rate (lb/hr)- provided	17.0	17.0	17.0
(TPY)	8.5	8.5	8.5
Sulfur Dioxide (lb/hr) = Natural gas (lb/hr) x sulfur content (%/100) x (lb SO_2/lb S)			
Fuel Sulfur Content	0.05%	0.05%	0.05%
Fuel use (lb/hr)	101,530	98,689	93,443
lb SO_2/lb S (64/32)	2	2	2
Emission rate (lb/hr)	101.5	98.7	93.4
(TPY)	50.77	49.34	46.72
Nitrogen Oxides (lb/hr) = NOx(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 x Volume flow (acfm) x 46 (mole. wgt NOx) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 5.9 x 1,000,000 (adj. for ppm)]			
Basis, ppmvd @15% O_2	42	42	42
Moisture (%)	11	11.7	13.3
Oxygen (%)	11.2	11.04	10.6
Turbine Flow (acfm)	2,790,601	2,731,215	2,622,427
Turbine Exhaust Temperature (°F)	1,076	1,094	1,121
Emission rate (lb/hr)	362.0	350.8	335.8
(TPY)	181.0	175.4	167.9
Carbon Monoxide (lb/hr) = CO(ppm) x [1 - Moisture(%)/100] x 2116.8 lb/ft2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]			
Basis, ppmvd	20	20	20
Moisture (%)	11	11.7	13.3
Turbine Flow (acfm)	2,790,601	2,731,215	2,622,427
Turbine Exhaust Temperature (°F)	1,076	1,094	1,121
Emission rate (lb/hr)	74.4	71.4	66.2
(TPY)	37.2	35.7	33.1
VOCs (lb/hr) = VOC(ppmvw) x 2116.8 lb/ft2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]			
Basis, ppmvw	7	7	7
Turbine Flow (acfm)	2,790,601	2,731,215	2,622,427
Turbine Exhaust Temperature (°F)	1,076	1,094	1,121
Emission rate (lb/hr)	16.73	16.18	15.27
(TPY)	8.4	8.1	7.6
Lead (lb/hr)= NA			
Emission Rate Basis (lb/10^{12} Btu)	10.8	10.8	10.8
Emission rate (lb/hr)	0.0213	0.0207	0.0196
(TPY)	0.0106	0.0103	0.0098

Note: ppmvd= parts per million, volume dry; O_2= oxygen.
Source: GE, 1998; Golder Associates, 1998; EPA, 1996 (AP-42 draft revisions)

Table A-15. Maximum Emissions for Other Regulated PSD Pollutants for IPS - Vandolah
GE Frame 7FA, Dry Low NOx Combustor, Distillate Oil, Base Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	1,000	1,000	1,000
2,3,7,8 TCDD Equivalents (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	3.38E-04	3.38E-04	3.38E-04
Heat Input Rate (MMBtu/hr)	1.97E+03	1.91E+03	1.81E+03
Emission Rate (lb/hr)	6.66E-07	6.47E-07	6.13E-07
(TPY)	3.33E-07	3.24E-07	3.06E-07
Beryllium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0.331	0.331	0.331
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	6.52E-04	6.34E-04	6.00E-04
(TPY)	3.26E-04	3.17E-04	3.00E-04
Fluoride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b), lb/10^{12} Btu	32.54	32.54	32.54
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	6.41E-02	6.23E-02	5.90E-02
(TPY)	3.20E-02	3.11E-02	2.95E-02
Hydrogen Chloride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (c), lb/10^{12} Btu	2.12E+02	2.12E+02	2.12E+02
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	4.18E-01	4.06E-01	3.84E-01
(TPY)	2.09E-01	2.03E-01	1.92E-01
Mercury (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	6.26E-01	6.26E-01	6.26E-01
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	1.23E-03	1.20E-03	1.13E-03
(TPY)	6.16E-04	5.99E-04	5.67E-04
Sulfuric Acid Mist = Fuel Use (lb/hr) x sulfur (S) content (fraction) x conversion of S to H_2SO_4 (%) x MW H_2SO_4 /MW S (98/32)			
Fuel Usage (cf/hr)	101,530	98,689	93,443
Sulfur (lb/hr)	50.77	49.34	46.72
lb H_2SO_4 /lb S (98/32)	3.0625	3.0625	3.0625
Conversion to H_2SO_4 (%) (d)	10	10	10
Emission Rate (lb/hr)	15.55	15.11	14.31
(TPY)	7.77	7.56	7.15

Sources: (a) EPA, 1998 (AP-42 draft revisions); (b) EPA, 1981; (c) 4 ppm assumed based on ASTM D2880
(d) assumed based on combustion and HRSG effects.

Table A-16. Maximum Emissions for Hazardous Air Pollutants for IPS - Vandolah
GE Frame 7FA, Dry Low NOx Combustor, Distillate Oil, Base Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	1,000	1,000	1,000
Arsenic (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	7.91E+00	7.91E+00	7.91E+00
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	1.56E-02	1.51E-02	1.43E-02
(TPY)	7.79E-03	7.57E-03	7.17E-03
Benzene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	1.1	1.1	1.1
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	2.17E-03	2.11E-03	1.99E-03
(TPY)	1.08E-03	1.05E-03	9.97E-04
Cadmium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	3.24	3.24	3.24
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	6.38E-03	6.20E-03	5.87E-03
(TPY)	3.19E-03	3.10E-03	2.94E-03
Chromium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	6.76	6.76	6.76
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	1.33E-02	1.29E-02	1.23E-02
(TPY)	6.66E-03	6.47E-03	6.13E-03
Formaldehyde (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	2	2	2
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	3.94E-03	3.83E-03	3.63E-03
(TPY)	1.97E-03	1.91E-03	1.81E-03
Cobalt (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b), lb/10^{12} Btu	37	37	37
Heat Input Rate (MMBtu/hr)	1.97E+03	1.91E+03	1.81E+03
Emission Rate (lb/hr)	7.29E-02	7.08E-02	6.71E-02
(TPY)	3.64E-02	3.54E-02	3.35E-02

Table A-16. Maximum Emissions for Hazardous Air Pollutants for IPS - Vandolah
GE Frame 7FA, Dry Low NOx Combustor, Distillate Oil, Base Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Manganese (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	432	432	432
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	8.51E-01	8.27E-01	7.83E-01
(TPY)	4.25E-01	4.14E-01	3.92E-01
Nickel (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	86.3	86.3	86.3
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	1.70E-01	1.65E-01	1.56E-01
(TPY)	8.50E-02	8.26E-02	7.82E-02
Phosphorous (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b) , lb/10^{12} Btu	3.00E+02	3.00E+02	3.00E+02
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	0.590844	0.574308	0.54378
(TPY)	0.295422	0.287154	0.27189
Selenium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	23	23	23
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	4.53E-02	4.40E-02	4.17E-02
(TPY)	2.26E-02	2.20E-02	2.08E-02
Toluene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	237	237	237
Heat Input Rate (MMBtu/hr)	1,969	1,914	1,813
Emission Rate (lb/hr)	4.67E-01	4.54E-01	4.30E-01
(TPY)	2.33E-01	2.27E-01	2.15E-01

Sources: (a) EPA, 1998 (AP-42 draft revisions); (b) EPA,1996 (AP-42,Table 3.1-4)

Table A-17. Design Information and Stack Parameters for IPS - Vandolah
GE Frame 7FA, Dry Low NOx Combustor, Distillate Oil, 75% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Combustion Turbine Performance			
Net power output (MW)	136.6	132.3	118.5
Net heat rate (Btu/kWh, LHV)	11,069	11,073	11,553
(Btu/kWh, HHV)	11,733	11,738	12,246
Heat Input (MMBtu/hr, LHV)	1,512	1,465	1,369
(MMBtu/hr, HHV)	1,603	1,553	1,451
Fuel heating value (Btu/lb, LHV)	18,300	18,300	18,300
(Btu/lb, HHV)	19,398	19,398	19,398
(HHV/LHV)	1.060	1.060	1.060
CT Exhaust Flow			
Mass Flow (lb/hr)- with margin of 10%	3,287,900	3,225,200	3,106,400
- provided	2,989,000	2,932,000	2,824,000
Temperature (°F)	1,170	1,176	1,186
Moisture (% Vol.)	11.5	11.8	12.9
Oxygen (% Vol.)	10.70	10.80	10.80
Molecular Weight	28.29	28.26	28.12
Fuel Usage			
Fuel usage (lb/hr) = Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))			
Heat input (MMBtu/hr, LHV)	1,512	1,465	1,369
Heat content (Btu/lb, LHV)	18,300	18,300	18,300
Fuel usage (lb/hr)- calculated	82,623	80,055	74,809
CT Stack			
CT - Stack height (ft)	60	60	60
Diameter (ft)	22	22	22
Turbine Flow Conditions			
Turbine Flow (acfm) = [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F) + 460°F)] / [Molecular weight x 2116.8] / 60 min/hr			
Mass flow (lb/hr)	3,287,900	3,225,200	3,106,400
Temperature (°F)	1,170	1,176	1,186
Molecular weight	28.29	28.26	28.12
Volume flow (acfm)- calculated	2,304,584	2,271,141	2,212,060
(ft3/s)- calculated	38,410	37,852	36,868
Velocity (ft/sec)	101.0	99.6	97.0

Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft^2; 14.7 lb/ft^3

Source: GE, 1999; Golder Associates, 1999

Table A-18. Maximum Emissions for Criteria Pollutants for IPS - Vandolah
GE Frame 7FA, Dry Low NOx Combustor, Distillate Oil, 75% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	1,000	1,000	1,000
Particulate (lb/hr) = Emission rate (lb/hr) from manufacturer			
Basis (excludes H_2SO_4), lb/hr	17	17	17
Emission rate (lb/hr)- provided	17.0	17.0	17.0
(TPY)	8.5	8.5	8.5
Sulfur Dioxide (lb/hr) = Natural gas (lb/hr) x sulfur content (%/100) x (lb SO_2/lb S)			
Fuel Sulfur Content	0.05%	0.05%	0.05%
Fuel use (lb/hr)	82,623	80,055	74,809
lb SO_2/lb S (64/32)	2	2	2
Emission rate (lb/hr)	82.6	80.1	74.8
(TPY)	41.31	40.03	37.40
Nitrogen Oxides (lb/hr) = NOx(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 x Volume flow (acfm) x 46 (mole. wgt NOx) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 5.9 x 1,000,000 (adj. for ppm)]			
Basis, ppmvd @15% O_2	42	42	42
Moisture (%)	11.5	11.8	12.9
Oxygen (%)	10.7	10.8	10.8
Turbine Flow (acfm)	2,304,584	2,271,141	2,212,060
Turbine Exhaust Temperature (°F)	1,170	1,176	1,186
Emission rate (lb/hr)	296.7	285.3	267.8
(TPY)	148.4	142.6	133.9
Carbon Monoxide (lb/hr) = CO(ppm) x [1 - Moisture(%)/100] x 2116.8 lb/ft2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]			
Basis, ppmvd	20	20	20
Moisture (%)	11.5	11.8	12.9
Turbine Flow (acfm)	2,304,584	2,271,141	2,212,060
Turbine Exhaust Temperature (°F)	1,170	1,176	1,186
Emission rate (lb/hr)	57.6	56.4	53.9
(TPY)	28.8	28.2	26.9
VOCs (lb/hr) = VOC(ppmvw) x 2116.8 lb/ft2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]			
Basis, ppmvw	7	7	7
Turbine Flow (acfm)	2,304,584	2,271,141	2,212,060
Turbine Exhaust Temperature (°F)	1,170	1,176	1,186
Emission rate (lb/hr)	13.02	12.78	12.37
(TPY)	6.5	6.4	6.2
Lead (lb/hr)= NA			
Emission Rate Basis (lb/10^{12} Btu)	10.8	10.8	10.8
Emission rate (lb/hr)	0.0173	0.0168	0.0157
(TPY)	0.0087	0.0084	0.0078

Note: ppmvd = parts per million, volume dry; O_2 = oxygen.

Source: GE, 1998; Golder Associates, 1998; EPA, 1996 (AP-42 draft revisions)

Table A-19. Maximum Emissions for Other Regulated PSD Pollutants for IPS - Vandolah
GE Frame 7FA, Dry Low NOx Combustor, Distillate Oil, 75% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	1,000	1,000	1,000
2,3,7,8 TCDD Equivalents (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	3.80E-04	3.80E-04	3.80E-04
Heat Input Rate (MMBtu/hr)	1.60E+03	1.55E+03	1.45E+03
Emission Rate (lb/hr)	6.09E-07	5.90E-07	5.51E-07
(TPY)	3.05E-07	2.95E-07	2.76E-07
Beryllium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	0.331	0.331	0.331
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	5.31E-04	5.14E-04	4.80E-04
(TPY)	2.65E-04	2.57E-04	2.40E-04
Fluoride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b) , lb/10^{12} Btu	32.54	32.54	32.54
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	5.22E-02	5.05E-02	4.72E-02
(TPY)	2.61E-02	2.53E-02	2.36E-02
Hydrogen Chloride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (c) , lb/10^{12} Btu	2.12E+02	2.12E+02	2.12E+02
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	3.40E-01	3.29E-01	3.08E-01
(TPY)	1.70E-01	1.65E-01	1.54E-01
Mercury (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a) , lb/10^{12} Btu	6.26E-01	6.26E-01	6.26E-01
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	1.00E-03	9.72E-04	9.08E-04
(TPY)	5.02E-04	4.86E-04	4.54E-04
Sulfuric Acid Mist = Fuel Use (lb/hr) x sulfur (S) content (fraction) x conversion of S to H_2SO_4 (%) x MW H_2SO_4 /MW S (98/32)			
Fuel Usage (cf/hr)	82,623	80,055	74,809
Sulfur (lb/hr)	41.31	40.03	37.40
lb H_2SO_4 /lb S (98/32)	3.0625	3.0625	3.0625
Conversion to H_2SO_4 (%) (d)	10	10	10
Emission Rate (lb/hr)	12.65	12.26	11.46
(TPY)	6.33	6.13	5.73

Sources: (a) EPA, 1998 (AP-42 draft revisions); (b) EPA, 1981; (c) 4 ppm assumed based on ASTM D2880
(d) assumed based on combustion and HRSG effects.

Table A-20. Maximum Emissions for Hazardous Air Pollutants for IPS - Vandolah
GE Frame 7FA, Dry Low NOx Combustor, Distillate Oil, 75% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	1,000	1,000	1,000
Arsenic (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	7.91E+00	7.91E+00	7.91E+00
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	1.27E-02	1.23E-02	1.15E-02
(TPY)	6.34E-03	6.14E-03	5.74E-03
Benzene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	1.1	1.1	1.1
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	1.76E-03	1.71E-03	1.60E-03
(TPY)	8.81E-04	8.54E-04	7.98E-04
Cadmium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	3.24	3.24	3.24
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	5.19E-03	5.03E-03	4.70E-03
(TPY)	2.60E-03	2.52E-03	2.35E-03
Chromium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	6.76	6.76	6.76
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	1.08E-02	1.05E-02	9.81E-03
(TPY)	5.42E-03	5.25E-03	4.90E-03
Formaldehyde (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	2	2	2
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	3.21E-03	3.11E-03	2.90E-03
(TPY)	1.60E-03	1.55E-03	1.45E-03
Cobalt (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b), lb/10^{12} Btu	37	37	37
Heat Input Rate (MMBtu/hr)	1.60E+03	1.55E+03	1.45E+03
Emission Rate (lb/hr)	5.93E-02	5.75E-02	5.37E-02
(TPY)	2.97E-02	2.87E-02	2.68E-02
Manganese (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	432	432	432
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	6.92E-01	6.71E-01	6.27E-01
(TPY)	3.46E-01	3.35E-01	3.13E-01
Nickel (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	86.3	86.3	86.3
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	1.38E-01	1.34E-01	1.25E-01
(TPY)	6.92E-02	6.70E-02	6.26E-02
Phosphorous (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b), lb/10^{12} Btu	3.00E+02	3.00E+02	3.00E+02
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	0.480816	0.46587	0.435342
(TPY)	0.240408	0.232935	0.217671
Selenium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	23	23	23
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	3.69E-02	3.57E-02	3.34E-02
(TPY)	1.84E-02	1.79E-02	1.67E-02
Toluene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	237	237	237
Heat Input Rate (MMBtu/hr)	1,603	1,553	1,451
Emission Rate (lb/hr)	3.80E-01	3.68E-01	3.44E-01
(TPY)	1.90E-01	1.84E-01	1.72E-01

Sources: (a) EPA, 1998 (AP-42 draft revisions); (b) EPA, 1996 (AP-42, Table 3.1-4)

Table A-21. Design Information and Stack Parameters for FPL Sanford Repowering Project
GE Frame 7FA, Dry Low NOx Combustor, Distillate Oil, 50% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Combustion Turbine Performance			
Net power output (MW)	90.2	87.3	77.6
Net heat rate (Btu/kWh, LHV)	13,304	13,162	13,892
(Btu/kWh, HHV)	14,102	13,951	14,725
Heat Input (MMBtu/hr, LHV)	1,200	1,149	1,078
(MMBtu/hr, HHV)	1,272	1,218	1,143
Fuel heating value (Btu/lb, LHV)	18,300	18,300	18,300
(Btu/lb, HHV)	19,398	19,398	19,398
(HHV/LHV)	1.060	1.060	1.060
CT Exhaust Flow			
Mass Flow (lb/hr)- with margin of 10%	2,737,900	2,655,400	2,586,100
- provided	2,489,000	2,414,000	2,351,000
Temperature (°F)	1,200	1,200	1,200
Moisture (% Vol.)	11.2	11.6	12.7
Oxygen (% Vol.)	11.10	11.20	11.30
Molecular Weight	28.29	28.24	28.10
Fuel Usage			
Fuel usage (lb/hr) = Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))			
Heat input (MMBtu/hr, LHV)	1,200	1,149	1,078
Heat content (Btu/lb, LHV)	18,300	18,300	18,300
Fuel usage (lb/hr)- calculated	65,574	62,787	58,907
CT Stack			
CT - Stack height (ft)	60	60	60
Diameter (ft)	22	22	22
Turbine Flow Conditions			
Turbine Flow (acfm) = [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F)+ 460°F)] / [Molecular weight x 2116.8] / 60 min/hr			
Mass flow (lb/hr)	2,737,900	2,655,400	2,586,100
Temperature (°F)	1,200	1,200	1,200
Molecular weight	28.29	28.24	28.10
Volume flow (acfm)- calculated	1,954,205	1,898,809	1,858,599
(ft3/s)- calculated	32,570	31,647	30,977
Velocity (ft/sec)	85.7	83.3	81.5

Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft^2; 14.7 lb/ft^3

Source: GE, 1999; Golder Associates, 1999

Table A-22. Maximum Emissions for Criteria Pollutants for IPS - Vandolah
GE Frame 7FA, Dry Low NOx Combustor, Distillate Oil, 50% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	1,000	1,000	1,000
Particulate (lb/hr) = Emission rate (lb/hr) from manufacturer			
Basis (excludes H_2SO_4), lb/hr	17	17	17
Emission rate (lb/hr)- provided	17.0	17.0	17.0
(TPY)	8.5	8.5	8.5
Sulfur Dioxide (lb/hr) = Natural gas (lb/hr) x sulfur content (%/100) x (lb SO_2/lb S)			
Fuel Sulfur Content	0.05%	0.05%	0.05%
Fuel use (lb/hr)	65,574	62,787	58,907
lb SO_2/lb S (64/32)	2	2	2
Emission rate (lb/hr)	65.6	62.8	58.9
(TPY)	32.79	31.39	29.45
Nitrogen Oxides (lb/hr) = NOx(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 x Volume flow (acfm) x 46 (mole. wgt NOx) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 5.9 x 1,000,000 (adj. for ppm)]			
Basis, ppmvd @15% O_2	42	42	42
Moisture (%)	11.2	11.6	12.7
Oxygen (%)	11.1	11.2	11.3
Turbine Flow (acfm)	1,954,205	1,898,809	1,858,599
Turbine Exhaust Temperature (°F)	1,200	1,200	1,200
Emission rate (lb/hr)	236.4	224.0	209.3
(TPY)	118.2	112.0	104.7
Carbon Monoxide (lb/hr) = CO(ppm) x [1 - Moisture(%)/100] x 2116.8 lb/ft2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]			
Basis, ppmvd	30	30	30
Moisture (%)	11.2	11.6	12.7
Turbine Flow (acfm)	1,954,205	1,898,809	1,858,599
Turbine Exhaust Temperature (°F)	1,200	1,200	1,200
Emission rate (lb/hr)	72.2	69.8	67.5
(TPY)	36.1	34.9	33.7
VOCs (lb/hr) = VOC(ppmvw) x 2116.8 lb/ft2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]			
Basis, ppmvw	7	7	7
Turbine Flow (acfm)	1,954,205	1,898,809	1,858,599
Turbine Exhaust Temperature (°F)	1,200	1,200	1,200
Emission rate (lb/hr)	10.84	10.53	10.31
(TPY)	5.4	5.3	5.2
Lead (lb/hr)= NA			
Emission Rate Basis (lb/10^{12} Btu)	10.8	10.8	10.8
Emission rate (lb/hr)	0.0137	0.0132	0.0123
(TPY)	0.0069	0.0066	0.0062

Note: ppmvd= parts per million, volume dry; O_2= oxygen.

Source: GE, 1998; Golder Associates, 1998; EPA, 1996 (AP-42 draft revisions)

Table A-23. Maximum Emissions for Other Regulated PSD Pollutants for IPS - Vandolah
GE Frame 7FA, Dry Low NOx Combustor, Distillate Oil, 50% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	1,000	1,000	1,000
2,3,7,8 TCDD Equivalents (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	3.80E-04	3.80E-04	3.80E-04
Heat Input Rate (MMBtu/hr)	1.27E+03	1.22E+03	1.14E+03
Emission Rate (lb/hr)	4.83E-07	4.63E-07	4.34E-07
(TPY)	2.42E-07	2.31E-07	2.17E-07
Beryllium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	0.331	0.331	0.331
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	4.21E-04	4.03E-04	3.78E-04
(TPY)	2.11E-04	2.02E-04	1.89E-04
Fluoride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b), lb/10^{12} Btu	32.54	32.54	32.54
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	4.14E-02	3.96E-02	3.72E-02
(TPY)	2.07E-02	1.98E-02	1.86E-02
Hydrogen Chloride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (c), lb/10^{12} Btu	2.12E+02	2.12E+02	2.12E+02
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	2.70E-01	2.58E-01	2.42E-01
(TPY)	1.35E-01	1.29E-01	1.21E-01
Mercury (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	6.26E-01	6.26E-01	6.26E-01
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	7.96E-04	7.62E-04	7.15E-04
(TPY)	3.98E-04	3.81E-04	3.58E-04
Sulfuric Acid Mist = Fuel Use (lb/hr) x sulfur (S) content (fraction) x conversion of S to H_2SO_4 (%) x MW H_2SO_4/MW S (98/32)			
Fuel Usage (cf/hr)	65,574	62,787	58,907
Sulfur (lb/hr)	32.79	31.39	29.45
lb H_2SO_4/lb S (98/32)	3.0625	3.0625	3.0625
Conversion to H_2SO_4 (%) (d)	10	10	10
Emission Rate (lb/hr)	10.04	9.61	9.02
(TPY)	5.02	4.81	4.51

Sources: (a) EPA, 1998 (AP-42 draft revisions); (b) EPA, 1981; (c) 4 ppm assumed based on ASTM D2880
(d) assumed based on combustion and HRSG effects.

Table A-24. Maximum Emissions for Hazardous Air Pollutants for IPS - Vandolah
GE Frame 7FA, Dry Low NOx Combustor, Distillate Oil, 50% Load

Parameter	Ambient Temperature 32 °F	59 °F	95 °F
Hours of Operation	1,000	1,000	1,000
Arsenic (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	7.91E+00	7.91E+00	7.91E+00
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	1.01E-02	9.63E-03	9.04E-03
(TPY)	5.03E-03	4.82E-03	4.52E-03
Benzene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	1.1	1.1	1.1
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	1.40E-03	1.34E-03	1.26E-03
(TPY)	7.00E-04	6.70E-04	6.28E-04
Cadmium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	3.24	3.24	3.24
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	4.12E-03	3.95E-03	3.70E-03
(TPY)	2.06E-03	1.97E-03	1.85E-03
Chromium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	6.76	6.76	6.76
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	8.60E-03	8.23E-03	7.72E-03
(TPY)	4.30E-03	4.12E-03	3.86E-03
Formaldehyde (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	2	2	2
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	2.54E-03	2.44E-03	2.29E-03
(TPY)	1.27E-03	1.22E-03	1.14E-03
Cobalt (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b), lb/10^{12} Btu	37	37	37
Heat Input Rate (MMBtu/hr)	1.27E+03	1.22E+03	1.14E+03
Emission Rate (lb/hr)	4.71E-02	4.51E-02	4.23E-02
(TPY)	2.35E-02	2.25E-02	2.11E-02
Manganese (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	432	432	432
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	5.50E-01	5.26E-01	4.94E-01
(TPY)	2.75E-01	2.63E-01	2.47E-01
Nickel (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	86.3	86.3	86.3
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	1.10E-01	1.05E-01	9.86E-02
(TPY)	5.49E-02	5.26E-02	4.93E-02
Phosphorous (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (b), lb/10^{12} Btu	3.00E+02	3.00E+02	3.00E+02
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	0.3816	0.365382	0.342804
(TPY)	0.1908	0.182691	0.171402
Selenium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	23	23	23
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	2.93E-02	2.80E-02	2.63E-02
(TPY)	1.46E-02	1.40E-02	1.31E-02
Toluene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu			
Basis (a), lb/10^{12} Btu	237	237	237
Heat Input Rate (MMBtu/hr)	1,272	1,218	1,143
Emission Rate (lb/hr)	3.01E-01	2.89E-01	2.71E-01
(TPY)	1.51E-01	1.44E-01	1.35E-01

Sources: (a) EPA, 1998 (AP-42 draft revisions); (b) EPA,1996 (AP-42,Table 3.1-4)

APPENDIX B

BEST AVAILABLE CONTROL TECHNOLOGY FOR THE PROPOSED COMBUSTION TURBINES

B.1 NEW SOURCE PERFORMANCE STANDARDS

The NSPS regulations (40 CFR, Subpart GG) applicable to gas turbines apply to:

1. Electric utility stationary gas turbines with a heat input at peak load of greater than 100 x 10^6 Btu/hr [40 CFR 60.332 (b)];
2. Stationary gas turbines with a heat input at peak load between 10 and 100 x 10^6 Btu/hr [40 CFR 60.332 (c)]; or
3. Stationary gas turbines with a manufacturer's rate base load at ISO conditions of 30 MW or less [40 CFR 60.332 (d)].

The electric utility stationary gas turbine provisions apply to stationary gas turbines constructed for the purpose of supplying more than one-third of their potential electric output capacity for sale to any utility power distribution system [40 CFR 60.331 (q)]. The requirements for electric utility stationary gas turbines are applicable to the proposed project and are the most stringent provision of the NSPS. These requirements are summarized in Table B-1 and were considered in the BACT analysis.

As noted from Table B-1, the NSPS NO_x emission limit can be adjusted upward to allow for fuel-bound nitrogen (FBN). For a fuel-bound nitrogen concentration of 0.015 percent or less, no increase in the NSPS is provided; for a fuel-bound nitrogen concentration of 0.03 percent, the NSPS is increased by 0.0012 percent or 12 parts per million (ppm).

B.2 BEST AVAILABLE CONTROL TECHNOLOGY

B.2.1 NITROGEN OXIDES

Advanced dry low-NO_x combustion alone has increasingly been approved by regulatory agencies as BACT and is technically feasible for the proposed project. Available information suggests that SCR with dry low-NO_x combustor technology or with wet injection is also technically feasible. For the "F" Class Project, advanced dry low-NO_x combustor technology is equivalent to the SCR technology and has several important advantages.

B.2.1.1 Identification of NO_x Control Technologies

NO_x emissions from combustion of fossil fuels consist of thermal NO_x and fuel-bound NO_x. Thermal NO_x is formed from the reaction of oxygen and nitrogen in the combustion air at combustion temperatures. Formation of thermal NO_x depends on the flame temperature, residence time, combustion pressure, and air-to-fuel ratios in the primary combustion zone. The design and operation of the combustion chamber dictates these conditions. Fuel-bound NO_x is created by the oxidation of volatilized nitrogen in the fuel. Nitrogen content in the fuel is the primary factor in its formation.

Table B-2 presents a listing of the lowest achievable emission rates/best available control technology (LAER/BACT) decisions made by state environmental agencies and EPA regional offices for gas turbines. This table was developed from the information obtained from BACT/LAER Information System (BLIS) database maintained at EPA's National Computer Center located at Research Triangle Park, North Carolina, (e.g., the California Air Control Board, the South Coast Air Quality Management District, the New Jersey Department of Environmental Protection, and the Rhode Island Department of Environmental Management).

Historically, the most stringent NO_x controls for CTs established as LAER/BACT by state agencies were selective catalytic reduction (SCR) with wet injection and wet injection alone. When SCR has been employed, wet injection is used initially to reduce NO_x emissions. However, advanced dry low-NO_x technology has only recently been developed and made available for gas turbines. SCR is a post-combustion control, while advanced dry low-NO_x combustors minimize the formation of NO_x in the combustion process.

SCR has been installed or permitted in over 100 projects. The majority of these projects (more than 90 percent) are cogeneration facilities with capacities of 50 MW or less. About 80 percent of the projects have been in California. Of these 109 projects that have either installed SCR or have been permitted with SCR, about 40 percent have been in the Southern California NO_2 nonattainment area where SCR was required not as BACT but as LAER, a more stringent requirement. LAER is distinctly different from BACT in that there is no consideration of economic, energy, or environmental impacts; if a control technology has previously been installed, it must be required as LAER. LAER is defined as follows:

> Lowest achievable emission rate means, for any source, the more stringent rate of emissions based on the following: (i) The most stringent emissions limitation which is contained in the implementation plan of any State of such class or category of stationary source, unless the owner or operator of the proposed stationary source demonstrates that such limitations are not achievable; or (ii) The most stringent emissions limitation which is achieved in practice by such class or category of stationary source. This limitation, when applied to a modification, means the lowest achievable emissions rate for the new or modified emissions units within the stationary source. In no event shall the application of this term permit a proposed new

modified stationary source to emit any pollutant in excess of the amount allowable under applicable new source standards of performance (40 CFR 51, Appendix S.II, A.18).

As noted previously, there are distinct regulatory and policy differences between LAER and BACT. BACT involves an evaluation of the economic, environmental, and energy impacts of alternative control technologies. In contrast, LAER only considers the technical aspects of control.

All the projects in California have natural gas as the primary fuel; only 15 of the SCR applications have distillate fuel as backup. The remaining projects with SCR (i.e., about 25 projects) are located in the eastern United States: Vermont, Massachusetts, Connecticut, New Jersey, New York, Rhode Island, and Virginia. A majority of these projects are cogenerators or independent power producers. The size of these projects ranges from 22 MW to 450 MW, with nearly 90 percent less than 100 MW in size.

Reported and permitted NO_x removal efficiencies of SCR range from 40 to 80 percent of NO_x in the exhaust gas stream. The most common emission limiting standards associated with SCR are approximately 9 ppm for natural gas firing. However, a few facilities have reported emission limits of about 4.5 ppm. These emission limits were clearly determined to be LAER on CTs using water injection with uncontrolled NO_x levels below 42 ppm.

The installation of SCR has primarily been on combined cycle units where the catalyst is located in the HRSG at the proper temperature range. SCR has been installed on two simple cycle projects in California on machines significantly smaller (less than 25 MW) than the "F" Class proposed. With smaller turbines, the exhaust as temperature is lower making possible the installation of high temperature catalysts. Exhaust temperatures from the "F" Class CTs will approach 1,200°F and monitoring and control systems will be required to prevent catalyst damage. The high temperature catalyst are more than 2 times more costly than conventional base metal catalysts that are installed in HRSG. While manufacturers guarantee the high temperature catalysts for 3 years, operating experience at temperatures above 1,000°F is limited. Continuous exposure at these elevated temperatures suggest a more limited life of the SCR system.

Wet injection historically has been the primary method of reducing NO_x emissions from CTs. Indeed, this method of control was first mandated by the NSPS to reduce NO_x levels to 75 parts per million by volume, dry (ppmvd) (corrected to 15 percent O_2 and heat rate). Development of improved wet injection combustors reduced NO_x concentrations to 25 ppmvd (corrected to

15 percent O_2) when burning natural gas. More recently, however, CT manufacturers have developed dry low-NO_x combustors that can reduce NO_x concentrations to 25 ppmvd (corrected to 15 percent O_2) or less when firing natural gas.

In Florida, all of the most recent PSD permits and BACT determinations for simple cycle gas turbines have required either wet injection or dry low-NO_x technology for NO_x control. The emission limits included in these permits and BACT determinations are primarily in the range of 9 ppmvd to 25 ppmvd (corrected to 15 percent O_2, dry conditions) for future operations on natural-gas firing.

B.2.1.2 Technology Description and Feasibility

Wet Injection--The injection of water or steam in the combustion zone of CTs reduces the flame temperature with a corresponding decrease of NO_x emissions. The amount of NO_x reduction possible depends on the combustor design and the water-to-fuel ratio employed. An increase in the water-to-fuel ratio will cause a concomitant decrease in NO_x emissions until flame instability occurs. At this point, operation of the CT becomes inefficient and unreliable, and significant increases in products of incomplete combustion will occur (i.e., CO and VOC emissions).

Dry Low-NO_x Combustor--In the past several years, CT manufacturers have offered and installed machines with dry low-NO_x combustors. These combustors, which are offered on conventional machines manufactured by Westinghouse, GE, Kraftwork Union, and ABB, can achieve NO_x concentrations of 25 ppmvd or less when firing natural gas. Westinghouse and GE have offered dry low-NO_x combustors on advanced heavy-duty industrial machines. Thermal NO_x formation is inhibited by using combustion techniques where the natural gas and combustion air are premixed before ignition. For the CT being considered for the project, the combustion chamber design includes the use of dry low-NO_x combustor technology. The NO_x emission level when firing natural gas at baseload conditions is 9 ppmvd (corrected to 9 percent O_2), a level which is available for the project.

Selective Catalytic Reduction (SCR)--SCR uses ammonia (NH_3) to react with NO_x in the gas stream in the presence of a catalyst. NH_3, which is diluted with air to about 5 percent by volume, is introduced into the gas stream at reaction temperatures between 600°F and 750°F. The reactions are as follows:

$$4NH_3 + 4NO + O_2 = 4N_2 + 6H_2O$$

$$4NH_3 + 2NO_2 + O_2 = 3N_2 + 6H_2O$$

SCR operating experience, as applied to gas turbines, consists primarily of baseload natural-gas-fired installations either of cogeneration or combined cycle configuration; no simple cycle facilities have SCR. Exhaust gas temperatures of simple cycle CTs generally are in the range of 1,000°F, which exceeds the optimum range for SCR with base metal catalysts. All current SCR applications have the catalyst placed in the HRSG to achieve proper reaction conditions. This allows a relatively constant temperature for the reaction of NH_3 and NO_x on the catalyst surface.

The use of SCR has been limited to facilities that burn natural gas or small amounts of fuel oil since SCR catalysts are contaminated by sulfur-containing fuels (i.e., fuel oil). For most fuel-oil-burning facilities, catalyst operation is discontinued, or the exhaust bypasses the SCR system. While the operating experience with SCR has not been extensive, certain cost, technical, and environmental considerations have surfaced for units firing both natural gas and oil while using SCR.

Ammonium salts (ammonium sulfate and bisulfate) are formed by the reaction of NH_3 and sulfur combustion products. Ammonium bisulfate can be corrosive and could cause damage to the surfaces that follow the catalyst, as well as to the stack. Corrosion protection for these areas would be required with concomitant cost and technical requirements. Ammonium sulfate is emitted as particulate matter. While the formation of ammonium salts is primarily associated with oil firing, sulfur combustion products from natural gas also could form small amounts of ammonium salts.

Zeolite and specially designed high temperature catalysts, which are reported to be capable of operating in temperature ranges up to 1,050°F, have become available commercially only recently. Their application with SCR primarily has been limited to internal combustion engines. Optimum performance of an SCR system using a zeolite catalyst is reported to range from about 800°F to 900°F. At temperatures of 1,050°F and above, the high-temperature catalyst will be irreparably damaged. Application of an SCR system using a zeolite catalyst would be feasible for the project; however, use in simple cycle operation will require monitoring to assure the temperature limits are not exceeded. If temperatures are exceeded then exhaust gas cooling would be required.

increase in fuel consumption, an increase in the volume of gases that must be treated by the control system, and an increase in uncontrolled air emissions, including NO_x.

<u>Thermal $DeNO_x$</u>--Thermal $DeNO_x$ is Exxon Research and Engineering Company's patented process for NO_x reduction. The process is a high temperature selective noncatalytic reduction (SNCR) of NO_x using ammonia as the reducing agent. Thermal $DeNO_x$ requires the exhaust gas temperature to be above 1,800°F. However, use of ammonia plus hydrogen lowers the temperature requirement to about 1,000°F. For some applications, this must be achieved by additional firing in the exhaust stream before ammonia injection.

The only known commercial applications of Thermal $DeNO_x$ are on heavy industrial boilers, large furnaces, and incinerators that consistently produce exhaust gas temperatures above 1,800°F. There are no known applications on or experience with CTs. Temperatures of 1,800°F require alloy materials constructed with very large piping and components since the exhaust gas volume would be increased by several times. As with the NO_xOUT process, high capital, operating, and maintenance costs are expected because of material requirements, an additional duct burner system, and fuel consumption. Uncontrolled emissions would increase because of the additional fuel burning.

Thus, the Thermal $DeNO_x$ process will not be considered for the proposed project since its high application temperature makes it technically infeasible. The maximum exhaust gas temperature of a combustion turbine is typically about 1,000°F; the cost to raise the exhaust gas to such a high temperature is prohibitively expensive.

<u>Nonselective Catalytic Reduction</u>--Certain manufacturers, such as Engelhard, market a nonselective catalytic reduction system (NSCR) for NO_x control on reciprocating engines. The NSCR process requires a low oxygen content in the exhaust gas stream and high temperature (700°F to 1,400°F) in order to be effective. CTs have the required temperature but also have high oxygen levels (greater than 12 percent) and, therefore, cannot use the NSCR process. As a result, NSCR is not a technically feasible add-on NO_x control device for CTs.

