Oleander Power Project

A Member of the Constellation Energy Group

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BUREAU OF AIR REGULATION

November 4, 2002

Florida Department of Environmental Protection
Bureau of Air Regulation, Title V Section
111 S. Magnolia Drive, Suite 4
Tallahassee, Florida 32301

Attention: Mr. Scott Sheplak, P.E.

RE: SUBMITTAL OF TITLE V PERMIT APPLICATION
OLEANDER POWER PROJECT, L.P., DEP FILE NO. 0090180

Dear Mr. Sheplak:

Enclosed for your review is an original and three copies of the Title V application for the Oleander Power Project. As required by the air construction permit a copy of this application has also been sent to the Department's Central District Office.

In addition to the Title V application, Oleander Power Project, L.P. would like to request a change to the PSD permit, Monitoring Requirement No. 44. The current requirement is as follows:

> ***"44. Fuel Oil Monitoring Schedule: The following monitoring schedule for No. 2 or superior grade fuel oil shall be followed: For bulk shipments of No. 2 or superior grade fuel oil received at the Oleander Power Plant, 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)."***

Oleander Power Project, L.P. requests that this requirement be changed to the following:

> "44. Fuel Oil Monitoring Schedule: The following monitoring schedule for No. 2 or superior grade fuel oil shall be followed: For bulk shipments of No. 2 or superior grade fuel oil received at the Oleander Power Plant, an analysis which reports the sulfur content and nitrogen content of the fuel shall be provided by the fuel vendor **or a separate analysis by the owner/operator or service contractor retained by the owner/operator**. 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)."

If you have any questions regarding any of the information contained in this application, please do not hesitate to contact Ed Much at (410) 787-9073. Thank you.

Sincerely,

S Carroll

Steven Carroll

Enclosures

cc: G. Kuberski, FLDEP Central District Office
E. Much

TITLE V APPLICATION FOR
OLEANDER POWER PROJECT
COCOA, FLORIDA

Prepared for:

Oleander Power Project
555 Townsend Road
Cocoa, FL 32926

Prepared by:

Golder Associates Inc.
6241 NW 23rd Street, Suite 500
Gainesville, Florida 32653-1500

October 2002
0237582

DISTRIBUTION:
4 Copies – FDEP
2 Copies – Oleander Power Project
2 Copies – Golder Associates Inc.

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: **Oleander Power Project, L.P.**	
2. Site Name: **Oleander Power Project**	
3. Facility Identification Number: [ ] Unknown	
4. Facility Location: Street Address or Other Locator: **555 Townsend Road** City: **Cocoa** County: **Brevard** Zip Code: **32926**	
5. Relocatable Facility? [ ] Yes [X] No	6. Existing Permitted Facility? [ ] Yes [X] No

Application Contact

1. Name and Title of Application Contact: **Edwin Much, Senior Engineer**
2. Application Contact Mailing Address: Organization/Firm: **Fort Smallwood Road Center** Street Address: **1000 Brandon Shores Road** City: **Baltimore** State: **MD** Zip Code: **21226**
3. Application Contact Telephone Numbers: Telephone: **(410) 787 - 9073** Fax: **(410) 787 - 5142**

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	11/5/02
2. Permit Number:	0090180-002-AV
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.

[X] 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: PSD-FL-258

[ ] 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)

[ ] 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:
   Steve Carroll, General Manager

2. Owner/Authorized Representative or Responsible Official Mailing Address:
   Organization/Firm: **Oleander Power Project, L.P.**
   Street Address: **555 Townsend Road**
   City: **Cocoa** State: **FL** Zip Code: **32936**

3. Owner/Authorized Representative or Responsible Official Telephone Numbers:
   Telephone: **(321) 638 - ~~2750~~** 2027 Fax: **(321) 638 - ~~5142~~** 0967

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.*

   Signature ______________ Date 11/4/02

* 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**

*** Board of Professional Engineers Certificate of Authorization #00001670**

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 [**X**], 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 [ ], 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 10/22/02

(seal)

* Attach any exception to certification statement.

Scope of Application

Emissions Unit ID	Description of Emissions Unit	Permit Type	Processing Fee
001	190 Megawatt Combustion Turbine		
002	190 Megawatt Combustion Turbine		
003	190 Megawatt Combustion Turbine		
004	190 Megawatt Combustion Turbine		
006, 007	1.8 Million Gallon Fuel Oil Storage Tanks		

Application Processing Fee

Check one: [ ] Attached - Amount: $: ______________ [X] Not Applicable

Construction/Modification Information

1. Description of Proposed Project or Alterations:
2. Projected or Actual Date of Commencement of Construction:
3. Projected Date of Completion of Construction:

Application Comment

Initial Title V Air Operation permit Appliction. The facility has the ability to fire distillate oil and natural gas. This permit addresses the operation of 4 permitted, simple-cycle CTs (Emission Units 1-4) and 2 permitted 1.8 million gallon fuel oil storage tanks (Emission Units 6-7) and miscellaneous insignificant activities and exempt emission units.

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates: Zone: **17**	East (km): **520.1**	North (km): **3137.6**	
2. Facility Latitude/Longitude: Latitude (DD/MM/SS): **28/ 21 / 58**		Longitude (DD/MM/SS): **80 / 47 / 41**	
3. Governmental Facility Code: **0**	4. Facility Status Code: **A**	5. Facility Major Group SIC Code **49**	6. Facility SIC(s): **4911**
7. Facility Comment (limit to 500 characters): **The Oleander Power Project was permitted to construct 5 190-MW dual-fuel conbustion turbines. Four combustion turbines are operational.**			

Facility Contact

1. Name and Title of Facility Contact: **Mr. Warren A. Harris**			
2. Facility Contact Mailing Address: Organization/Firm: **Oleander Power Project** Street Address: **555 Townsend Road**			
City: **Cocoa**	State: **FL**	Zip Code: **32926**	
3. Facility Contact Telephone Numbers: Telephone: **(321) 638 - 4967**	Fax: **(321) 638 - 0967**		

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): **CTs are subject to NSPS Subpart GG. The tanks are subject to Subpart Kb.**	

List of Applicable Regulations

See Attachment OPP-FI-A.

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 Monoxide**
PM_{10}	**A**				**Particulate Matter-PM_{10}**

C. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements

1.	Area Map Showing Facility Location: [X] Attached, Document ID: OPP-FI-C1 [ ] Not Applicable [ ] Waiver Requested
2.	Facility Plot Plan: [X] Attached, Document ID: OPP-FI-C2 [ ] Not Applicable [ ] Waiver Requested
3.	Process Flow Diagram(s): [X] Attached, Document ID: OPP-FI-C3 [ ] Not Applicable [ ] Waiver Requested
4.	Precautions to Prevent Emissions of Unconfined Particulate Matter: [X] Attached, Document ID: OPP-FI-C4 [ ] Not Applicable [ ] Waiver Requested
5.	Fugitive Emissions Identification: [X] Attached, Document ID: OPP-FI-C5 [ ] Not Applicable [ ] Waiver Requested
6.	Supplemental Information for Construction Permit Application: [ ] Attached, Document ID: ____________ [X] Not Applicable
7.	Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

8. List of Proposed Insignificant Activities: [X] Attached, Document ID: OPP-FI-C8 [ ] Not Applicable	
9. List of Equipment/Activities Regulated under Title VI: [X] Attached, Document ID: OPP-FI-C9 [ ] Equipment/Activities On site but Not Required to be Individually Listed [ ] Not Applicable	
10. Alternative Methods of Operation: [X] Attached, Document ID: OPP-FI-C10 [ ] Not Applicable	
11. Alternative Modes of Operation (Emissions Trading): [ ] Attached, Document ID:________ [X] Not Applicable	
12. Identification of Additional Applicable Requirements: [X] Attached, Document ID: OPP-FI-C12 [ ] 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:____________________________) [X] Not Applicable	
14. Compliance Report and Plan: [X] Attached, Document ID: OPP-FI-C14 [ ] Not Applicable	
15. Compliance Certification (Hard-copy Required): [X] Attached, Document ID: OPP-FI-C15 [ ] Not Applicable	

ATTACHMENT OPP-FI-A

LIST OF APPLICABLE REGULATIONS

Title V Core List

Effective: 03/01/02

[**Note:** The Title V Core List is meant to simplify the completion of the "List of Applicable Regulations" for DEP Form No. 62-210.900(1), Application for Air Permit - Long Form. The Title V Core List is a list of rules to which all Title V Sources are presumptively subject. The Title V Core List may be referenced in its entirety, or with specific exceptions. The Department may periodically update the Title V Core List.]

Federal: ***(description)***

40 CFR 61, Subpart M: NESHAP for Asbestos.

40 CFR 82: Protection of Stratospheric Ozone.
40 CFR 82, Subpart B: Servicing of Motor Vehicle Air Conditioners (MVAC).
40 CFR 82, Subpart F: Recycling and Emissions Reduction.