<u>Technology Determination</u>--A technical evaluation of available post-combustion gas controls (i.e., NO_xOUT, Thermal $DeNO_x$, and NSCR) indicates that these processes have not been applied to

NO$_x$OUT Process--The NO$_x$OUT process originated from the initial research by the Electric Power Research Institute (EPRI) in 1976 on the use of urea to reduce NO$_x$. EPRI licensed the proprietary process to Fuel Tech, Inc., for commercialization. In the NO$_x$OUT process, aqueous urea is injected into the flue gas stream ideally within a temperature range of 1,600°F to 1,900°F. In the presence of oxygen, the following reaction results:

$$CO(NH_2)_2 + 2NO + \frac{1}{2} O_2 \rightarrow 2N_2 + CO_2 + 2H_2O$$

The amount of urea required is most cost-effective when the treatment rate is 0.5 to 2 moles of urea per mole of NO$_x$. In addition to the original EPRI urea patents, Fuel Tech claims to have a number of proprietary catalysts capable of expanding the effective temperature range of the reaction to between 1,600°F and 1,950°F. Advantages of the system are as follows:

1. Low capital and operating costs as a result of use of urea injection, and
2. The proprietary catalysts used are nontoxic and nonhazardous, thus eliminating potential disposal problems.

Disadvantages of the system are as follows:

1. Formation of ammonia from excess urea treatment rates and/or improper use of reagent catalysts, and
2. Sulfur trioxide (SO_3), if present, will react with ammonia created from the urea to form ammonium bisulfate, potentially plugging the cold end equipment downstream.

Commercial application of the NO$_x$OUT system is limited to three reported cases:

1. Trial demonstration on a 62.5-ton-per-hour (TPH) stoker-fired wood waste boiler with 60 to 65 percent NO$_x$ reduction,
2. A 600 x 10^6 Btu CO boiler with 60 to 70 percent NO$_x$ reduction, and
3. A 75-MW pulverized coal-fired unit with 65 percent NO$_x$ reduction.

The NO$_x$OUT system has not been demonstrated on any combustion turbine/HRSG unit.

The NO$_x$OUT process is not technically feasible for the proposed project because of the high application temperature of 1,600°F to 1,950°F. The maximum exhaust gas temperature of the "F" Class CT is about 1,150°F. Raising the exhaust temperature the required amount essentially would require installation of a heater. This would be economically prohibitive and would result in an

CT/HRSG and are technically infeasible for the project because of process constraints (e.g., temperature).

For the BACT analysis, dry low-NO_x combustion technology is technically feasible and SCR in combination with combustion controls is a potentially feasible alternative that can achieve a maximum degree of emission reduction. The advanced dry low-NO_x combustor alone can achieve 9 ppm (corrected) and the SCR with dry low-NO_x combustor is capable of achieving a NO_x emission level of 3.6 ppm when firing natural gas (corrected to 15 percent O_2 dry conditions). When firing oil, the emissions with SCR and wet injection would be about 16.8 ppm (corrected), whereas emissions with wet injection alone would be 42 ppm (corrected). The SCR has a NO_x removal rate of 60 percent based on an associated ammonia slip (i.e., to 10 ppm).

B.2.1.3 SCR Cost Estimates

Tables B-3 and B-4 present the total capital and annualized cost for SCR, respectively. The costs were developed using EPA Cost Control Manual (EPA, 1990 and 1993). The cost for the SCR system was based on vendor estimates. Standard EPA recommended cost factors were used. For simple cycle operation, a capital recovery period of 15 years was used. However, the SCR system would be subjected to temperatures exceeding 1,000°F where considerable wear can take place resulting in lower life of equipment.

B.2.2 CARBON MONOXIDE

B.2.2.1 Identification of CO Control Technologies

CO emissions are a result of incomplete or partial combustion of fossil fuel. Combustion design and catalytic oxidation are the control alternatives that are viable for the project. Table B-5 presents a listing of LAER/BACT decisions for CO emissions from combustion turbines. Combustion design is the more common control technique used in CTs. Sufficient time, temperature, and turbulence is required within the combustion zone to maximize combustion efficiency and minimize the emissions of CO. Combustion efficiency is dependent upon combustor design. For the CTs being evaluated, CO emissions will not exceed 12 ppmvd, corrected to dry conditions when firing natural gas under full load conditions and 20 ppmvd when firing distillate oil at baseload.

Catalytic oxidation is a post-combustion control that has been employed in CO nonattainment areas where regulations have required CO emission levels to be less than those associated with wet injection. These installations have been required to use LAER technology and typically have CO limits in the 10 ppm range (corrected to dry conditions).

B.2.2.2 Technology Description

In an oxidation catalyst control system, CO emissions are reduced by allowing unburned CO to react with oxygen at the surface of a precious metal catalyst, such as platinum. Combustion of CO starts at about 300°F, with efficiencies above 90 percent occurring at temperatures above 600°F. Catalytic oxidation occurs at temperatures 50 percent lower than that of thermal oxidation, which reduces the amount of thermal energy required.

For CTs, the oxidation catalyst can be located directly after the CT. Catalyst size depends upon the exhaust flow, temperature, and desired efficiency. The existing oxidation catalyst applications primarily have been limited to smaller cogeneration facilities burning natural gas. Oxidation catalysts have not been used on fuel-oil-fired CTs or combined cycle facilities. The use of sulfur-containing fuels in an oxidation catalyst system would result in an increase of SO_3 emissions and concomitant corrosive effects to the stack. In addition, trace metals in the fuel could result in catalyst poisoning during prolonged periods of operation.

Since the units likely will require numerous startups, variations in exhaust conditions will influence catalyst life and performance. Very little technical data exist to demonstrate the effect of such cycling.

The lack of demonstrated operation with oil firing suggests rejection of catalytic oxidation as a technically feasible alternative. However, the advent of a second generation catalyst suggests that an oxidation catalyst could be used although none have been placed in actual operation.

B.2.2.3 Oxidation Catalyst Costs

Tables B-6 and B-7 present the capital and annualized cost for an oxidation catalyst. The maximum CO impacts are less than 0.1 percent of the applicable ambient air quality standards. There would also be no secondary benefits, such as acidic deposition, to reducing CO.

Table B-1. Federal NSPS for Electric Utility Stationary Gas Turbines

Pollutant	Emission Limitation[a]
Nitrogen Oxides[b]	0.0075 percent by volume (75 ppm) at 15 percent O_2 on a dry basis adjusted for heat rate and fuel nitrogen

[a] Applicable to electric utility gas turbines with a heat input at peak load of greater than 100 x 10^6 Btu/hr.

[b] Standard is multiplied by 14.4/Y; where Y is the manufacturer's rated heat rate in kilojoules per watt at rated load or actual measured heat rate based on the lower heating value of fuel measured at actual peak load; Y cannot be greater than 14.4. Standard is adjusted upward (additive) by the percent of nitrogen in the fuel:

Fuel-Bound Nitrogen (percent by weight)	Allowed Increase NO_x Percent by Volume
$N \leq 0.015$	0
$0.015 < N \leq 0.1$	0.04(N)
$0.1 < N \leq 0.25$	0.004+0.0067(N-0.1)
$N > 0.25$	0.005

where: N = the nitrogen content of the fuel (percent by weight).

Source: 40 CFR 60 Subpart GG.

Table B-2. Summary of Best Available Control Technology (BACT) Determinations for Nitrogen Oxide (NOx) Emissions

Facility Name	State	Permit Issue Date	Unit/Process Description	Capacity (size)	NOx Emission Limit	Control Method	Efficiency (%	Type
SOUTHERN NATURAL GAS	AL	Mar-98	2-9160 HP GE MODEL MS3002G NATURAL GAS TURBINES	9,160 HP	53 LB/HR		0	BACT-PSD
SOUTHERN NATURAL GAS	AL	Mar-98	9160 HP GE MODEL MS3002G NATURAL GAS FIRED TURBINE	9,160 HP	53 LB/HR		0	BACT-PSD
ALABAMA POWER COMPANY	AL	Dec-97	COMBUSTION TURBINE W/ DUCT BURNER (COMBINED CYCL	100 MW	15 PPM	DRY LOW NOX BURNERS	0	BACT-PSD
BUCKNELL UNIVERSITY	PA	Nov-97	NG FIRED TURBINE, SOLAR TAURUS T-7300S	5.0 MW	25 PPMV@15%O2	SOLONOX BURNER; LOW NOX BURNER	0	BACT-OTHER
NORTHERN CALIFORNIA POWER AGENCY	CA	Oct-97	GE FRAME 5 GAS TURBINE	325 MMBTU/HR	25 PPMVD @ 15% O2	DRY LOW NOX BURNERS	0	LAER
LORDSBURG L.P.	NM	Jun-97	TURBINE, NATURAL GAS-FIRED, ELEC. GEN.	100 MW	74.4 LBS/HR	DRY LOW-NOX TECHNOLOGY WHICH ADOPTS STAGED OR SCHEDULED COMBUSTION.	80	BACT-PSD
SOUTHERN CALIFORNIA GAS COMPANY	CA	May-97	VARIABLE LOAD NATURAL GAS FIRED TURBINE COMPRESSOR	50 MMBTU/HR	25 PPMVD @ 15% O2	DRY LOW NOX COMBUSTOR	0	LAER
MEAD COATED BOARD, INC.	AL	Mar-97	COMBINED CYCLE TURBINE (25 MW)	568 MMBTU/HR	25 PPMVD@ 15% O2 (GAS)	FUEL OIL SULFUR CONTENT <=0.05% BY WEIGHT, DRY LOW NOX COMBUSTOR DESIGN FIRING GAS AND DRY LOW NOX COMBUSTOR WITH WATER INJECTION FIRING OIL	0	BACT-PSD
FORMOSA PLASTICS CORPORATION, BATON ROUGE PLANT	LA	Mar-97	TURBINE/HSRG, GAS COGENERATION	450 MM BTU/HR	9 PPMV	DRY LOW NOX BURNER/COMBUSTION DESIGN AND	0	BACT-PSD
SOUTHWESTERN PUBLIC SERVICE COMPANY/CUNNINGHAM STA	NM	Feb-97	COMBUSTION TURBINE, NATURAL GAS	100 MW	0 SEE FACILITY NOTES	DRY LOW NOX COMBUSTION	0	BACT-PSD
CALRESOURCES LLC	CA	Jan-97	SOLAR MODEL 1100 SATURN GAS TURBINE	14 MMBTU/HR	69 PPMVD @15% O2	NO CONTROL	0	LAER
TEMPO PLASTICS	CA	Dec-96	GAS TURBINE COGENERATION UNIT	0.0	0.109 LB/MMBTU	LOW-NOX COMBUSTOR	0	LAER
SOUTHERN NATURAL GAS COMPANY	MS	Dec-96	TURBINE, NATURAL GAS-FIRED	9,160 HORSEPOWER	110 PPMV @ 15% O2, DRY	PROPER TURBINE DESIGN AND OPERATION	0	BACT-PSD
SOUTHERN NATURAL GAS COMPANY-SELMA COMPRESSOR STAT	AL	Dec-96	9160 HP GE MS3002G NATURAL GAS FIRED TURBINE	0.0	53 LB/HR		0	BACT-PSD
SOUTHWESTERN PUBLIC SERVICE CO/CUNNINGHAM STATION	NM	Nov-96	COMBUSTION TURBINE, NATURAL GAS	100 MW	15 PPM; SEE FAC. NOTES	DRY LOW NOX COMBUSTION	0	BACT-PSD
ECOELECTRICA, L.P.	PR	Oct-96	TURBINES, COMBINED-CYCLE COGENERATION	461 MW	60 LB/HR (GAS)	STEAM/WATER INJECTION AND SELECTIVE CATALYTIC REDUCTION (SCR).	72	BACT-PSD
ECOELECTRICA, L.P.	PR	Oct-96	TURBINES, COMBINED-CYCLE COGENERATION	461 MW	73 LB/HR (OIL)	STEAM/WATER INJECTION AND SELECTIVE CATALYTIC REDUCTION (SCR).	72	BACT-PSD
BLUE MOUNTAIN POWER, LP	PA	Jul-96	COMBUSTION TURBINE WITH HEAT RECOVERY BOILER	153 MW	4 PPM @ 15% O2	DRY LNB WITH SCR WATER INJECTION IN PLACE WHEN FIRING OIL. OIL FIRING LIMITS SET TO 8.4 PPM @15% O2	84	LAER
CITY OF ST.PAUL POWER PLANT	AK	Jun-96	INTERNAL COMBUSTION	3.4 MW	427 TPY	AFTERCOOLERS	0	BACT-PSD
CITY OF UNALASKA	AK	Jun-96	INTERNAL COMBUSTION	6.5 MW	633 TPY	LIMIT OF OPERATION HOURS AND AFTERCOOLERS	0	BACT-PSD
GENERAL ELECTRIC GAS TURBINES	SC	Apr-96	I.C. TURBINE	2,700 MMBTU/HR	885 LB/HR	GOOD COMBUSTION PRACTICES TO MINIMIZE EMISSIONS	0	BACT-PSD
CAROLINA POWER & LIGHT	NC	Apr-96	COMBUSTION TURBINE, 4 EACH	1,908 MMBTU/HR	512 LB/HR (OIL)	WATER INJECTION; FUEL SPEC: 0.04% N FUEL OIL	0	BACT-PSD
CAROLINA POWER & LIGHT	NC	Apr-96	COMBUSTION TURBINE, 4 EACH	1908 MMBTU/HR	156 LB/HR (GAS)	WATER INJECTION	0	BACT-PSD
MID-GEORGIA COGEN.	GA	Apr-96	COMBUSTION TURBINE (2), FUEL OIL	116 MW	20 PPMVD	WATER INJECTION WITH SCR	0	BACT-PSD
MID-GEORGIA COGEN.	GA	Apr-96	COMBUSTION TURBINE (2), NATURAL GAS	116 MW	9 PPMVD	DRY LOW NOX BURNER WITH SCR	0	BACT-PSD
GEORGIA GULF CORPORATION	LA	Mar-96	GENERATOR, NATURAL GAS FIRED TURBINE	1,123 MM BTU/HR	25 PPMV-CORR. TO 15%O2	CONTROL NOX USING STEAM INJECTION	0	BACT-PSD
SEMINOLE HARDEE UNIT 3	FL	Jan-96	COMBINED CYCLE COMBUSTION TURBINE	140 MW	15 PPM @ 15% O2	DRY LNB STAGED COMBUSTION	0	BACT-PSD
KEY WEST CITY ELECTRIC SYSTEM	FL	Sep-95	TURBINE, EXISTING CT RELOCATION TO A NEW PLANT	23 MW	75 PPM @ 15% O2	WATER INJECTION	0	BACT-PSD
UNION CARBIDE CORPORATION	LA	Sep-95	GENERATOR, GAS TURBINE	1,313 MM BTU/HR	25 PPMV CORR. TO 15% O	DRY LOW NOX COMBUSTOR	0	BACT-PSD
PUERTO RICO ELECTRIC POWER AUTHORITY (PREPA)	PR	Jul-95	COMBUSTION TURBINES (3), 83 MW SIMPLE-CYCLE EACH	248 MW	35 LB/HR AS NO2	STEAM INJECTION PLUS SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM. USE OF NO. 2 FUEL OIL WITH NITROGEN CONTENT NOT TO EXCEED 0.10% BY WEIGHT.	0	BACT-PSD
HIGGINSVILLE MUNICIPAL POWER FACILITY	MO	Jul-95	ADD OF A DUAL FUEL FIRED TWIN-PAC TURBINE	49 MW	42 PPM BY VOL 1 HR AVG (	CONTROLS TO REGULATE THE FUEL CONSUMPTION AND THE RATIO OF WATER TO FUEL BEING FIRED IN THE TURBINES	0	BACT-PSD
HIGGINSVILLE MUNICIPAL POWER FACILITY	MO	Jul-95	ADD OF A DUAL FUEL FIRED TWIN-PAC TURBINE	49 MW	75 PPM BY VOL 1 HR AVG (	CONTROLS TO REGULATE THE FUEL CONSUMPTION AND THE RATIO OF WATER TO FUEL BEING FIRED IN THE TURBINES	0	BACT-PSD
BROOKLYN NAVY YARD COGENERATION PARTNERS L.P.	NY	Jun-95	TURBINE, NATURAL GAS FIRED	240 MW	3.5 PPM @ 15% O2	SCR	0	LAER
PANDA-KATHLEEN, L.P.	FL	Jun-95	COMBINED CYCLE COMBUSTION TURBINE (TOTAL 115MW)	75 MW	15 PPM @ 15% O2	DRY LOW NOX BURNER	0	BACT-PSD
PROCTOR AND GAMBLE PAPER PRODUCTS CO (CHARMIN)	PA	May-95	TURBINE, NATURAL GAS	580 MMBTU/HR	55 PPM @ 15% O2	STEAM INJECTION	75	RACT
MILAGRO, WILLIAMS FIELD SERVICE	NM	May-95	TURBINE/COGEN, NATURAL GAS (2)	900 MMCF/DAY	9 PPM @ 15% O2	DRY LOW NOX (GENERAL ELECTRIC MODEL PG6541B)	94	BACT-PSD
GAINESVILLE REGIONAL UTILITIES	FL	Apr-95	SIMPLE CYCLE COMBUSTION TURBINE, GAS/NO 2 OIL B-UP	74 MW	15 PPM AT 15% OXYGEN	DRY LOW NOX BURNERS GE FRAME UNIT, CAN ANNULAR COMBUSTORS	0	BACT-PSD
GAINESVILLE REGIONAL UTILITIES	FL	Apr-95	OIL FIRED COMBUSTION TURBINE	74 MW	42 PPM AT 15% OXYGEN	WATER INJECTION	0	BACT-PSD
LEDERLE LABORATORIES	NY	Apr-95	(2) GAS TURBINES (EP #S 00101&102)	110 MMBTU/HR	42 PPM, 18 LB/HR	STEAM INJECTION	0	BACT-PSD
PILGRIM ENERGY CENTER	NY	Apr-95	(2) WESTINGHOUSE W501D5 TURBINES (EP #S 00001&2)	1,400 MMBTU/HR	4.5 PPM, 23.6 LB/HR	STEAM INJECTION FOLLOWED BY SCR	0	BACT
BALTIMORE GAS & ELECTRIC - PERRYMAN PLANT	MD	Mar-95	TURBINE, 140 MW NATURAL GAS FIRED ELECTRIC	140 MW	15 PPM @ 15% O2	DRY BURN LOW NOX BURNERS	91	BACT-PSD
FORMOSA PLASTICS CORPORATION, LOUISIANA	LA	Mar-95	TURBINE/HRSG, GAS COGENERATION	450 MM BTU/HR	9 PPMV	DRY LOW NOX BURNER/COMBUSTION DESIGN AND CONTROL	0	LAER
LSP-COTTAGE GROVE, L.P.	MN	Mar-95	COMBUSTION TURBINE/GENERATOR	1,970 MMBTU/HR	4.5 PPM @ 15% O2 GAS	SELECTIVE CATALYTIC REDUCTION (SCR)	70	BACT-PSD
EMPIRE DISTRICT ELECTRIC CO.	MO	Feb-95	INSTALL TWO NEW SIMPLE-CYCLE TURBINES	89 MW	360 TPY	WATER INJECTION.	0	BACT-PSD
MARATHON OIL CO. - INDIAN BASIN N.G. PLAN	NM	Jan-95	TURBINES, NATURAL GAS (2)	5,500 HP	7.4 LBS/HR	LEAN-PREMIXED COMBUSTION TECHNOLOGY. DRY/LOW NOX	66	BACT-PSD
KAMINE/BESICORP SYRACUSE LP	NY	Dec-94	SIEMENS V64.3 GAS TURBINE (EP #00001)	650 MMBTU/HR	25 PPM	WATER INJECTION	70	BACT
INDECK-OSWEGO ENERGY CENTER	NY	Oct-94	GE FRAME 6 GAS TURBINE	533 LB/MMBTU	42 PPM, 75.00 LB/HR	STEAM INJECTION	53	BACT
FULTON COGEN PLANT	NY	Sep-94	GE LM5000 GAS TURBINE	500 MMBTU/HR	36 PPM, 65 LB/HR	WATER INJECTION	59	BACT
CAROLINA POWER AND LIGHT	SC	Aug-94	STATIONARY GAS TURBINE	1,520 MMBTU/H	25 PPMDV @ 15% O2 (GAS)	WATER INJECTION	30	BACT-PSD
CAROLINA POWER AND LIGHT	SC	Aug-94	STATIONARY GAS TURBINE	1,520 MMBTU/H	62 PPMDV @ 15% O2 (OIL)	WATER INJECTION	30	BACT-PSD
BRUSH COGENERATION PARTNERSHIP	CO	Jul-94	TURBINE	350 MMBTU/H	25 PPM @ 15% O2	DRY LOW NOX BURNER	74	BACT-PSD
COLORADO POWER PARTNERSHIP	CO	Jul-94	TURBINES, 2 NAT GAS & 2 DUCT BURNERS	365 MMBTU/H EACH TURBIN	42 PPM @ 15% O2	WATER INJECTION	66	BACT-PSD
MUDDY RIVER L.P.	NV	Jun-94	COMBUSTION TURBINE, DIESEL & NATURAL GAS	140 MEGAWATT	303 LB/HR	LOW NOX BURNER	0	BACT-PSD
CSW NEVADA, INC.	NV	Jun-94	COMBUSTION TURBINE, DIESEL & NATURAL GAS	140 MEGAWATT	273 LB/HR	DRY LOW NOX COMBUSTOR	0	BACT-PSD
PORTLAND GENERAL ELECTRIC CO.	OR	May-94	TURBINES, NATURAL GAS (2)	1,720 MMBTU	4.5 PPM @ 15% O2	SCR	82	BACT-PSD
EMPIRE DISTRICT ELECTRIC CO.	MO	May-94	INSTALL TWO NEW SIMPLE-CYCLE TURBINES	1345 MMBTU/HR	25 PPM BY VOL 1 HR AVG (	LOW NOX BURNERS, AND WATER INJECTION	0	BACT-PSD
EMPIRE DISTRICT ELECTRIC CO.	MO	May-94	INSTALL TWO NEW SIMPLE-CYCLE TURBINES	1,345 MMBTU/HR	1,135 TPY (NO. 2 OIL)	LOW NOX BURNERS, AND WATER INJECTION	0	BACT-PSD
GEORGIA POWER COMPANY, ROBINS TURBINE PROJECT	GA	May-94	TURBINE, COMBUSTION, NATURAL GAS	80 MW	25 PPM	WATER INJECTION, FUEL SPEC: NATURAL GAS	0	BACT-PSD
WEST CAMPUS COGENERATION COMPANY	TX	May-94	GAS TURBINES	75 MW (TOTAL POWER)	200 TPY	INTERNAL COMBUSTION CONTROLS	0	BACT-PSD
FLEETWOOD COGENERATION ASSOCIATES	PA	Apr-94	NG TURBINE (GE LM6000) WITH WASTE HEAT BOILER	360 MMBTU/HR	21 LB/HR	SCR WITH LOW NOX COMBUSTORS	47	BACT-OTHER
HERMISTON GENERATING CO.	OR	Apr-94	TURBINES, NATURAL GAS (2)	1,696 MMBTU	4.5 PPM @ 15% O2	SCR	62	BACT-PSD
FLORIDA POWER CORPORATION POLK COUNTY SITE	FL	Feb-94	TURBINE, NATURAL GAS (2)	1,510 MMBTU/H	12 PPMVD @15 % O2	DRY LOW NOX COMBUSTOR	0	BACT-PSD
FLORIDA POWER CORPORATION POLK COUNTY SITE	FL	Feb-94	TURBINE, FUEL OIL (2)	1,730 MMBTU/H	42 PPMVD @ 15 %O2	WATER INJECTION	0	BACT-PSD
TECO POLK POWER STATION	FL	Feb-94	TURBINE, SYNGAS (COAL GASIFICATION)	1,755 MMBTU/H	25 PPMVD @ 15 % O2	DRY LOW NOX COMBUSTOR	0	BACT-PSD
TECO POLK POWER STATION	FL	Feb-94	TURBINE, FUEL OIL	1,765 MMBTU/H	42 PPMVD @ 15 % O2	WET INJECTION	0	BACT-PSD
INTERNATIONAL PAPER	LA	Feb-94	TURBINE/HRSG, GAS COGEN	338 MM BTU/HR TURBINE	25 PPMV 15% O2 TURBINE	DRY LOW NOX COMBUSTOR/COMBUSTION CONTROL	0	BACT
KAMINE/BESICORP CARTHAGE L.P.	NY	Jan-94	GE FRAME 6 GAS TURBINE	491 BTU/HR	42 PPM, 76.6 LB/HR	STEAM INJECTION	63	BACT
ORANGE COGENERATION LP	FL	Dec-93	TURBINE, NATURAL GAS, 2	368 MMBTU/H	15 PPM @ 15% O2	DRY LOW NOX COMBUSTOR	0	BACT-PSD
PROJECT ORANGE ASSOCIATES	NY	Dec-93	GE LM-5000 GAS TURBINE	550 MMBTU/HR	25 PPM, 47 LB/HR	STEAM INJECTION, FUEL SPEC; NATURAL GAS ONLY	80	BACT
WILLIAMS FIELD SERVICES CO. - EL CEDRO COMPRESSOR	NM	Oct-93	TURBINE, GAS-FIRED	11,257 HP	42 PPM @ 15% O2	SOLONOX COMBUSTOR, DRY LOW NOX TECHNOLOGY	66	BACT-PSD
FLORIDA GAS TRANSMISSION	FL	Sep-93	TURBINE, GAS	132 MMBTU/H	25 PPM @ 15% O2	DRY LOW NOX COMBUSTOR	0	BACT-PSD

Table B-2. Summary of Best Available Control Technology (BACT) Determinations for Nitrogen Oxide (NOx) Emissions

PATOWMACK POWER PARTNERS, LIMITED PARTNERSHIP	VA	Sep-93	TURBINE, COMBUSTION, SIEMENS MODEL V84.2, 3	10.2 X109 SCF/YR NAT GAS	131 LB/HR(GAS); 339 OIL	DRY LOW NOX COMBUSTOR; DESIGN, WATER INJECTION	0	BACT-PSD
FLORIDA GAS TRANSMISSION COMPANY	AL	Aug-93	TURBINE, NATURAL GAS	12,600 BHP	0.58 GM/HP HR	AIR-TO-FUEL RATIO CONTROL, DRY LOW NOX COMBUSTION	71	BACT-PSD
LOCKPORT COGEN FACILITY	NY	Jul-93	(6) GE FRAME 6 TURBINES (EP #S 00001-00006)	424 MMBTU/HR	42 PPM	STEAM INJECTION	78	BACT
ANITEC COGEN PLANT	NY	Jul-93	GE LM5000 COMBINED CYCLE GAS TURBINE EP #00001	451 MMBTU/HR	25 PPM, 41 LB/HR	NO CONTROLS	0	BACT-OTHER
NEWARK BAY COGENERATION PARTNERSHIP, L.P.	NJ	Jun-93	TURBINES, COMBUSTION, KEROSENE-FIRED (2)	640 MMBTU/H (EACH)	16 PPMDV	SCR	0	BACT-PSD
NEWARK BAY COGENERATION PARTNERSHIP, L.P.	NJ	Jun-93	TURBINES, COMBUSTION, NATURAL GAS-FIRED (2)	617 MMBTU/HR (EACH)	8.3 PPMDV	SCR	0	BACT-PSD
TIGER BAY LP	FL	May-93	TURBINE, OIL	1,850 MMBTU/H	42 PPM @ 15% O2	WATER INJECTION	0	BACT-PSD
TIGER BAY LP	FL	May-93	TURBINE, GAS	1,615 MMBTU/H	15 PPM @ 15% O2	DRY LOW NOX COMBUSTOR	0	BACT-PSD
INDECK ENERGY COMPANY	NY	May-93	GE FRAME 6 GAS TURBINE EP #00001	491 MMBTU/HR	32 PPM	STEAM INJECTION	58	BACT
PHOENIX POWER PARTNERS	CO	May-93	TURBINE (NATURAL GAS)	311 MMBTU/HR	22 PPM @ 15% O2	DRY LOW NOX COMBUSTION	0	BACT-OTHER
TRIGEN MITCHEL FIELD	NY	Apr-93	GE FRAME 6 GAS TURBINE	425 MMBTU/HR	60 PPM, 90 LB/HR	STEAM INJECTION	20	BACT
KISSIMMEE UTILITY AUTHORITY	FL	Apr-93	TURBINE, FUEL OIL	928 MMBTU/H	42 PPM @ 15% O2	WATER INJECTION	0	BACT-PSD
KISSIMMEE UTILITY AUTHORITY	FL	Apr-93	TURBINE, FUEL OIL	371 MMBTU/H	42 PPM @ 15% O2	WATER INJECTION	0	BACT-PSD
KISSIMMEE UTILITY AUTHORITY	FL	Apr-93	TURBINE, NATURAL GAS	869 MMBTU/H	15 PPM @ 15% O2	DRY LOW NOX COMBUSTOR	0	BACT-PSD
KISSIMMEE UTILITY AUTHORITY	FL	Apr-93	TURBINE, NATURAL GAS	367 MMBTU/H	15 PPM @ 15% O2	DRY LOW NOX COMBUSTOR	0	BACT-PSD
EAST KENTUCKY POWER COOPERATIVE	KY	Mar-93	TURBINES (5), #2 FUEL OIL AND NAT. GAS FIRED	1,492 MMBTU/H (EACH)	42 PPM @ 15% O2 (OIL)	WATER INJECTION	46	SEE NOTES
INTERNATIONAL PAPER CO. RIVERDALE MILL	AL	Jan-93	TURBINE, STATIONARY (GAS-FIRED) WITH DUCT BURNER	40 MW	0.08 LB/MMBTU (GAS)	LOW NOX BURNERS (ON THE DUCT BURNER) STEAM INJECTION INTO THE TURBINE	0	BACT-PSD
OKLAHOMA MUNICIPAL POWER AUTHORITY	OK	Dec-92	TURBINE, COMBUSTION	58 MW	65 PPM @ 15% O2 (OIL)	COMBUSTION CONTROLS	83	BACT-OTHER
OKLAHOMA MUNICIPAL POWER AUTHORITY	OK	Dec-92	TURBINE, COMBUSTION	58 MW	25 PPM @ 15% O2 (GAS)	COMBUSTION CONTROLS	83	BACT-OTHER
AUBURNDALE POWER PARTNERS, LP	FL	Dec-92	TURBINE, OIL	1,170 MMBTU/H	42 PPMVD @ 15 % 02	STEAM INJECTION	0	BACT-PSD
AUBURNDALE POWER PARTNERS, LP	FL	Dec-92	TURBINE,GAS	1,214 MMBTU/H	15 PPMVD @ 15 % O2	DRY LOW NOX COMBUSTOR	0	BACT-PSD
SITHE/INDEPENDENCE POWER PARTNERS	NY	Nov-92	TURBINES, COMBUSTION (4) (NATURAL GAS) (1012 MW)	2,133 MMBTU/HR (EACH)	4.5 PPM	SCR AND DRY LOW NOX	0	BACT-OTHER
KAMINE/BESICORP BEAVER FALLS COGENERATION FACILITY	NY	Nov-92	TURBINE, COMBUSTION (NAT. GAS & OIL FUEL) (79MW)	650 MMBTU/HR	9 PPM (GAS)	DRY LOW NOX OR SCR	0	BACT-OTHER
KAMINE/BESICORP BEAVER FALLS COGENERATION FACILITY	NY	Nov-92	TURBINE, COMBUSTION (NAT. GAS & OIL FUEL) (79MW)	650 MMBTU/HR	55 PPM (OIL)	DRY LOW NOX OR SCR	0	BACT-OTHER
KAMINE/BESICORP CORNING L.P.	NY	Nov-92	TURBINE, COMBUSTION (79 MW)	653 MMBTU/HR	9 PPM	DRY LOW NOX OR SCR	0	BACT-OTHER
GRAYS FERRY CO. GENERATION PARTNERSHIP	PA	Nov-92	TURBINE (NATURAL GAS & OIL)	1,150 MMBTU	9 PPMVD (NAT. GAS)*	DRY LOW NOX BURNER, COMBUSTION CONTROL	0	BACT-OTHER
GOAL LINE, LP ICEFLOE	CA	Nov-92	TURBINE, COMBUSTION (NATURAL GAS) (42.4 MW)	386 MMBTU/HR	5 PPMVD @ 15% OXYGEN	WATER INJECTION & SCR W/ AUTOMATIC AMMONIA INJECT.	88	BACT-OTHER
BEAR ISLAND PAPER COMPANY, L.P.	VA	Oct-92	TURBINE, COMBUSTION GAS	468 X10(6) BTU/HR #2 OIL	15 PPM	SCR	81	BACT-PSD
BEAR ISLAND PAPER COMPANY, L.P.	VA	Oct-92	TURBINE, COMBUSTION GAS (TOTAL)	0.0	69.7 TPY	SCR	0	BACT-PSD
BEAR ISLAND PAPER COMPANY, L.P.	VA	Oct-92	TURBINE, COMBUSTION GAS	474 X10(6) BTU/HR N. GAS	9 PPM	SELECTIVE CATALYTIC REDUCTION (SCR)	75	BACT-PSD
GORDONSVILLE ENERGY L.P.	VA	Sep-92	TURBINE FACILITY, GAS	7.4 X10(7) GPY FUEL OIL	245 TOTAL TPY	SELECTIVE CATALYTIC REDUCTION (SCR)	60	BACT-PSD
GORDONSVILLE ENERGY L.P.	VA	Sep-92	TURBINES (2) [EACH WITH A SF]	1.4 X10(9) BTU/H #2 OIL	66 LBS/HR/UNIT	WATER INJECTION AND SCR	80	BACT-PSD
GORDONSVILLE ENERGY L.P.	VA	Sep-92	TURBINE FACILITY, GAS	1,331 X10(7) SCF/Y NAT GAS	245 TOTAL TPY	SELECTIVE CATALYTIC REDUCTION (SCR) W/ WATER INJEC	80	BACT-PSD
GORDONSVILLE ENERGY L.P.	VA	Sep-92	TURBINES (2) [EACH WITH A SF]	1.5 X10(9) BTU/HR N GAS	9 PPMDV/UNIT @ 15% 02	SCR WITH WATER INJECTION	60	BACT-PSD
NEVADA POWER COMPANY, HARRY ALLEN PEAKING PLANT	NV	Sep-92	COMBUSTION TURBINE ELECTRIC POWER GENERATION	600 MW (8 UNITS 75 EACH)	88.6 TPY (EACH TURBINE)	LOW NOX COMBUSTOR	0	BACT-PSD
KAMINE SOUTH GLENS FALLS COGEN CO	NY	Sep-92	GE FRAME 6 GAS TURBINE	498 MMBTU/HR	42 PPM, 76.6 LB/HR	WATER INJECTION	50	BACT
NORTHERN STATES POWER COMPANY	SD	Sep-92	TURBINE, SIMPLE CYCLE, 4 EACH	129 MW	24 PPM @ 15% O2 GAS	WATER INJECTION FOR GAS & DISTILLATION	0	BACT-PSD
PASNY/HOLTSVILLE COMBINED CYCLE PLANT	NY	Sep-92	TURBINE, COMBUSTION GAS (150 MW)	1,146 MMBTU/HR (GAS)*	9 PPM (GAS)	DRY LOW NOX	0	BACT-OTHER
PASNY/HOLTSVILLE COMBINED CYCLE PLANT	NY	Sep-92	TURBINE, COMBUSTION GAS (150 MW)	1,146 MMBTU/HR (GAS)*	42 PPM (OIL)	WATER INJECTOR	0	BACT-OTHER
WEPCU, PARIS SITE	WI	Aug-92	TURBINES, COMBUSTION (4)	0.0	65 PPM @ 15% O2 (OIL)	GOOD COMBUSTION PRACTICES	0	BACT-PSD
WEPCU, PARIS SITE	WI	Aug-92	TURBINES, COMBUSTION (4)	0.0	25 PPM @ 15% O2 (GAS)	GOOD COMBUSTION PRACTICES	0	BACT-PSD
FLORIDA POWER CORPORATION	FL	Aug-92	TURBINE, OIL	1,029 MMBTU/H	42 PPMVD @ 15 % O2	WET INJECTION	0	BACT-PSD
FLORIDA POWER CORPORATION	FL	Aug-92	TURBINE, OIL	1,866 MMBTU/H	42 PPMVD @ 15 % O2	WET INJECTION	0	BACT-PSD
NORTHWEST PIPELINE COMPANY	WA	Aug-92	TURBINE, GAS-FIRED	12,100 HP	196 PPM @ 15% O2	ADVANCED DRY LOW NOX COMBUSTOR (BY 07/01/95)	76	BACT-PSD
CNG TRANSMISSION	OH	Aug-92	TURBINE (NATURAL GAS) (3)	5,500 HP (EACH)	1.6 G/HP-HR*	LOW NOX COMBUSTION	0	BACT-OTHER
SARANAC ENERGY COMPANY	NY	Jul-92	TURBINES, COMBUSTION (2) (NATURAL GAS)	1,123 MMBTU/HR (EACH)	9 PPM	SCR	0	BACT-OTHER
HARTWELL ENERGY LIMITED PARTNERSHIP	GA	Jul-92	TURBINE, OIL FIRED (2 EACH)	1,840 M BTU/HR	25 PPMVD, FUEL N AFLOW	MAXIMUM WATER INJECTION	0	BACT-PSD
MAUI ELECTRIC COMPANY, LTD./MAALAEA GENERATING STA	HI	Jul-92	TURBINE, COMBINED-CYCLE COMBUSTION	28 MW	42.3 LB/HR	WATER INJECTION	69	BACT-OTHER
HARTWELL ENERGY LIMITED PARTNERSHIP	GA	Jul-92	TURBINE, GAS FIRED (2 EACH)	1,817 M BTU/HR	25 PPM @ 15% O2	MAXIMUM WATER INJECTION	0	BACT-PSD
INDECK-YERKES ENERGY SERVICES	NY	Jun-92	GE FRAME 6 GAS TURBINE (EP #00001)	432 MMBTU/HR	42 PPM, 74 LB/HR	STEAM INJECTION	35	BACT
SELKIRK COGENERATION PARTNERS, L.P.	NY	Jun-92	COMBUSTION TURBINES (2) (252 MW)	1,173 MMBTU/HR (EACH)	9 PPM GAS	STEAM INJECTION AND SCR	0	BACT-OTHER
SELKIRK COGENERATION PARTNERS, L.P.	NY	Jun-92	COMBUSTION TURBINE (79 MW)	1,173 MMBTU/HR	25 PPM GAS	STEAM INJECTION	0	BACT-OTHER
NORTHWEST PIPELINE CORPORATION	CO	May-92	TURBINE, SOLAR TAURUS	45 MMBTU/HR	95 PPMVD (UNTIL 11/98)	DRY LOW NOX COMBUSTOR (BY 11/01/98)	0	BACT-PSD
NARRAGANSETT ELECTRIC/NEW ENGLAND POWER CO.	RI	Apr-92	TURBINE, GAS AND DUCT BURNER	1,360 MMBTU/H EACH	9 PPM @ 15% O2, GAS	SCR	0	BACT-PSD
KENTUCKY UTILITIES COMPANY	KY	Mar-92	TURBINE, #2 FUEL OIL/NATURAL GAS (8)	1,500 MM BTU/HR (EACH)	42 PPM @ 15% O2, N. GAS	WATER INJECTION	0	BACT-PSD
BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP	VA	Mar-92	TURBINE, COMBUSTION	1,175 MMBTU/H NAT. GAS	9 PPM @ 15% O2	SCR, STEAM INJECTION	91	BACT-PSD
BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP	VA	Mar-92	TURBINE, COMBUSTION	1,117 MMBTU/H NO2 FUEL OIL	15 PPM @ 15% O2	SCR, STEAM INJ.	91	BACT-PSD
BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP	VA	Mar-92	TURBINE, COMBUSTION, 2	0.0	191 T/YR/UNIT		0	BACT-PSD
THERMO INDUSTRIES, LTD.	CO	Feb-92	TURBINE, GAS FIRED, 5 EACH	246 MMBTU/H	25 PPM @ 15% D2	DRY LOW NOX TECH.	0	BACT-PSD
HAWAII ELECTRIC LIGHT CO., INC.	HI	Feb-92	TURBINE, FUEL OIL #2	20 MW	42.3 LB/HR	COMBUSTOR WATER INJECTOR, WATER INJECTION	70	BACT-PSD
SAVANNAH ELECTRIC AND POWER CO.	GA	Feb-92	TURBINES, 8	1,032 MMBTU/H, NAT GAS	25 PPM @ 15% O2	MAX WATER INJECTION	0	BACT-PSD
SAVANNAH ELECTRIC AND POWER CO.	GA	Feb-92	TURBINES, 8	972 MMBTU/H, #2 OIL	0 SEE NOTES	MAX WATER INJECTION	0	BACT-PSD
LINDEN COGENERATION TECHNOLOGY	NJ	Jan-92	TURBINE, NATURAL GAS FIRED	50 X E12 BTU/YR	33.8 LB/HR	STEAM INJECTION AND SCR	95	BACT-PSD
ALYESKA PIPELINE SERVICE COMPANY	AK	Jan-92	SOLAR CENTAUR, 3	800 KW	150 PPMVD @ 15% O2	LOW NOX BURNERS	0	NSPS
KAMINE/BESICORP NATURAL DAM LP	NY	Dec-91	GE FRAME 6 GAS TURBINE	500 MMBTU/HR	42 PPM, 80.1 LB/HR	STEAM INJECTION	35	BACT
DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION	NC	Dec-91	TURBINE, COMBUSTION	1,247 MM BTU/HR	287 LB/HR	MULTINOZZLE COMBUSTOR, MAXIMUM WATER INJECTION	0	BACT-PSD
DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION	NC	Dec-91	TURBINE, COMBUSTION	1,313 MM BTU/HR	119 LB/HR	MULTINOZZLE COMBUSTOR, MAXIMUM WATER INJECTION	0	BACT-PSD
MAUI ELECTRIC COMPANY, LTD.	HI	Dec-91	TURBINE, FUEL OIL #2	28 MW	42 PPM	WATER INJECTION	71	BACT-PSD
KALAMAZOO POWER LIMITED	MI	Dec-91	TURBINE, GAS-FIRED, 2, W/ WASTE HEAT BOILERS	1,806 MMBTU/H	15 PPMV	DRY LOW NOX TURBINES	0	BACT-PSD
LAKE COGEN LIMITED	FL	Nov-91	TURBINE, OIL, 2 EACH	42 MW	42 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
LAKE COGEN LIMITED	FL	Nov-91	TURBINE, GAS, 2 EACH	42 MW	25 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
SHELL PIPELINE CORPORATION	CA	Nov-91	GENERATOR, EMERGENCY, PROPANE FIRED	82 BHP	0.28 LB/H	3-WAY CATALYTIC CONVERTER	60	BACT-PSD
DE LA GUERRA POWER, INC	CA	Nov-91	ENGINE IC & GEN (1 OF 3)	380 HP	6.34 LB/D	NON-SELECTIVE CATALYTIC CONVERTER	90	BACT-PSD
ORLANDO UTILITIES COMMISSION	FL	Nov-91	TURBINE, GAS, 4 EACH	35 MW	42 PPM @ 15% O2	WET INJECTION	70	BACT-PSD
ORLANDO UTILITIES COMMISSION	FL	Nov-91	TURBINE, OIL, 4 EACH	35 MW	65 PPM @ 15% O2	WET INJECTION	0	BACT-PSD
SOUTHERN CALIFORNIA GAS	CA	Oct-91	TURBINE, GAS FIRED, SOLAR MODEL H	5,500 HP	8 PPM @ 15% O2	HIGH TEMP SELECT. CAT. REDUCTION	93	BACT-PSD
EL PASO NATURAL GAS	AZ	Oct-91	TURBINE, GAS, SOLAR CENTAUR H	5,500 HP	84.9 PPM @ 15% O2	LEAN BURN	0	NSPS
EL PASO NATURAL GAS	AZ	Oct-91	TURBINE, GAS, SOLAR CENTAUR H	5,500 HP	42 PPM @ 15% O2	DRY LOW NOX COMBUSTOR	51	BACT-PSD
EL PASO NATURAL GAS	AZ	Oct-91	TURBINE, GAS, SOLAR CENTAUR H	5,500 HP	85.1 PPM @ 15% O2	FUEL SPEC: LEAN FUEL MIX	0	NSPS
EL PASO NATURAL GAS	AZ	Oct-91	TURBINE, GAS, SOLAR CENTAUR H	5500 HP	42 PPM @ 15% O2	DRY LOW NOX COMBUSTOR	51	BACT-PSD
FLORIDA POWER GENERATION	FL	Oct-91	TURBINE, OIL, 6 EACH	93 MW	42 PPM @ 15% O2	WET INJECTION	0	BACT-PSD
EL PASO NATURAL GAS	AZ	Oct-91	TURBINE, NAT. GAS TRANSM., GE FRAME 3	12,000 HP	225 PPM @ 15% O2	LEAN BURN	0	BACT-PSD
EL PASO NATURAL GAS	AZ	Oct-91	TURBINE, NAT. GAS TRANSM., GE FRAME 3	12,000 HP	42 PPM @ 15% O2	DRY LOW NOX COMBUSTOR	80	BACT-PSD
NUGGET OIL CO.	CA	Oct-91	GENERATOR, STEAM, GAS FIRED	63 MMBTU/H	0.043 LB/MMBTU	LOW NOX BURNER AND FLUE GAS RECIRCULATION*	57	BACT-PSD
CAROLINA POWER AND LIGHT CO.	SC	Sep-91	TURBINE, I.C.	80 MW	292 LB/H	WATER INJECTION	50	BACT-PSD
ENRON LOUISIANA ENERGY COMPANY	LA	Aug-91	TURBINE, GAS, 2	39 MMBTU/H	40 PPM @ 15% O2	H2O INJECT 0.67 LB/LB	71	BACT-PSD
ALGONQUIN GAS TRANSMISSION CO.	RI	Jul-91	TURBINE, GAS, 2	49 MMBTU/H	100 PPM @ 15% O2	LOW NOX COMBUSTION	0	BACT-OTHER