State: ***(description)***

CHAPTER 62-4, F.A.C.: PERMITS, effective 06-01-01

62-4.030, F.A.C.: General Prohibition.
62-4.040, F.A.C.: Exemptions.
62-4.050, F.A.C.: Procedure to Obtain Permits; Application.
62-4.060, F.A.C.: Consultation.
62-4.070, F.A.C.: Standards for Issuing or Denying Permits; Issuance; Denial.
62-4.080, F.A.C.: Modification of Permit Conditions.
62-4.090, F.A.C.: Renewals.
62-4.100, F.A.C.: Suspension and Revocation.
62-4.110, F.A.C.: Financial Responsibility.
62-4.120, F.A.C.: Transfer of Permits.
62-4.130, F.A.C.: Plant Operation - Problems.
62-4.150, F.A.C.: Review.
62-4.160, F.A.C.: Permit Conditions.
62-4.210, F.A.C.: Construction Permits.
62-4.220, F.A.C.: Operation Permit for New Sources.

CHAPTER 62-210, F.A.C.: STATIONARY SOURCES - GENERAL REQUIREMENTS, effective 06-21-01

62-210.300, F.A.C.: Permits Required.
62-210.300(1), F.A.C.: Air Construction Permits.
62-210.300(2), F.A.C.: Air Operation Permits.
62-210.300(3), F.A.C.: Exemptions.
62-210.300(5), F.A.C.: Notification of Startup.
62-210.300(6), F.A.C.: Emissions Unit Reclassification.
62-210.300(7), F.A.C.: Transfer of Air Permits.

62-210.350, F.A.C.: Public Notice and Comment.
62-210.350(1), F.A.C.: Public Notice of Proposed Agency Action.
62-210.350(2), F.A.C.: Additional Public Notice Requirements for Emissions Units Subject to Prevention of Significant Deterioration or Nonattainment-Area Preconstruction Review.
62-210.350(3), F.A.C.: Additional Public Notice Requirements for Sources Subject to Operation Permits for Title V Sources.

62-210.360, F.A.C.: Administrative Permit Corrections.
62-210.370(3), F.A.C.: Annual Operating Report for Air Pollutant Emitting Facility.
62-210.400, F.A.C.: Emission Estimates.
62-210.650, F.A.C.: Circumvention.
62-210.700, F.A.C.: Excess Emissions.

62-210.900, F.A.C.: Forms and Instructions.
62-210.900(1), F.A.C.: Application for Air Permit – Title V Source, Form and Instructions.
62-210.900(5), F.A.C.: Annual Operating Report for Air Pollutant Emitting Facility, Form and Instructions.
62-210.900(7), F.A.C.: Application for Transfer of Air Permit – Title V and Non-Title V Source.

CHAPTER 62-212, F.A.C.: STATIONARY SOURCES - PRECONSTRUCTION REVIEW, effective 08-17-00

CHAPTER 62-213, F.A.C.: OPERATION PERMITS FOR MAJOR SOURCES OF AIR POLLUTION, effective 04-16-01

62-213.205, F.A.C.: Annual Emissions Fee.
62-213.400, F.A.C.: Permits and Permit Revisions Required.
62-213.410, F.A.C.: Changes Without Permit Revision.
62-213.412, F.A.C.: Immediate Implementation Pending Revision Process.
62-213.415, F.A.C.: Trading of Emissions Within a Source.
62-213.420, F.A.C.: Permit Applications.
62-213.430, F.A.C.: Permit Issuance, Renewal, and Revision.
62-213.440, F.A.C.: Permit Content.
62-213.450, F.A.C.: Permit Review by EPA and Affected States
62-213.460, F.A.C.: Permit Shield.

62-213.900, F.A.C.: Forms and Instructions.
62-213.900(1), F.A.C.: Major Air Pollution Source Annual Emissions Fee Form.
62-213.900(7), F.A.C.: Statement of Compliance Form.

CHAPTER 62-296, F.A.C.: STATIONARY SOURCES - EMISSION STANDARDS, effective 03-02-99

62-296.320(4)(c), F.A.C.: Unconfined Emissions of Particulate Matter.

62-296.320(2), F.A.C.: Objectionable Odor Prohibited.

CHAPTER 62-297, F.A.C.: STATIONARY SOURCES - EMISSIONS MONITORING, effective 03-02-99

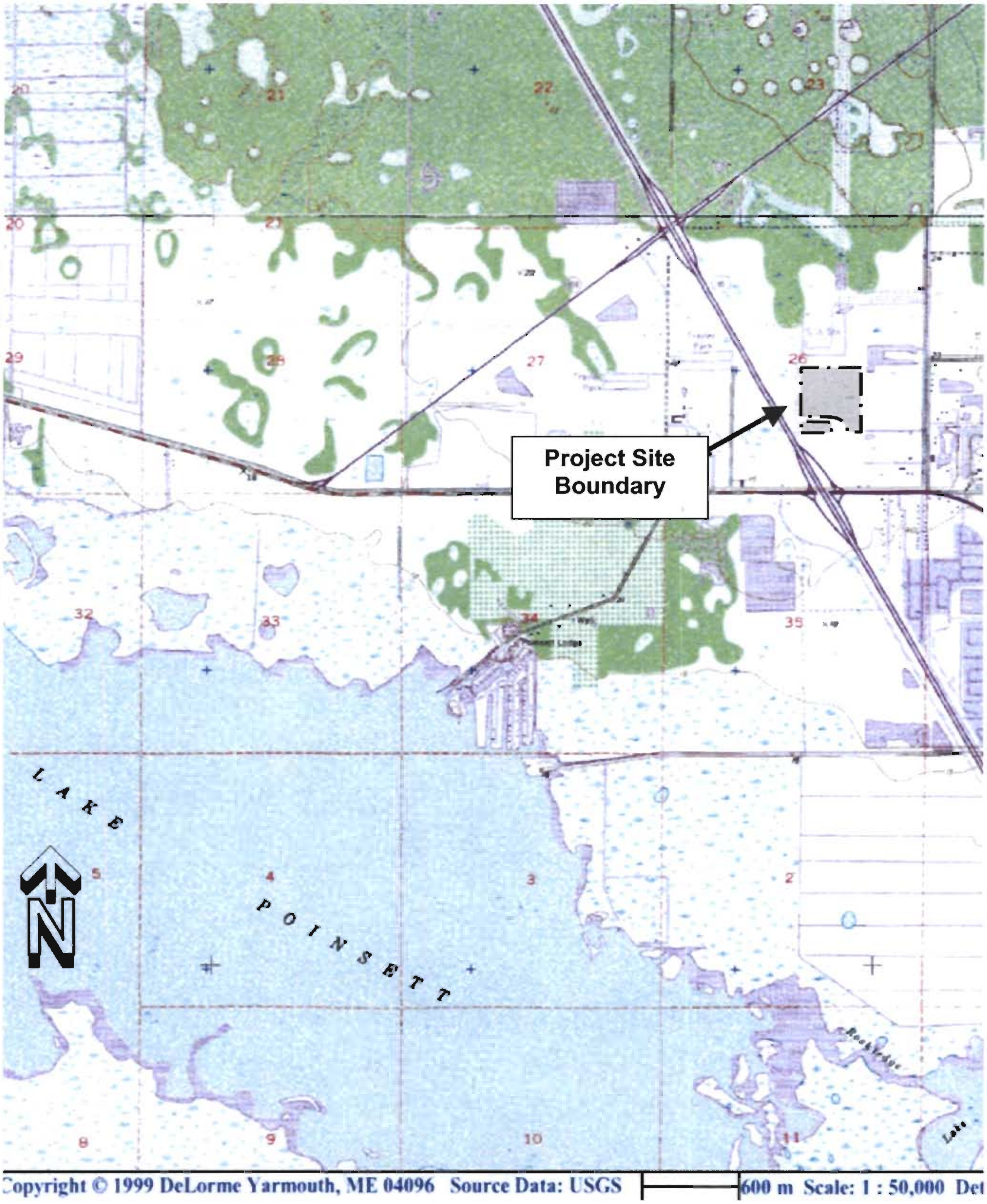
62-297.310, F.A.C.: General Test Requirements.
62-297.330, F.A.C.: Applicable Test Procedures.
62-297.340, F.A.C.: Frequency of Compliance Tests.
62-297.345, F.A.C.: Stack Sampling Facilities Provided by the Owner of an Emissions Unit.
62-297.350, F.A.C.: Determination of Process Variables.
62-297.570, F.A.C.: Test Report.
62-297.620, F.A.C.: Exceptions and Approval of Alternate Procedures and Requirements.

Miscellaneous:

CHAPTER 28-106, F.A.C.: Decisions Determining Substantial Interests
CHAPTER 62-110, F.A.C.: Exception to the Uniform Rules of Procedure, effective 07-01-98
CHAPTER 62-256, F.A.C.: Open Burning and Frost Protection Fires, effective 11-30-94
CHAPTER 62-257, F.A.C.: Asbestos Notification and Fee, effective 02-09-99
CHAPTER 62-281, F.A.C.: Motor Vehicle Air Conditioning Refrigerant Recovery and Recycling, effective 09-10-96