Table B-2. Summary of Best Available Control Technology (BACT) Determinations for Nitrogen Oxide (NOx) Emissions

CHARLES LARSEN POWER PLANT	FL	Jul-91	TURBINE, OIL, 1 EACH	80 MW	42 PPM @ 15% O2	WET INJECTION	0	BACT-PSD
CHARLES LARSEN POWER PLANT	FL	Jul-91	TURBINE, GAS, 1 EACH	80 MW	25 PPM @ 15% O2	WET INJECTION	0	BACT-PSD
SUMAS ENERGY INC.	WA	Jun-91	TURBINE, NATURAL GAS	88 MW	6 PPM @ 15% O2	SCR	90	BACT-PSD
SAGUARO POWER COMPANY	NV	Jun-91	COMBUSTION TURBINE GENERATOR	35 MW	16.9 PPH (WINTER)	SELECTIVE CATALYTIC REDUCTION (SCR)	80	BACT-PSD
FLORIDA POWER AND LIGHT	FL	Jun-91	TURBINE, OIL, 2 EACH	400 MW	65 PPM @ 15% O2	LOW NOX COMBUSTORS	0	BACT-PSD
FLORIDA POWER AND LIGHT	FL	Jun-91	TURBINE, GAS, 4 EACH	400 MW	25 PPM @ 15% O2	LOW NOX COMBUSTORS	0	BACT-PSD
FLORIDA POWER AND LIGHT	FL	Jun-91	TURBINE, CO, 4 EACH	400 MW	42 PPM @ 15% O2	LOW NOX COMBUSTORS	0	BACT-PSD
GRANITE ROAD LIMITED	CA	May-91	TURBINE, GAS, ELECTRIC GENERATION	461 MMBTU/H*	3.5 PPMVD @ 15% O2	SCR, STEAM INJECTION	97	BACT-PSD
NORTHERN CONSOLIDATED POWER	PA	May-91	TURBINES, GAS, 2	35 KW EACH	25 PPM @ 15% O2	STEAM INJECTION/+SCR IN 1997	85	OTHER
CIMARRON CHEMICAL	CO	Mar-91	TURBINE #1, GE FRAME 6	33 MW	25 PPM @ 15% O2	WATER INJECTION	0	OTHER
CIMARRON CHEMICAL	CO	Mar-91	TURBINE #2, GE FRAME 6	33 MW	9 PPM @ 15% O2	SCR	0	OTHER
SEMINOLE FERTILIZER CORPORATION	FL	Mar-91	TURBINE, GAS	26 MW	9 PPM @ 15% O2	SCR	0	BACT-PSD
FLORIDA POWER AND LIGHT	FL	Mar-91	TURBINE, GAS, 4 EACH	240 MW	42 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
FLORIDA POWER AND LIGHT	FL	Mar-91	TURBINE, OIL, 4 EACH	0.0	65 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
CITY UTILITIES OF SPRINGFIELD	MO	Mar-91	GENERATION OF ELECTRICAL POWER	752 MMBTU/HR	42 PPM BY VOL 1 HR AVG (	WATER INJECTION	0	BACT-PSD
CITY UTILITIES OF SPRINGFIELD	MO	Mar-91	GENERATION OF ELECTRICAL POWER	752 MMBTU/HR	65 PPM BY VOL 1 HR AVG (	WATER INJECTION	0	BACT-PSD
CITY UTILITIES OF SPRINGFIELD	MO	Mar-91	GENERATION OF ELECTRICAL POWER	585 MMBTU/HR.	42 PPM BY VOL 1 HR AVG (	WATER INJECTION	0	BACT-PSD
CITY UTILITIES OF SPRINGFIELD	MO	Mar-91	GENERATION OF ELECTRICAL POWER	585 MMBTU/HR.	65 PPM BY VOL 1 HR AVG (	WATER INJECTION	0	BACT-PSD
NEVADA COGENERATION ASSOCIATES #2	NV	Jan-91	COMBINED-CYCLE POWER GENERATION	85 MW POWER OUTPUT	61.3 LBS/HR	SELECTIVE CATALYTIC SYSTEM ON ONE UNIT	0	BACT-PSD
NEVADA COGENERATION ASSOCIATES #1	NV	Jan-91	COMBINED-CYCLE POWER GENERATION	85 MW TOTAL OUTPUT	61.3 LBS/HR	SELECTIVE CATALYTIC SYSTEM ON ONE UNIT	0	BACT-PSD
NEWARK BAY COGENERATION PARTNERSHIP	NJ	Nov-90	TURBINE, NATURAL GAS FIRED	585 MMBTU/HR	0.033 LB/MMBTU	STEAM INJECTION AND SCR	94	BACT-PSD
NORTHERN NATURAL GAS COMPANY	*IA*	*Sep-90*	*ENGINE, COMPRESSOR*	*4,000 HP*	*1.8 G/B-HP-H*	*GOOD COMBUSTION PRACTICES*	0	BACT-PSD
NORTHERN NATURAL GAS COMPANY	IA	Sep-90	ENGINES, COMPRESSOR, 2	2,000 HP EACH	1.8 G/B-HP-H	GOOD COMBUSTION PRACTICES	0	BACT-PSD
TBG COGEN COGENERATION PLANT	NY	Aug-90	GE LM2500 GAS TURBINE	215 MMBTU/HR	75 PPM + FBN CORRECTIO	WATER INJECTION	60	BACT
PEPCO - CHALK POINT PLANT	MD	Jun-90	TURBINE, 105 MW NATURAL GAS FIRED ELECTRIC	105 MW	77 PPM @ 15% O2	DRY PREMIX AND WATER INJECTION	0	BACT-PSD
PEPCO - CHALK POINT PLANT	MD	Jun-90	TURBINE, 84 MW NATURAL GAS FIRED ELECTRIC	84 MW	25 PPM @ 15% O2	QUIET COMBUSTION AND WATER INJECTION	0	BACT-PSD
PACIFIC GAS TRANSMISSION COMPANY	OR	Jun-90	TURBINE GAS, COMPRESSOR STATION	110 MMBTU/HR	198 PPM @ 15% O2	LOW NOX BURNER DESIGN	30	NSPS
PEPCO - STATION A	MD	May-90	TURBINE, 124 MW NATURAL GAS FIRED	125 MW	42 PPM @ 15% O2	WATER INJECTION	0	BACT-PSD
PEDRICKTOWN COGENERATION LIMITED PARTNERSHIP	NJ	Feb-90	TURBINE, NATURAL GAS FIRED	1,000 MMBTU/HR	0.044 LB/MMBTU	STEAM INJECTION AND SCR	93	BACT-PSD
SC ELECTRIC AND GAS COMPANY - HAGOOD STATION	SC	Dec-89	INTERNAL COMBUSTION TURBINE	110 MEGAWATTS	308 LBS/HR	WATER INJECTION	0	BACT-PSD
PEABODY MUNICIPAL LIGHT PLANT	MA	Nov-89	TURBINE, 38 MW NATURAL FAS FIRED	412 MMBTU/HR	25 PPM @ 15% O2	WATER INJECTION	0	BACT-OTHER
PACIFIC GAS TRANSMITION	OR	Nov-89	TURBINE, NAT. GAS	14,600 HP	42 PPM @ 15% O2	LOW NOX BURNERS	75	BACT-PSD
SOUTHERN MARYLAND ELECTRIC COOPERATIVE (SMECO)	MD	Oct-89	TURBINE, NATURAL GAS FIRED ELECTRIC	90 MW	199 LB/HR	WATER INJECTION	0	BACT-PSD
KINGSBURG ENERGY SYSTEMS	CA	Sep-89	TURBINE, NATURAL GAS FIRED, DUCT BURNER	35 MW	6 PPM @ 15% O2	SCR, STEAM INJECTION	90	BACT-PSD
MEGAN-RACINE ASSOCIATES, INC	NY	Aug-89	GE LM5000-N COMBINED CYCLE GAS TURBINE	.401 LB/MMBTU	42 PPMDV @ 15% O2	WATER INJECTION	60	BACT

Note: PSD= Prevention of Significant Deterioration
BACT= Best Available Control Technology
LAER= Lowest Achievable Emission Rate

Table B-3. Capital Cost for Selective Catalytic Reduction for General Electric Frame "F" Simple Cycle Combustion Turbine

Cost Component	Costs	Basis of Cost Component
Direct Capital Costs		
SCR Associated Equipment	$825,252	Vendor Based Estimate
Ammonia Storage Tank	$134,225	$35 per 1,000 lb mass flow developed from vendor quotes
Flue Gas Cooling	$260,000	Vendor Based Estimate (110,000 acfm)
Instrumentation	$82,525	10% of SCR Associated Equipment
Taxes	$197,007	6% of SCR Associated Equipment and Catalyst
Freight	$164,172	5% of SCR Associated Equipment and Catalyst
Total Direct Capital Costs (TDCC)	$1,663,182	
Recurring Capital Costs (RCC)	$2,458,197	Catalyst; Vendor Based Estimate
TOTAL CAPITAL COSTS (TCC)	$2,919,595	Sum of TDCC and RCC
Direct Installation Costs		
Foundation and supports	$329,710	8% of TCC; OAQPS Cost Control Manual
Handling & Erection	$576,993	14% of TCC; OAQPS Cost Control Manual
Electrical	$164,855	4% of TCC; OAQPS Cost Control Manual
Piping	$82,428	2% of TCC; OAQPS Cost Control Manual
Insulation for ductwork	$41,214	1% of TCC; OAQPS Cost Control Manual
Painting	$41,214	1% of TCC; OAQPS Cost Control Manual
Site Preparation	$5,000	Engineering Estimate
Buildings	$15,000	Engineering Estimate
Total Direct Installation Costs (TDIC)	$1,256,414	
Total Direct Capital Costs (TDCC)	$4,176,009	
Indirect Costs		
Engineering	$291,960	10% of Total Capital Costs; OAQPS Cost Control Manual
PSM/RMP Plan	$25,000	Engineering Estimate
Construction and Field Expense	$145,980	5% of Total Capital Costs; OAQPS Cost Control Manual
Contractor Fees	$291,960	10% of Total Capital Costs; OAQPS Cost Control Manual
Start-up	$58,392	2% of Total Capital Costs; OAQPS Cost Control Manual
Performance Tests	$29,196	1% of Total Capital Costs; OAQPS Cost Control Manual
Allowance for Funds Used During Construction (AFU	$157,111	2.5% of Total Capital Costs; borrowed at a rate of 7.0% for 9 months.
Contingencies	$87,588	3% of Total Capital Costs; OAQPS Cost Control Manual
TOTAL INDIRECT CAPITAL COST (TICC)	$1,087,185	
TOTAL DIRECT and INDIRECT CAPITAL COSTS (TDICC)	$5,263,194	Sum of TDCC and TDIC

Table B-4. Annualized Cost for Selective Catalytic Reduction for General Electric Frame "F" Simple Cycle Operation

Cost Component	Costs	Basis of Cost Component
Direct Annual Costs		
Operating Personnel	$24,960	24 hours/week at $20/hr
Supervision	$3,744	15% of Operating Personnel;OAQPS Cost Control Manual
Maintenance - Labor	$13,104	0.5 hr per shift, $24/hr; OAQPS Cost Manual
- Materials	$13,104	100% of maintenance labor; OAQPS Cost Manual
Ammonia	$65,856	$300 per ton NH3 Aqueous
PSM/RMP Update	$5,000	Engineering Estimate
Inventory Cost	$89,970	Capital Recovery (10.98%) for 1/3 catalyst
Catalyst Disposal Cost	$35,793	$28/1,000 lb/hr mass flow over 3 years; developed from vendor quotes
Contingency	$7,546	3% of Direct Annual Costs
Total Direct Annual Costs (TDAC)	$259,078	
Energy Costs		
Electrical	$47,460	80kW/h for SCR; 200 kW/h for cooling fan@ $0.05/kWh times Capacity Factor
Heat Rate Penalty	$241,210	0.5% of MW output; EPA, 1993 (Page 6-20); plus fuel costs at $3/mmBtu
MW Loss Penalty	$78,611	3 days lost energy costs @ $0.05 kWh each three period; minus fuel costs at $3/mmBtu
Fuel Escalation	$8,660	Escalation of fuel over inflation; 3% of energy costs
Contingency	$11,278	3% of Energy Costs
Total Energy Costs (TEC)	$387,219	
Indirect Annual Costs		
Overhead	$17,222	60% of Operating/Supervision Labor and Ammonia
Property Taxes, Insurance, Admin.	$210,528	4% of Total Capital Costs
Annualized Total Direct Capital	$439,944	10.98% Capital Recovery Factor of 7% over 15 years times sum of TDCC, TDIC and TI
Annualized Total Direct Recurring	$936,700	38.11% Capital Recovery Factor of 7% over 3 years times RCC
Total Indirect Annual Costs (TIAC)	$1,604,395	
TOTAL ANNUALIZED COSTS	$2,250,692	Sum of TDAC, TEC and TIAC
COST EFFECTIVENESS ($ per ton removed)	$14,886	NO_x Only
	$25,267	All Pollutants

Table B-5. Summary of Best Available Control Technology (BACT) Determinations for Carbon Monoxide (CO) Emissions

Facility Name	State	Permit Issue Date	Unit/Process Description	Capacity (size)	CO Emission Limit	Control Method	Efficiency (%)	Type
BUCKNELL UNIVERSITY	PA	Nov-97	NG FIRED TURBINE, SOLAR TAURUS T-7300S	5 MW	50 PPMV@15%O2	GOOD COMBUSTION	0	BACT-OTHER
LORDSBURG L.P.	NM	Jun-97	TURBINE, NATURAL GAS-FIRED, ELEC. GEN.	100 MW	27 LBS/HR	DRY LOW-NOX TECHNOLOGY BY MAINTAINING PROPER AIR- FUEL RATIO.	0	BACT-PSD
MEAD COATED BOARD, INC.	AL	Mar-97	COMBINED CYCLE TURBINE (25 MW)	568 MMBTU/HR	26 PPMVD@15% O2 (GAS)	PROPER DESIGN AND GOOD COMBUSTION PRACTICES	0	BACT-PSD
FORMOSA PLASTICS CORPORATION, BATON ROUGE PLANT	LA	Mar-97	TURBINE/HSRG, GAS COGENERATION	450 MM BTU/HR	70 LB/HR	COMBUSTION DESIGN AND CONSTRUCTION.	0	BACT-PSD
SOUTHWESTERN PUBLIC SERVICE COMPANY/CUNNINGHAM STA	NM	Feb-97	COMBUSTION TURBINE, NATURAL GAS	100 MW	0 SEE FACILITY NOTES	GOOD COMBUSTION PRACTICES	0	BACT-PSD
SOUTHWESTERN PUBLIC SERVICE CO/CUNNINGHAM STATION	NM	Nov-96	COMBUSTION TURBINE, NATURAL GAS	100 MW	0 SEE P2	GOOD COMBUSTION PRACTICES	0	BACT-PSD
ECOELECTRICA, L.P.	PR	Oct-96	TURBINES, COMBINED-CYCLE COGENERATION	461 MW	33 PPMDV	COMBUSTION CONTROLS.	0	BACT-PSD
ECOELECTRICA, L.P.	PR	Oct-96	TURBINES, COMBINED-CYCLE COGENERATION	461 MW	100 PPMDV AT MIN. LOAD	COMBUSTION CONTROLS.	0	BACT-PSD
BLUE MOUNTAIN POWER, LP	PA	Jul-96	COMBUSTION TURBINE WITH HEAT RECOVERY BOILER	153 MW	3.1 PPM @ 15% O2	OXIDATION CATALYST 16 PPM @ 15% O2 WHEN FIRING NO. 2 OIL. AT 75% NG LIMIT SET TO 22.1 PPM	80	OTHER
COMMONWEALTH CHESAPEAKE CORPORATION	VA	May-96	3 COMBUSTION TURBINES (OIL-FIRED)	6,000 HRS/YR	96 TPY	GOOD COMBUSTION OPERATING PRACTICES	0	BACT/NSPS
PORTSIDE ENERGY CORP.	IN	May-96	TURBINE, NATURAL GAS-FIRED	63 MEGAWATT	40 LBS/HR	GOOD COMBUSTION AND EMISSIONS NOT TO EXCEED 40 PPMVD AT 15% OXYGEN.	0	BACT-PSD
PORTSIDE ENERGY CORP.	IN	May-96	TURBINE, NATURAL GAS-FIRED	63 MEGAWATT	12 LBS/HR	GOOD COMBUSTION AND EMISSIONS NOT TO EXCEED 10 PPMVD AT 15% OXYGEN.	0	BACT-PSD
GENERAL ELECTRIC GAS TURBINES	SC	Apr-96	I.C. TURBINE	2,700 MMBTU/HR	27,169 LB/HR	GOOD COMBUSTION PRACTICES TO MINIMIZE EMISSIONS	0	BACT-PSD
CAROLINA POWER & LIGHT	NC	Apr-96	COMBUSTION TURBINE, 4 EACH	1,908 MMBTU/HR	81 LB/HR	COMBUSTION CONTROL	0	BACT-PSD
CAROLINA POWER & LIGHT	NC	Apr-96	COMBUSTION TURBINE, 4 EACH	1,908 MMBTU/HR	80 LB/HR	COMBUSTION CONTROL	0	BACT-PSD
SOUTH MISSISSIPPI ELECTRIC POWER ASSOC.	MS	Apr-96	COMBUSTION TURBINE, COMBINED CYCLE	1,299 MMBTU/HR NAT GAS	26.3 PPM @ 15% O2, GAS	GOOD COMBUSTION CONTROLS	0	BACT-PSD
MID-GEORGIA COGEN.	GA	Apr-96	COMBUSTION TURBINE (2), FUEL OIL	116 MW	30 PPMVD	COMPLETE COMBUSTION	0	BACT-PSD
MID-GEORGIA COGEN.	GA	Apr-96	COMBUSTION TURBINE (2), NATURAL GAS	116 MW	10 PPMVD	COMPLETE COMBUSTION	0	BACT-PSD
GEORGIA GULF CORPORATION	LA	Mar-96	GENERATOR, NATURAL GAS FIRED TURBINE	1,123 MM BTU/HR	972 TPY CAP FOR 3 TURB.	GOOD COMBUSTION PRACTICE AND PROPER OPERATION	0	BACT-PSD
SEMINOLE HARDEE UNIT 3	FL	Jan-96	COMBINED CYCLE COMBUSTION TURBINE	140 MW	20 PPM (NAT. GAS)	DRY LNB GOOD COMBUSTION PRACTICES	0	BACT-PSD
KEY WEST CITY ELECTRIC SYSTEM	FL	Sep-95	TURBINE, EXISTING CT RELOCATION TO A NEW PLANT	23 MW	20 PPM @ 15% O2 FULL LD,	GOOD COMBUSTION	0	BACT-PSD
UNION CARBIDE CORPORATION	LA	Sep-95	GENERATOR, GAS TURBINE	1,313 MM BTU/HR	199 LB/HR	NO ADD-ON CONTROL GOOD COMBUSTION PRACTICE	0	BACT-PSD
PUERTO RICO ELECTRIC POWER AUTHORITY (PREPA)	PR	Jul-95	COMBUSTION TURBINES (3), 83 MW SIMPLE-CYCLE EAC	248 MW	20 LB/HR	MAINTAIN EACH TURBINE IN GOOD WORKING ORDER AND IMPLEMENT GOOD COMBUSTION PRACTICES.	0	BACT-PSD
PUERTO RICO ELECTRIC POWER AUTHORITY (PREPA)	PR	Jul-95	COMBUSTION TURBINES (3), 83 MW SIMPLE-CYCLE EAC	248 MW	104 LB/HR	MAINTAIN EACH TURBINE IN GOOD WORKING ORDER AND IMPLEMENT GOOD COMBUSTION PRACTICES.	0	BACT-PSD
BROOKLYN NAVY YARD COGENERATION PARTNERS L.P.	NY	Jun-95	TURBINE, NATURAL GAS FIRED	240 MW	4 PPM @ 15% O2		0	LAER
PANDA-KATHLEEN, L.P.	FL	Jun-95	COMBINED CYCLE COMBUSTION TURBINE (TOTAL 115M	75 MW	25 PPM @ 15% O2	COMBUSTION CONTROLS STANDARD ONLY APPLIES IF GE CT IS SELECTED, THE ABB CT WAS LESS THAN SIGNIFICANT EMIS. INCR FOR CO	0	BACT-PSD
MILAGRO, WILLIAMS FIELD SERVICE	NM	May-95	TURBINE/COGEN, NATURAL GAS (2)	900 MMCF/DAY	28 PPM @ 15% O2		0	BACT-PSD
LEDERLE LABORATORIES	NY	Apr-95	(2) GAS TURBINES (EP #S 00101&102)	110 MMBTU/HR	48 PPM, 12.6 LB/HR		0	BACT-OTHER
PILGRIM ENERGY CENTER	NY	Apr-95	(2) WESTINGHOUSE W501DS TURBINES (EP #S 00001&2)	1,400 MMBTU/HR	10 PPM, 29.0 LB/HR		0	BACT-OTHER
BALTIMORE GAS & ELECTRIC - PERRYMAN PLANT	MD	Mar-95	TURBINE, 140 MW NATURAL GAS FIRED ELECTRIC	140 MW	20 PPM @ 15% O2	GOOD COMBUSTION PRACTICES	0	BACT-PSD
FORMOSA PLASTICS CORPORATION, LOUISIANA	LA	Mar-95	TURBINE/HRSG, GAS COGENERATION	450 MM BTU/HR	26 LB/HR	PROPER OPERATION	0	BACT-PSD
EMPIRE DISTRICT ELECTRIC CO.	MO	Feb-95	INSTALL TWO NEW SIMPLE-CYCLE TURBINES	89 MW	428 TPY	GOOD COMBUSTION CONTROL	0	BACT-PSD
MARATHON OIL CO. - INDIAN BASIN N.G. PLAN	NM	Jan-95	TURBINES, NATURAL GAS (2)	5,500 HP	13 LBS/HR	LEAN-PREMIXED COMBUSTION TECHNOLOGY.	68	BACT-PSD
KAMINE/BESICORP SYRACUSE LP	NY	Dec-94	SIEMENS V64.3 GAS TURBINE (EP #00001)	650 MMBTU/HR	9.5 PPM	NO CONTROLS	0	BACT-OTHER
INDECK-OSWEGO ENERGY CENTER	NY	Oct-94	GE FRAME 6 GAS TURBINE	533 LB/MMBTU	10 PPM, 10.00 LB/HR	NO CONTROLS	0	BACT-OTHER
FULTON COGEN PLANT	NY	Sep-94	GE LM5000 GAS TURBINE	500 MMBTU/HR	107 PPM, 120 LB/HR	NO CONTROLS	0	BACT-OTHER
CAROLINA POWER AND LIGHT	SC	Aug-94	STATIONARY GAS TURBINE	1,520 MMBTU/H	702 LB/H	PROPER OPERATION TO ACHIEVE GOOD COMBUSTION	0	BACT-PSD
CAROLINA POWER AND LIGHT	SC	Aug-94	STATIONARY GAS TURBINE	1,520 MMBTU/H	414 LB/H	PROPER OPERATION TO ACHIEVE GOOD COMBUSTION	0	BACT-PSD
SNYDER OIL CORPORATION-RIVERTON DOME GAS PLANT	WY	Jul-94	NATURAL GAS-FIRED COMPRESSOR ENGINE	520 HORSEPOWER	1.7 LBS/HR	GOOD COMBUSTION	0	BACT
SNYDER OIL CORPORATION-RIVERTON DOME GAS PLANT	WY	Jul-94	2 GAS-FIRED GENERATOR ENGINES	365 HORSEPOWER	1.3 LBS/HR	GOOD COMBUSTION	0	BACT
SNYDER OIL CORPORATION-RIVERTON DOME GAS PLANT	WY	Jul-94	1 GAS-FIRED GENERATOR ENGINE	577 HORSEPOWER	1.9 LBS/HR	GOOD COMBUSTION	0	BACT
COLORADO POWER PARTNERSHIP	CO	Jul-94	TURBINES, 2 NAT GAS & 2 DUCT BURNERS	385 MMBTU/H EACH TURBINE	22 PPM @ 15% O2		0	BACT-PSD
MUDDY RIVER L.P.	NV	Jun-94	COMBUSTION TURBINE, DIESEL & NATURAL GAS	140 MEGAWATT	77 LB/HR	FUEL SPEC: NATURAL GAS	0	BACT-PSD
CSW NEVADA, INC.	NV	Jun-94	COMBUSTION TURBINE, DIESEL & NATURAL GAS	140 MEGAWATT	83 LB/HR	FUEL SPEC: NATURAL GAS	0	BACT-PSD
PORTLAND GENERAL ELECTRIC CO.	OR	May-94	TURBINES, NATURAL GAS (2)	1,720 MMBTU	15 PPM @ 15% O2	GOOD COMBUSTION PRACTICES	0	BACT-PSD
EMPIRE DISTRICT ELECTRIC CO.	MO	May-94	INSTALL TWO NEW SIMPLE-CYCLE TURBINES	1,345 MMBTU/HR	120 TPY	NONE	0	BACT-PSD
EMPIRE DISTRICT ELECTRIC CO.	MO	May-94	INSTALL TWO NEW SIMPLE-CYCLE TURBINES	1,345 MMBTU/HR	1200 TPY	NONE	0	BACT-PSD
NAVY PUBLIC WORKS CENTER	VA	May-94	1 EMERGENCY GENERATOR	1,500 KW	14.4 TPY	RETARD TIMING 6 DEGREES	0	NSPS
WEST CAMPUS COGENERATION COMPANY	TX	May-94	GAS TURBINES	75 MW (TOTAL POWER)	300 TPY	INTERNAL COMBUSTION CONTROLS	0	BACT
HERMISTON GENERATING CO.	OR	Apr-94	TURBINES, NATURAL GAS (2)	1,696 MMBTU	15 PPM @ 15% O2	GOOD COMBUSTION PRACTICES	0	BACT-PSD
FLORIDA POWER CORPORATION POLK COUNTY SITE	FL	Feb-94	TURBINE, NATURAL GAS (2)	1,510 MMBTU/H	25 PPMVD	GOOD COMBUSTION PRACTICES	0	BACT-PSD
FLORIDA POWER CORPORATION POLK COUNTY SITE	FL	Feb-94	TURBINE, FUEL OIL (2)	1,730 MMBTU/H	30 PPMVD	GOOD COMBUSTION PRACTICES	0	BACT-PSD
TECO POLK POWER STATION	FL	Feb-94	TURBINE, SYNGAS (COAL GASIFICATION)	1,755 MMBTU/H	25 PPMVD	GOOD COMBUSTION	0	BACT-PSD
TECO POLK POWER STATION	FL	Feb-94	TURBINE, FUEL OIL	1,765 MMBTU/H	40 PPMVD	GOOD COMBUSTION	0	BACT-PSD
INTERNATIONAL PAPER	LA	Feb-94	TURBINE/HRSG, GAS COGEN	338 MM BTU/HR TURBINE	166 LB/HR	COMBUSTION CONTROL	0	BACT
KAMINE/BESICORP CARTHAGE L.P.	NY	Jan-94	GE FRAME 6 GAS TURBINE	491 BTU/HR	10 PPM, 11.0 LB/HR	NO CONTROLS	0	BACT-OTHER
ORANGE COGENERATION LP	FL	Dec-93	TURBINE, NATURAL GAS, 2	368 MMBTU/H	30 PPMVD	GOOD COMBUSTION	0	BACT-PSD
PROJECT ORANGE ASSOCIATES	NY	Dec-93	GE LM-5000 GAS TURBINE	550 MMBTU/HR	92 LB/HR TEMP > 20F	NO CONTROLS	0	BACT-OTHER
WILLIAMS FIELD SERVICES CO. - EL CEDRO COMPRESSOR	NM	Oct-93	TURBINE, GAS-FIRED	11,257 HP	50 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
PATOWMACK POWER PARTNERS, LIMITED PARTNERSHIP	VA	Sep-93	TURBINE, COMBUSTION, SIEMENS MODEL V84.2, 3	10.2 X109 SCF/YR NAT GAS	26 LB/HR	GOOD COMBUSTION OPERATING PRACTICES	0	BACT-PSD
FLORIDA GAS TRANSMISSION COMPANY	AL	Aug-93	TURBINE, NATURAL GAS	12,600 BHP	0.42 GM/HP HR	AIR-TO-FUEL RATIO CONTROL, DRY COMBUSTION CONTROLS	0	BACT-PSD
LOCKPORT COGEN FACILITY	NY	Jul-93	(6) GE FRAME 6 TURBINES (EP #S 00001-00006)	424 MMBTU/HR	10 PPM	NO CONTROLS	0	BACT-OTHER
ANITEC COGEN PLANT	NY	Jul-93	GE LM5000 COMBINED CYCLE GAS TURBINE EP #00001	451 MMBTU/HR	36 PPM, 33 LB/HR	BAFFLE CHAMBER	60	SEE NOTE #4
NEWARK BAY COGENERATION PARTNERSHIP, L.P.	NJ	Jun-93	TURBINES, COMBUSTION, KEROSENE-FIRED (2)	640 MMBTU/H (EACH)	2.6 PPMDV	OXIDATION CATALYST	0	OTHER
NEWARK BAY COGENERATION PARTNERSHIP, L.P.	NJ	Jun-93	TURBINES, COMBUSTION, NATURAL GAS-FIRED (2)	617 MMBTU/HR (EACH)	1.8 PPMDV	OXIDATION CATALYST	0	OTHER
PSI ENERGY, INC. WABASH RIVER STATION	IN	May-93	COMBINED CYCLE SYNGAS TURBINE	1,775 MMBTU/HR	15 LESS THAN PPM	OPERATION PRACTICES AND GOOD COMBUSTION, COMBINED CYCLE SYNGAS TURBINE	0	BACT-PSD
TIGER BAY LP	FL	May-93	TURBINE, OIL	1,650 MMBTU/H	96.4 LB/H	GOOD COMBUSTION PRACTICES	0	BACT-PSD
TIGER BAY LP	FL	May-93	TURBINE, GAS	1,615 MMBTU/H	49 LB/H	GOOD COMBUSTION PRACTICES	0	BACT-PSD
INDECK ENERGY COMPANY	NY	May-93	GE FRAME 6 GAS TURBINE EP #00001	491 MMBTU/HR	40 PPM	NO CONTROLS	0	BACT-OTHER
TRIGEN MITCHEL FIELD	NY	Apr-93	GE FRAME 6 GAS TURBINE	425 MMBTU/HR	10 PPM, 10.0 LB/HR	NO CONTROLS	0	BACT-OTHER
KISSIMMEE UTILITY AUTHORITY	FL	Apr-93	TURBINE, FUEL OIL	926 MMBTU/H	65 LB/H	GOOD COMBUSTION PRACTICES	0	BACT-PSD
KISSIMMEE UTILITY AUTHORITY	FL	Apr-93	TURBINE, FUEL OIL	371 MMBTU/H	76 LB/H	GOOD COMBUSTION PRACTICES	0	BACT-PSD
KISSIMMEE UTILITY AUTHORITY	FL	Apr-93	TURBINE, NATURAL GAS	869 MMBTU/H	54 LB/H	GOOD COMBUSTION PRACTICES	0	BACT-PSD
KISSIMMEE UTILITY AUTHORITY	FL	Apr-93	TURBINE, NATURAL GAS	367 MMBTU/H	40 LB/H	GOOD COMBUSTION PRACTICES	0	BACT-PSD
EAST KENTUCKY POWER COOPERATIVE	KY	Mar-93	TURBINES (5), #2 FUEL OIL AND NAT. GAS FIRED	1,492 MMBTU/H (EACH)	75 LBS/H (EACH)	PROPER COMBUSTION TECHNIQUES	0	BACT-OTHER
INTERNATIONAL PAPER CO. RIVERDALE MILL	AL	Jan-93	TURBINE, STATIONARY (GAS-FIRED) WITH DUCT BURNE	40 MW	22 LB/HR	DESIGN	0	BACT-PSD
AUBURNDALE POWER PARTNERS, LP	FL	Dec-92	TURBINE, OIL	1,170 MMBTU/H	25 PPMVD	GOOD COMBUSTION PRACTICES	0	BACT-PSD
AUBURNDALE POWER PARTNERS, LP	FL	Dec-92	TURBINE,GAS	1,214 MMBTU/H	15 PPMVD	GOOD COMBUSTION PRACTICES	0	BACT-PSD
SITHE/INDEPENDENCE POWER PARTNERS	NY	Nov-92	TURBINES, COMBUSTION (4) (NATURAL GAS) (1012 MW)	2,133 MMBTU/HR (EACH)	13 PPM	COMBUSTION CONTROLS	0	BACT-OTHER
KAMINE/BESICORP BEAVER FALLS COGENERATION FACILITY	NY	Nov-92	TURBINE, COMBUSTION (NAT. GAS & OIL FUEL) (79MW)	650 MMBTU/HR	9.5 PPM	COMBUSTION CONTROLS	0	BACT-OTHER
GRAYS FERRY CO. GENERATION PARTNERSHIP	PA	Nov-92	TURBINE (NATURAL GAS & OIL)	1,150 MMBTU	0.0055 LB/MMBTU (GAS)*	COMBUSTION	0	BACT-OTHER
BEAR ISLAND PAPER COMPANY, L.P.	VA	Oct-92	TURBINE, COMBUSTION GAS	468 X10(6) BTU/HR #2 OIL	11 LBS/HR	GOOD COMBUSTION	0	BACT-PSD
BEAR ISLAND PAPER COMPANY, L.P.	VA	Oct-92	TURBINE, COMBUSTION GAS (TOTAL)	0	46 TPY	GOOD COMBUSTION	0	BACT-PSD