ATTACHMENT OPP-FI-C1

AREA MAP SHOWING FACILITY LOCATION



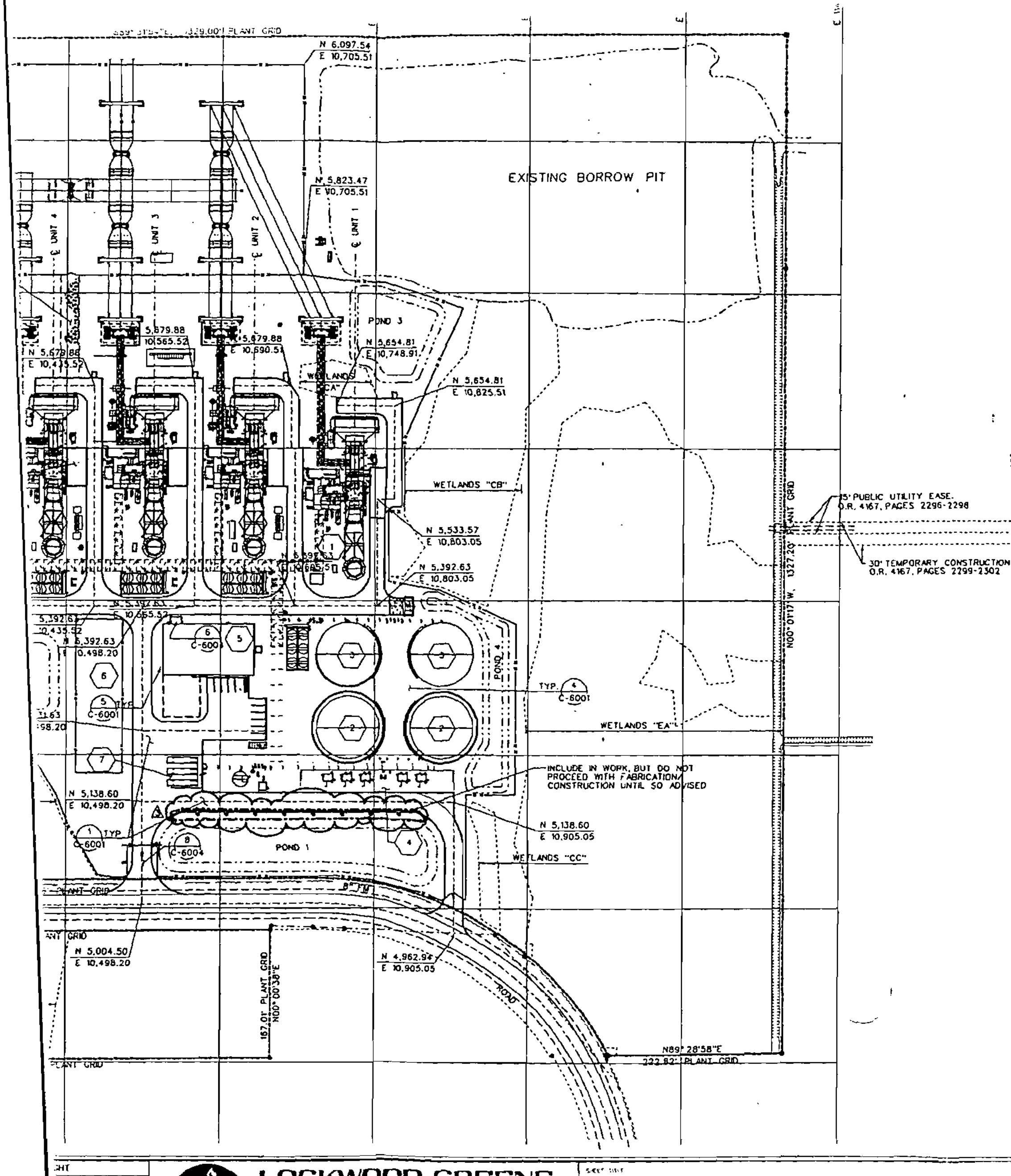
Attachment OPP-FI-C1
Area Map
Oleander Power Project, L.P.

Source: DeLorme, 1999; Golder, 2002.

ATTACHMENT OPP-FI-C2

FACILITY PLOT PLAN

BEST AVAILABLE COPY



1. GAS TURBINE
2. FUEL OIL STORAGE TANK
3. DEMINERALIZED WATER STORAGE TANK
4. FUEL OIL TRUCK UNLOADING AREA
5. COMBINED OFFICE, OPERATIONS, CONTROL, ELECTRICAL, AND WAREHOUSE BUILDING
6. NATURAL GAS PRESSURE REGULATING AND MEASUREMENT STATION
7. TEMPORARY PORTABLE DEMINERALIZER TRAILER AREA

NOTES:

1. ALL ON-SITE ROADS TO BE HEAVY DUTY ASPHALT
2. ROAD COORDINATES ARE TO THE CENTERLINE OF ROAD UNLESS OTHERWISE SHOWN
3. SITE COORDINATES ARE BASED ON PLANT GRID SYSTEM. ORIGIN IS AT THE INTERSECTION OF CENTERLINE OF TOWNSEND ROAD AND THE WEST PROPERTY LINE AT N 5000 AND E 10000 FEET
4. SITE BOUNDARY INFORMATION BASED ON PLANT NORTH.

SURVEY NORTH — PLANT NORTH 00°01'47"

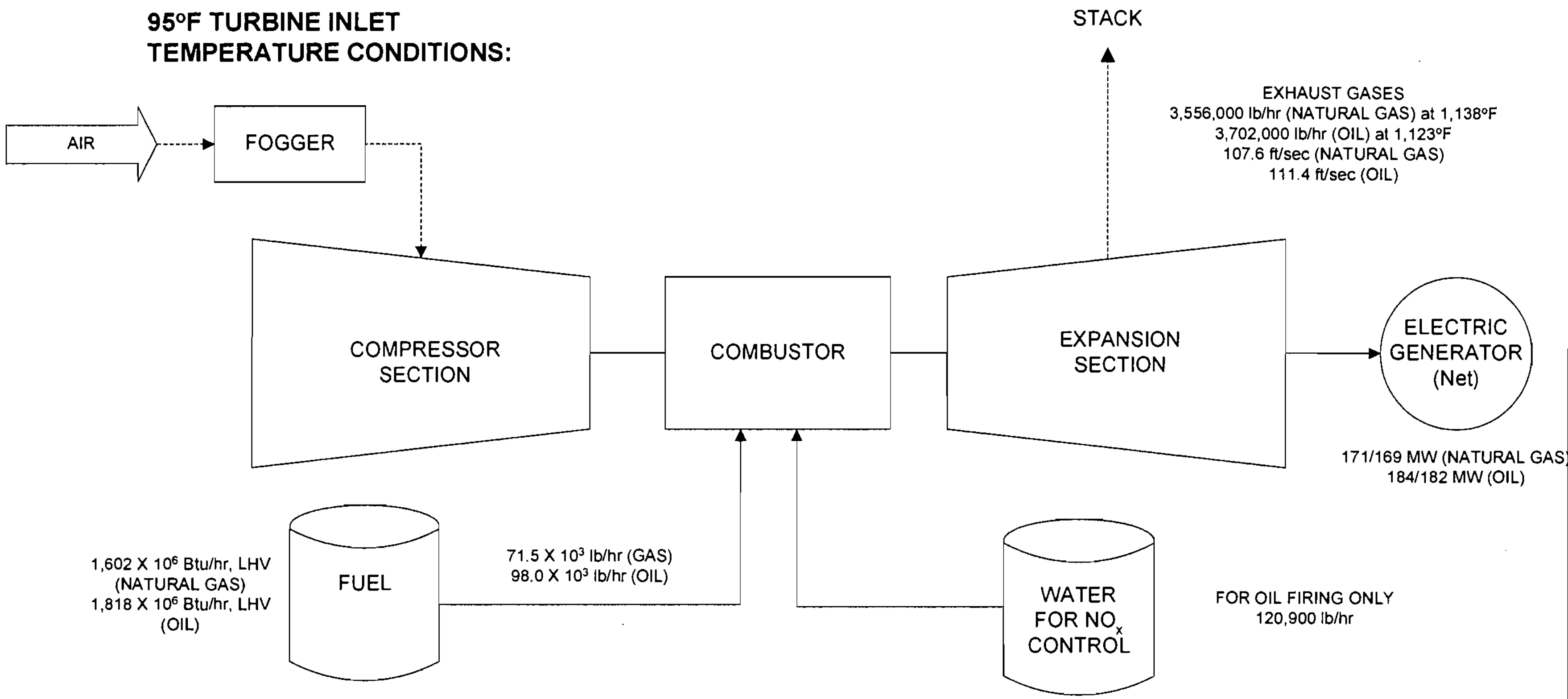
SCALE: 1"=80'

LOCKWOOD GREENE

ATTACHMENT OPP-FI-C3

PROCESS FLOW DIAGRAMS

95ºF TURBINE INLET TEMPERATURE CONDITIONS:



NOTE: SEE APPENDIX A FOR DESIGN INFORMATION AND STACK PARAMETERS FOR EACH FUEL.

Attachment OPP-FI-C3
Simplified Flow Diagram of Proposed "F" Class Combustion Turbine
Baseload, Summer Design Conditions
Oleander Power Project, L.P.