Table B-5. Summary of Best Available Control Technology (BACT) Determinations for Carbon Monoxide (CO) Emissions

Facility Name	State	Permit Issue Date	Unit/Process Description	Capacity (size)	CO Emission Limit	Control Method	Efficiency (%)	Type
BEAR ISLAND PAPER COMPANY, L.P.	VA	Oct-92	TURBINE, COMBUSTION GAS	474 X10(6) BTU/HR N. GAS	11 LBS/HR	GOOD COMBUSTION	0	BACT-PSD
PHILADELPHIA SOUTHWEST WATER TREATMENT PLANT	PA	Oct-92	ENGINES (2) (NATURAL GAS)	443 KW (EACH)	0	LEAN BURN ENGINE	0	OTHER
PHILADELPHIA NORTHEAST WATER TREATMENT PLANT	PA	Oct-92	ENGINES (3) (NATURAL GAS)	443 KW (EACH)	0	LEAN BURN ENGINE	0	OTHER
GORDONSVILLE ENERGY L.P.	VA	Sep-92	TURBINE FACILITY, GAS	7.44 X10(7) GPY FUEL OIL	250 TOTAL TPY	GOOD COMBUSTION PRACTICES	0	BACT-PSD
GORDONSVILLE ENERGY L.P.	VA	Sep-92	TURBINES (2) [EACH WITH A SF]	1.36 X10(9) BTU/H #2 OIL	68 LBS/HR/UNIT	GOOD COMBUSTION PRACTICES	0	BACT-PSD
GORDONSVILLE ENERGY L.P.	VA	Sep-92	TURBINE FACILITY, GAS	1,331 X10(7) SCF/Y NAT GAS	250 TOTAL TPY	GOOD COMBUSTION PRACTICES	0	BACT-PSD
GORDONSVILLE ENERGY L.P.	VA	Sep-92	TURBINES (2) [EACH WITH A SF]	1.51 X10(9) BTU/HR N GAS	57 LBS/HR/UNIT	GOOD COMBUSTION PRACTICES	0	BACT-PSD
NEVADA POWER COMPANY, HARRY ALLEN PEAKING PLANT	NV	Sep-92	COMBUSTION TURBINE ELECTRIC POWER GENERATION	600 MW (8 UNITS 75 EACH)	153 TPY (EACH TURBINE)	PRECISION CONTROL FOR THE LOW NOX COMBUSTOR	0	BACT-PSD
KAMINE SOUTH GLENS FALLS COGEN CO	NY	Sep-92	GE FRAME 6 GAS TURBINE	498 MMBTU/HR	9 PPM, 11.0 LB/HR	NO CONTROLS	0	BACT-OTHER
NORTHERN STATES POWER COMPANY	SD	Sep-92	TURBINE, SIMPLE CYCLE, 4 EACH	129 MW	50 PPM FOR GAS	GOOD COMBUSTION TECHNIQUES	0	BACT-PSD
PASNY/HOLTSVILLE COMBINED CYCLE PLANT	NY	Sep-92	TURBINE, COMBUSTION GAS (150 MW)	1,148 MMBTU/HR (GAS)*	6.5 PPM	COMBUSTION CONTROL	0	BACT-OTHER
WEPCU, PARIS SITE	WI	Aug-92	TURBINES, COMBUSTION (4)	0	25 LBS/HR (SEE NOTES)		0	BACT-PSD
FLORIDA POWER CORPORATION	FL	Aug-92	TURBINE, OIL	1,029 MMBTU/H	54 LB/H	GOOD COMBUSTION PRACTICES	0	BACT-PSD
FLORIDA POWER CORPORATION	FL	Aug-92	TURBINE, OIL	1,866 MMBTU/H	79 LB/H	GOOD COMBUSTION PRACTICES	0	BACT-PSD
CNG TRANSMISSION	OH	Aug-92	TURBINE (NATURAL GAS) (3)	5,500 HP (EACH)	0.015 G/HP-HR	FUEL SPEC: USE OF NATURAL GAS	0	OTHER
SARANAC ENERGY COMPANY	NY	Jul-92	TURBINES, COMBUSTION (2) (NATURAL GAS)	1,123 MMBTU/HR (EACH)	3 PPM	OXIDATION CATALYST	0	BACT-OTHER
HARTWELL ENERGY LIMITED PARTNERSHIP	GA	Jul-92	TURBINE, OIL FIRED (2 EACH)	1,840 M BTU/HR	25 PPMVD @ FULL LOAD	FUEL SPEC: CLEAN BURNING FUELS	0	BACT-PSD
MAUI ELECTRIC COMPANY, LTD./MAALAEA GENERATING STA	HI	Jul-92	TURBINE, COMBINED-CYCLE COMBUSTION	28 MW	27 LB/HR	COMBUSTION TECHNOLOGY/DESIGN	0	BACT-OTHER
HARTWELL ENERGY LIMITED PARTNERSHIP	GA	Jul-92	TURBINE, GAS FIRED (2 EACH)	1,617 M BTU/HR	25 PPMVD @ FULL LOAD	FUEL SPEC: CLEAN BURNING FUELS	0	BACT-PSD
INDECK-YERKES ENERGY SERVICES	NY	Jun-92	GE FRAME 6 GAS TURBINE (EP #00001)	432 MMBTU/HR	10 PPM, 10 LB/HR	NO CONTROLS	0	BACT-OTHER
SELKIRK COGENERATION PARTNERS, L.P.	NY	Jun-92	COMBUSTION TURBINES (2) (252 MW)	1,173 MMBTU/HR (EACH)	10 PPM	COMBUSTION CONTROLS	0	BACT-OTHER
SELKIRK COGENERATION PARTNERS, L.P.	NY	Jun-92	COMBUSTION TURBINE (79 MW)	1,173 MMBTU/HR	25 PPM	COMBUSTION CONTROL	0	BACT-OTHER
TENASKA WASHINGTON PARTNERS, L.P.	WA	May-92	COGENERATION PLANT, COMBINED CYCLE	1.83 MMBTU/HR	20 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
NARRAGANSETT ELECTRIC/NEW ENGLAND POWER CO.	RI	Apr-92	TURBINE, GAS AND DUCT BURNER	1,360 MMBTU/H EACH	11 PPM @ 15% O2, GAS		0	BACT-PSD
KENTUCKY UTILITIES COMPANY	KY	Mar-92	TURBINE, #2 FUEL OIL/NATURAL GAS (8)	1,500 MM BTU/HR (EACH)	75 LB/HR (EACH)	COMBUSTION CONTROL	0	BACT-PSD
BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP	VA	Mar-92	TURBINE, COMBUSTION	1,175 MMBTU/H NAT. GAS	62 LB/H/UNIT	FURNACE DESIGN	91	BACT-PSD
BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP	VA	Mar-92	TURBINE, COMBUSTION	1,117 MMBTU/H NO2 FUEL OIL	62 LB/H/UNIT	FURNACE DESIGN	91	BACT-PSD
BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP	VA	Mar-92	TURBINE, COMBUSTION, 2	0	229 T/YR/UNIT		0	BACT-PSD
THERMO INDUSTRIES, LTD.	CO	Feb-92	TURBINE, GAS FIRED, 5 EACH	248 MMBTU/H	25 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
HAWAII ELECTRIC LIGHT CO., INC.	HI	Feb-92	TURBINE, FUEL OIL #2	20 MW	27 LB/HR @ 100% PEAKLD	COMBUSTION DESIGN	0	BACT-PSD
HAWAII ELECTRIC LIGHT CO., INC.	HI	Feb-92	TURBINE, FUEL OIL #2	20 MW	56 LB/H @ 75-<100% PKLD	COMBUSTION DESIGN	0	BACT-PSD
HAWAII ELECTRIC LIGHT CO., INC.	HI	Feb-92	TURBINE, FUEL OIL #2	20 MW	161 LB/H @ 50-<75% PKLD	COMBUSTION DESIGN	0	BACT-PSD
HAWAII ELECTRIC LIGHT CO., INC.	HI	Feb-92	TURBINE, FUEL OIL #2	20 MW	476 LB/H @ 25-<50% PKLD	COMBUSTION DESIGN	0	BACT-PSD
SAVANNAH ELECTRIC AND POWER CO.	GA	Feb-92	TURBINES, 8	1,032 MMBTU/H, NAT GAS	9 PPM @ 15% O2	FUEL SPEC: LOW SULFUR FUEL OIL	0	BACT-PSD
SAVANNAH ELECTRIC AND POWER CO.	GA	Feb-92	TURBINES, 8	972 MMBTU/H, #2 OIL	9 PPM @ 15% O2	FUEL SPEC: LOW SULFUR FUEL OIL	0	BACT-PSD
KAMINE/BESICORP NATURAL DAM LP	NY	Dec-91	GE FRAME 6 GAS TURBINE	500 MMBTU/HR	0.02 LB/MMBTU, 10 LB/HR	NO CONTROLS	0	BACT-OTHER
DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION	NC	Dec-91	TURBINE, COMBUSTION	1,247 MM BTU/HR	60 LB/HR	COMBUSTION CONTROL	0	BACT-PSD
DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION	NC	Dec-91	TURBINE, COMBUSTION	1,313 MM BTU/HR	59 LB/HR	COMBUSTION CONTROL	0	BACT-PSD
MAUI ELECTRIC COMPANY, LTD.	HI	Dec-91	TURBINE, FUEL OIL #2	28 MW	0 SEE NOTES	GOOD COMBUSTION PRACTICES	0	BACT-PSD
KALAMAZOO POWER LIMITED	MI	Dec-91	TURBINE, GAS-FIRED, 2, W/ WASTE HEAT BOILERS	1,806 MMBTU/H	20 PPMV	DRY LOW NOX TURBINES	0	BACT-PSD
LAKE COGEN LIMITED	FL	Nov-91	TURBINE, OIL, 2 EACH	42 MW	78 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
LAKE COGEN LIMITED	FL	Nov-91	TURBINE, GAS, 2 EACH	42 MW	42 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
ORLANDO UTILITIES COMMISSION	FL	Nov-91	TURBINE, GAS, 4 EACH	35 MW	10 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
ORLANDO UTILITIES COMMISSION	FL	Nov-91	TURBINE, OIL, 4 EACH	35 MW	10 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
SOUTHERN CALIFORNIA GAS	CA	Oct-91	TURBINE, GAS-FIRED	48 MMBTU/H	7.74 PPM @ 15% O2	HIGH TEMPERATURE OXIDATION CATALYST	80	BACT-PSD
SOUTHERN CALIFORNIA GAS	CA	Oct-91	TURBINE, GAS FIRED, SOLAR MODEL H	5,500 HP	7.74 PPM @ 15% O2	HIGH TEMP OXIDATION CATALYST	80	BACT-PSD
EL PASO NATURAL GAS	AZ	Oct-91	TURBINE, GAS, SOLAR CENTAUR H	5,500 HP	10.5 PPM @ 15% O2	FUEL SPEC: LEAN FUEL MIX	0	BACT-PSD
EL PASO NATURAL GAS	AZ	Oct-91	TURBINE, GAS, SOLAR CENTAUR H	5,500 HP	10.5 PPM @ 15% O2	FUEL SPEC: LEAN FUEL MIX	0	BACT-PSD
FLORIDA POWER GENERATION	FL	Oct-91	TURBINE, OIL, 8 EACH	93 MW	54 LB/H	COMBUSTION CONTROL	0	BACT-PSD
EL PASO NATURAL GAS	AZ	Oct-91	TURBINE, NAT. GAS TRANSM., GE FRAME 3	12,000 HP	60 PPM @ 15% O2	LEAN BURN	0	BACT-PSD
CAROLINA POWER AND LIGHT CO.	SC	Sep-91	TURBINE, I.C.	80 MW	60 LB/H		0	BACT-PSD
ENRON LOUISIANA ENERGY COMPANY	LA	Aug-91	TURBINE, GAS, 2	39 MMBTU/H	60 PPM @ 15% O2	BASE CASE, NO ADDITIONAL CONTROLS	0	BACT-PSD
ALGONQUIN GAS TRANSMISSION CO.	RI	Jul-91	TURBINE, GAS, 2	49 MMBTU/H	0.114 LB/MMBTU	GOOD COMBUSTION PRACTICES	0	BACT-OTHER
CHARLES LARSEN POWER PLANT	FL	Jul-91	TURBINE, OIL, 1 EACH	80 MW	25 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
CHARLES LARSEN POWER PLANT	FL	Jul-91	TURBINE, GAS, 1 EACH	80 MW	25 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
SUMAS ENERGY INC.	WA	Jun-91	TURBINE, NATURAL GAS	88 MW	6 PPM @ 15% O2	CO CATALYST	80	BACT-PSD
SAGUARO POWER COMPANY	NV	Jun-91	COMBUSTION TURBINE GENERATOR	34.5 MW	9 PPH	CONVERTER (CATALYTIC)	90	BACT-PSD
FLORIDA POWER AND LIGHT	FL	Jun-91	TURBINE, OIL, 2 EACH	400 MW	33 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
FLORIDA POWER AND LIGHT	FL	Jun-91	TURBINE, GAS, 4 EACH	400 MW	30 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
FLORIDA POWER AND LIGHT	FL	Jun-91	TURBINE, CG, 4 EACH	400 MW	33 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
NORTHERN CONSOLIDATED POWER	PA	May-91	TURBINES, GAS, 2	34.6 KW EACH	118 T/YR	OXIDATION CATALYST	90	OTHER
LAKEWOOD COGENERATION, L.P.	NJ	Apr-91	TURBINES (#2 FUEL OIL) (2)	1,190 MMBTU/HR (EACH)	0.06 LB/MMBTU	TURBINE DESIGN	0	BACT-OTHER
LAKEWOOD COGENERATION, L.P.	NJ	Apr-91	TURBINES (NATURAL GAS) (2)	1,190 MMBTU/HR (EACH)	0.026 LB/MMBTU	TURBINE DESIGN	0	BACT-OTHER
CIMARRON CHEMICAL	CO	Mar-91	TURBINE #2, GE FRAME 6	33 MW	250 T/YR, LESS THAN	CO CATALYST	0	OTHER
FLORIDA POWER AND LIGHT	FL	Mar-91	TURBINE, GAS, 4 EACH	240 MW	30 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
FLORIDA POWER AND LIGHT	FL	Mar-91	TURBINE, OIL, 4 EACH	0	33 PPM @ 15% O2	COMBUSTION CONTROL	0	BACT-PSD
NEVADA COGENERATION ASSOCIATES #2	NV	Jan-91	COMBINED-CYCLE POWER GENERATION	85 MW POWER OUTPUT	40 LBS/HR	CATALYTIC CONVERTER	0	BACT-PSD
NEVADA COGENERATION ASSOCIATES #1	NV	Jan-91	COMBINED-CYCLE POWER GENERATION	85 MW TOTAL OUTPUT	40 LBS/HR	CATALYTIC CONVERTER	0	BACT-PSD
NEWARK BAY COGENERATION PARTNERSHIP	NJ	Nov-90	TURBINE, NATURAL GAS FIRED	585 MMBTU/HR	0.0055 LB/MMBTU	CATALYTIC OXIDATION	80	BACT-PSD
TBG COGEN COGENERATION PLANT	NY	Aug-90	GE LM2500 GAS TURBINE	215 MMBTU/HR	0.181 LB/MMBTU	CATALYTIC OXIDIZER	80	BACT
SC ELECTRIC AND GAS COMPANY - HAGOOD STATION	SC	Dec-89	INTERNAL COMBUSTION TURBINE	110 MEGAWATTS	23 LBS/HR	GOOD COMBUSTION PRACTICES	0	BACT-PSD
PEABODY MUNICIPAL LIGHT PLANT	MA	Nov-89	TURBINE, 38 MW NATURAL FAS FIRED	412 MMBTU/HR	40 PPM @ 15% O2	GOOD COMBUSTION PRACTICES	0	BACT-OTHER
MEGAN-RACINE ASSOCIATES, INC	NY	Aug-89	GE LM5000-N COMBINED CYCLE GAS TURBINE	401 LB/MMBTU	0.026 LB/MMBTU, 11 LB/HR	NO CONTROLS	0	BACT-OTHER
UNOCAL	CA	Jul-89	TURBINE, GAS (SEE NOTES)	0	10 PPM @ 15% O2	OXIDATION CATALYST	75	BACT-OTHER

Note: PSD= Prevention of Significant Deterioration
BACT= Best Available Control Technology
LAER= Lowest Achievable Emission Rate

Table B-6. Direct and Indirect Capital Costs for CO Catalyst for Frame "F" Simple Cycle Operation

Cost Component	Costs	Basis of Cost Component
Direct Capital Costs		
CO Associated Equipment	$235,000	Vendor Quote
Instrumentation	$23,500	10% of SCR Associated Equipment
Sales Tax	$14,100	6% of SCR Associated Equipment/Catalyst
Freight	$47,965	5% of SCR Associated Equipment/Catalyst
Total Direct Capital Costs (TDCC)	$320,565	
Recurring Capital Costs (RCC)	$724,290	Catalyst; Vendor Based Estimate
TOTAL CAPITAL COSTS	$1,044,855	Sum of TDCC, TDIC and RCC
Direct Installation Costs		
Foundation and supports	$83,588	8% of Total Capital Costs; OAQPS Cost Control Manual
Handling & Erection	$146,280	14% of Total Capital Costs; OAQPS Cost Control Manual
Electrical	$41,794	4% of Total Capital Costs; OAQPS Cost Control Manual
Piping	$20,897	2% of Total Capital Costs; OAQPS Cost Control Manual
Insulation for ductwork	$10,449	1% of Total Capital Costs; OAQPS Cost Control Manual
Painting	$10,449	1% of Total Capital Costs; OAQPS Cost Control Manual
Site Preparation	$5,000	Engineering Estimate
Buildings	$0	
Total Direct Installation Costs (TDIC)	$318,456	
Indirect Costs		
Engineering	$104,485	10% of Total Capital Costs; OAQPS Cost Control Manual
Construction and Field Expense	$52,243	5% of Total Capital Costs; OAQPS Cost Control Manual
Contractor Fees	$104,485	10% of Total Capital Costs; OAQPS Cost Control Manual
Start-up	$20,897	2% of Total Capital Costs; OAQPS Cost Control Manual
Performance Tests	$10,449	1% of Total Capital Costs; OAQPS Cost Control Manual
Allowance for Funds Used During Constructi	$56,226	2.5% of Total Capital Costs; borrowed at a rate 7.0% for 9 months
Contingencies	$31,346	3% of Total Capital Costs; OAQPS Cost Control Manual
TOTAL INDIRECT CAPITAL COST (TICC)	$380,131	
TOTAL DIRECT and INDIRECT CAPITAL COSTS (TDICC)	$1,743,442	Sum of TDCC, TDIC and TICC

Table B-7. Annualized Cost for CO Catalyst for Frame "F" Simple Cycle Operation

Cost Component	Cost		Basis of Cost Estimate
Direct Annual Costs			
Operating Personnel	$8,320		8 hours/week at $20/hr
Supervision	$1,248		15% of Operating Personnel;OAQPS Cost Control Manual
Maintenance - Labor	$4,368		0.5 hr per shift, $24/hr; OAQPS Cost Manual
- Materials	$4,368		100% of maintenance labor; OAQPS Cost Manual
Inventory Cost	$26,509.02		Capital Recovery (11.74%) for 1/3 catalyst
Catalyst Disposal Cost	$37,025		$28/1,000 lb/hr mass flow over 3 years; developed from vendor quotes
Contingency	$2,455		3% of direct costs
Total Direct Annual Costs (TDAC)	$84,293		
Energy Costs			
Heat Rate Penalty	$59,346		0.2% of MW output; EPA, 1993 (Page 6-20)
MW Loss Penalty	$42,015		2 days replacement energy costs @ $0.01 kWh each three period
Fuel Escalation	$3,041		Escalation of fuel over inflation; 3% of energy costs
Contingency	$3,132		3% of energy costs
Total Energy Costs (TEC)	$107,533		
Indirect Annual Costs			
Overhead	$8,362	60%	of Operating/Supervision Labor and Ammonia
Property Taxes, insurance, admin.	$69,738	4%	of Total Capital Costs
Annualized Total Direct Capital	$111,903	10.98%	Capital Recovery Factor of 7% over 15 years times sum of TDCC, TDIC and TICC
Annualized Total Direct Recurring	$276,027	38.11%	Capital Recovery Factor of 7% over 3 years times RCC
Total Indirect Annual Costs (TIAC)	$466,029		
TOTAL ANNUALIZED COSTS	$657,856		Sum of TDAC, TEC and TIAC
COST EFFECTIVENESS	$9,508		

APPENDIX C

BUILDING DOWNWASH INFORMATION FROM BPIP

```
'BPIP data for Sonat Power Project, Hardee County Site'
'ST'
'FEET' 0.3048
'UTMN' 0
12
'N.Demin WTk' 1 0.0
8 50
400   200
364.6 185.4
350   150
364.6 114.6
400   100
435.4 114.6
450   150
435.4 185.4
'S.Demin Wtk' 1 0.0
8 50
400    80
364.6  65.4
350    30
364.6  -5.4
400   -20
435.4  -5.4
450    30
435.4  65.4
'W.FO Tk' 1 0.0
8 50
256   -214
220.6 -228.6
206   -264
220.6 -299.4
256   -314
291.4 -299.4
306   -264
291.4 -228.6
'E.FO Tk' 1 0.0
8 50
400   -214
364.6 -228.6
350   -264
364.6 -299.4
400   -314
435.4 -299.4
450   -264
435.4 -228.6
'InlFilt1' 1 0.0
4 47
-94 104
-94 140
-58 140
-58 104
'InlFilt2' 1 0.0
4 47
 22 104
 22 140
 58 140
 58 104
'InlFilt3' 1 0.0
4 47
138 104
138 140
174 140
174 104
'InlFilt4' 1 0.0
4 47
254 104
254 140
290 140
290 104
'Turb1' 1 0.0
4 22.
-131 34
-131 76
-101 76
-101 34
'Turb2' 1 0.0
4 22.
```

```
-15  34
-15  76
15   76
15   34
'Turb3' 1 0.0
4 22.
101  34
101  76
131  76
131  34
'Turb4' 1 0.0
4 22.
217  34
217  76
247  76
247  34
4
'CT1' 0.0 60 -116 0
'CT2' 0.0 60    0 0
'CT3' 0.0 60  116 0
'CT4' 0.0 60  232 0
0
```

BPIP (Dated: 95086)

DATE : 08/25/99
TIME : 11:27:35
BPIP data for Sonat Power Project, Hardee County Site

============================
BPIP PROCESSING INFORMATION:
============================

The ST flag has been set for processing for an ISCST2 run.

Inputs entered in FEET will be converted to meters using a conversion factor of 0.3048. Output will be in meters.

UTMP is set to UTMN. The input is assumed to be in a local X-Y coordinate system as opposed to a UTM coordinate system. True North is in the positive Y direction.

Plant north is set to 0.00 degrees with respect to True North.

BPIP data for Sonat Power Project, Hardee County Site

PRELIMINARY* GEP STACK HEIGHT RESULTS TABLE
(Output Units: meters)

Stack Name	Stack Height	Stack-Building Base Elevation Differences	GEP** EQN1	Preliminary* GEP Stack Height Value
CT1	18.29	0.00	35.81	65.00
CT2	18.29	0.00	35.81	65.00
CT3	18.29	0.00	38.10	65.00
CT4	18.29	0.00	38.10	65.00

* Results are based on Determinants 1 & 2 on pages 1 & 2 of the GEP Technical Support Document. Determinant 3 may be investigated for additional stack height credit. Final values result after Determinant 3 has been taken into consideration.
** Results were derived from Equation 1 on page 6 of GEP Technical Support Document. Values have been adjusted for any stack-building base elevation differences.

Note: Criteria for determining stack heights for modeling emission limitations for a source can be found in Table 3.1 of the GEP Technical Support Document.

BPIP (Dated: 95086)

DATE : 08/25/99
TIME : 11:27:35

BPIP data for Sonat Power Project, Hardee County Site

BPIP output is in meters

SO BUILDHGT CT1	6.71	6.71	6.71	14.33	0.00	0.00
SO BUILDHGT CT1	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT CT1	0.00	6.71	6.71	6.71	6.71	6.71
SO BUILDHGT CT1	14.33	14.33	14.33	14.33	14.33	14.33
SO BUILDHGT CT1	6.71	6.71	0.00	0.00	0.00	0.00
SO BUILDHGT CT1	0.00	6.71	6.71	6.71	6.71	6.71
SO BUILDWID CT1	11.23	12.97	14.32	15.46	0.00	0.00
SO BUILDWID CT1	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID CT1	0.00	15.23	14.32	12.97	11.23	9.14
SO BUILDWID CT1	12.71	14.06	14.99	15.46	15.46	14.99
SO BUILDWID CT1	15.16	14.19	0.00	0.00	0.00	0.00
SO BUILDWID CT1	0.00	15.23	14.32	12.97	11.23	9.14

```
SO BUILDHGT CT2       6.71   6.71   6.71  14.33   0.00   0.00
SO BUILDHGT CT2       0.00   0.00   0.00   6.71   6.71   6.71
SO BUILDHGT CT2      14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDHGT CT2      14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT CT2       6.71   6.71   0.00   0.00   0.00   0.00
SO BUILDHGT CT2       0.00   6.71   6.71   6.71   6.71   6.71
SO BUILDWID CT2      11.23  12.97  14.32  15.46   0.00   0.00
SO BUILDWID CT2       0.00   0.00   0.00  14.19  15.16  15.66
SO BUILDWID CT2      15.46  15.46  14.99  14.06  11.23   9.14
SO BUILDWID CT2      12.71  14.06  14.99  15.46  15.46  14.99
SO BUILDWID CT2      15.16  14.19   0.00   0.00   0.00   0.00
SO BUILDWID CT2       0.00  15.23  14.32  12.97  11.23   9.14

SO BUILDHGT CT3       6.71   6.71   6.71  14.33   0.00   0.00
SO BUILDHGT CT3       0.00   0.00   0.00   6.71   6.71  14.33
SO BUILDHGT CT3      14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDHGT CT3      14.33  14.33  14.33  14.33  15.24  15.24
SO BUILDHGT CT3      15.24  15.24  15.24   0.00   0.00   0.00
SO BUILDHGT CT3       0.00   6.71   6.71   6.71   6.71   6.71
SO BUILDWID CT3      11.23  12.97  14.32  15.46   0.00   0.00
SO BUILDWID CT3       0.00   0.00   0.00  14.19  15.16  14.99
SO BUILDWID CT3      15.46  15.46  14.99  14.06  11.23   9.14
SO BUILDWID CT3      12.71  14.06  14.99  15.46  58.42  61.15
SO BUILDWID CT3      28.64  30.02  30.48   0.00   0.00   0.00
SO BUILDWID CT3       0.00  15.23  14.32  12.97  11.23   9.14

SO BUILDHGT CT4      15.24   6.71  15.24  15.24  15.24   0.00
SO BUILDHGT CT4       0.00   0.00   0.00  15.24   6.71  14.33
SO BUILDHGT CT4      14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDHGT CT4      14.33  14.33  15.24  15.24  15.24  15.24
SO BUILDHGT CT4      15.24  15.24  15.24  15.24   0.00   0.00
SO BUILDHGT CT4       0.00  15.24  15.24  15.24  15.24  15.24
SO BUILDWID CT4      30.02  12.97  47.77  53.91  58.42   0.00
SO BUILDWID CT4       0.00   0.00   0.00  66.04  15.16  14.99
SO BUILDWID CT4      15.46  15.46  14.99  14.06  11.23   9.14
SO BUILDWID CT4      12.71  14.06  29.48  30.40  30.40  29.48
SO BUILDWID CT4      28.64  30.02  30.48  30.02   0.00   0.00
SO BUILDWID CT4       0.00  64.02  67.49  28.64  30.02  30.48
```

BPIP (Dated: 95086)

DATE : 08/25/99
TIME : 11:27:35
BPIP data for Sonat Power Project, Hardee County Site

============================
BPIP PROCESSING INFORMATION:
============================

The ST flag has been set for processing for an ISCST2 run.

Inputs entered in FEET will be converted to meters using a conversion factor of 0.3048. Output will be in meters.

UTMP is set to UTMN. The input is assumed to be in a local X-Y coordinate system as opposed to a UTM coordinate system. True North is in the positive Y direction.

Plant north is set to 0.00 degrees with respect to True North.

==============
INPUT SUMMARY:
==============

Number of buildings to be processed : 12

N.Demin has 1 tier(s) with a base elevation of 0.00 FEET
(0.00) meters

BUILDING NAME	TIER NUMBER	BLDG-TIER NUMBER	TIER HEIGHT	NO. OF CORNERS	CORNER X	COORDINATES Y	
N.Demin	1	1	50.00	8			
			15.24 meters				
					400.00	200.00	FEET
					121.92	60.96	meters
					364.60	185.40	FEET
					111.13	56.51	meters
					350.00	150.00	FEET
					106.68	45.72	meters
					364.60	114.60	FEET
					111.13	34.93	meters
					400.00	100.00	FEET
					121.92	30.48	meters
					435.40	114.60	FEET
					132.71	34.93	meters
					450.00	150.00	FEET
					137.16	45.72	meters
					435.40	185.40	FEET
					132.71	56.51	meters