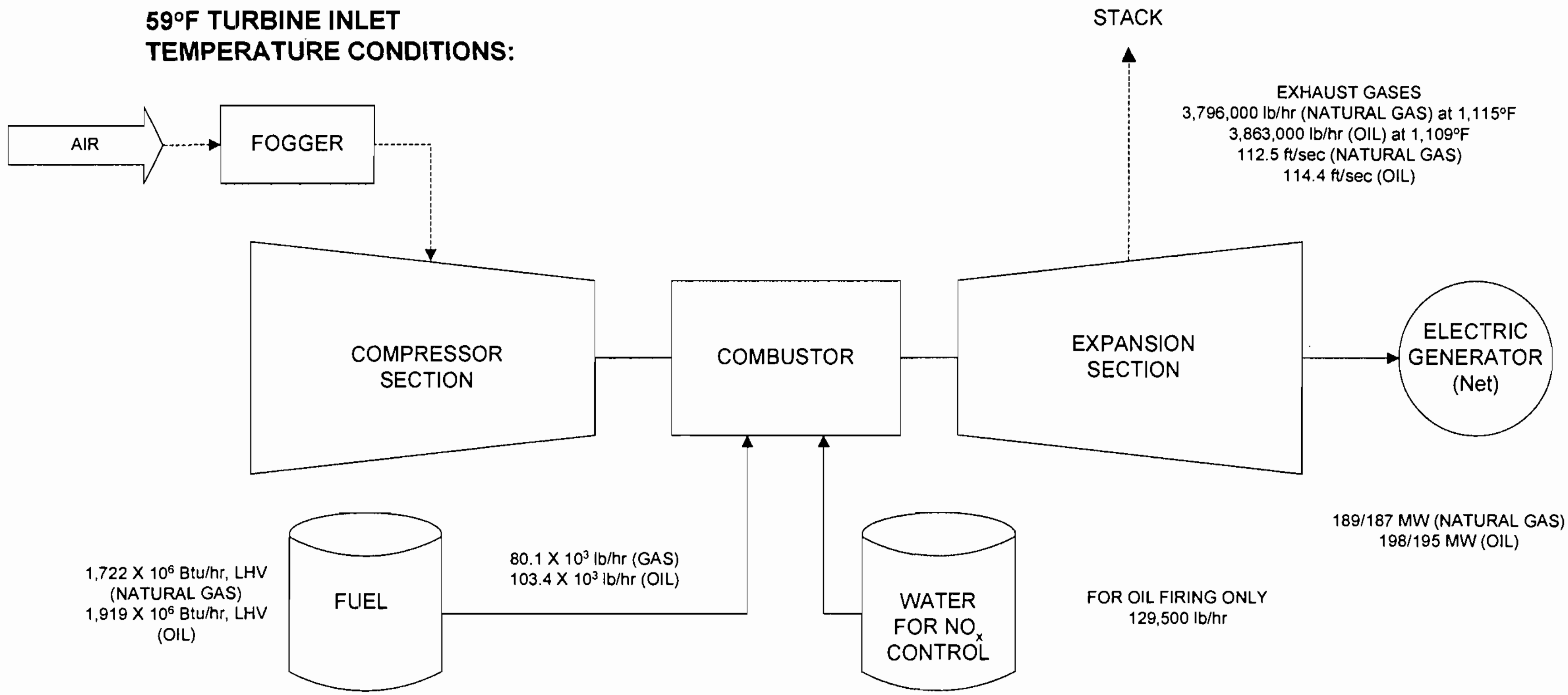
Process Flow Legend

Solid/Liquid	———▶
Gas	- - - - -▶
Steam	·········▶

Filename:
0237582/4/4.4/4.4.1/OPP-FI-C3.VSD

Date:
10/23/02

Golder Associates



NOTE: SEE APPENDIX A FOR DESIGN INFORMATION AND STACK PARAMETERS FOR EACH FUEL.