S.Demin has 1 tier(s) with a base elevation of 0.00 FEET
(0.00) meters

BUILDING NAME	TIER NUMBER	BLDG-TIER NUMBER	TIER HEIGHT	NO. OF CORNERS	CORNER X	COORDINATES Y	
S.Demin	1	5	50.00	8			
			15.24 meters				
					400.00	80.00	FEET
					121.92	24.38	meters
					364.60	65.40	FEET
					111.13	19.93	meters
					350.00	30.00	FEET
					106.68	9.14	meters
					364.60	-5.40	FEET
					111.13	-1.65	meters
					400.00	-20.00	FEET
					121.92	-6.10	meters
					435.40	-5.40	FEET
					132.71	-1.65	meters

```
                                                  450.00       30.00 FEET
                                                  137.16        9.14 meters
                                                  435.40       65.40 FEET
                                                  132.71       19.93 meters


W.FO Tk  has 1 tier(s) with a base elevation of     0.00 FEET
                                                 (    0.00) meters

BUILDING  TIER  BLDG-TIER  TIER   NO. OF        CORNER    COORDINATES
  NAME   NUMBER   NUMBER  HEIGHT  CORNERS          X           Y

W.FO Tk     1        9     50.00     8
                           15.24 meters
                                                  256.00     -214.00 FEET
                                                   78.03      -65.23 meters
                                                  220.60     -228.60 FEET
                                                   67.24      -69.68 meters
                                                  206.00     -264.00 FEET
                                                   62.79      -80.47 meters
                                                  220.60     -299.40 FEET
                                                   67.24      -91.26 meters
                                                  256.00     -314.00 FEET
                                                   78.03      -95.71 meters
                                                  291.40     -299.40 FEET
                                                   88.82      -91.26 meters
                                                  306.00     -264.00 FEET
                                                   93.27      -80.47 meters
                                                  291.40     -228.60 FEET
                                                   88.82      -69.68 meters


E.FO Tk  has 1 tier(s) with a base elevation of     0.00 FEET
                                                 (    0.00) meters

BUILDING  TIER  BLDG-TIER  TIER   NO. OF        CORNER    COORDINATES
  NAME   NUMBER   NUMBER  HEIGHT  CORNERS          X           Y

E.FO Tk     1       13     50.00     8
                           15.24 meters
                                                  400.00     -214.00 FEET
                                                  121.92      -65.23 meters
                                                  364.60     -228.60 FEET
                                                  111.13      -69.68 meters
                                                  350.00     -264.00 FEET
                                                  106.68      -80.47 meters
                                                  364.60     -299.40 FEET
                                                  111.13      -91.26 meters
                                                  400.00     -314.00 FEET
                                                  121.92      -95.71 meters
                                                  435.40     -299.40 FEET
                                                  132.71      -91.26 meters
                                                  450.00     -264.00 FEET
                                                  137.16      -80.47 meters
                                                  435.40     -228.60 FEET
                                                  132.71      -69.68 meters


InlFilt1 has 1 tier(s) with a base elevation of     0.00 FEET
                                                 (    0.00) meters

BUILDING  TIER  BLDG-TIER  TIER   NO. OF        CORNER    COORDINATES
  NAME   NUMBER   NUMBER  HEIGHT  CORNERS          X           Y

InlFilt1    1       17     47.00     4
                           14.33 meters
                                                  -94.00      104.00 FEET
                                                  -28.65       31.70 meters
                                                  -94.00      140.00 FEET
                                                  -28.65       42.67 meters
                                                  -58.00      140.00 FEET
                                                  -17.68       42.67 meters
                                                  -58.00      104.00 FEET
                                                  -17.68       31.70 meters


InlFilt2 has 1 tier(s) with a base elevation of     0.00 FEET
```

```
                                                      (    0.00) meters

BUILDING  TIER  BLDG-TIER  TIER    NO. OF        CORNER   COORDINATES
  NAME   NUMBER   NUMBER  HEIGHT  CORNERS          X            Y

InlFilt2    1        21     47.00     4
                            14.33 meters
                                                  22.00       104.00 FEET
                                                   6.71        31.70 meters
                                                  22.00       140.00 FEET
                                                   6.71        42.67 meters
                                                  58.00       140.00 FEET
                                                  17.68        42.67 meters
                                                  58.00       104.00 FEET
                                                  17.68        31.70 meters


InlFilt3 has 1 tier(s) with a base elevation of    0.00 FEET
                                                (    0.00) meters

BUILDING  TIER  BLDG-TIER  TIER    NO. OF        CORNER   COORDINATES
  NAME   NUMBER   NUMBER  HEIGHT  CORNERS          X            Y

InlFilt3    1        25     47.00     4
                            14.33 meters
                                                 138.00       104.00 FEET
                                                  42.06        31.70 meters
                                                 138.00       140.00 FEET
                                                  42.06        42.67 meters
                                                 174.00       140.00 FEET
                                                  53.04        42.67 meters
                                                 174.00       104.00 FEET
                                                  53.04        31.70 meters


InlFilt4 has 1 tier(s) with a base elevation of    0.00 FEET
                                                (    0.00) meters

BUILDING  TIER  BLDG-TIER  TIER    NO. OF        CORNER   COORDINATES
  NAME   NUMBER   NUMBER  HEIGHT  CORNERS          X            Y

InlFilt4    1        29     47.00     4
                            14.33 meters
                                                 254.00       104.00 FEET
                                                  77.42        31.70 meters
                                                 254.00       140.00 FEET
                                                  77.42        42.67 meters
                                                 290.00       140.00 FEET
                                                  88.39        42.67 meters
                                                 290.00       104.00 FEET
                                                  88.39        31.70 meters


Turb1    has 1 tier(s) with a base elevation of    0.00 FEET
                                                (    0.00) meters

BUILDING  TIER  BLDG-TIER  TIER    NO. OF        CORNER   COORDINATES
  NAME   NUMBER   NUMBER  HEIGHT  CORNERS          X            Y

Turb1       1        33     22.00     4
                             6.71 meters
                                                -131.00        34.00 FEET
                                                 -39.93        10.36 meters
                                                -131.00        76.00 FEET
                                                 -39.93        23.16 meters
                                                -101.00        76.00 FEET
                                                 -30.78        23.16 meters
                                                -101.00        34.00 FEET
                                                 -30.78        10.36 meters


Turb2    has 1 tier(s) with a base elevation of    0.00 FEET
                                                (    0.00) meters

BUILDING  TIER  BLDG-TIER  TIER    NO. OF        CORNER   COORDINATES
  NAME   NUMBER   NUMBER  HEIGHT  CORNERS          X            Y
```

```
Turb2        1        37       22.00     4.
                                6.71 meters
                                                    -15.00        34.00 FEET
                                                     -4.57        10.36 meters
                                                    -15.00        76.00 FEET
                                                     -4.57        23.16 meters
                                                     15.00        76.00 FEET
                                                      4.57        23.16 meters
                                                     15.00        34.00 FEET
                                                      4.57        10.36 meters


Turb3    has 1 tier(s) with a base elevation of    0.00 FEET
                                               (    0.00) meters

BUILDING  TIER  BLDG-TIER  TIER   NO. OF      CORNER   COORDINATES
  NAME   NUMBER   NUMBER  HEIGHT  CORNERS        X            Y

Turb3        1        41       22.00     4
                                6.71 meters
                                                    101.00        34.00 FEET
                                                     30.78        10.36 meters
                                                    101.00        76.00 FEET
                                                     30.78        23.16 meters
                                                    131.00        76.00 FEET
                                                     39.93        23.16 meters
                                                    131.00        34.00 FEET
                                                     39.93        10.36 meters


Turb4    has 1 tier(s) with a base elevation of    0.00 FEET
                                               (    0.00) meters

BUILDING  TIER  BLDG-TIER  TIER   NO. OF      CORNER   COORDINATES
  NAME   NUMBER   NUMBER  HEIGHT  CORNERS        X            Y

Turb4        1        45       22.00     4
                                6.71 meters
                                                    217.00        34.00 FEET
                                                     66.14        10.36 meters
                                                    217.00        76.00 FEET
                                                     66.14        23.16 meters
                                                    247.00        76.00 FEET
                                                     75.29        23.16 meters
                                                    247.00        34.00 FEET
                                                     75.29        10.36 meters

Number of stacks to be processed :    4

                   STACK            STACK    COORDINATES
 STACK NAME     BASE  HEIGHT          X            Y

 CT1             0.00   60.00 FEET
          (      0.00   18.29) meters
                                  -116.00        0.00 FEET
                               (   -35.36        0.00) meters
 CT2             0.00   60.00 FEET
          (      0.00   18.29) meters
                                     0.00        0.00 FEET
                               (     0.00        0.00) meters
 CT3             0.00   60.00 FEET
          (      0.00   18.29) meters
                                   116.00        0.00 FEET
                               (    35.36        0.00) meters
 CT4             0.00   60.00 FEET
          (      0.00   18.29) meters
                                   232.00        0.00 FEET
                               (    70.71        0.00) meters

  No stacks have been detected as being atop any structures.

                    Overall GEP Summary Table
                        (Units: meters)


 StkNo:  1  Stk Name:CT1     Stk Ht:  18.29 Prelim. GEP Stk.Ht:   65.00
```

```
          GEP:  BH:  14.33  PBW:   14.34              *Eqn1 Ht:   35.81
        *adjusted for a Stack-Building elevation difference of    0.00
 No. of Tiers affecting Stk:  1  Direction occurred:  202.50
  Bldg-Tier nos. contributing to GEP:  17


StkNo:  2  Stk Name:CT2      Stk Ht:  18.29 Prelim. GEP Stk.Ht:   65.00
          GEP:  BH:  14.33  PBW:   14.34              *Eqn1 Ht:   35.81
        *adjusted for a Stack-Building elevation difference of    0.00
 No. of Tiers affecting Stk:  1  Direction occurred:  202.50
  Bldg-Tier nos. contributing to GEP:  21


StkNo:  3  Stk Name:CT3      Stk Ht:  18.29 Prelim. GEP Stk.Ht:   65.00
          GEP:  BH:  15.24  PBW:   29.76              *Eqn1 Ht:   38.10
        *adjusted for a Stack-Building elevation difference of    0.00
 No. of Tiers affecting Stk:  1  Direction occurred:  257.50
  Bldg-Tier nos. contributing to GEP:   5


StkNo:  4  Stk Name:CT4      Stk Ht:  18.29 Prelim. GEP Stk.Ht:   65.00
          GEP:  BH:  15.24  PBW:   28.20              *Eqn1 Ht:   38.10
        *adjusted for a Stack-Building elevation difference of    0.00
 No. of Tiers affecting Stk:  1  Direction occurred:  247.50
  Bldg-Tier nos. contributing to GEP:   5


                    Summary By Direction Table
                        (Units:  meters)

Dominate stand alone tiers:


Drtcn:  10.00

StkNo:  1  Stk Name:CT1                               Stack Ht:   18.29
               GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
    Single tier MAX:  BH:   6.71  PBW:  11.23  *Wake Effect Ht:  16.76
        *adjusted for a Stack-Building elevation difference of    0.00
             BldNo:  9  Bld Name:Turb1      TierNo:  1
StkNo:  2  Stk Name:CT2                               Stack Ht:   18.29
               GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
    Single tier MAX:  BH:   6.71  PBW:  11.23  *Wake Effect Ht:  16.76
        *adjusted for a Stack-Building elevation difference of    0.00
             BldNo: 10  Bld Name:Turb2      TierNo:  1
StkNo:  3  Stk Name:CT3                               Stack Ht:   18.29
               GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
    Single tier MAX:  BH:   6.71  PBW:  11.23  *Wake Effect Ht:  16.76
        *adjusted for a Stack-Building elevation difference of    0.00
             BldNo: 11  Bld Name:Turb3      TierNo:  1
StkNo:  4  Stk Name:CT4                               Stack Ht:   18.29
               GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
    Single tier MAX:  BH:  15.24  PBW:  30.02  *Wake Effect Ht:  38.10
        *adjusted for a Stack-Building elevation difference of    0.00
             BldNo:  3  Bld Name:W.FO Tk    TierNo:  1

Drtcn:  20.00

StkNo:  1  Stk Name:CT1                               Stack Ht:   18.29
               GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
    Single tier MAX:  BH:   6.71  PBW:  12.97  *Wake Effect Ht:  16.76
        *adjusted for a Stack-Building elevation difference of    0.00
             BldNo:  9  Bld Name:Turb1      TierNo:  1
StkNo:  2  Stk Name:CT2                               Stack Ht:   18.29
               GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
    Single tier MAX:  BH:   6.71  PBW:  12.97  *Wake Effect Ht:  16.76
        *adjusted for a Stack-Building elevation difference of    0.00
             BldNo: 10  Bld Name:Turb2      TierNo:  1
StkNo:  3  Stk Name:CT3                               Stack Ht:   18.29
               GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
    Single tier MAX:  BH:   6.71  PBW:  12.97  *Wake Effect Ht:  16.76
        *adjusted for a Stack-Building elevation difference of    0.00
             BldNo: 11  Bld Name:Turb3      TierNo:  1
StkNo:  4  Stk Name:CT4                               Stack Ht:   18.29
               GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
```

```
    Single tier MAX: BH:   6.71  PBW:  12.97  *Wake Effect Ht:    16.76
         *adjusted for a Stack-Building elevation difference of    0.00
              BldNo: 12  Bld Name:Turb4      TierNo:  1

 Drtcn:  30.00

 StkNo:  1  Stk Name:CT1                               Stack Ht:    18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:    35.81
    Single tier MAX:  BH:   6.71  PBW:  14.32  *Wake Effect Ht:    16.76
         *adjusted for a Stack-Building elevation difference of    0.00
              BldNo:  9  Bld Name:Turb1      TierNo:  1
 StkNo:  2  Stk Name:CT2                               Stack Ht:    18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:    35.81
    Single tier MAX:  BH:   6.71  PBW:  14.32  *Wake Effect Ht:    16.76
         *adjusted for a Stack-Building elevation difference of    0.00
              BldNo: 10  Bld Name:Turb2      TierNo:  1
 StkNo:  3  Stk Name:CT3                               Stack Ht:    18.29
                GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:    38.10
    Single tier MAX:  BH:   6.71  PBW:  14.32  *Wake Effect Ht:    16.76
         *adjusted for a Stack-Building elevation difference of    0.00
              BldNo: 11  Bld Name:Turb3      TierNo:  1
 StkNo:  4  Stk Name:CT4                               Stack Ht:    18.29
                GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:    38.10
    Single tier MAX:  BH:   6.71  PBW:  14.32  *Wake Effect Ht:    16.76
         *adjusted for a Stack-Building elevation difference of    0.00
              BldNo: 12  Bld Name:Turb4      TierNo:  1

 Drtcn:  40.00

 StkNo:  1  Stk Name:CT1                               Stack Ht:    18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:    35.81
    Single tier MAX:  BH:  14.33  PBW:  15.46  *Wake Effect Ht:    35.81
         *adjusted for a Stack-Building elevation difference of    0.00
              BldNo:  5  Bld Name:InlFilt1  TierNo:  1
 StkNo:  2  Stk Name:CT2                               Stack Ht:    18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:    35.81
    Single tier MAX:  BH:  14.33  PBW:  15.46  *Wake Effect Ht:    35.81
         *adjusted for a Stack-Building elevation difference of    0.00
              BldNo:  6  Bld Name:InlFilt2  TierNo:  1
 StkNo:  3  Stk Name:CT3                               Stack Ht:    18.29
                GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:    38.10
    Single tier MAX:  BH:  14.33  PBW:  15.46  *Wake Effect Ht:    35.81
         *adjusted for a Stack-Building elevation difference of    0.00
              BldNo:  7  Bld Name:InlFilt3  TierNo:  1
 StkNo:  4  Stk Name:CT4                               Stack Ht:    18.29
                GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:    38.10
    Single tier MAX:  BH:  14.33  PBW:  15.46  *Wake Effect Ht:    35.81
         *adjusted for a Stack-Building elevation difference of    0.00
              BldNo:  8  Bld Name:InlFilt4  TierNo:  1

 Drtcn:  50.00

 StkNo:  1  Stk Name:CT1                               Stack Ht:    18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:    35.81
    No single tier affects this stack for this direction.
 StkNo:  2  Stk Name:CT2                               Stack Ht:    18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:    35.81
    No single tier affects this stack for this direction.
 StkNo:  3  Stk Name:CT3                               Stack Ht:    18.29
                GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:    38.10
    No single tier affects this stack for this direction.
 StkNo:  4  Stk Name:CT4                               Stack Ht:    18.29
                GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:    38.10
    No single tier affects this stack for this direction.

 Drtcn:  60.00

 StkNo:  1  Stk Name:CT1                               Stack Ht:    18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:    35.81
    No single tier affects this stack for this direction.
 StkNo:  2  Stk Name:CT2                               Stack Ht:    18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:    35.81
    No single tier affects this stack for this direction.
 StkNo:  3  Stk Name:CT3                               Stack Ht:    18.29
                GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:    38.10
    No single tier affects this stack for this direction.
 StkNo:  4  Stk Name:CT4                               Stack Ht:    18.29
```

```
                GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:   38.10
    No single tier affects this stack for this direction.

Drtcn:  70.00

StkNo:  1  Stk Name:CT1                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
    No single tier affects this stack for this direction.
StkNo:  2  Stk Name:CT2                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
    No single tier affects this stack for this direction.
StkNo:  3  Stk Name:CT3                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:   38.10
    No single tier affects this stack for this direction.
StkNo:  4  Stk Name:CT4                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:   38.10
    No single tier affects this stack for this direction.

Drtcn:  80.00

StkNo:  1  Stk Name:CT1                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
    No single tier affects this stack for this direction.
StkNo:  2  Stk Name:CT2                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
    No single tier affects this stack for this direction.
StkNo:  3  Stk Name:CT3                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:   38.10
    No single tier affects this stack for this direction.
StkNo:  4  Stk Name:CT4                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:   38.10
    No single tier affects this stack for this direction.

Drtcn:  90.00

StkNo:  1  Stk Name:CT1                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
    No single tier affects this stack for this direction.
StkNo:  2  Stk Name:CT2                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
    No single tier affects this stack for this direction.
StkNo:  3  Stk Name:CT3                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:   38.10
    No single tier affects this stack for this direction.
StkNo:  4  Stk Name:CT4                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:   38.10
    No single tier affects this stack for this direction.

Drtcn: 100.00

StkNo:  1  Stk Name:CT1                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
    No single tier affects this stack for this direction.
StkNo:  2  Stk Name:CT2                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
    Single tier MAX:  BH:   6.71  PBW:  14.19  *Wake Effect Ht:   16.76
         *adjusted for a Stack-Building elevation difference of    0.00
               BldNo:  9  Bld Name:Turb1     TierNo:  1
StkNo:  3  Stk Name:CT3                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:   38.10
    Single tier MAX:  BH:   6.71  PBW:  14.19  *Wake Effect Ht:   16.76
         *adjusted for a Stack-Building elevation difference of    0.00
               BldNo: 10  Bld Name:Turb2     TierNo:  1
StkNo:  4  Stk Name:CT4                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:   38.10
    Single tier MAX:  BH:   6.71  PBW:  14.19  *Wake Effect Ht:   16.76
         *adjusted for a Stack-Building elevation difference of    0.00
               BldNo: 11  Bld Name:Turb3     TierNo:  1

Drtcn: 110.00

StkNo:  1  Stk Name:CT1                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
    No single tier affects this stack for this direction.
StkNo:  2  Stk Name:CT2                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
    Single tier MAX:  BH:   6.71  PBW:  15.16  *Wake Effect Ht:   16.76
```

```
        *adjusted for a Stack-Building elevation difference of    0.00
             BldNo:  9  Bld Name:Turb1      TierNo:  1
StkNo:  3  Stk-Name:CT3                              Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:  38.10
    Single tier MAX:  BH:   6.71  PBW:  15.16  *Wake Effect Ht:  16.76
        *adjusted for a Stack-Building elevation difference of    0.00
             BldNo: 10  Bld Name:Turb2      TierNo:  1
StkNo:  4  Stk Name:CT4                              Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:  38.10
    Single tier MAX:  BH:   6.71  PBW:  15.16  *Wake Effect Ht:  16.76
        *adjusted for a Stack-Building elevation difference of    0.00
             BldNo: 11  Bld Name:Turb3      TierNo:  1

Drtcn: 120.00

StkNo:  1  Stk Name:CT1                              Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:  35.81
    No single tier affects this stack for this direction.
StkNo:  2  Stk Name:CT2                              Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:  35.81
    Single tier MAX:  BH:   6.71  PBW:  15.66  *Wake Effect Ht:  16.76
        *adjusted for a Stack-Building elevation difference of    0.00
             BldNo:  9  Bld Name:Turb1      TierNo:  1
StkNo:  3  Stk Name:CT3                              Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:  38.10
    Single tier MAX:  BH:  14.33  PBW:  14.99  *Wake Effect Ht:  35.81
        *adjusted for a Stack-Building elevation difference of    0.00
             BldNo:  5  Bld Name:InlFilt1  TierNo:  1
StkNo:  4  Stk Name:CT4                              Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:  38.10
    Single tier MAX:  BH:  14.33  PBW:  14.99  *Wake Effect Ht:  35.81
        *adjusted for a Stack-Building elevation difference of    0.00
             BldNo:  6  Bld Name:InlFilt2  TierNo:  1

Drtcn: 130.00

StkNo:  1  Stk Name:CT1                              Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:  35.81
    No single tier affects this stack for this direction.
StkNo:  2  Stk Name:CT2                              Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:  35.81
    Single tier MAX:  BH:  14.33  PBW:  15.46  *Wake Effect Ht:  35.81
        *adjusted for a Stack-Building elevation difference of    0.00
             BldNo:  5  Bld Name:InlFilt1  TierNo:  1
StkNo:  3  Stk Name:CT3                              Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:  38.10
    Single tier MAX:  BH:  14.33  PBW:  15.46  *Wake Effect Ht:  35.81
        *adjusted for a Stack-Building elevation difference of    0.00
             BldNo:  6  Bld Name:InlFilt2  TierNo:  1
StkNo:  4  Stk Name:CT4                              Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:  38.10
    Single tier MAX:  BH:  14.33  PBW:  15.46  *Wake Effect Ht:  35.81
        *adjusted for a Stack-Building elevation difference of    0.00
             BldNo:  7  Bld Name:InlFilt3  TierNo:  1

Drtcn: 140.00

StkNo:  1  Stk Name:CT1                              Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:  35.81
    Single tier MAX:  BH:   6.71  PBW:  15.23  *Wake Effect Ht:  16.76
        *adjusted for a Stack-Building elevation difference of    0.00
             BldNo:  9  Bld Name:Turb1      TierNo:  1
StkNo:  2  Stk Name:CT2                              Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:  35.81
    Single tier MAX:  BH:  14.33  PBW:  15.46  *Wake Effect Ht:  35.81
        *adjusted for a Stack-Building elevation difference of    0.00
             BldNo:  5  Bld Name:InlFilt1  TierNo:  1
StkNo:  3  Stk Name:CT3                              Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:  38.10
    Single tier MAX:  BH:  14.33  PBW:  15.46  *Wake Effect Ht:  35.81
        *adjusted for a Stack-Building elevation difference of    0.00
             BldNo:  6  Bld Name:InlFilt2  TierNo:  1
StkNo:  4  Stk Name:CT4                              Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:  38.10
    Single tier MAX:  BH:  14.33  PBW:  15.46  *Wake Effect Ht:  35.81
        *adjusted for a Stack-Building elevation difference of    0.00
             BldNo:  7  Bld Name:InlFilt3  TierNo:  1
```

```
Drtcn: 150.00

StkNo:  1  Stk Name:CT1                                      Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
    Single tier MAX:  BH:   6.71  PBW:  14.32  *Wake Effect Ht:   16.76
        *adjusted for a Stack-Building elevation difference of    0.00
                 BldNo:  9  Bld Name:Turb1      TierNo:  1
StkNo:  2  Stk Name:CT2                                      Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
    Single tier MAX:  BH:  14.33  PBW:  14.99  *Wake Effect Ht:   35.81
        *adjusted for a Stack-Building elevation difference of    0.00
                 BldNo:  5  Bld Name:InlFilt1  TierNo:  1
StkNo:  3  Stk Name:CT3                                      Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:   38.10
    Single tier MAX:  BH:  14.33  PBW:  14.99  *Wake Effect Ht:   35.81
        *adjusted for a Stack-Building elevation difference of    0.00
                 BldNo:  6  Bld Name:InlFilt2  TierNo:  1
StkNo:  4  Stk Name:CT4                                      Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:   38.10
    Single tier MAX:  BH:  14.33  PBW:  14.99  *Wake Effect Ht:   35.81
        *adjusted for a Stack-Building elevation difference of    0.00
                 BldNo:  7  Bld Name:InlFilt3  TierNo:  1

Drtcn: 160.00

StkNo:  1  Stk Name:CT1                                      Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
    Single tier MAX:  BH:   6.71  PBW:  12.97  *Wake Effect Ht:   16.76
        *adjusted for a Stack-Building elevation difference of    0.00
                 BldNo:  9  Bld Name:Turb1      TierNo:  1
StkNo:  2  Stk Name:CT2                                      Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
    Single tier MAX:  BH:  14.33  PBW:  14.06  *Wake Effect Ht:   35.42
        *adjusted for a Stack-Building elevation difference of    0.00
                 BldNo:  5  Bld Name:InlFilt1  TierNo:  1
StkNo:  3  Stk Name:CT3                                      Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:   38.10
    Single tier MAX:  BH:  14.33  PBW:  14.06  *Wake Effect Ht:   35.42
        *adjusted for a Stack-Building elevation difference of    0.00
                 BldNo:  6  Bld Name:InlFilt2  TierNo:  1
StkNo:  4  Stk Name:CT4                                      Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:   38.10
    Single tier MAX:  BH:  14.33  PBW:  14.06  *Wake Effect Ht:   35.42
        *adjusted for a Stack-Building elevation difference of    0.00
                 BldNo:  7  Bld Name:InlFilt3  TierNo:  1

Drtcn: 170.00

StkNo:  1  Stk Name:CT1                                      Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
    Single tier MAX:  BH:   6.71  PBW:  11.23  *Wake Effect Ht:   16.76
        *adjusted for a Stack-Building elevation difference of    0.00
                 BldNo:  9  Bld Name:Turb1      TierNo:  1
StkNo:  2  Stk Name:CT2                                      Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
    Single tier MAX:  BH:   6.71  PBW:  11.23  *Wake Effect Ht:   16.76
        *adjusted for a Stack-Building elevation difference of    0.00
                 BldNo: 10  Bld Name:Turb2      TierNo:  1
StkNo:  3  Stk Name:CT3                                      Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:   38.10
    Single tier MAX:  BH:   6.71  PBW:  11.23  *Wake Effect Ht:   16.76
        *adjusted for a Stack-Building elevation difference of    0.00
                 BldNo: 11  Bld Name:Turb3      TierNo:  1
StkNo:  4  Stk Name:CT4                                      Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:   38.10
    Single tier MAX:  BH:   6.71  PBW:  11.23  *Wake Effect Ht:   16.76
        *adjusted for a Stack-Building elevation difference of    0.00
                 BldNo: 12  Bld Name:Turb4      TierNo:  1

Drtcn: 180.00

StkNo:  1  Stk Name:CT1                                      Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
    Single tier MAX:  BH:   6.71  PBW:   9.14  *Wake Effect Ht:   16.76
        *adjusted for a Stack-Building elevation difference of    0.00
                 BldNo:  9  Bld Name:Turb1      TierNo:  1
```

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StkNo:  2  Stk Name:CT2                                    Stack Ht:    18.29
                GEP:  BH:   14.33  PBW:   14.34   *Equation 1 Ht:    35.81
    Single tier MAX:  BH:    6.71  PBW:    9.14  *Wake Effect Ht:    16.76
        *adjusted for a Stack-Building elevation difference of        0.00
              BldNo: 10  Bld Name:Turb2       TierNo:  1
StkNo:  3  Stk Name:CT3                                    Stack Ht:    18.29
                GEP:  BH:   15.24  PBW:   29.76   *Equation 1 Ht:    38.10
    Single tier MAX:  BH:    6.71  PBW:    9.14  *Wake Effect Ht:    16.76
        *adjusted for a Stack-Building elevation difference of        0.00
              BldNo: 11  Bld Name:Turb3       TierNo:  1
StkNo:  4  Stk Name:CT4                                    Stack Ht:    18.29
                GEP:  BH:   15.24  PBW:   28.20   *Equation 1 Ht:    38.10
    Single tier MAX:  BH:    6.71  PBW:    9.14  *Wake Effect Ht:    16.76
        *adjusted for a Stack-Building elevation difference of        0.00
              BldNo: 12  Bld Name:Turb4       TierNo:  1

Drtcn: 190.00

StkNo:  1  Stk Name:CT1                                    Stack Ht:    18.29
                GEP:  BH:   14.33  PBW:   14.34   *Equation 1 Ht:    35.81
    Single tier MAX:  BH:   14.33  PBW:   12.71  *Wake Effect Ht:    33.39
        *adjusted for a Stack-Building elevation difference of        0.00
              BldNo:  5  Bld Name:InlFilt1  TierNo:  1
StkNo:  2  Stk Name:CT2                                    Stack Ht:    18.29
                GEP:  BH:   14.33  PBW:   14.34   *Equation 1 Ht:    35.81
    Single tier MAX:  BH:   14.33  PBW:   12.71  *Wake Effect Ht:    33.39
        *adjusted for a Stack-Building elevation difference of        0.00
              BldNo:  6  Bld Name:InlFilt2  TierNo:  1
StkNo:  3  Stk Name:CT3                                    Stack Ht:    18.29
                GEP:  BH:   15.24  PBW:   29.76   *Equation 1 Ht:    38.10
    Single tier MAX:  BH:   14.33  PBW:   12.71  *Wake Effect Ht:    33.39
        *adjusted for a Stack-Building elevation difference of        0.00
              BldNo:  7  Bld Name:InlFilt3  TierNo:  1
StkNo:  4  Stk Name:CT4                                    Stack Ht:    18.29
                GEP:  BH:   15.24  PBW:   28.20   *Equation 1 Ht:    38.10
    Single tier MAX:  BH:   14.33  PBW:   12.71  *Wake Effect Ht:    33.39
        *adjusted for a Stack-Building elevation difference of        0.00
              BldNo:  8  Bld Name:InlFilt4  TierNo:  1

Drtcn: 200.00

StkNo:  1  Stk Name:CT1                                    Stack Ht:    18.29
                GEP:  BH:   14.33  PBW:   14.34   *Equation 1 Ht:    35.81
    Single tier MAX:  BH:   14.33  PBW:   14.06  *Wake Effect Ht:    35.42
        *adjusted for a Stack-Building elevation difference of        0.00
              BldNo:  5  Bld Name:InlFilt1  TierNo:  1
StkNo:  2  Stk Name:CT2                                    Stack Ht:    18.29
                GEP:  BH:   14.33  PBW:   14.34   *Equation 1 Ht:    35.81
    Single tier MAX:  BH:   14.33  PBW:   14.06  *Wake Effect Ht:    35.42
        *adjusted for a Stack-Building elevation difference of        0.00
              BldNo:  6  Bld Name:InlFilt2  TierNo:  1
StkNo:  3  Stk Name:CT3                                    Stack Ht:    18.29
                GEP:  BH:   15.24  PBW:   29.76   *Equation 1 Ht:    38.10
    Single tier MAX:  BH:   14.33  PBW:   14.06  *Wake Effect Ht:    35.42
        *adjusted for a Stack-Building elevation difference of        0.00
              BldNo:  7  Bld Name:InlFilt3  TierNo:  1
StkNo:  4  Stk Name:CT4                                    Stack Ht:    18.29
                GEP:  BH:   15.24  PBW:   28.20   *Equation 1 Ht:    38.10
    Single tier MAX:  BH:   14.33  PBW:   14.06  *Wake Effect Ht:    35.42
        *adjusted for a Stack-Building elevation difference of        0.00
              BldNo:  8  Bld Name:InlFilt4  TierNo:  1

Drtcn: 210.00

StkNo:  1  Stk Name:CT1                                    Stack Ht:    18.29
                GEP:  BH:   14.33  PBW:   14.34   *Equation 1 Ht:    35.81
    Single tier MAX:  BH:   14.33  PBW:   14.99  *Wake Effect Ht:    35.81
        *adjusted for a Stack-Building elevation difference of        0.00
              BldNo:  5  Bld Name:InlFilt1  TierNo:  1
StkNo:  2  Stk Name:CT2                                    Stack Ht:    18.29
                GEP:  BH:   14.33  PBW:   14.34   *Equation 1 Ht:    35.81
    Single tier MAX:  BH:   14.33  PBW:   14.99  *Wake Effect Ht:    35.81
        *adjusted for a Stack-Building elevation difference of        0.00
              BldNo:  6  Bld Name:InlFilt2  TierNo:  1
StkNo:  3  Stk Name:CT3                                    Stack Ht:    18.29
                GEP:  BH:   15.24  PBW:   29.76   *Equation 1 Ht:    38.10
    Single tier MAX:  BH:   14.33  PBW:   14.99  *Wake Effect Ht:    35.81
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        *adjusted for a Stack-Building elevation difference of    0.00
              BldNo:  7  Bld Name:InlFilt3  TierNo:  1
StkNo:  4  Stk Name:CT4                              Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:  38.10
    Single tier MAX:  BH:  15.24  PBW:  29.48  *Wake Effect Ht:  38.10
        *adjusted for a Stack-Building elevation difference of    0.00
              BldNo:  1  Bld Name:N.Demin   TierNo:  1

Drtcn: 220.00

StkNo:  1  Stk Name:CT1                              Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:  35.81
    Single tier MAX:  BH:  14.33  PBW:  15.46  *Wake Effect Ht:  35.81
        *adjusted for a Stack-Building elevation difference of    0.00
              BldNo:  5  Bld Name:InlFilt1  TierNo:  1
StkNo:  2  Stk Name:CT2                              Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:  35.81
    Single tier MAX:  BH:  14.33  PBW:  15.46  *Wake Effect Ht:  35.81
        *adjusted for a Stack-Building elevation difference of    0.00
              BldNo:  6  Bld Name:InlFilt2  TierNo:  1
StkNo:  3  Stk Name:CT3                              Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:  38.10
    Single tier MAX:  BH:  14.33  PBW:  15.46  *Wake Effect Ht:  35.81
        *adjusted for a Stack-Building elevation difference of    0.00
              BldNo:  8  Bld Name:InlFilt4  TierNo:  1
StkNo:  4  Stk Name:CT4                              Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:  38.10
    Single tier MAX:  BH:  15.24  PBW:  30.40  *Wake Effect Ht:  38.10
        *adjusted for a Stack-Building elevation difference of    0.00
              BldNo:  1  Bld Name:N.Demin   TierNo:  1

Drtcn: 230.00

StkNo:  1  Stk Name:CT1                              Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:  35.81
    Single tier MAX:  BH:  14.33  PBW:  15.46  *Wake Effect Ht:  35.81
        *adjusted for a Stack-Building elevation difference of    0.00
              BldNo:  6  Bld Name:InlFilt2  TierNo:  1
StkNo:  2  Stk Name:CT2                              Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:  35.81
    Single tier MAX:  BH:  14.33  PBW:  15.46  *Wake Effect Ht:  35.81
        *adjusted for a Stack-Building elevation difference of    0.00
              BldNo:  7  Bld Name:InlFilt3  TierNo:  1
StkNo:  3  Stk Name:CT3                              Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:  38.10
    Single tier MAX:  BH:  14.33  PBW:  15.46  *Wake Effect Ht:  35.81
        *adjusted for a Stack-Building elevation difference of    0.00
              BldNo:  8  Bld Name:InlFilt4  TierNo:  1
StkNo:  4  Stk Name:CT4                              Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:  38.10
    Single tier MAX:  BH:  15.24  PBW:  30.40  *Wake Effect Ht:  38.10
        *adjusted for a Stack-Building elevation difference of    0.00
              BldNo:  1  Bld Name:N.Demin   TierNo:  1

Drtcn: 240.00

StkNo:  1  Stk Name:CT1                              Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:  35.81
    Single tier MAX:  BH:  14.33  PBW:  14.99  *Wake Effect Ht:  35.81
        *adjusted for a Stack-Building elevation difference of    0.00
              BldNo:  6  Bld Name:InlFilt2  TierNo:  1
StkNo:  2  Stk Name:CT2                              Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:  35.81
    Single tier MAX:  BH:  14.33  PBW:  14.99  *Wake Effect Ht:  35.81
        *adjusted for a Stack-Building elevation difference of    0.00
              BldNo:  7  Bld Name:InlFilt3  TierNo:  1
StkNo:  3  Stk Name:CT3                              Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:  38.10
    Single tier MAX:  BH:  14.33  PBW:  14.99  *Wake Effect Ht:  35.81
        *adjusted for a Stack-Building elevation difference of    0.00
              BldNo:  8  Bld Name:InlFilt4  TierNo:  1
StkNo:  4  Stk Name:CT4                              Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:  38.10
    Single tier MAX:  BH:  15.24  PBW:  29.48  *Wake Effect Ht:  38.10
        *adjusted for a Stack-Building elevation difference of    0.00
              BldNo:  2  Bld Name:S.Demin   TierNo:  1
```

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Drtcn: 250.00

StkNo:  1  Stk Name:CT1                                   Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
    Single tier MAX:  BH:   6.71  PBW:  15.16  *Wake Effect Ht:   16.76
        *adjusted for a Stack-Building elevation difference of    0.00
              BldNo: 10  Bld Name:Turb2     TierNo:  1
StkNo:  2  Stk Name:CT2                                   Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
    Single tier MAX:  BH:   6.71  PBW:  15.16  *Wake Effect Ht:   16.76
        *adjusted for a Stack-Building elevation difference of    0.00
              BldNo: 11  Bld Name:Turb3     TierNo:  1
StkNo:  3  Stk Name:CT3                                   Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
    Single tier MAX:  BH:  15.24  PBW:  28.64  *Wake Effect Ht:   38.10
        *adjusted for a Stack-Building elevation difference of    0.00
              BldNo:  2  Bld Name:S.Demin   TierNo:  1
StkNo:  4  Stk Name:CT4                                   Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
    Single tier MAX:  BH:  15.24  PBW:  28.64  *Wake Effect Ht:   38.10
        *adjusted for a Stack-Building elevation difference of    0.00
              BldNo:  2  Bld Name:S.Demin   TierNo:  1

Drtcn: 260.00

StkNo:  1  Stk Name:CT1                                   Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
    Single tier MAX:  BH:   6.71  PBW:  14.19  *Wake Effect Ht:   16.76
        *adjusted for a Stack-Building elevation difference of    0.00
              BldNo: 10  Bld Name:Turb2     TierNo:  1
StkNo:  2  Stk Name:CT2                                   Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
    Single tier MAX:  BH:   6.71  PBW:  14.19  *Wake Effect Ht:   16.76
        *adjusted for a Stack-Building elevation difference of    0.00
              BldNo: 11  Bld Name:Turb3     TierNo:  1
StkNo:  3  Stk Name:CT3                                   Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
    Single tier MAX:  BH:  15.24  PBW:  30.02  *Wake Effect Ht:   38.10
        *adjusted for a Stack-Building elevation difference of    0.00
              BldNo:  2  Bld Name:S.Demin   TierNo:  1
StkNo:  4  Stk Name:CT4                                   Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
    Single tier MAX:  BH:  15.24  PBW:  30.02  *Wake Effect Ht:   38.10
        *adjusted for a Stack-Building elevation difference of    0.00
              BldNo:  2  Bld Name:S.Demin   TierNo:  1

Drtcn: 270.00

StkNo:  1  Stk Name:CT1                                   Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
    No single tier affects this stack for this direction.
StkNo:  2  Stk Name:CT2                                   Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
    No single tier affects this stack for this direction.
StkNo:  3  Stk Name:CT3                                   Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
    Single tier MAX:  BH:  15.24  PBW:  30.48  *Wake Effect Ht:   38.10
        *adjusted for a Stack-Building elevation difference of    0.00
              BldNo:  2  Bld Name:S.Demin   TierNo:  1
StkNo:  4  Stk Name:CT4                                   Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
    Single tier MAX:  BH:  15.24  PBW:  30.48  *Wake Effect Ht:   38.10
        *adjusted for a Stack-Building elevation difference of    0.00
              BldNo:  2  Bld Name:S.Demin   TierNo:  1

Drtcn: 280.00

StkNo:  1  Stk Name:CT1                                   Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
    No single tier affects this stack for this direction.
StkNo:  2  Stk Name:CT2                                   Stack Ht:   18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
    No single tier affects this stack for this direction.
StkNo:  3  Stk Name:CT3                                   Stack Ht:   18.29
                 GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
    No single tier affects this stack for this direction.
StkNo:  4  Stk Name:CT4                                   Stack Ht:   18.29
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                GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:   38.10
    Single tier MAX:  BH:  15.24  PBW:  30.02  *Wake Effect Ht:   38.10
         *adjusted for a Stack-Building elevation difference of    0.00
               BldNo:  2  Bld Name:S.Demin     TierNo:  1

Drtcn: 290.00

StkNo:  1  Stk Name:CT1                                Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
    No single tier affects this stack for this direction.
StkNo:  2  Stk Name:CT2                                Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
    No single tier affects this stack for this direction.
StkNo:  3  Stk Name:CT3                                Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:   38.10
    No single tier affects this stack for this direction.
StkNo:  4  Stk Name:CT4                                Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:   38.10
    No single tier affects this stack for this direction.

Drtcn: 300.00

StkNo:  1  Stk Name:CT1                                Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
    No single tier affects this stack for this direction.
StkNo:  2  Stk Name:CT2                                Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
    No single tier affects this stack for this direction.
StkNo:  3  Stk Name:CT3                                Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:   38.10
    No single tier affects this stack for this direction.
StkNo:  4  Stk Name:CT4                                Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:   38.10
    No single tier affects this stack for this direction.

Drtcn: 310.00

StkNo:  1  Stk Name:CT1                                Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
    No single tier affects this stack for this direction.
StkNo:  2  Stk Name:CT2                                Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
    No single tier affects this stack for this direction.
StkNo:  3  Stk Name:CT3                                Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:   38.10
    No single tier affects this stack for this direction.
StkNo:  4  Stk Name:CT4                                Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:   38.10
    No single tier affects this stack for this direction.

Drtcn: 320.00

StkNo:  1  Stk Name:CT1                                Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
    Single tier MAX:  BH:   6.71  PBW:  15.23  *Wake Effect Ht:   16.76
         *adjusted for a Stack-Building elevation difference of    0.00
               BldNo:  9  Bld Name:Turb1      TierNo:  1
StkNo:  2  Stk Name:CT2                                Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
    Single tier MAX:  BH:   6.71  PBW:  15.23  *Wake Effect Ht:   16.76
         *adjusted for a Stack-Building elevation difference of    0.00
               BldNo: 10  Bld Name:Turb2      TierNo:  1
StkNo:  3  Stk Name:CT3                                Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:   38.10
    Single tier MAX:  BH:   6.71  PBW:  15.23  *Wake Effect Ht:   16.76
         *adjusted for a Stack-Building elevation difference of    0.00
               BldNo: 11  Bld Name:Turb3      TierNo:  1
StkNo:  4  Stk Name:CT4                                Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:   38.10
    Single tier MAX:  BH:   6.71  PBW:  15.23  *Wake Effect Ht:   16.76
         *adjusted for a Stack-Building elevation difference of    0.00
               BldNo: 12  Bld Name:Turb4      TierNo:  1

Drtcn: 330.00

StkNo:  1  Stk Name:CT1                                Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
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     Single tier MAX:  BH:   6.71  PBW:  14.32  *Wake Effect Ht:    16.76
         *adjusted for a Stack-Building elevation difference of     0.00
              BldNo:  9  Bld Name:Turb1      TierNo:  1
StkNo:  2  Stk Name:CT2                                Stack Ht:    18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:    35.81
     Single tier MAX:  BH:   6.71  PBW:  14.32  *Wake Effect Ht:    16.76
         *adjusted for a Stack-Building elevation difference of     0.00
              BldNo: 10  Bld Name:Turb2      TierNo:  1
StkNo:  3  Stk Name:CT3                                Stack Ht:    18.29
                 GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:    38.10
     Single tier MAX:  BH:   6.71  PBW:  14.32  *Wake Effect Ht:    16.76
         *adjusted for a Stack-Building elevation difference of     0.00
              BldNo: 11  Bld Name:Turb3      TierNo:  1
StkNo:  4  Stk Name:CT4                                Stack Ht:    18.29
                 GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:    38.10
     Single tier MAX:  BH:   6.71  PBW:  14.32  *Wake Effect Ht:    16.76
         *adjusted for a Stack-Building elevation difference of     0.00
              BldNo: 12  Bld Name:Turb4      TierNo:  1

Drtcn: 340.00

StkNo:  1  Stk Name:CT1                                Stack Ht:    18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:    35.81
     Single tier MAX:  BH:   6.71  PBW:  12.97  *Wake Effect Ht:    16.76
         *adjusted for a Stack-Building elevation difference of     0.00
              BldNo:  9  Bld Name:Turb1      TierNo:  1
StkNo:  2  Stk Name:CT2                                Stack Ht:    18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:    35.81
     Single tier MAX:  BH:   6.71  PBW:  12.97  *Wake Effect Ht:    16.76
         *adjusted for a Stack-Building elevation difference of     0.00
              BldNo: 10  Bld Name:Turb2      TierNo:  1
StkNo:  3  Stk Name:CT3                                Stack Ht:    18.29
                 GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:    38.10
     Single tier MAX:  BH:   6.71  PBW:  12.97  *Wake Effect Ht:    16.76
         *adjusted for a Stack-Building elevation difference of     0.00
              BldNo: 11  Bld Name:Turb3      TierNo:  1
StkNo:  4  Stk Name:CT4                                Stack Ht:    18.29
                 GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:    38.10
     Single tier MAX:  BH:  15.24  PBW:  28.64  *Wake Effect Ht:    38.10
         *adjusted for a Stack-Building elevation difference of     0.00
              BldNo:  3  Bld Name:W.FO Tk    TierNo:  1

Drtcn: 350.00

StkNo:  1  Stk Name:CT1                                Stack Ht:    18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:    35.81
     Single tier MAX:  BH:   6.71  PBW:  11.23  *Wake Effect Ht:    16.76
         *adjusted for a Stack-Building elevation difference of     0.00
              BldNo:  9  Bld Name:Turb1      TierNo:  1
StkNo:  2  Stk Name:CT2                                Stack Ht:    18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:    35.81
     Single tier MAX:  BH:   6.71  PBW:  11.23  *Wake Effect Ht:    16.76
         *adjusted for a Stack-Building elevation difference of     0.00
              BldNo: 10  Bld Name:Turb2      TierNo:  1
StkNo:  3  Stk Name:CT3                                Stack Ht:    18.29
                 GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:    38.10
     Single tier MAX:  BH:   6.71  PBW:  11.23  *Wake Effect Ht:    16.76
         *adjusted for a Stack-Building elevation difference of     0.00
              BldNo: 11  Bld Name:Turb3      TierNo:  1
StkNo:  4  Stk Name:CT4                                Stack Ht:    18.29
                 GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:    38.10
     Single tier MAX:  BH:  15.24  PBW:  30.02  *Wake Effect Ht:    38.10
         *adjusted for a Stack-Building elevation difference of     0.00
              BldNo:  3  Bld Name:W.FO Tk    TierNo:  1

Drtcn: 360.00

StkNo:  1  Stk Name:CT1                                Stack Ht:    18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:    35.81
     Single tier MAX:  BH:   6.71  PBW:   9.14  *Wake Effect Ht:    16.76
         *adjusted for a Stack-Building elevation difference of     0.00
              BldNo:  9  Bld Name:Turb1      TierNo:  1
StkNo:  2  Stk Name:CT2                                Stack Ht:    18.29
                 GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:    35.81
     Single tier MAX:  BH:   6.71  PBW:   9.14  *Wake Effect Ht:    16.76
         *adjusted for a Stack-Building elevation difference of     0.00
              BldNo: 10  Bld Name:Turb2      TierNo:  1
```

```
 StkNo:  3  Stk Name:CT3                                 Stack Ht:    18.29
                 GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:    38.10
     Single tier MAX:  BH:   6.71  PBW:   9.14  *Wake Effect Ht:   16.76
          *adjusted for a Stack-Building elevation difference of    0.00
                BldNo: 11  Bld Name:Turb3      TierNo:  1
 StkNo:  4  Stk Name:CT4                                 Stack Ht:    18.29
                 GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:    38.10
     Single tier MAX:  BH:  15.24  PBW:  30.48  *Wake Effect Ht:   38.10
          *adjusted for a Stack-Building elevation difference of    0.00
                BldNo:  3  Bld Name:W.FO Tk    TierNo:  1


Dominate combined buildings:

 Drtcn:  10.00

 StkNo:  1  Stk Name:CT1                                 Stack Ht:    18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:    35.81
      No combined tiers affect this stack for this direction.
 StkNo:  2  Stk Name:CT2                                 Stack Ht:    18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:    35.81
      No combined tiers affect this stack for this direction.
 StkNo:  3  Stk Name:CT3                                 Stack Ht:    18.29
                 GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:    38.10
      No combined tiers affect this stack for this direction.
 StkNo:  4  Stk Name:CT4                                 Stack Ht:    18.29
                 GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:    38.10
   Combined tier MAX:  BH:  15.24  PBW:  73.24  *Wake Effect Ht:   38.10
          *adjusted for a Stack-Building elevation difference of    0.00
  No. of Tiers affecting Stk:  2
   Bldg-Tier nos. contributing to MAX:   9  13

 Drtcn:  20.00

 StkNo:  1  Stk Name:CT1                                 Stack Ht:    18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:    35.81
      No combined tiers affect this stack for this direction.
 StkNo:  2  Stk Name:CT2                                 Stack Ht:    18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:    35.81
      No combined tiers affect this stack for this direction.
 StkNo:  3  Stk Name:CT3                                 Stack Ht:    18.29
                 GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:    38.10
      No combined tiers affect this stack for this direction.
 StkNo:  4  Stk Name:CT4                                 Stack Ht:    18.29
                 GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:    38.10
      No combined tiers affect this stack for this direction

 Drtcn:  30.00

 StkNo:  1  Stk Name:CT1                                 Stack Ht:    18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:    35.81
      No combined tiers affect this stack for this direction.
 StkNo:  2  Stk Name:CT2                                 Stack Ht:    18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:    35.81
      No combined tiers affect this stack for this direction.
 StkNo:  3  Stk Name:CT3                                 Stack Ht:    18.29
                 GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:    38.10
      No combined tiers affect this stack for this direction.
 StkNo:  4  Stk Name:CT4                                 Stack Ht:    18.29
                 GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:    38.10
   Combined tier MAX:  BH:  15.24  PBW:  47.77  *Wake Effect Ht:   38.10
          *adjusted for a Stack-Building elevation difference of    0.00
  No. of Tiers affecting Stk:  2
   Bldg-Tier nos. contributing to MAX:   1   5

 Drtcn:  40.00

 StkNo:  1  Stk Name:CT1                                 Stack Ht:    18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:    35.81
      No combined tiers affect this stack for this direction.
 StkNo:  2  Stk Name:CT2                                 Stack Ht:    18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:    35.81
      No combined tiers affect this stack for this direction.
 StkNo:  3  Stk Name:CT3                                 Stack Ht:    18.29
                 GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:    38.10
      No combined tiers affect this stack for this direction.
 StkNo:  4  Stk Name:CT4                                 Stack Ht:    18.29
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                 GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
   Combined tier MAX:  BH:  15.24  PBW:  53.91  *Wake Effect Ht:  38.10
        *adjusted for a Stack-Building elevation difference of     0.00
  No. of Tiers affecting Stk:  2
   Bldg-Tier nos. contributing to MAX:   1   5

 Drtcn:  50.00

 StkNo:  1  Stk Name:CT1                                Stack Ht:  18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
      No combined tiers affect this stack for this direction.
 StkNo:  2  Stk Name:CT2                                Stack Ht:  18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
      No combined tiers affect this stack for this direction.
 StkNo:  3  Stk Name:CT3                                Stack Ht:  18.29
                 GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
      No combined tiers affect this stack for this direction.
 StkNo:  4  Stk Name:CT4                                Stack Ht:  18.29
                 GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
   Combined tier MAX:  BH:  15.24  PBW:  58.42  *Wake Effect Ht:  38.10
        *adjusted for a Stack-Building elevation difference of     0.00
  No. of Tiers affecting Stk:  2
   Bldg-Tier nos. contributing to MAX:   1   5

 Drtcn:  60.00

 StkNo:  1  Stk Name:CT1                                Stack Ht:  18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
      No combined tiers affect this stack for this direction.
 StkNo:  2  Stk Name:CT2                                Stack Ht:  18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
      No combined tiers affect this stack for this direction.
 StkNo:  3  Stk Name:CT3                                Stack Ht:  18.29
                 GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
      No combined tiers affect this stack for this direction.
 StkNo:  4  Stk Name:CT4                                Stack Ht:  18.29
                 GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
      No combined tiers affect this stack for this direction

 Drtcn:  70.00

 StkNo:  1  Stk Name:CT1                                Stack Ht:  18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
      No combined tiers affect this stack for this direction.
 StkNo:  2  Stk Name:CT2                                Stack Ht:  18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
      No combined tiers affect this stack for this direction.
 StkNo:  3  Stk Name:CT3                                Stack Ht:  18.29
                 GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
      No combined tiers affect this stack for this direction.
 StkNo:  4  Stk Name:CT4                                Stack Ht:  18.29
                 GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
      No combined tiers affect this stack for this direction

 Drtcn:  80.00

 StkNo:  1  Stk Name:CT1                                Stack Ht:  18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
      No combined tiers affect this stack for this direction.
 StkNo:  2  Stk Name:CT2                                Stack Ht:  18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
      No combined tiers affect this stack for this direction.
 StkNo:  3  Stk Name:CT3                                Stack Ht:  18.29
                 GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
      No combined tiers affect this stack for this direction.
 StkNo:  4  Stk Name:CT4                                Stack Ht:  18.29
                 GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
      No combined tiers affect this stack for this direction

 Drtcn:  90.00

 StkNo:  1  Stk Name:CT1                                Stack Ht:  18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
      No combined tiers affect this stack for this direction.
 StkNo:  2  Stk Name:CT2                                Stack Ht:  18.29
                 GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
      No combined tiers affect this stack for this direction.
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StkNo:  3  Stk Name:CT3                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction.
StkNo:  4  Stk Name:CT4                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction

Drtcn: 100.00

StkNo:  1  Stk Name:CT1                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  2  Stk Name:CT2                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  3  Stk Name:CT3                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction.
StkNo:  4  Stk Name:CT4                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
  Combined tier MAX:  BH:  15.24  PBW:  66.04  *Wake Effect Ht:   38.10
        *adjusted for a Stack-Building elevation difference of     0.00
 No. of Tiers affecting Stk:  2
  Bldg-Tier nos. contributing to MAX:    1    5

Drtcn: 110.00

StkNo:  1  Stk Name:CT1                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  2  Stk Name:CT2                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  3  Stk Name:CT3                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction.
StkNo:  4  Stk Name:CT4                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction

Drtcn: 120.00

StkNo:  1  Stk Name:CT1                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  2  Stk Name:CT2                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  3  Stk Name:CT3                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction.
StkNo:  4  Stk Name:CT4                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction

Drtcn: 130.00

StkNo:  1  Stk Name:CT1                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  2  Stk Name:CT2                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  3  Stk Name:CT3                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction.
StkNo:  4  Stk Name:CT4                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction

Drtcn: 140.00

StkNo:  1  Stk Name:CT1                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  2  Stk Name:CT2                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
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     No combined tiers affect this stack for this direction.
StkNo:  3  Stk Name:CT3                                   Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction.
StkNo:  4  Stk Name:CT4                                   Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction

Drtcn: 150.00

StkNo:  1  Stk Name:CT1                                   Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  2  Stk Name:CT2                                   Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  3  Stk Name:CT3                                   Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction.
StkNo:  4  Stk Name:CT4                                   Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction

Drtcn: 160.00

StkNo:  1  Stk Name:CT1                                   Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  2  Stk Name:CT2                                   Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  3  Stk Name:CT3                                   Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction.
StkNo:  4  Stk Name:CT4                                   Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction

Drtcn: 170.00

StkNo:  1  Stk Name:CT1                                   Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  2  Stk Name:CT2                                   Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  3  Stk Name:CT3                                   Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction.
StkNo:  4  Stk Name:CT4                                   Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction

Drtcn: 180.00

StkNo:  1  Stk Name:CT1                                   Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  2  Stk Name:CT2                                   Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  3  Stk Name:CT3                                   Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction.
StkNo:  4  Stk Name:CT4                                   Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction

Drtcn: 190.00

StkNo:  1  Stk Name:CT1                                   Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  2  Stk Name:CT2                                   Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  3  Stk Name:CT3                                   Stack Ht:   18.29
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                GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction.
StkNo:  4  Stk_Name:CT4                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction

Drtcn: 200.00

StkNo:  1  Stk Name:CT1                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  2  Stk Name:CT2                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  3  Stk Name:CT3                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction.
StkNo:  4  Stk Name:CT4                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction

Drtcn: 210.00

StkNo:  1  Stk Name:CT1                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  2  Stk Name:CT2                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  3  Stk Name:CT3                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction.
StkNo:  4  Stk Name:CT4                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:   38.10
   Combined tier MAX:  BH:  15.24  PBW:  47.77  *Wake Effect Ht:   38.10
         *adjusted for a Stack-Building elevation difference of    0.00
  No. of Tiers affecting Stk:  2
   Bldg-Tier nos. contributing to MAX:   1   5

Drtcn: 220.00

StkNo:  1  Stk Name:CT1                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  2  Stk Name:CT2                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  3  Stk Name:CT3                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction.
StkNo:  4  Stk Name:CT4                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:   38.10
   Combined tier MAX:  BH:  15.24  PBW:  53.91  *Wake Effect Ht:   38.10
         *adjusted for a Stack-Building elevation difference of    0.00
  No. of Tiers affecting Stk:  2
   Bldg-Tier nos. contributing to MAX:   1   5

Drtcn: 230.00

StkNo:  1  Stk Name:CT1                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  2  Stk Name:CT2                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  3  Stk Name:CT3                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:   38.10
   Combined tier MAX:  BH:  15.24  PBW:  58.42  *Wake Effect Ht:   38.10
         *adjusted for a Stack-Building elevation difference of    0.00
  No. of Tiers affecting Stk:  2
   Bldg-Tier nos. contributing to MAX:   1   5
StkNo:  4  Stk Name:CT4                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:   38.10
   Combined tier MAX:  BH:  15.24  PBW:  58.42  *Wake Effect Ht:   38.10
         *adjusted for a Stack-Building elevation difference of    0.00
  No. of Tiers affecting Stk:  2
   Bldg-Tier nos. contributing to MAX:   1   5
```

```
Drtcn: 240.00

StkNo:  1  Stk Name:CT1                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  2  Stk Name:CT2                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  3  Stk Name:CT3                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
  Combined tier MAX:  BH:  15.24  PBW:  61.15  *Wake Effect Ht:  38.10
        *adjusted for a Stack-Building elevation difference of    0.00
 No. of Tiers affecting Stk:  2
  Bldg-Tier nos. contributing to MAX:   1   5
StkNo:  4  Stk Name:CT4                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
  Combined tier MAX:  BH:  15.24  PBW:  61.15  *Wake Effect Ht:  38.10
        *adjusted for a Stack-Building elevation difference of    0.00
 No. of Tiers affecting Stk:  2
  Bldg-Tier nos. contributing to MAX:   1   5

Drtcn: 250.00

StkNo:  1  Stk Name:CT1                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  2  Stk Name:CT2-                             Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  3  Stk Name:CT3                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
  Combined tier MAX:  BH:  15.24  PBW:  63.01  *Wake Effect Ht:  38.10
        *adjusted for a Stack-Building elevation difference of    0.00
 No. of Tiers affecting Stk:  2
  Bldg-Tier nos. contributing to MAX:   1   5
StkNo:  4  Stk Name:CT4                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
  Combined tier MAX:  BH:  15.24  PBW:  63.01  *Wake Effect Ht:  38.10
        *adjusted for a Stack-Building elevation difference of    0.00
 No. of Tiers affecting Stk:  2
  Bldg-Tier nos. contributing to MAX:   1   5

Drtcn: 260.00

StkNo:  1  Stk Name:CT1                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  2  Stk Name:CT2                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  3  Stk Name:CT3                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
  Combined tier MAX:  BH:  15.24  PBW:  66.04  *Wake Effect Ht:  38.10
        *adjusted for a Stack-Building elevation difference of    0.00
 No. of Tiers affecting Stk:  2
  Bldg-Tier nos. contributing to MAX:   1   5
StkNo:  4  Stk Name:CT4                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
  Combined tier MAX:  BH:  15.24  PBW:  66.04  *Wake Effect Ht:  38.10
        *adjusted for a Stack-Building elevation difference of    0.00
 No. of Tiers affecting Stk:  2
  Bldg-Tier nos. contributing to MAX:   1   5

Drtcn: 270.00

StkNo:  1  Stk Name:CT1                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  2  Stk Name:CT2                              Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  3  Stk Name:CT3                              Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
  Combined tier MAX:  BH:  15.24  PBW:  67.06  *Wake Effect Ht:  38.10
        *adjusted for a Stack-Building elevation difference of    0.00
 No. of Tiers affecting Stk:  2
```

```
  Bldg-Tier nos. contributing to MAX:   1   5
 StkNo:  4  Stk Name:CT4                                Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
  Combined tier MAX:  BH:  15.24  PBW:  67.06 *Wake Effect Ht:   38.10
        *adjusted for a Stack-Building elevation difference of    0.00
 No. of Tiers affecting Stk:  2
  Bldg-Tier nos. contributing to MAX:   1   5

 Drtcn: 280.00

 StkNo:  1  Stk Name:CT1                                Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
 StkNo:  2  Stk Name:CT2                                Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
 StkNo:  3  Stk Name:CT3                                Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction.
 StkNo:  4  Stk Name:CT4                                Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
  Combined tier MAX:  BH:  15.24  PBW:  66.04 *Wake Effect Ht:   38.10
        *adjusted for a Stack-Building elevation difference of    0.00
 No. of Tiers affecting Stk:  2
  Bldg-Tier nos. contributing to MAX:   1   5

 Drtcn: 290.00

 StkNo:  1  Stk Name:CT1                                Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
 StkNo:  2  Stk Name:CT2                                Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
 StkNo:  3  Stk Name:CT3                                Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction.
 StkNo:  4  Stk Name:CT4                                Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction

 Drtcn: 300.00

 StkNo:  1  Stk Name:CT1                                Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
 StkNo:  2  Stk Name:CT2                                Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
 StkNo:  3  Stk Name:CT3                                Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction.
 StkNo:  4  Stk Name:CT4                                Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction

 Drtcn: 310.00

 StkNo:  1  Stk Name:CT1                                Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
 StkNo:  2  Stk Name:CT2                                Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
 StkNo:  3  Stk Name:CT3                                Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  29.76  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction.
 StkNo:  4  Stk Name:CT4                                Stack Ht:   18.29
                GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction

 Drtcn: 320.00

 StkNo:  1  Stk Name:CT1                                Stack Ht:   18.29
                GEP:  BH:  14.33  PBW:  14.34  *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
 StkNo:  2  Stk Name:CT2                                Stack Ht:   18.29
```

```
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  3  Stk Name:CT3                              Stack Ht:    18.29
                GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction.
StkNo:  4  Stk Name:CT4                              Stack Ht:    18.29
                GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:   38.10
  Combined tier MAX:  BH:  15.24  PBW:  64.02  *Wake Effect Ht:   38.10
       *adjusted for a Stack-Building elevation difference of      0.00
 No. of Tiers affecting Stk:  2
  Bldg-Tier nos. contributing to MAX:   9  13

Drtcn: 330.00

StkNo:  1  Stk Name:CT1                              Stack Ht:    18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  2  Stk Name:CT2                              Stack Ht:    18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  3  Stk Name:CT3                              Stack Ht:    18.29
                GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction.
StkNo:  4  Stk Name:CT4                              Stack Ht:    18.29
                GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:   38.10
  Combined tier MAX:  BH:  15.24  PBW:  67.49  *Wake Effect Ht:   38.10
       *adjusted for a Stack-Building elevation difference of      0.00
 No. of Tiers affecting-Stk:  2
  Bldg-Tier nos. contributing to MAX:   9  13

Drtcn: 340.00

StkNo:  1  Stk Name:CT1                              Stack Ht:    18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  2  Stk Name:CT2                              Stack Ht:    18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  3  Stk Name:CT3                              Stack Ht:    18.29
                GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction.
StkNo:  4  Stk Name:CT4                              Stack Ht:    18.29
                GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:   38.10
  Combined tier MAX:  BH:  15.24  PBW:  69.89  *Wake Effect Ht:   38.10
       *adjusted for a Stack-Building elevation difference of      0.00
 No. of Tiers affecting Stk:  2
  Bldg-Tier nos. contributing to MAX:   9  13

Drtcn: 350.00

StkNo:  1  Stk Name:CT1                              Stack Ht:    18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  2  Stk Name:CT2                              Stack Ht:    18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  3  Stk Name:CT3                              Stack Ht:    18.29
                GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction.
StkNo:  4  Stk Name:CT4                              Stack Ht:    18.29
                GEP:  BH:  15.24  PBW:  28.20   *Equation 1 Ht:   38.10
  Combined tier MAX:  BH:  15.24  PBW:  73.24  *Wake Effect Ht:   38.10
       *adjusted for a Stack-Building elevation difference of      0.00
 No. of Tiers affecting Stk:  2
  Bldg-Tier nos. contributing to MAX:   9  13

Drtcn: 360.00

StkNo:  1  Stk Name:CT1                              Stack Ht:    18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  2  Stk Name:CT2                              Stack Ht:    18.29
                GEP:  BH:  14.33  PBW:  14.34   *Equation 1 Ht:   35.81
     No combined tiers affect this stack for this direction.
StkNo:  3  Stk Name:CT3                              Stack Ht:    18.29
                GEP:  BH:  15.24  PBW:  29.76   *Equation 1 Ht:   38.10
     No combined tiers affect this stack for this direction.
```

```
StkNo:  4  Stk Name:CT4                                  Stack Ht:   18.29
               GEP:  BH:  15.24  PBW:  28.20  *Equation 1 Ht:   38.10
  Combined tier MAX:  BH:  15.24  PBW:  74.37  *Wake Effect Ht:   38.10
        *adjusted for a Stack-Building elevation difference of    0.00
 No. of Tiers affecting Stk:  2
  Bldg-Tier nos. contributing to MAX:   9  13
```

APPENDIX D

DETAILED SUMMARY OF ISCST MODEL RESULTS

ISCBOB3 RELEASE 98056

ISCST3 OUTPUT FILE NUMBER 1 :GENNG.087
ISCST3 OUTPUT FILE NUMBER 2 :GENNG.088
ISCST3 OUTPUT FILE NUMBER 3 :GENNG.089
ISCST3 OUTPUT FILE NUMBER 4 :GENNG.090
ISCST3 OUTPUT FILE NUMBER 5 :GENNG.091
First title for last output file is: 1987 SONAT HARDEE COUNTY SITE 8/25/99
Second title for last output file is: NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES

AVERAGING TIME	YEAR	CONC (ug/m3)	DIR (deg) or X (m)	DIST (m) or Y (m)	PERIOD ENDING (YYMMDDHH)
SOURCE GROUP ID:	BASE32				
Annual					
	1987	0.01248	240.	15000.	87123124
	1988	0.01201	220.	15000.	88123124
	1989	0.01196	210.	300.	89123124
	1990	0.01546	250.	15000.	90123124
	1991	0.01383	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.14978	80.	7000.	87040624
	1988	0.20047	220.	20000.	88091324
	1989	0.20101	180.	20000.	89012324
	1990	0.18980	230.	20000.	90011624
	1991	0.13692	250.	10000.	91040224
HIGH 8-Hour					
	1987	0.41303	60.	20000.	87120408
	1988	0.39232	240.	20000.	88011524
	1989	0.43457	180.	20000.	89012308
	1990	0.39739	180.	20000.	90041208
	1991	0.32688	240.	20000.	91122608
HIGH 3-Hour					
	1987	0.80207	110.	20000.	87031003
	1988	0.76167	220.	20000.	88091324
	1989	0.65842	350.	20000.	89060824
	1990	0.62848	250.	10000.	90041312
	1991	0.82723	70.	2000.	91051215
HIGH 1-Hour					
	1987	1.68787	90.	2000.	87082614
	1988	1.61233	20.	2000.	88082914
	1989	1.73693	310.	1500.	89070913
	1990	1.68193	30.	2000.	90042312
	1991	1.78281	290.	1500.	91083113
SOURCE GROUP ID:	BASE95				
Annual					
	1987	0.01132	240.	15000.	87123124
	1988	0.01077	220.	15000.	88123124
	1989	0.01186	210.	300.	89123124
	1990	0.01392	250.	15000.	90123124
	1991	0.01259	240.	20000.	91123124
HIGH 24-Hour					
	1987	0.14448	80.	7000.	87040624
	1988	0.18685	220.	20000.	88091324
	1989	0.18691	180.	20000.	89012324
	1990	0.17532	230.	20000.	90011624
	1991	0.13984	270.	7000.	91061124
HIGH 8-Hour					
	1987	0.38152	60.	20000.	87120408
	1988	0.36398	240.	20000.	88011524
	1989	0.40189	180.	20000.	89012308
	1990	0.36705	180.	20000.	90041208
	1991	0.30586	70.	2000.	91051216
HIGH 3-Hour					
	1987	0.74421	110.	20000.	87031003
	1988	0.70506	220.	20000.	88091324
	1989	0.60876	350.	20000.	89060824
	1990	0.61963	250.	10000.	90041312
	1991	0.81515	70.	2000.	91051215
HIGH 1-Hour					
	1987	1.59669	60.	2000.	87061714
	1988	1.59151	20.	2000.	88082914
	1989	1.60114	250.	2000.	89082614
	1990	1.61887	30.	2000.	90092113
	1991	1.59840	270.	2000.	91061113
SOURCE GROUP ID:	LD7532				

Annual					
	1987	0.01442	240.	15000.	87123124
	1988	0.01389	220.	15000.	88123124
	1989	0.01231	200.	15000.	89123124
	1990	0.01800	250.	15000.	90123124
	1991	0.01637	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.17821	270.	10000.	87052424
	1988	0.22818	220.	15000.	88091324
	1989	0.22811	180.	20000.	89012324
	1990	0.21948	240.	15000.	90102724
	1991	0.16541	270.	10000.	91061124
HIGH 8-Hour					
	1987	0.47169	60.	20000.	87120408
	1988	0.43706	240.	20000.	88011524
	1989	0.49666	180.	20000.	89012308
	1990	0.45401	180.	20000.	90041208
	1991	0.37890	240.	20000.	91122608
HIGH 3-Hour					
	1987	0.90855	110.	20000.	87031003
	1988	0.86491	220.	20000.	88091324
	1989	0.74896	350.	20000.	89060824
	1990	0.97128	270.	2000.	90061315
	1991	0.84768	70.	2000.	91051215
HIGH 1-Hour					
	1987	2.10147	280.	1500.	87052413
	1988	1.95754	20.	1500.	88062313
	1989	2.01611	330.	1500.	89032712
	1990	2.08252	70.	1500.	90081414
	1991	2.10759	190.	1500.	91090612
SOURCE GROUP ID:	LD7595				
Annual					
	1987	0.01500	240.	15000.	87123124
	1988	0.01456	220.	15000.	88123124
	1989	0.01306	200.	15000.	89123124
	1990	0.01881	250.	12000.	90123124
	1991	0.01704	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.18491	270.	10000.	87052424
	1988	0.23522	220.	15000.	88091324
	1989	0.24313	180.	20000.	89012324
	1990	0.22951	240.	15000.	90102724
	1991	0.17107	270.	10000.	91061124
HIGH 8-Hour					
	1987	0.49308	60.	20000.	87120408
	1988	0.43300	240.	20000.	88011524
	1989	0.51944	180.	20000.	89012308
	1990	0.47462	180.	20000.	90041208
	1991	0.39823	240.	20000.	91122608
HIGH 3-Hour					
	1987	0.94699	110.	20000.	87031003
	1988	0.90233	220.	20000.	88091324
	1989	0.78186	350.	20000.	89060824
	1990	0.97811	270.	2000.	90061315
	1991	0.85467	70.	2000.	91051215
HIGH 1-Hour					
	1987	2.15338	70.	1500.	87080713
	1988	2.12348	160.	1500.	88080712
	1989	2.18542	10.	1500.	89061912
	1990	2.16744	290.	1500.	90071012
	1991	2.17368	320.	1500.	91061514
SOURCE GROUP ID:	LD5032				
Annual					
	1987	0.01685	240.	15000.	87123124
	1988	0.01635	220.	15000.	88123124
	1989	0.01493	200.	15000.	89123124
	1990	0.02108	250.	12000.	90123124
	1991	0.01941	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.20383	270.	10000.	87052424
	1988	0.24548	220.	20000.	88091324
	1989	0.27213	180.	15000.	89012324
	1990	0.25773	240.	15000.	90102724
	1991	0.17409	250.	10000.	91040224
HIGH 8-Hour					
	1987	0.55505	60.	15000.	87120408
	1988	0.50559	160.	1500.	88080716

	1989	0.58108	180.	20000.	89012308
	1990	0.55770	160.	1500.	90061716
	1991	0.45136	240.	20000.	91122608
HIGH 3-Hour					
	1987	1.05883	110.	15000.	87031003
	1988	0.95051	220.	20000.	88091324
	1989	0.85828	350.	20000.	89060824
	1990	1.18045	40.	1500.	90042312
	1991	0.91606	270.	20000.	91010306
HIGH 1-Hour					
	1987	2.51939	250.	1500.	87082212
	1988	2.55232	360.	1500.	88081913
	1989	2.49256	180.	1500.	89041613
	1990	2.52849	60.	1500.	90072013
	1991	2.41349	330.	1500.	91040612
SOURCE GROUP ID:	LD5095				
Annual					
	1987	0.01758	240.	15000.	87123124
	1988	0.01697	220.	15000.	88123124
	1989	0.01593	180.	15000.	89123124
	1990	0.02186	250.	12000.	90123124
	1991	0.02028	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.20872	270.	10000.	87052424
	1988	0.24992	220.	20000.	88091324
	1989	0.28159	180.	15000.	89012324
	1990	0.26647	240.	15000.	90102724
	1991	0.21255	250.	5000.	91090224
HIGH 8-Hour					
	1987	0.57487	60.	15000.	87120408
	1988	0.50889	160.	1500.	88080716
	1989	0.60213	180.	15000.	89012308
	1990	0.56179	160.	1500.	90061716
	1991	0.46759	240.	20000.	91122608
HIGH 3-Hour					
	1987	1.09449	110.	15000.	87031003
	1988	0.95532	220.	20000.	88091324
	1989	0.87816	200.	15000.	89092106
	1990	1.18941	40.	1500.	90042312
	1991	0.94760	270.	20000.	91010306
HIGH 1-Hour					
	1987	2.53279	250.	1500.	87082212
	1988	2.56549	360.	1500.	88081913
	1989	2.50515	180.	1500.	89041613
	1990	2.54155	60.	1500.	90072013
	1991	2.42505	330.	1500.	91040612

All receptor computations reported with respect to a user-specified origin

GRID	0.00	0.00
DISCRETE	0.00	0.00

ISCBOB3 RELEASE 98056

ISCST3 OUTPUT FILE NUMBER 1 :GENFO.087
ISCST3 OUTPUT FILE NUMBER 2 :GENFO.088
ISCST3 OUTPUT FILE NUMBER 3 :GENFO.089
ISCST3 OUTPUT FILE NUMBER 4 :GENFO.090
ISCST3 OUTPUT FILE NUMBER 5 :GENFO.091
First title for last output file is: 1987 SONAT HARDEE COUNTY SITE 8/14/99
Second title for last output file is: FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES

AVERAGING TIME	YEAR	CONC (ug/m3)	DIR (deg) or X (m)	DIST (m) or Y (m)	PERIOD ENDING (YYMMDDHH)
SOURCE GROUP ID: BASE32					
Annual					
	1987	0.01217	240.	15000.	87123124
	1988	0.01173	220.	15000.	88123124
	1989	0.01194	210.	300.	89123124
	1990	0.01508	250.	15000.	90123124
	1991	0.01344	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.14836	80.	7000.	87040624
	1988	0.19658	220.	20000.	88091324
	1989	0.19681	180.	20000.	89012324
	1990	0.18558	230.	20000.	90011624
	1991	0.13437	250.	10000.	91040224
HIGH 8-Hour					
	1987	0.40384	60.	20000.	87120408
	1988	0.38393	240.	20000.	88011524
	1989	0.42487	180.	20000.	89012308
	1990	0.38850	180.	20000.	90041208
	1991	0.31884	240.	20000.	91122608
HIGH 3-Hour					
	1987	0.78525	110.	20000.	87031003
	1988	0.74549	220.	20000.	88091324
	1989	0.64427	350.	20000.	89060824
	1990	0.62576	250.	10000.	90041312
	1991	0.82387	70.	2000.	91051215
HIGH 1-Hour					
	1987	1.68181	90.	2000.	87082614
	1988	1.60663	20.	2000.	88082914
	1989	1.73080	310.	1500.	89070913
	1990	1.67577	30.	2000.	90042312
	1991	1.61389	270.	2000.	91061113
SOURCE GROUP ID: BASE95					
Annual					
	1987	0.01276	240.	15000.	87123124
	1988	0.01224	220.	15000.	88123124
	1989	0.01199	210.	300.	89123124
	1990	0.01586	250.	15000.	90123124
	1991	0.01421	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.15151	230.	7000.	87042724
	1988	0.20446	220.	20000.	88091324
	1989	0.20533	180.	20000.	89012324
	1990	0.19413	230.	20000.	90011624
	1991	0.14000	110.	7000.	91080924
HIGH 8-Hour					
	1987	0.42244	60.	20000.	87120408
	1988	0.40092	240.	20000.	88011524
	1989	0.44455	180.	20000.	89012308
	1990	0.40650	180.	20000.	90041208
	1991	0.33515	240.	20000.	91122608
HIGH 3-Hour					
	1987	0.81927	110.	20000.	87031003
	1988	0.77819	220.	20000.	88091324
	1989	0.67286	350.	20000.	89060824
	1990	0.95460	270.	2000.	90061315
	1991	0.83060	70.	2000.	91051215
HIGH 1-Hour					
	1987	1.78459	150.	1500.	87080813
	1988	1.61804	20.	2000.	88082914
	1989	1.74374	310.	1500.	89070913
	1990	1.83620	260.	1500.	90071613
	1991	1.78915	290.	1500.	91083113
SOURCE GROUP ID: LD7532					

Annual					
	1987	0.01430	240.	15000.	87123124
	1988	0.01375	220.	15000.	88123124
	1989	0.01222	200.	15000.	89123124
	1990	0.01792	250.	15000.	90123124
	1991	0.01624	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.17756	270.	10000.	87052424
	1988	0.22716	220.	15000.	88091324
	1989	0.22714	180.	20000.	89012324
	1990	0.21852	240.	15000.	90102724
	1991	0.16488	270.	10000.	91061124
HIGH 8-Hour					
	1987	0.46962	60.	20000.	87120408
	1988	0.43517	240.	20000.	88011524
	1989	0.49446	180.	20000.	89012308
	1990	0.45201	180.	20000.	90041208
	1991	0.37704	240.	20000.	91122608
HIGH 3-Hour					
	1987	0.90480	110.	20000.	87031003
	1988	0.86125	220.	20000.	88091324
	1989	0.74574	350.	20000.	89060824
	1990	0.97060	270.	2000.	90061315
	1991	0.84698	70.	2000.	91051215
HIGH 1-Hour					
	1987	2.09999	280.	1500.	87052413
	1988	1.95593	20.	1500.	88062313
	1989	2.01453	330.	1500.	89032712
	1990	2.03440	200.	1500.	90081313
	1991	2.10609	190.	1500.	91090612
SOURCE GROUP ID:	LD7595				
Annual					
	1987	0.01489	240.	15000.	87123124
	1988	0.01443	220.	15000.	88123124
	1989	0.01284	200.	15000.	89123124
	1990	0.01862	250.	12000.	90123124
	1991	0.01694	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.18231	270.	10000.	87052424
	1988	0.23459	220.	15000.	88091324
	1989	0.23932	180.	20000.	89012324
	1990	0.22562	240.	15000.	90102724
	1991	0.16888	270.	10000.	91061124
HIGH 8-Hour					
	1987	0.48486	60.	20000.	87120408
	1988	0.42524	240.	20000.	88011524
	1989	0.51068	180.	20000.	89012308
	1990	0.46670	180.	20000.	90041208
	1991	0.39078	240.	20000.	91122608
HIGH 3-Hour					
	1987	0.93223	110.	20000.	87031003
	1988	0.88794	220.	20000.	88091324
	1989	0.76920	350.	20000.	89060824
	1990	0.97551	270.	2000.	90061315
	1991	0.85200	70.	2000.	91051215
HIGH 1-Hour					
	1987	2.12170	250.	1500.	87072411
	1988	1.96803	20.	1500.	88062313
	1989	2.15942	330.	1500.	89062212
	1990	2.16144	290.	1500.	90071012
	1991	2.16785	320.	1500.	91061514
SOURCE GROUP ID:	LD5032				
Annual					
	1987	0.01650	240.	15000.	87123124
	1988	0.01593	220.	15000.	88123124
	1989	0.01455	200.	15000.	89123124
	1990	0.02072	250.	12000.	90123124
	1991	0.01886	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.20498	250.	12000.	87112324
	1988	0.23990	220.	20000.	88091324
	1989	0.26568	180.	15000.	89012324
	1990	0.25168	240.	15000.	90102724
	1991	0.18430	270.	10000.	91061124
HIGH 8-Hour					
	1987	0.54122	60.	15000.	87120408
	1988	0.50337	160.	1500.	88080716

	1989	0.56822	180.	20000.	89012308
	1990	0.51858	180.	20000.	90041208
	1991	0.44014	240.	20000.	91122608
HIGH 3-Hour					
	1987	1.03387	110.	15000.	87031003
	1988	0.92741	220.	20000.	88091324
	1989	0.83886	350.	20000.	89060824
	1990	1.17424	40.	1500.	90042312
	1991	0.89392	270.	20000.	91010306
HIGH 1-Hour					
	1987	2.50980	250.	1500.	87082212
	1988	2.37943	260.	1500.	88040513
	1989	2.39547	30.	1500.	89062011
	1990	2.44629	120.	1500.	90080212
	1991	2.36298	130.	1500.	91092113
SOURCE GROUP ID:	LD5095				
Annual					
	1987	0.01737	240.	15000.	87123124
	1988	0.01677	220.	15000.	88123124
	1989	0.01540	180.	15000.	89123124
	1990	0.02155	250.	12000.	90123124
	1991	0.02002	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.20670	270.	10000.	87052424
	1988	0.24725	220.	20000.	88091324
	1989	0.27841	180.	15000.	89012324
	1990	0.26352	240.	15000.	90102724
	1991	0.21073	250.	5000.	91090224
HIGH 8-Hour					
	1987	0.56820	60.	15000.	87120408
	1988	0.50773	160.	1500.	88080716
	1989	0.59505	180.	15000.	89012308
	1990	0.56037	160.	1500.	90061716
	1991	0.46215	240.	20000.	91122608
HIGH 3-Hour					
	1987	1.08251	110.	15000.	87031003
	1988	0.94408	220.	20000.	88091324
	1989	0.86876	350.	20000.	89060824
	1990	1.18632	40.	1500.	90042312
	1991	0.93698	270.	20000.	91010306
HIGH 1-Hour					
	1987	2.52817	250.	1500.	87082212
	1988	2.56094	360.	1500.	88081913
	1989	2.50082	180.	1500.	89041613
	1990	2.53702	60.	1500.	90072013
	1991	2.42107	330.	1500.	91040612

All receptor computations reported with respect to a user-specified origin

GRID	0.00	0.00
DISCRETE	0.00	0.00

ISCBOB3 RELEASE 98056

ISCST3 OUTPUT FILE NUMBER 1 :GENNGC1.087
ISCST3 OUTPUT FILE NUMBER 2 :GENNGC1.088
ISCST3 OUTPUT FILE NUMBER 3 :GENNGC1.089
ISCST3 OUTPUT FILE NUMBER 4 :GENNGC1.090
ISCST3 OUTPUT FILE NUMBER 5 :GENNGC1.091
First title for last output file is: 1987 SONAT HARDEE COUNTY SITE, AT PSD CLASS I AREA 8/25/99
Second title for last output file is: NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES

AVERAGING TIME	YEAR	CONC (ug/m3)	DIR (deg) or X (m)	DIST (m) or Y (m)	PERIOD ENDING (YYMMDDHH)
SOURCE GROUP ID: BASE32					
Annual					
	1987	0.00111	340300.	3165700.	87123124
	1988	0.00187	340300.	3165700.	88123124
	1989	0.00256	340300.	3165700.	89123124
	1990	0.00156	340300.	3165700.	90123124
	1991	0.00106	340300.	3165700.	91123124
HIGH 24-Hour					
	1987	0.02971	340300.	3165700.	87122524
	1988	0.05210	340300.	3169800.	88122824
	1989	0.04930	340300.	3165700.	89042424
	1990	0.05073	340300.	3169800.	90021524
	1991	0.02766	340300.	3165700.	91042324
HIGH 8-Hour					
	1987	0.08875	343700.	3178300.	87011008
	1988	0.15630	340300.	3169800.	88122808
	1989	0.13451	340300.	3165700.	89071208
	1990	0.13741	340300.	3169800.	90021508
	1991	0.07951	340300.	3165700.	91042308
HIGH 3-Hour					
	1987	0.23345	340300.	3165700.	87041503
	1988	0.25106	340300.	3169800.	88040403
	1989	0.20683	340700.	3171900.	89111506
	1990	0.20232	340700.	3171900.	90021503
	1991	0.21135	340300.	3165700.	91042303
HIGH 1-Hour					
	1987	0.45487	340700.	3171900.	87090604
	1988	0.51196	340700.	3171900.	88080907
	1989	0.49547	340300.	3165700.	89071207
	1990	0.45532	340700.	3171900.	90112902
	1991	0.46254	340300.	3167700.	91042802
SOURCE GROUP ID: BASE95					
Annual					
	1987	0.00104	340300.	3165700.	87123124
	1988	0.00176	340300.	3165700.	88123124
	1989	0.00238	340300.	3165700.	89123124
	1990	0.00148	340300.	3165700.	90123124
	1991	0.00100	340300.	3165700.	91123124
HIGH 24-Hour					
	1987	0.02873	340300.	3165700.	87122524
	1988	0.04840	340300.	3169800.	88122824
	1989	0.04599	340300.	3165700.	89042424
	1990	0.04847	340300.	3169800.	90021524
	1991	0.02621	340300.	3165700.	91042324
HIGH 8-Hour					
	1987	0.08495	343700.	3178300.	87011008
	1988	0.14520	340300.	3169800.	88122808
	1989	0.12599	340300.	3165700.	89071208
	1990	0.13110	340300.	3169800.	90021508
	1991	0.07535	340300.	3165700.	91042308
HIGH 3-Hour					
	1987	0.22047	340300.	3165700.	87041503
	1988	0.24104	340300.	3169800.	88040403
	1989	0.19901	340700.	3171900.	89111506
	1990	0.19138	340700.	3171900.	90021503
	1991	0.20031	340300.	3165700.	91042303
HIGH 1-Hour					
	1987	0.43393	340700.	3171900.	87090604
	1988	0.48520	340700.	3171900.	88080907
	1989	0.46913	340300.	3165700.	89071207
	1990	0.43439	340700.	3171900.	90112902
	1991	0.44102	340300.	3167700.	91042802
SOURCE GROUP ID: LD7532					

Annual					
	1987	0.00123	340300.	3165700.	87123124
	1988	0.00208	340300.	3165700.	88123124
	1989	0.00294	340300.	3165700.	89123124
	1990	0.00175	340300.	3165700.	90123124
	1991	0.00120	340300.	3165700.	91123124
HIGH 24-Hour					
	1987	0.03208	340300.	3165700.	87041524
	1988	0.05888	340300.	3169800.	88122824
	1989	0.05538	340300.	3165700.	89042424
	1990	0.05481	340300.	3169800.	90021524
	1991	0.03022	340300.	3165700.	91042324
HIGH 8-Hour					
	1987	0.09624	340300.	3165700.	87041508
	1988	0.17664	340300.	3169800.	88122808
	1989	0.14977	340300.	3165700.	89071208
	1990	0.14886	340300.	3169800.	90021508
	1991	0.08689	340300.	3165700.	91042308
HIGH 3-Hour					
	1987	0.25665	340300.	3165700.	87041503
	1988	0.26817	340300.	3169800.	88040403
	1989	0.22014	340700.	3171900.	89111506
	1990	0.22190	340700.	3171900.	90021503
	1991	0.23096	340300.	3165700.	91042303
HIGH 1-Hour					
	1987	0.49091	340700.	3171900.	87090604
	1988	0.55857	340700.	3171900.	88080907
	1989	0.54129	340300.	3165700.	89071207
	1990	0.49139	340700.	3171900.	90112902
	1991	0.49959	340300.	3167700.	91042802
SOURCE GROUP ID:	LD7595				
Annual					
	1987	0.00126	340300.	3165700.	87123124
	1988	0.00216	340300.	3165700.	88123124
	1989	0.00304	340300.	3165700.	89123124
	1990	0.00182	340300.	3165700.	90123124
	1991	0.00123	340300.	3165700.	91123124
HIGH 24-Hour					
	1987	0.03311	340300.	3165700.	87041524
	1988	0.06132	340300.	3169800.	88122824
	1989	0.05757	340300.	3165700.	89042424
	1990	0.05619	340300.	3169800.	90021524
	1991	0.03113	340300.	3165700.	91042324
HIGH 8-Hour					
	1987	0.09984	342000.	3174000.	87073108
	1988	0.18397	340300.	3169800.	88122808
	1989	0.15524	340300.	3165700.	89071208
	1990	0.15274	340300.	3169800.	90021508
	1991	0.08950	340300.	3165700.	91042308
HIGH 3-Hour					
	1987	0.26490	340300.	3165700.	87041503
	1988	0.27402	340300.	3169800.	88040403
	1989	0.22468	340700.	3171900.	89111506
	1990	0.22883	340700.	3171900.	90021503
	1991	0.23788	340300.	3165700.	91042303
HIGH 1-Hour					
	1987	0.50335	340700.	3171900.	87090604
	1988	0.57482	340700.	3171900.	88080907
	1989	0.55729	340300.	3165700.	89071207
	1990	0.50384	340700.	3171900.	90112902
	1991	0.51239	340300.	3167700.	91042802
SOURCE GROUP ID:	LD5032				
Annual					
	1987	0.00140	340300.	3165700.	87123124
	1988	0.00236	340300.	3165700.	88123124
	1989	0.00345	340300.	3165700.	89123124
	1990	0.00195	340300.	3165700.	90123124
	1991	0.00137	340300.	3165700.	91123124
HIGH 24-Hour					
	1987	0.03585	340300.	3165700.	87041524
	1988	0.06787	340300.	3169800.	88122824
	1989	0.06350	340300.	3165700.	89042424
	1990	0.05978	340300.	3169800.	90021524
	1991	0.03353	340300.	3165700.	91042324
HIGH 8-Hour					
	1987	0.11065	342000.	3174000.	87073108
	1988	0.20362	340300.	3169800.	88122808

	1989	0.16988	340300.	3165700.	89071208
	1990	0.16287	340300.	3169800.	90021508
	1991	0.09638	340300.	3165700.	91042308
HIGH 3-Hour					
	1987	0.28679	340300.	3165700.	87041503
	1988	0.30141	342000.	3174000.	88071103
	1989	0.23628	340700.	3171900.	89111506
	1990	0.24712	340700.	3171900.	90021503
	1991	0.25615	340300.	3165700.	91042303
HIGH 1-Hour					
	1987	0.53558	340700.	3171900.	87090604
	1988	0.61730	340700.	3171900.	88080907
	1989	0.59922	340300.	3165700.	89071207
	1990	0.53606	340700.	3171900.	90112902
	1991	0.54558	340300.	3167700.	91042802
SOURCE GROUP ID:	LD5095				
Annual					
	1987	0.00143	340300.	3165700.	87123124
	1988	0.00242	340300.	3165700.	88123124
	1989	0.00352	340300.	3165700.	89123124
	1990	0.00201	340300.	3165700.	90123124
	1991	0.00139	340300.	3165700.	91123124
HIGH 24-Hour					
	1987	0.03665	340300.	3165700.	87041524
	1988	0.06981	340300.	3169800.	88122824
	1989	0.06526	340300.	3165700.	89042424
	1990	0.06083	340300.	3169800.	90021524
	1991	0.03422	340300.	3165700.	91042324
HIGH 8-Hour					
	1987	0.11382	342000.	3174000.	87073108
	1988	0.20943	340300.	3169800.	88122808
	1989	0.17414	340300.	3165700.	89071208
	1990	0.16582	340300.	3169800.	90021508
	1991	0.09838	340300.	3165700.	91042308
HIGH 3-Hour					
	1987	0.29316	340300.	3165700.	87041503
	1988	0.31153	342000.	3174000.	88071103
	1989	0.23953	340700.	3171900.	89111506
	1990	0.25245	340700.	3171900.	90021503
	1991	0.26145	340300.	3165700.	91042303
HIGH 1-Hour					
	1987	0.54469	340700.	3171900.	87090604
	1988	0.62940	340700.	3171900.	88080907
	1989	0.61115	340300.	3165700.	89071207
	1990	0.54518	340700.	3171900.	90112902
	1991	0.55497	340300.	3167700.	91042802

All receptor computations reported with respect to a user-specified origin

GRID	0.00	0.00
DISCRETE	0.00	0.00

ISCBOB3 RELEASE 98056

ISCST3 OUTPUT FILE NUMBER 1 :GENFOC1.087
ISCST3 OUTPUT FILE NUMBER 2 :GENFOC1.088
ISCST3 OUTPUT FILE NUMBER 3 :GENFOC1.089
ISCST3 OUTPUT FILE NUMBER 4 :GENFOC1.090
ISCST3 OUTPUT FILE NUMBER 5 :GENFOC1.091
First title for last output file is: 1987 SONAT HARDEE COUNTY SITE, AT PSD CLASS I AREA 8/25/99
Second title for last output file is: FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES

AVERAGING TIME	YEAR	CONC (ug/m3)	DIR (deg) or X (m)	DIST (m) or Y (m)	PERIOD ENDING (YYMMDDHH)
SOURCE GROUP ID: BASE32					
Annual					
	1987	0.00109	340300.	3165700.	87123124
	1988	0.00183	340300.	3165700.	88123124
	1989	0.00251	340300.	3165700.	89123124
	1990	0.00153	340300.	3165700.	90123124
	1991	0.00105	340300.	3165700.	91123124
HIGH 24-Hour					
	1987	0.02943	340300.	3165700.	87122524
	1988	0.05103	340300.	3169800.	88122824
	1989	0.04835	340300.	3165700.	89042424
	1990	0.05009	340300.	3169800.	90021524
	1991	0.02724	340300.	3165700.	91042324
HIGH 8-Hour					
	1987	0.08766	343700.	3178300.	87011008
	1988	0.15309	340300.	3169800.	88122808
	1989	0.13209	340300.	3165700.	89071208
	1990	0.13561	340300.	3169800.	90021508
	1991	0.07832	340300.	3165700.	91042308
HIGH 3-Hour					
	1987	0.22974	340300.	3165700.	87041503
	1988	0.24822	340300.	3169800.	88040403
	1989	0.20463	340700.	3171900.	89111506
	1990	0.19917	340700.	3171900.	90021503
	1991	0.20820	340300.	3165700.	91042303
HIGH 1-Hour					
	1987	0.44897	340700.	3171900.	87090604
	1988	0.50440	340700.	3171900.	88080907
	1989	0.48805	340300.	3165700.	89071207
	1990	0.44941	340700.	3171900.	90112902
	1991	0.45648	340300.	3167700.	91042802
SOURCE GROUP ID: BASE95					
Annual					
	1987	0.00113	340300.	3165700.	87123124
	1988	0.00190	340300.	3165700.	88123124
	1989	0.00262	340300.	3165700.	89123124
	1990	0.00158	340300.	3165700.	90123124
	1991	0.00109	340300.	3165700.	91123124
HIGH 24-Hour					
	1987	0.02998	340300.	3165700.	87122524
	1988	0.05320	340300.	3169800.	88122824
	1989	0.05028	340300.	3165700.	89042424
	1990	0.05139	340300.	3169800.	90021524
	1991	0.02807	340300.	3165700.	91042324
HIGH 8-Hour					
	1987	0.08984	343700.	3178300.	87011008
	1988	0.15959	340300.	3169800.	88122808
	1989	0.13697	340300.	3165700.	89071208
	1990	0.13925	340300.	3169800.	90021508
	1991	0.08071	340300.	3165700.	91042308
HIGH 3-Hour					
	1987	0.23722	340300.	3165700.	87041503
	1988	0.25391	340300.	3169800.	88040403
	1989	0.20906	340700.	3171900.	89111506
	1990	0.20552	340700.	3171900.	90021503
	1991	0.21455	340300.	3165700.	91042303
HIGH 1-Hour					
	1987	0.46082	340700.	3171900.	87090604
	1988	0.51961	340700.	3171900.	88080907
	1989	0.50297	340300.	3165700.	89071207
	1990	0.46128	340700.	3171900.	90112902
	1991	0.46865	340300.	3167700.	91042802
SOURCE GROUP ID: LD7532					

Annual					
	1987	0.00122	340300.	3165700.	87123124
	1988	0.00207	340300.	3165700.	88123124
	1989	0.00290	340300.	3165700.	89123124
	1990	0.00175	340300.	3165700.	90123124
	1991	0.00120	340300.	3165700.	91123124
HIGH 24-Hour					
	1987	0.03198	340300.	3165700.	87041524
	1988	0.05864	340300.	3169800.	88122824
	1989	0.05516	340300.	3165700.	89042424
	1990	0.05467	340300.	3169800.	90021524
	1991	0.03013	340300.	3165700.	91042324
HIGH 8-Hour					
	1987	0.09594	340300.	3165700.	87041508
	1988	0.17593	340300.	3169800.	88122808
	1989	0.14924	340300.	3165700.	89071208
	1990	0.14847	340300.	3169800.	90021508
	1991	0.08664	340300.	3165700.	91042308
HIGH 3-Hour					
	1987	0.25584	340300.	3165700.	87041503
	1988	0.26759	340300.	3169800.	88040403
	1989	0.21969	340700.	3171900.	89111506
	1990	0.22122	340700.	3171900.	90021503
	1991	0.23028	340300.	3165700.	91042303
HIGH 1-Hour					
	1987	0.48967	340700.	3171900.	87090604
	1988	0.55697	340700.	3171900.	88080907
	1989	0.53971	340300.	3165700.	89071207
	1990	0.49016	340700.	3171900.	90112902
	1991	0.49832	340300.	3167700.	91042802
SOURCE GROUP ID:	LD7595				
Annual					
	1987	0.00125	340300.	3165700.	87123124
	1988	0.00211	340300.	3165700.	88123124
	1989	0.00300	340300.	3165700.	89123124
	1990	0.00179	340300.	3165700.	90123124
	1991	0.00122	340300.	3165700.	91123124
HIGH 24-Hour					
	1987	0.03272	340300.	3165700.	87041524
	1988	0.06039	340300.	3169800.	88122824
	1989	0.05673	340300.	3165700.	89042424
	1990	0.05566	340300.	3169800.	90021524
	1991	0.03078	340300.	3165700.	91042324
HIGH 8-Hour					
	1987	0.09830	342000.	3174000.	87073108
	1988	0.18116	340300.	3169800.	88122808
	1989	0.15314	340300.	3165700.	89071208
	1990	0.15126	340300.	3169800.	90021508
	1991	0.08850	340300.	3165700.	91042308
HIGH 3-Hour					
	1987	0.26174	340300.	3165700.	87041503
	1988	0.27179	340300.	3169800.	88040403
	1989	0.22295	340700.	3171900.	89111506
	1990	0.22618	340700.	3171900.	90021503
	1991	0.23523	340300.	3165700.	91042303
HIGH 1-Hour					
	1987	0.49860	340700.	3171900.	87090604
	1988	0.56861	340700.	3171900.	88080907
	1989	0.55117	340300.	3165700.	89071207
	1990	0.49909	340700.	3171900.	90112902
	1991	0.50751	340300.	3167700.	91042802
SOURCE GROUP ID:	LD5032				
Annual					
	1987	0.00137	340300.	3165700.	87123124
	1988	0.00232	340300.	3165700.	88123124
	1989	0.00340	340300.	3165700.	89123124
	1990	0.00193	340300.	3165700.	90123124
	1991	0.00133	340300.	3165700.	91123124
HIGH 24-Hour					
	1987	0.03528	340300.	3165700.	87041524
	1988	0.06650	340300.	3169800.	88122824
	1989	0.06226	340300.	3165700.	89042424
	1990	0.05904	340300.	3169800.	90021524
	1991	0.03303	340300.	3165700.	91042324
HIGH 8-Hour					
	1987	0.10837	342000.	3174000.	87073108
	1988	0.19951	340300.	3169800.	88122808

	1989	0.16680	340300.	3165700.	89071208
	1990	0.16078	340300.	3169800.	90021508
	1991	0.09496	340300.	3165700.	91042308
HIGH 3-Hour					
	1987	0.28222	340300.	3165700.	87041503
	1988	0.29417	342000.	3174000.	88071103
	1989	0.23391	340700.	3171900.	89111506
	1990	0.24333	340700.	3171900.	90021503
	1991	0.25236	340300.	3165700.	91042303
HIGH 1-Hour					
	1987	0.52894	340700.	3171900.	87090604
	1988	0.60850	340700.	3171900.	88080907
	1989	0.59051	340300.	3165700.	89071207
	1990	0.52943	340700.	3171900.	90112902
	1991	0.53874	340300.	3167700.	91042802
SOURCE GROUP ID:	LD5095				
Annual					
	1987	0.00142	340300.	3165700.	87123124
	1988	0.00240	340300.	3165700.	88123124
	1989	0.00349	340300.	3165700.	89123124
	1990	0.00198	340300.	3165700.	90123124
	1991	0.00139	340300.	3165700.	91123124
HIGH 24-Hour					
	1987	0.03638	340300.	3165700.	87041524
	1988	0.06916	340300.	3169800.	88122824
	1989	0.06467	340300.	3165700.	89042424
	1990	0.06048	340300.	3169800.	90021524
	1991	0.03399	340300.	3165700.	91042324
HIGH 8-Hour					
	1987	0.11275	342000.	3174000.	87073108
	1988	0.20748	340300.	3169800.	88122808
	1989	0.17270	340300.	3165700.	89071208
	1990	0.16484	340300.	3169800.	90021508
	1991	0.09771	340300.	3165700.	91042308
HIGH 3-Hour					
	1987	0.29102	340300.	3165700.	87041503
	1988	0.30810	342000.	3174000.	88071103
	1989	0.23844	340700.	3171900.	89111506
	1990	0.25067	340700.	3171900.	90021503
	1991	0.25967	340300.	3165700.	91042303
HIGH 1-Hour					
	1987	0.54162	340700.	3171900.	87090604
	1988	0.62532	340700.	3171900.	88080907
	1989	0.60713	340300.	3165700.	89071207
	1990	0.54212	340700.	3171900.	90112902
	1991	0.55181	340300.	3167700.	91042802

All receptor computations reported with respect to a user-specified origin

GRID	0.00	0.00
DISCRETE	0.00	0.00

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CO STARTING
CO TITLEONE 1987 SONAT HARDEE COUNTY SITE                                    8/25/99
CO TITLETWO NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES
CO MODELOPT DFAULT CONC   RURAL NOCMPL
CO AVERTIME  PERIOD 24 8 3 1
CO POLLUTID GEN
CO DCAYCOEF     .000000
CO RUNORNOT RUN
CO FINISHED

SO STARTING

** Source Location Cards:
**         SRCID SRCTYP        XS            YS             ZS
** MODELING ORIGIN CT 3 STACK LOCATION
** LOCATION IS USED FOR POLAR DISCRETE RECEPTORS.
**  CT STACK NUMBER CODE
** ------------------------
**  B -  CT 1
**  C -  CT 2
**  D -  CT 3
**  E -  CT 4
** Source Location Cards:
**         SRCID SRCTYP      XS        YS        ZS
**   UTM                     (m)       (m)       (m)
SO LOCATION  BASE32A  POINT  -35.36     0.0       0.0
SO LOCATION  BASE32B  POINT    0.00     0.0       0.0
SO LOCATION  BASE32C  POINT   35.36     0.0       0.0
SO LOCATION  BASE32D  POINT   70.71     0.0       0.0
SO LOCATION  BASE95A  POINT  -35.36     0.0       0.0
SO LOCATION  BASE95B  POINT    0.00     0.0       0.0
SO LOCATION  BASE95C  POINT   35.36     0.0       0.0
SO LOCATION  BASE95D  POINT   70.71     0.0       0.0
SO LOCATION  LD7532A  POINT  -35.36     0.0       0.0
SO LOCATION  LD7532B  POINT    0.00     0.0       0.0
SO LOCATION  LD7532C  POINT   35.36     0.0       0.0
SO LOCATION  LD7532D  POINT   70.71     0.0       0.0
SO LOCATION  LD7595A  POINT  -35.36     0.0       0.0
SO LOCATION  LD7595B  POINT    0.00     0.0       0.0
SO LOCATION  LD7595C  POINT   35.36     0.0       0.0
SO LOCATION  LD7595D  POINT   70.71     0.0       0.0
SO LOCATION  LD5032A  POINT  -35.36     0.0       0.0
SO LOCATION  LD5032B  POINT    0.00     0.0       0.0
SO LOCATION  LD5032C  POINT   35.36     0.0       0.0
SO LOCATION  LD5032D  POINT   70.71     0.0       0.0
SO LOCATION  LD5095A  POINT  -35.36     0.0       0.0
SO LOCATION  LD5095B  POINT    0.00     0.0       0.0
SO LOCATION  LD5095C  POINT   35.36     0.0       0.0
SO LOCATION  LD5095D  POINT   70.71     0.0       0.0
** Source Parameter Cards:
** POINT:   SRCID            QS        HS        TS        VS        DS
**                          (g/s)      (m)       (K)      (m/s)      (m)
SO SRCPARAM   BASE32A     2.5000     18.3     864.8     36.18     6.71
SO SRCPARAM   BASE32B     2.5000     18.3     864.8     36.18     6.71
SO SRCPARAM   BASE32C     2.5000     18.3     864.8     36.18     6.71
SO SRCPARAM   BASE32D     2.5000     18.3     864.8     36.18     6.71
SO SRCPARAM   BASE95A     2.5000     18.3     885.9     38.86     6.71
SO SRCPARAM   BASE95B     2.5000     18.3     885.9     38.86     6.71
SO SRCPARAM   BASE95C     2.5000     18.3     885.9     38.86     6.71
SO SRCPARAM   BASE95D     2.5000     18.3     885.9     38.86     6.71
SO SRCPARAM   LD7532A     2.5000     18.3     905.4     30.63     6.71
SO SRCPARAM   LD7532B     2.5000     18.3     905.4     30.63     6.71
SO SRCPARAM   LD7532C     2.5000     18.3     905.4     30.63     6.71
SO SRCPARAM   LD7532D     2.5000     18.3     905.4     30.63     6.71
SO SRCPARAM   LD7595A     2.5000     18.3     918.2     28.96     6.71
SO SRCPARAM   LD7595B     2.5000     18.3     918.2     28.96     6.71
SO SRCPARAM   LD7595C     2.5000     18.3     918.2     28.96     6.71
SO SRCPARAM   LD7595D     2.5000     18.3     918.2     28.96     6.71
SO SRCPARAM   LD5032A     2.5000     18.3     905.9     25.66     6.71
SO SRCPARAM   LD5032B     2.5000     18.3     905.9     25.66     6.71
SO SRCPARAM   LD5032C     2.5000     18.3     905.9     25.66     6.71
SO SRCPARAM   LD5032D     2.5000     18.3     905.9     25.66     6.71
SO SRCPARAM   LD5095A     2.5000     18.3     922.0     24.54     6.71
SO SRCPARAM   LD5095B     2.5000     18.3     922.0     24.54     6.71
SO SRCPARAM   LD5095C     2.5000     18.3     922.0     24.54     6.71
SO SRCPARAM   LD5095D     2.5000     18.3     922.0     24.54     6.71
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SO BUILDHGT BASE32A-BASE95A    6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT BASE32A-BASE95A    0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT BASE32A-BASE95A    0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDHGT BASE32A-BASE95A   14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT BASE32A-BASE95A    6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT BASE32A-BASE95A    0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID BASE32A-BASE95A   11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID BASE32A-BASE95A    0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID BASE32A-BASE95A    0.00   15.23   14.32   12.97   11.23    9.14
SO BUILDWID BASE32A-BASE95A   12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID BASE32A-BASE95A   15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID BASE32A-BASE95A    0.00   15.23   14.32   12.97   11.23    9.14
SO BUILDHGT LD5032A-LD7595A    6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT LD5032A-LD7595A    0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032A-LD7595A    0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDHGT LD5032A-LD7595A   14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032A-LD7595A    6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032A-LD7595A    0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID LD5032A-LD7595A   11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID LD5032A-LD7595A    0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID LD5032A-LD7595A    0.00   15.23   14.32   12.97   11.23    9.14
SO BUILDWID LD5032A-LD7595A   12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID LD5032A-LD7595A   15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID LD5032A-LD7595A    0.00   15.23   14.32   12.97   11.23    9.14


SO BUILDHGT BASE32B-BASE95B    6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT BASE32B-BASE95B    0.00    0.00    0.00    6.71    6.71    6.71
SO BUILDHGT BASE32B-BASE95B   14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT BASE32B-BASE95B   14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT BASE32B-BASE95B    6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT BASE32B-BASE95B    0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID BASE32B-BASE95B   11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID BASE32B-BASE95B    0.00    0.00    0.00   14.19   15.16   15.66
SO BUILDWID BASE32B-BASE95B   15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID BASE32B-BASE95B   12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID BASE32B-BASE95B   15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID BASE32B-BASE95B    0.00   15.23   14.32   12.97   11.23    9.14
SO BUILDHGT LD5032B-LD7595B    6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT LD5032B-LD7595B    0.00    0.00    0.00    6.71    6.71    6.71
SO BUILDHGT LD5032B-LD7595B   14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD5032B-LD7595B   14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032B-LD7595B    6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032B-LD7595B    0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID LD5032B-LD7595B   11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID LD5032B-LD7595B    0.00    0.00    0.00   14.19   15.16   15.66
SO BUILDWID LD5032B-LD7595B   15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID LD5032B-LD7595B   12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID LD5032B-LD7595B   15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID LD5032B-LD7595B    0.00   15.23   14.32   12.97   11.23    9.14

SO BUILDHGT BASE32C-BASE95C    6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT BASE32C-BASE95C    0.00    0.00    0.00    6.71    6.71   14.33
SO BUILDHGT BASE32C-BASE95C   14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT BASE32C-BASE95C   14.33   14.33   14.33   14.33   15.24   15.24
SO BUILDHGT BASE32C-BASE95C   15.24   15.24   15.24    0.00    0.00    0.00
SO BUILDHGT BASE32C-BASE95C    0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID BASE32C-BASE95C   11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID BASE32C-BASE95C    0.00    0.00    0.00   14.19   15.16   14.99
SO BUILDWID BASE32C-BASE95C   15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID BASE32C-BASE95C   12.71   14.06   14.99   15.46   58.42   61.15
SO BUILDWID BASE32C-BASE95C   28.64   30.02   30.48    0.00    0.00    0.00
SO BUILDWID BASE32C-BASE95C    0.00   15.23   14.32   12.97   11.23    9.14
SO BUILDHGT LD5032C-LD7595C    6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT LD5032C-LD7595C    0.00    0.00    0.00    6.71    6.71   14.33
SO BUILDHGT LD5032C-LD7595C   14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD5032C-LD7595C   14.33   14.33   14.33   14.33   15.24   15.24
SO BUILDHGT LD5032C-LD7595C   15.24   15.24   15.24    0.00    0.00    0.00
SO BUILDHGT LD5032C-LD7595C    0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID LD5032C-LD7595C   11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID LD5032C-LD7595C    0.00    0.00    0.00   14.19   15.16   14.99
SO BUILDWID LD5032C-LD7595C   15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID LD5032C-LD7595C   12.71   14.06   14.99   15.46   58.42   61.15
SO BUILDWID LD5032C-LD7595C   28.64   30.02   30.48    0.00    0.00    0.00
SO BUILDWID LD5032C-LD7595C    0.00   15.23   14.32   12.97   11.23    9.14
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SO BUILDHGT BASE32D-BASE95D    15.24    6.71   15.24   15.24   15.24    0.00
SO BUILDHGT BASE32D-BASE95D     0.00    0.00    0.00   15.24    6.71   14.33
SO BUILDHGT BASE32D-BASE95D    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT BASE32D-BASE95D    14.33   14.33   15.24   15.24   15.24   15.24
SO BUILDHGT BASE32D-BASE95D    15.24   15.24   15.24   15.24    0.00    0.00
SO BUILDHGT BASE32D-BASE95D     0.00   15.24   15.24   15.24   15.24   15.24
SO BUILDWID BASE32D-BASE95D    30.02   12.97   47.77   53.91   58.42    0.00
SO BUILDWID BASE32D-BASE95D     0.00    0.00    0.00   66.04   15.16   14.99
SO BUILDWID BASE32D-BASE95D    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID BASE32D-BASE95D    12.71   14.06   29.48   30.40   30.40   29.48
SO BUILDWID BASE32D-BASE95D    28.64   30.02   30.48   30.02    0.00    0.00
SO BUILDWID BASE32D-BASE95D     0.00   64.02   67.49   28.64   30.02   30.48
SO BUILDHGT LD5032D-LD7595D    15.24    6.71   15.24   15.24   15.24    0.00
SO BUILDHGT LD5032D-LD7595D     0.00    0.00    0.00   15.24    6.71   14.33
SO BUILDHGT LD5032D-LD7595D    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD5032D-LD7595D    14.33   14.33   15.24   15.24   15.24   15.24
SO BUILDHGT LD5032D-LD7595D    15.24   15.24   15.24   15.24    0.00    0.00
SO BUILDHGT LD5032D-LD7595D     0.00   15.24   15.24   15.24   15.24   15.24
SO BUILDWID LD5032D-LD7595D    30.02   12.97   47.77   53.91   58.42    0.00
SO BUILDWID LD5032D-LD7595D     0.00    0.00    0.00   66.04   15.16   14.99
SO BUILDWID LD5032D-LD7595D    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID LD5032D-LD7595D    12.71   14.06   29.48   30.40   30.40   29.48
SO BUILDWID LD5032D-LD7595D    28.64   30.02   30.48   30.02    0.00    0.00
SO BUILDWID LD5032D-LD7595D     0.00   64.02   67.49   28.64   30.02   30.48

SO EMISUNIT    .100000E+07 (GRAMS/SEC)        (MICROGRAMS/CUBIC-METER)
SO SRCGROUP BASE32 BASE32A BASE32B BASE32C BASE32D
SO SRCGROUP BASE95 BASE95A BASE95B BASE95C BASE95D
SO SRCGROUP LD7532 LD7532A LD7532B LD7532C LD7532D
SO SRCGROUP LD7595 LD7595A LD7595B LD7595C LD7595D
SO SRCGROUP LD5032 LD5032A LD5032B LD5032C LD5032D
SO SRCGROUP LD5095 LD5095A LD5095B LD5095C LD5095D
SO FINISHED

RE STARTING
RE GRIDPOLR POL STA
RE GRIDPOLR POL ORIG  0.0   0.0
RE GRIDPOLR POL DIST  100 200 300  500 700 1000 1500 2000 2500 3000 4000 5000
RE GRIDPOLR POL DIST  7000 10000 12000 15000 20000 25000 30000
RE GRIDPOLR POL GDIR  36  10.00  10.00
RE GRIDPOLR POL END
RE FINISHED

ME STARTING
ME INPUTFIL D:\MET\TPAPRL87.BIN                    UNFORM
ME ANEMHGHT    6.700 METERS
ME SURFDATA  12842  1987           TAMPA
ME UAIRDATA  12842  1987           RUSKIN
ME WINDCATS    1.54    3.09    5.14    8.23    10.80
ME FINISHED


OU STARTING
OU RECTABLE ALLAVE FIRST
OU FINISHED
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CO STARTING
CO TITLEONE 1987 SONAT HARDEE COUNTY SITE                                    8/14/99
CO TITLETWO FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES
CO MODELOPT DFAULT CONC   RURAL NOCMPL
CO AVERTIME  PERIOD 24 8 3 1
CO POLLUTID GEN
CO DCAYCOEF     .000000
CO RUNORNOT RUN
CO FINISHED

SO STARTING

** Source Location Cards:
**          SRCID SRCTYP        XS            YS             ZS
** MODELING ORIGIN CT 3 STACK LOCATION
** LOCATION IS USED FOR POLAR DISCRETE RECEPTORS.
**  CT STACK NUMBER CODE
** -----------------------
**  B -  CT 1
**  C -  CT 2
**  D -  CT 3
**  E -  CT 4
** Source Location Cards:
**          SRCID SRCTYP      XS        YS        ZS
**   UTM                     (m)       (m)       (m)
SO LOCATION  BASE32A  POINT  -35.36     0.0       0.0
SO LOCATION  BASE32B  POINT    0.00     0.0       0.0
SO LOCATION  BASE32C  POINT   35.36     0.0       0.0
SO LOCATION  BASE32D  POINT   70.71     0.0       0.0
SO LOCATION  BASE95A  POINT  -35.36     0.0       0.0
SO LOCATION  BASE95B  POINT    0.00     0.0       0.0
SO LOCATION  BASE95C  POINT   35.36     0.0       0.0
SO LOCATION  BASE95D  POINT   70.71     0.0       0.0
SO LOCATION  LD7532A  POINT  -35.36     0.0       0.0
SO LOCATION  LD7532B  POINT    0.00     0.0       0.0
SO LOCATION  LD7532C  POINT   35.36     0.0       0.0
SO LOCATION  LD7532D  POINT   70.71     0.0       0.0
SO LOCATION  LD7595A  POINT  -35.36     0.0       0.0
SO LOCATION  LD7595B  POINT    0.00     0.0       0.0
SO LOCATION  LD7595C  POINT   35.36     0.0       0.0
SO LOCATION  LD7595D  POINT   70.71     0.0       0.0
SO LOCATION  LD5032A  POINT  -35.36     0.0       0.0
SO LOCATION  LD5032B  POINT    0.00     0.0       0.0
SO LOCATION  LD5032C  POINT   35.36     0.0       0.0
SO LOCATION  LD5032D  POINT   70.71     0.0       0.0
SO LOCATION  LD5095A  POINT  -35.36     0.0       0.0
SO LOCATION  LD5095B  POINT    0.00     0.0       0.0
SO LOCATION  LD5095C  POINT   35.36     0.0       0.0
SO LOCATION  LD5095D  POINT   70.71     0.0       0.0
** Source Parameter Cards:
** POINT:   SRCID              QS       HS         TS         VS        DS
**                            (g/s)     (m)        (K)       (m/s)      (m)
SO SRCPARAM   BASE32A        2.500     18.3       853.2      37.31     6.71
SO SRCPARAM   BASE32B        2.500     18.3       853.2      37.31     6.71
SO SRCPARAM   BASE32C        2.500     18.3       853.2      37.31     6.71
SO SRCPARAM   BASE32D        2.500     18.3       853.2      37.31     6.71
SO SRCPARAM   BASE95A        2.500     18.3       878.2      35.05     6.71
SO SRCPARAM   BASE95B        2.500     18.3       878.2      35.05     6.71
SO SRCPARAM   BASE95C        2.500     18.3       878.2      35.05     6.71
SO SRCPARAM   BASE95D        2.500     18.3       878.2      35.05     6.71
SO SRCPARAM   LD7532A        2.500     18.3       905.4      30.78     6.71
SO SRCPARAM   LD7532B        2.500     18.3       905.4      30.78     6.71
SO SRCPARAM   LD7532C        2.500     18.3       905.4      30.78     6.71
SO SRCPARAM   LD7532D        2.500     18.3       905.4      30.78     6.71
SO SRCPARAM   LD7595A        2.500     18.3       914.3      29.57     6.71
SO SRCPARAM   LD7595B        2.500     18.3       914.3      29.57     6.71
SO SRCPARAM   LD7595C        2.500     18.3       914.3      29.57     6.71
SO SRCPARAM   LD7595D        2.500     18.3       914.3      29.57     6.71
SO SRCPARAM   LD5032A        2.500     18.3       922.0      26.12     6.71
SO SRCPARAM   LD5032B        2.500     18.3       922.0      26.12     6.71
SO SRCPARAM   LD5032C        2.500     18.3       922.0      26.12     6.71
SO SRCPARAM   LD5032D        2.500     18.3       922.0      26.12     6.71
SO SRCPARAM   LD5095A        2.500     18.3       922.0      24.84     6.71
SO SRCPARAM   LD5095B        2.500     18.3       922.0      24.84     6.71
SO SRCPARAM   LD5095C        2.500     18.3       922.0      24.84     6.71
SO SRCPARAM   LD5095D        2.500     18.3       922.0      24.84     6.71
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SO BUILDHGT BASE32A-BASE95A     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT BASE32A-BASE95A     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT BASE32A-BASE95A     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDHGT BASE32A-BASE95A    14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT BASE32A-BASE95A     6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT BASE32A-BASE95A     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID BASE32A-BASE95A    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID BASE32A-BASE95A     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID BASE32A-BASE95A     0.00   15.23   14.32   12.97   11.23    9.14
SO BUILDWID BASE32A-BASE95A    12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID BASE32A-BASE95A    15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID BASE32A-BASE95A     0.00   15.23   14.32   12.97   11.23    9.14
SO BUILDHGT LD5032A-LD7595A     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT LD5032A-LD7595A     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032A-LD7595A     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDHGT LD5032A-LD7595A    14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032A-LD7595A     6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032A-LD7595A     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID LD5032A-LD7595A    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID LD5032A-LD7595A     0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID LD5032A-LD7595A     0.00   15.23   14.32   12.97   11.23    9.14
SO BUILDWID LD5032A-LD7595A    12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID LD5032A-LD7595A    15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID LD5032A-LD7595A     0.00   15.23   14.32   12.97   11.23    9.14


SO BUILDHGT BASE32B-BASE95B     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT BASE32B-BASE95B     0.00    0.00    0.00    6.71    6.71    6.71
SO BUILDHGT BASE32B-BASE95B    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT BASE32B-BASE95B    14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT BASE32B-BASE95B     6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT BASE32B-BASE95B     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID BASE32B-BASE95B    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID BASE32B-BASE95B     0.00    0.00    0.00   14.19   15.16   15.66
SO BUILDWID BASE32B-BASE95B    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID BASE32B-BASE95B    12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID BASE32B-BASE95B    15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID BASE32B-BASE95B     0.00   15.23   14.32   12.97   11.23    9.14
SO BUILDHGT LD5032B-LD7595B     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT LD5032B-LD7595B     0.00    0.00    0.00    6.71    6.71    6.71
SO BUILDHGT LD5032B-LD7595B    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD5032B-LD7595B    14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032B-LD7595B     6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032B-LD7595B     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID LD5032B-LD7595B    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID LD5032B-LD7595B     0.00    0.00    0.00   14.19   15.16   15.66
SO BUILDWID LD5032B-LD7595B    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID LD5032B-LD7595B    12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID LD5032B-LD7595B    15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID LD5032B-LD7595B     0.00   15.23   14.32   12.97   11.23    9.14


SO BUILDHGT BASE32C-BASE95C     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT BASE32C-BASE95C     0.00    0.00    0.00    6.71    6.71   14.33
SO BUILDHGT BASE32C-BASE95C    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT BASE32C-BASE95C    14.33   14.33   14.33   14.33   15.24   15.24
SO BUILDHGT BASE32C-BASE95C    15.24   15.24   15.24    0.00    0.00    0.00
SO BUILDHGT BASE32C-BASE95C     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID BASE32C-BASE95C    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID BASE32C-BASE95C     0.00    0.00    0.00   14.19   15.16   14.99
SO BUILDWID BASE32C-BASE95C    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID BASE32C-BASE95C    12.71   14.06   14.99   15.46   58.42   61.15
SO BUILDWID BASE32C-BASE95C    28.64   30.02   30.48    0.00    0.00    0.00
SO BUILDWID BASE32C-BASE95C     0.00   15.23   14.32   12.97   11.23    9.14
SO BUILDHGT LD5032C-LD7595C     6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT LD5032C-LD7595C     0.00    0.00    0.00    6.71    6.71   14.33
SO BUILDHGT LD5032C-LD7595C    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD5032C-LD7595C    14.33   14.33   14.33   14.33   15.24   15.24
SO BUILDHGT LD5032C-LD7595C    15.24   15.24   15.24    0.00    0.00    0.00
SO BUILDHGT LD5032C-LD7595C     0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID LD5032C-LD7595C    11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID LD5032C-LD7595C     0.00    0.00    0.00   14.19   15.16   14.99
SO BUILDWID LD5032C-LD7595C    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID LD5032C-LD7595C    12.71   14.06   14.99   15.46   58.42   61.15
SO BUILDWID LD5032C-LD7595C    28.64   30.02   30.48    0.00    0.00    0.00
SO BUILDWID LD5032C-LD7595C     0.00   15.23   14.32   12.97   11.23    9.14
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SO BUILDHGT BASE32D-BASE95D     15.24    6.71   15.24   15.24   15.24    0.00
SO BUILDHGT BASE32D-BASE95D      0.00    0.00    0.00   15.24    6.71   14.33
SO BUILDHGT BASE32D-BASE95D     14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT BASE32D-BASE95D     14.33   14.33   15.24   15.24   15.24   15.24
SO BUILDHGT BASE32D-BASE95D     15.24   15.24   15.24   15.24    0.00    0.00
SO BUILDHGT BASE32D-BASE95D      0.00   15.24   15.24   15.24   15.24   15.24
SO BUILDWID BASE32D-BASE95D     30.02   12.97   47.77   53.91   58.42    0.00
SO BUILDWID BASE32D-BASE95D      0.00    0.00    0.00   66.04   15.16   14.99
SO BUILDWID BASE32D-BASE95D     15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID BASE32D-BASE95D     12.71   14.06   29.48   30.40   30.40   29.48
SO BUILDWID BASE32D-BASE95D     28.64   30.02   30.48   30.02    0.00    0.00
SO BUILDWID BASE32D-BASE95D      0.00   64.02   67.49   28.64   30.02   30.48
SO BUILDHGT LD5032D-LD7595D     15.24    6.71   15.24   15.24   15.24    0.00
SO BUILDHGT LD5032D-LD7595D      0.00    0.00    0.00   15.24    6.71   14.33
SO BUILDHGT LD5032D-LD7595D     14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD5032D-LD7595D     14.33   14.33   15.24   15.24   15.24   15.24
SO BUILDHGT LD5032D-LD7595D     15.24   15.24   15.24   15.24    0.00    0.00
SO BUILDHGT LD5032D-LD7595D      0.00   15.24   15.24   15.24   15.24   15.24
SO BUILDWID LD5032D-LD7595D     30.02   12.97   47.77   53.91   58.42    0.00
SO BUILDWID LD5032D-LD7595D      0.00    0.00    0.00   66.04   15.16   14.99
SO BUILDWID LD5032D-LD7595D     15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID LD5032D-LD7595D     12.71   14.06   29.48   30.40   30.40   29.48
SO BUILDWID LD5032D-LD7595D     28.64   30.02   30.48   30.02    0.00    0.00
SO BUILDWID LD5032D-LD7595D      0.00   64.02   67.49   28.64   30.02   30.48

SO EMISUNIT    .100000E+07 (GRAMS/SEC)        (MICROGRAMS/CUBIC-METER)
SO SRCGROUP BASE32 BASE32A BASE32B BASE32C BASE32D
SO SRCGROUP BASE95 BASE95A BASE95B BASE95C BASE95D
SO SRCGROUP LD7532 LD7532A LD7532B LD7532C LD7532D
SO SRCGROUP LD7595 LD7595A LD7595B LD7595C LD7595D
SO SRCGROUP LD5032 LD5032A LD5032B LD5032C LD5032D
SO SRCGROUP LD5095 LD5095A LD5095B LD5095C LD5095D
SO FINISHED

RE STARTING
RE GRIDPOLR POL STA
RE GRIDPOLR POL ORIG  0.0   0.0
RE GRIDPOLR POL DIST  100 200 300  500 700 1000 1500 2000 2500 3000 4000 5000
RE GRIDPOLR POL DIST  7000 10000 12000 15000 20000 25000 30000
RE GRIDPOLR POL GDIR  36  10.00  10.00
RE GRIDPOLR POL END
RE FINISHED

ME STARTING
ME INPUTFIL D:\MET\TPAPRL87.BIN                    UNFORM
ME ANEMHGHT    6.700 METERS
ME SURFDATA  12842  1987            TAMPA
ME UAIRDATA  12842  1987            RUSKIN
ME WINDCATS    1.54    3.09    5.14    8.23   10.80
ME FINISHED

OU STARTING
OU RECTABLE ALLAVE FIRST
OU FINISHED
```

D:\PROJECTS\SONAT\LOAD\GENNGC1.187

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CO STARTING
CO TITLEONE 1987 SONAT HARDEE COUNTY SITE, AT PSD CLASS I AREA        8/25/99
CO TITLETWO NATURAL GAS, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES
CO MODELOPT DFAULT CONC   RURAL NOCMPL
CO AVERTIME  PERIOD 24 8 3 1
CO POLLUTID GEN
CO DCAYCOEF     .000000
CO RUNORNOT RUN
CO FINISHED

SO STARTING

** Source Location Cards:
**          SRCID SRCTYP        XS             YS             ZS
** MODELING ORIGIN CT 3 STACK LOCATION
** LOCATION IS USED FOR POLAR DISCRETE RECEPTORS.
**  CT STACK NUMBER CODE
** -----------------------
**  B -  CT 1
**  C -  CT 2
**  D -  CT 3
**  E -  CT 4
** Source Location Cards:
**          SRCID SRCTYP      XS         YS        ZS
**   UTM                      (m)        (m)       (m)
SO LOCATION  BASE32A  POINT  408750.  3044500.  0.0
SO LOCATION  BASE32B  POINT  408750.  3044500.  0.0
SO LOCATION  BASE32C  POINT  408750.  3044500.  0.0
SO LOCATION  BASE32D  POINT  408750.  3044500.  0.0
SO LOCATION  BASE95A  POINT  408750.  3044500.  0.0
SO LOCATION  BASE95B  POINT  408750.  3044500.  0.0
SO LOCATION  BASE95C  POINT  408750.  3044500.  0.0
SO LOCATION  BASE95D  POINT  408750.  3044500.  0.0
SO LOCATION  LD7532A  POINT  408750.  3044500.  0.0
SO LOCATION  LD7532B  POINT  408750.  3044500.  0.0
SO LOCATION  LD7532C  POINT  408750.  3044500.  0.0
SO LOCATION  LD7532D  POINT  408750.  3044500.  0.0
SO LOCATION  LD7595A  POINT  408750.  3044500.  0.0
SO LOCATION  LD7595B  POINT  408750.  3044500.  0.0
SO LOCATION  LD7595C  POINT  408750.  3044500.  0.0
SO LOCATION  LD7595D  POINT  408750.  3044500.  0.0
SO LOCATION  LD5032A  POINT  408750.  3044500.  0.0
SO LOCATION  LD5032B  POINT  408750.  3044500.  0.0
SO LOCATION  LD5032C  POINT  408750.  3044500.  0.0
SO LOCATION  LD5032D  POINT  408750.  3044500.  0.0
SO LOCATION  LD5095A  POINT  408750.  3044500.  0.0
SO LOCATION  LD5095B  POINT  408750.  3044500.  0.0
SO LOCATION  LD5095C  POINT  408750.  3044500.  0.0
SO LOCATION  LD5095D  POINT  408750.  3044500.  0.0
** Source Parameter Cards:
** POINT:   SRCID            QS        HS         TS         VS         DS
**                          (g/s)      (m)        (K)       (m/s)       (m)
SO SRCPARAM   BASE32A    2.5000     18.3       864.8      36.18      6.71
SO SRCPARAM   BASE32B    2.5000     18.3       864.8      36.18      6.71
SO SRCPARAM   BASE32C    2.5000     18.3       864.8      36.18      6.71
SO SRCPARAM   BASE32D    2.5000     18.3       864.8      36.18      6.71
SO SRCPARAM   BASE95A    2.5000     18.3       885.9      38.86      6.71
SO SRCPARAM   BASE95B    2.5000     18.3       885.9      38.86      6.71
SO SRCPARAM   BASE95C    2.5000     18.3       885.9      38.86      6.71
SO SRCPARAM   BASE95D    2.5000     18.3       885.9      38.86      6.71
SO SRCPARAM   LD7532A    2.5000     18.3       905.4      30.63      6.71
SO SRCPARAM   LD7532B    2.5000     18.3       905.4      30.63      6.71
SO SRCPARAM   LD7532C    2.5000     18.3       905.4      30.63      6.71
SO SRCPARAM   LD7532D    2.5000     18.3       905.4      30.63      6.71
SO SRCPARAM   LD7595A    2.5000     18.3       918.2      28.96      6.71
SO SRCPARAM   LD7595B    2.5000     18.3       918.2      28.96      6.71
SO SRCPARAM   LD7595C    2.5000     18.3       918.2      28.96      6.71
SO SRCPARAM   LD7595D    2.5000     18.3       918.2      28.96      6.71
SO SRCPARAM   LD5032A    2.5000     18.3       905.9      25.66      6.71
SO SRCPARAM   LD5032B    2.5000     18.3       905.9      25.66      6.71
SO SRCPARAM   LD5032C    2.5000     18.3       905.9      25.66      6.71
SO SRCPARAM   LD5032D    2.5000     18.3       905.9      25.66      6.71
SO SRCPARAM   LD5095A    2.5000     18.3       922.0      24.54      6.71
SO SRCPARAM   LD5095B    2.5000     18.3       922.0      24.54      6.71
SO SRCPARAM   LD5095C    2.5000     18.3       922.0      24.54      6.71
SO SRCPARAM   LD5095D    2.5000     18.3       922.0      24.54      6.71
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SO BUILDHGT BASE32A-BASE95A    6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT BASE32A-BASE95A    0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT BASE32A-BASE95A    0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDHGT BASE32A-BASE95A   14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT BASE32A-BASE95A    6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT BASE32A-BASE95A    0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID BASE32A-BASE95A   11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID BASE32A-BASE95A    0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID BASE32A-BASE95A    0.00   15.23   14.32   12.97   11.23    9.14
SO BUILDWID BASE32A-BASE95A   12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID BASE32A-BASE95A   15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID BASE32A-BASE95A    0.00   15.23   14.32   12.97   11.23    9.14
SO BUILDHGT LD5032A-LD7595A    6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT LD5032A-LD7595A    0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032A-LD7595A    0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDHGT LD5032A-LD7595A   14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032A-LD7595A    6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032A-LD7595A    0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID LD5032A-LD7595A   11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID LD5032A-LD7595A    0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID LD5032A-LD7595A    0.00   15.23   14.32   12.97   11.23    9.14
SO BUILDWID LD5032A-LD7595A   12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID LD5032A-LD7595A   15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID LD5032A-LD7595A    0.00   15.23   14.32   12.97   11.23    9.14


SO BUILDHGT BASE32B-BASE95B    6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT BASE32B-BASE95B    0.00    0.00    0.00    6.71    6.71    6.71
SO BUILDHGT BASE32B-BASE95B   14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT BASE32B-BASE95B   14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT BASE32B-BASE95B    6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT BASE32B-BASE95B    0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID BASE32B-BASE95B   11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID BASE32B-BASE95B    0.00    0.00    0.00   14.19   15.16   15.66
SO BUILDWID BASE32B-BASE95B   15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID BASE32B-BASE95B   12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID BASE32B-BASE95B   15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID BASE32B-BASE95B    0.00   15.23   14.32   12.97   11.23    9.14
SO BUILDHGT LD5032B-LD7595B    6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT LD5032B-LD7595B    0.00    0.00    0.00    6.71    6.71    6.71
SO BUILDHGT LD5032B-LD7595B   14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD5032B-LD7595B   14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032B-LD7595B    6.71    6.71    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032B-LD7595B    0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID LD5032B-LD7595B   11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID LD5032B-LD7595B    0.00    0.00    0.00   14.19   15.16   15.66
SO BUILDWID LD5032B-LD7595B   15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID LD5032B-LD7595B   12.71   14.06   14.99   15.46   15.46   14.99
SO BUILDWID LD5032B-LD7595B   15.16   14.19    0.00    0.00    0.00    0.00
SO BUILDWID LD5032B-LD7595B    0.00   15.23   14.32   12.97   11.23    9.14


SO BUILDHGT BASE32C-BASE95C    6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT BASE32C-BASE95C    0.00    0.00    0.00    6.71    6.71   14.33
SO BUILDHGT BASE32C-BASE95C   14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT BASE32C-BASE95C   14.33   14.33   14.33   14.33   15.24   15.24
SO BUILDHGT BASE32C-BASE95C   15.24   15.24   15.24    0.00    0.00    0.00
SO BUILDHGT BASE32C-BASE95C    0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID BASE32C-BASE95C   11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID BASE32C-BASE95C    0.00    0.00    0.00   14.19   15.16   14.99
SO BUILDWID BASE32C-BASE95C   15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID BASE32C-BASE95C   12.71   14.06   14.99   15.46   58.42   61.15
SO BUILDWID BASE32C-BASE95C   28.64   30.02   30.48    0.00    0.00    0.00
SO BUILDWID BASE32C-BASE95C    0.00   15.23   14.32   12.97   11.23    9.14
SO BUILDHGT LD5032C-LD7595C    6.71    6.71    6.71   14.33    0.00    0.00
SO BUILDHGT LD5032C-LD7595C    0.00    0.00    0.00    6.71    6.71   14.33
SO BUILDHGT LD5032C-LD7595C   14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD5032C-LD7595C   14.33   14.33   14.33   14.33   15.24   15.24
SO BUILDHGT LD5032C-LD7595C   15.24   15.24   15.24    0.00    0.00    0.00
SO BUILDHGT LD5032C-LD7595C    0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID LD5032C-LD7595C   11.23   12.97   14.32   15.46    0.00    0.00
SO BUILDWID LD5032C-LD7595C    0.00    0.00    0.00   14.19   15.16   14.99
SO BUILDWID LD5032C-LD7595C   15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID LD5032C-LD7595C   12.71   14.06   14.99   15.46   58.42   61.15
SO BUILDWID LD5032C-LD7595C   28.64   30.02   30.48    0.00    0.00    0.00
SO BUILDWID LD5032C-LD7595C    0.00   15.23   14.32   12.97   11.23    9.14
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SO BUILDHGT BASE32D-BASE95D     15.24    6.71   15.24   15.24   15.24    0.00
SO BUILDHGT BASE32D-BASE95D      0.00    0.00    0.00   15.24    6.71   14.33
SO BUILDHGT BASE32D-BASE95D     14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT BASE32D-BASE95D     14.33   14.33   15.24   15.24   15.24   15.24
SO BUILDHGT BASE32D-BASE95D     15.24   15.24   15.24   15.24    0.00    0.00
SO BUILDHGT BASE32D-BASE95D      0.00   15.24   15.24   15.24   15.24   15.24
SO BUILDWID BASE32D-BASE95D     30.02   12.97   47.77   53.91   58.42    0.00
SO BUILDWID BASE32D-BASE95D      0.00    0.00    0.00   66.04   15.16   14.99
SO BUILDWID BASE32D-BASE95D     15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID BASE32D-BASE95D     12.71   14.06   29.48   30.40   30.40   29.48
SO BUILDWID BASE32D-BASE95D     28.64   30.02   30.48   30.02    0.00    0.00
SO BUILDWID BASE32D-BASE95D      0.00   64.02   67.49   28.64   30.02   30.48
SO BUILDHGT LD5032D-LD7595D     15.24    6.71   15.24   15.24   15.24    0.00
SO BUILDHGT LD5032D-LD7595D      0.00    0.00    0.00   15.24    6.71   14.33
SO BUILDHGT LD5032D-LD7595D     14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD5032D-LD7595D     14.33   14.33   15.24   15.24   15.24   15.24
SO BUILDHGT LD5032D-LD7595D     15.24   15.24   15.24   15.24    0.00    0.00
SO BUILDHGT LD5032D-LD7595D      0.00   15.24   15.24   15.24   15.24   15.24
SO BUILDWID LD5032D-LD7595D     30.02   12.97   47.77   53.91   58.42    0.00
SO BUILDWID LD5032D-LD7595D      0.00    0.00    0.00   66.04   15.16   14.99
SO BUILDWID LD5032D-LD7595D     15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID LD5032D-LD7595D     12.71   14.06   29.48   30.40   30.40   29.48
SO BUILDWID LD5032D-LD7595D     28.64   30.02   30.48   30.02    0.00    0.00
SO BUILDWID LD5032D-LD7595D      0.00   64.02   67.49   28.64   30.02   30.48

SO EMISUNIT    .100000E+07 (GRAMS/SEC)          (MICROGRAMS/CUBIC-METER)
SO SRCGROUP BASE32 BASE32A BASE32B BASE32C BASE32D
SO SRCGROUP BASE95 BASE95A BASE95B BASE95C BASE95D
SO SRCGROUP LD7532 LD7532A LD7532B LD7532C LD7532D
SO SRCGROUP LD7595 LD7595A LD7595B LD7595C LD7595D
SO SRCGROUP LD5032 LD5032A LD5032B LD5032C LD5032D
SO SRCGROUP LD5095 LD5095A LD5095B LD5095C LD5095D
SO FINISHED

RE STARTING
RE DISCCART  340300 3165700
RE DISCCART  340300 3167700
RE DISCCART  340300 3169800
RE DISCCART  340700 3171900
RE DISCCART  342000 3174000
RE DISCCART  343000 3176200
RE DISCCART  343700 3178300
RE DISCCART  342400 3180600
RE DISCCART  341100 3183400
RE DISCCART  339000 3183400
RE DISCCART  336500 3183400
RE DISCCART  334000 3183400
RE DISCCART  331500 3183400
RE FINISHED

ME STARTING
ME INPUTFIL D:\MET\TPAPRL87.BIN                          UNFORM
ME ANEMHGHT    6.700 METERS
ME SURFDATA  12842  1987            TAMPA
ME UAIRDATA  12842  1987            RUSKIN
ME WINDCATS    1.54    3.09    5.14    8.23   10.80
ME FINISHED

OU STARTING
OU RECTABLE ALLAVE FIRST
OU FINISHED
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CO STARTING
CO TITLEONE 1987 SONAT HARDEE COUNTY SITE, AT PSD CLASS I AREA        8/25/99
CO TITLETWO FUEL OIL, GENERIC EMISSION RATES, 3 LOADS AND 2 TEMPERATURES
CO MODELOPT DFAULT CONC   RURAL NOCMPL
CO AVERTIME  PERIOD 24 8 3 1
CO POLLUTID GEN
CO DCAYCOEF    .000000
CO RUNORNOT RUN
CO FINISHED

SO STARTING

** Source Location Cards:
**          SRCID SRCTYP        XS            YS             ZS
** MODELING ORIGIN CT 3 STACK LOCATION
** LOCATION IS USED FOR POLAR DISCRETE RECEPTORS.
**  CT STACK NUMBER CODE
** ------------------------
**  B -  CT 1
**  C -  CT 2
**  D -  CT 3
**  E -  CT 4
** Source Location Cards:
**          SRCID SRCTYP      XS        YS       ZS
**   UTM                     (m)       (m)      (m)
SO LOCATION  BASE32A  POINT  408750.  3044500.  0.0
SO LOCATION  BASE32B  POINT  408750.  3044500.  0.0
SO LOCATION  BASE32C  POINT  408750.  3044500.  0.0
SO LOCATION  BASE32D  POINT  408750.  3044500.  0.0
SO LOCATION  BASE95A  POINT  408750.  3044500.  0.0
SO LOCATION  BASE95B  POINT  408750.  3044500.  0.0
SO LOCATION  BASE95C  POINT  408750.  3044500.  0.0
SO LOCATION  BASE95D  POINT  408750.  3044500.  0.0
SO LOCATION  LD7532A  POINT  408750.  3044500.  0.0
SO LOCATION  LD7532B  POINT  408750.  3044500.  0.0
SO LOCATION  LD7532C  POINT  408750.  3044500.  0.0
SO LOCATION  LD7532D  POINT  408750.  3044500.  0.0
SO LOCATION  LD7595A  POINT  408750.  3044500.  0.0
SO LOCATION  LD7595B  POINT  408750.  3044500.  0.0
SO LOCATION  LD7595C  POINT  408750.  3044500.  0.0
SO LOCATION  LD7595D  POINT  408750.  3044500.  0.0
SO LOCATION  LD5032A  POINT  408750.  3044500.  0.0
SO LOCATION  LD5032B  POINT  408750.  3044500.  0.0
SO LOCATION  LD5032C  POINT  408750.  3044500.  0.0
SO LOCATION  LD5032D  POINT  408750.  3044500.  0.0
SO LOCATION  LD5095A  POINT  408750.  3044500.  0.0
SO LOCATION  LD5095B  POINT  408750.  3044500.  0.0
SO LOCATION  LD5095C  POINT  408750.  3044500.  0.0
SO LOCATION  LD5095D  POINT  408750.  3044500.  0.0
** Source Parameter Cards:
** POINT:   SRCID           QS        HS        TS        VS        DS
**                         (g/s)     (m)       (K)      (m/s)      (m)
SO SRCPARAM   BASE32A     2.500     18.3     853.2     37.31     6.71
SO SRCPARAM   BASE32B     2.500     18.3     853.2     37.31     6.71
SO SRCPARAM   BASE32C     2.500     18.3     853.2     37.31     6.71
SO SRCPARAM   BASE32D     2.500     18.3     853.2     37.31     6.71
SO SRCPARAM   BASE95A     2.500     18.3     878.2     35.05     6.71
SO SRCPARAM   BASE95B     2.500     18.3     878.2     35.05     6.71
SO SRCPARAM   BASE95C     2.500     18.3     878.2     35.05     6.71
SO SRCPARAM   BASE95D     2.500     18.3     878.2     35.05     6.71
SO SRCPARAM   LD7532A     2.500     18.3     905.4     30.78     6.71
SO SRCPARAM   LD7532B     2.500     18.3     905.4     30.78     6.71
SO SRCPARAM   LD7532C     2.500     18.3     905.4     30.78     6.71
SO SRCPARAM   LD7532D     2.500     18.3     905.4     30.78     6.71
SO SRCPARAM   LD7595A     2.500     18.3     914.3     29.57     6.71
SO SRCPARAM   LD7595B     2.500     18.3     914.3     29.57     6.71
SO SRCPARAM   LD7595C     2.500     18.3     914.3     29.57     6.71
SO SRCPARAM   LD7595D     2.500     18.3     914.3     29.57     6.71
SO SRCPARAM   LD5032A     2.500     18.3     922.0     26.12     6.71
SO SRCPARAM   LD5032B     2.500     18.3     922.0     26.12     6.71
SO SRCPARAM   LD5032C     2.500     18.3     922.0     26.12     6.71
SO SRCPARAM   LD5032D     2.500     18.3     922.0     26.12     6.71
SO SRCPARAM   LD5095A     2.500     18.3     922.0     24.84     6.71
SO SRCPARAM   LD5095B     2.500     18.3     922.0     24.84     6.71
SO SRCPARAM   LD5095C     2.500     18.3     922.0     24.84     6.71
SO SRCPARAM   LD5095D     2.500     18.3     922.0     24.84     6.71
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SO BUILDHGT BASE32A-BASE95A    6.71   6.71   6.71  14.33   0.00   0.00
SO BUILDHGT BASE32A-BASE95A    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT BASE32A-BASE95A    0.00   6.71   6.71   6.71   6.71   6.71
SO BUILDHGT BASE32A-BASE95A   14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT BASE32A-BASE95A    6.71   6.71   0.00   0.00   0.00   0.00
SO BUILDHGT BASE32A-BASE95A    0.00   6.71   6.71   6.71   6.71   6.71
SO BUILDWID BASE32A-BASE95A   11.23  12.97  14.32  15.46   0.00   0.00
SO BUILDWID BASE32A-BASE95A    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID BASE32A-BASE95A    0.00  15.23  14.32  12.97  11.23   9.14
SO BUILDWID BASE32A-BASE95A   12.71  14.06  14.99  15.46  15.46  14.99
SO BUILDWID BASE32A-BASE95A   15.16  14.19   0.00   0.00   0.00   0.00
SO BUILDWID BASE32A-BASE95A    0.00  15.23  14.32  12.97  11.23   9.14
SO BUILDHGT LD5032A-LD7595A    6.71   6.71   6.71  14.33   0.00   0.00
SO BUILDHGT LD5032A-LD7595A    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT LD5032A-LD7595A    0.00   6.71   6.71   6.71   6.71   6.71
SO BUILDHGT LD5032A-LD7595A   14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT LD5032A-LD7595A    6.71   6.71   0.00   0.00   0.00   0.00
SO BUILDHGT LD5032A-LD7595A    0.00   6.71   6.71   6.71   6.71   6.71
SO BUILDWID LD5032A-LD7595A   11.23  12.97  14.32  15.46   0.00   0.00
SO BUILDWID LD5032A-LD7595A    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID LD5032A-LD7595A    0.00  15.23  14.32  12.97  11.23   9.14
SO BUILDWID LD5032A-LD7595A   12.71  14.06  14.99  15.46  15.46  14.99
SO BUILDWID LD5032A-LD7595A   15.16  14.19   0.00   0.00   0.00   0.00
SO BUILDWID LD5032A-LD7595A    0.00  15.23  14.32  12.97  11.23   9.14


SO BUILDHGT BASE32B-BASE95B    6.71   6.71   6.71  14.33   0.00   0.00
SO BUILDHGT BASE32B-BASE95B    0.00   0.00   0.00   6.71   6.71   6.71
SO BUILDHGT BASE32B-BASE95B   14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDHGT BASE32B-BASE95B   14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT BASE32B-BASE95B    6.71   6.71   0.00   0.00   0.00   0.00
SO BUILDHGT BASE32B-BASE95B    0.00   6.71   6.71   6.71   6.71   6.71
SO BUILDWID BASE32B-BASE95B   11.23  12.97  14.32  15.46   0.00   0.00
SO BUILDWID BASE32B-BASE95B    0.00   0.00   0.00  14.19  15.16  15.66
SO BUILDWID BASE32B-BASE95B   15.46  15.46  14.99  14.06  11.23   9.14
SO BUILDWID BASE32B-BASE95B   12.71  14.06  14.99  15.46  15.46  14.99
SO BUILDWID BASE32B-BASE95B   15.16  14.19   0.00   0.00   0.00   0.00
SO BUILDWID BASE32B-BASE95B    0.00  15.23  14.32  12.97  11.23   9.14
SO BUILDHGT LD5032B-LD7595B    6.71   6.71   6.71  14.33   0.00   0.00
SO BUILDHGT LD5032B-LD7595B    0.00   0.00   0.00   6.71   6.71   6.71
SO BUILDHGT LD5032B-LD7595B   14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDHGT LD5032B-LD7595B   14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT LD5032B-LD7595B    6.71   6.71   0.00   0.00   0.00   0.00
SO BUILDHGT LD5032B-LD7595B    0.00   6.71   6.71   6.71   6.71   6.71
SO BUILDWID LD5032B-LD7595B   11.23  12.97  14.32  15.46   0.00   0.00
SO BUILDWID LD5032B-LD7595B    0.00   0.00   0.00  14.19  15.16  15.66
SO BUILDWID LD5032B-LD7595B   15.46  15.46  14.99  14.06  11.23   9.14
SO BUILDWID LD5032B-LD7595B   12.71  14.06  14.99  15.46  15.46  14.99
SO BUILDWID LD5032B-LD7595B   15.16  14.19   0.00   0.00   0.00   0.00
SO BUILDWID LD5032B-LD7595B    0.00  15.23  14.32  12.97  11.23   9.14


SO BUILDHGT BASE32C-BASE95C    6.71   6.71   6.71  14.33   0.00   0.00
SO BUILDHGT BASE32C-BASE95C    0.00   0.00   0.00   6.71   6.71  14.33
SO BUILDHGT BASE32C-BASE95C   14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDHGT BASE32C-BASE95C   14.33  14.33  14.33  14.33  15.24  15.24
SO BUILDHGT BASE32C-BASE95C   15.24  15.24  15.24   0.00   0.00   0.00
SO BUILDHGT BASE32C-BASE95C    0.00   6.71   6.71   6.71   6.71   6.71
SO BUILDWID BASE32C-BASE95C   11.23  12.97  14.32  15.46   0.00   0.00
SO BUILDWID BASE32C-BASE95C    0.00   0.00   0.00  14.19  15.16  14.99
SO BUILDWID BASE32C-BASE95C   15.46  15.46  14.99  14.06  11.23   9.14
SO BUILDWID BASE32C-BASE95C   12.71  14.06  14.99  15.46  58.42  61.15
SO BUILDWID BASE32C-BASE95C   28.64  30.02  30.48   0.00   0.00   0.00
SO BUILDWID BASE32C-BASE95C    0.00  15.23  14.32  12.97  11.23   9.14
SO BUILDHGT LD5032C-LD7595C    6.71   6.71   6.71  14.33   0.00   0.00
SO BUILDHGT LD5032C-LD7595C    0.00   0.00   0.00   6.71   6.71  14.33
SO BUILDHGT LD5032C-LD7595C   14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDHGT LD5032C-LD7595C   14.33  14.33  14.33  14.33  15.24  15.24
SO BUILDHGT LD5032C-LD7595C   15.24  15.24  15.24   0.00   0.00   0.00
SO BUILDHGT LD5032C-LD7595C    0.00   6.71   6.71   6.71   6.71   6.71
SO BUILDWID LD5032C-LD7595C   11.23  12.97  14.32  15.46   0.00   0.00
SO BUILDWID LD5032C-LD7595C    0.00   0.00   0.00  14.19  15.16  14.99
SO BUILDWID LD5032C-LD7595C   15.46  15.46  14.99  14.06  11.23   9.14
SO BUILDWID LD5032C-LD7595C   12.71  14.06  14.99  15.46  58.42  61.15
SO BUILDWID LD5032C-LD7595C   28.64  30.02  30.48   0.00   0.00   0.00
SO BUILDWID LD5032C-LD7595C    0.00  15.23  14.32  12.97  11.23   9.14
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SO BUILDHGT BASE32D-BASE95D    15.24    6.71   15.24   15.24   15.24    0.00
SO BUILDHGT BASE32D-BASE95D     0.00    0.00    0.00   15.24    6.71   14.33
SO BUILDHGT BASE32D-BASE95D    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT BASE32D-BASE95D    14.33   14.33   15.24   15.24   15.24   15.24
SO BUILDHGT BASE32D-BASE95D    15.24   15.24   15.24   15.24    0.00    0.00
SO BUILDHGT BASE32D-BASE95D     0.00   15.24   15.24   15.24   15.24   15.24
SO BUILDWID BASE32D-BASE95D    30.02   12.97   47.77   53.91   58.42    0.00
SO BUILDWID BASE32D-BASE95D     0.00    0.00    0.00   66.04   15.16   14.99
SO BUILDWID BASE32D-BASE95D    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID BASE32D-BASE95D    12.71   14.06   29.48   30.40   30.40   29.48
SO BUILDWID BASE32D-BASE95D    28.64   30.02   30.48   30.02    0.00    0.00
SO BUILDWID BASE32D-BASE95D     0.00   64.02   67.49   28.64   30.02   30.48
SO BUILDHGT LD5032D-LD7595D    15.24    6.71   15.24   15.24   15.24    0.00
SO BUILDHGT LD5032D-LD7595D     0.00    0.00    0.00   15.24    6.71   14.33
SO BUILDHGT LD5032D-LD7595D    14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD5032D-LD7595D    14.33   14.33   15.24   15.24   15.24   15.24
SO BUILDHGT LD5032D-LD7595D    15.24   15.24   15.24   15.24    0.00    0.00
SO BUILDHGT LD5032D-LD7595D     0.00   15.24   15.24   15.24   15.24   15.24
SO BUILDWID LD5032D-LD7595D    30.02   12.97   47.77   53.91   58.42    0.00
SO BUILDWID LD5032D-LD7595D     0.00    0.00    0.00   66.04   15.16   14.99
SO BUILDWID LD5032D-LD7595D    15.46   15.46   14.99   14.06   11.23    9.14
SO BUILDWID LD5032D-LD7595D    12.71   14.06   29.48   30.40   30.40   29.48
SO BUILDWID LD5032D-LD7595D    28.64   30.02   30.48   30.02    0.00    0.00
SO BUILDWID LD5032D-LD7595D     0.00   64.02   67.49   28.64   30.02   30.48

SO EMISUNIT    .100000E+07 (GRAMS/SEC)          (MICROGRAMS/CUBIC-METER)
SO SRCGROUP BASE32 BASE32A BASE32B BASE32C BASE32D
SO SRCGROUP BASE95 BASE95A BASE95B BASE95C BASE95D
SO SRCGROUP LD7532 LD7532A LD7532B LD7532C LD7532D
SO SRCGROUP LD7595 LD7595A LD7595B LD7595C LD7595D
SO SRCGROUP LD5032 LD5032A LD5032B LD5032C LD5032D
SO SRCGROUP LD5095 LD5095A LD5095B LD5095C LD5095D
SO FINISHED

RE STARTING
RE DISCCART  340300 3165700
RE DISCCART  340300 3167700
RE DISCCART  340300 3169800
RE DISCCART  340700 3171900
RE DISCCART  342000 3174000
RE DISCCART  343000 3176200
RE DISCCART  343700 3178300
RE DISCCART  342400 3180600
RE DISCCART  341100 3183400
RE DISCCART  339000 3183400
RE DISCCART  336500 3183400
RE DISCCART  334000 3183400
RE DISCCART  331500 3183400
RE FINISHED

ME STARTING
ME INPUTFIL D:\MET\TPAPRL87.BIN                         UNFORM
ME ANEMHGHT    6.700 METERS
ME SURFDATA  12842  1987            TAMPA
ME UAIRDATA  12842  1987            RUSKIN
ME WINDCATS    1.54     3.09     5.14     8.23    10.80
ME FINISHED

OU STARTING
OU RECTABLE ALLAVE FIRST SECOND
OU FINISHED
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