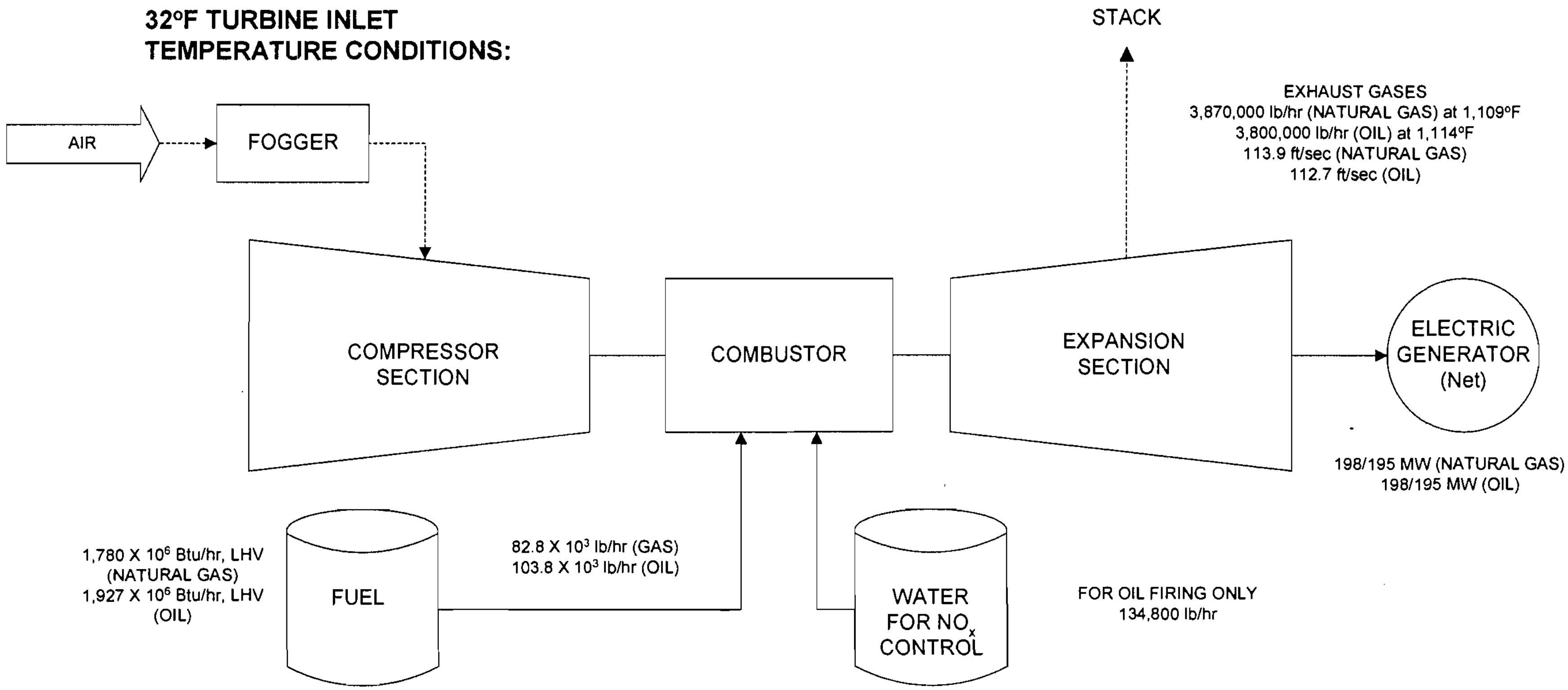
Attachment OPP-FI-C3
Simplified Flow Diagram of Proposed "F" Class Combustion Turbine
Baseload, Annual Design Conditions
Oleander Power Project, L.P.

Process Flow Legend	
Solid/Liquid	——→
Gas	- - - -→
Steam	·······→

Filename:
0237582/4/4.4/4.4.1/OPP-FI-C3.VSD

Date:
10/23/02

Golder Associates



NOTE: SEE APPENDIX A FOR DESIGN INFORMATION AND STACK PARAMETERS FOR EACH FUEL.

Attachment OPP-FI-C3 Simplified Flow Diagram of Proposed "F" Class Combustion Turbine Baseload, Winter Design Conditions Oleander Power Project, L.P.	**Process Flow Legend** Solid/Liquid ⟶ Gas ⇢ Steam ⇢	Filename: 0237582/4/4.4/4.4.1/OPP-FI-C3.VSD Date: 10/23/02 Golder Associates

ATTACHMENT OPP-FI-C4

PRECAUTIONS TO PREVENT EMISSIONS OF UNCONFINED PARTICULATE MATTER

ATTACHMENT OPP-FI-C4

PRECAUTIONS TO PREVENT EMISSIONS OF UNCONFINED PARTICULATE MATTER

- No person shall cause, let, permit, suffer or allow the emissions of unconfined particulate matter from any activity, including vehicular movement; transportation of materials; construction, alteration, demolition or wrecking; or industrially related activities such as loading, unloading, storing or handling; without taking reasonable precautions to prevent such emissions.
- Any permit issued to this facility with emissions of unconfined particulate matter shall specify the reasonable precautions to be taken by that facility to control the emissions of unconfined particulate matter.
- Reasonable precautions include the following:
  - Paving and maintenance of roads, parking areas and yards
  - Application of water or chemicals to control emissions from such activities as demolition of buildings, grading roads, construction, and land clearing.
  - Application of asphalt, water, oil, chemicals or other dust suppressants to unpaved roads, yards, open stock piles and similar activities.
  - Removal of particulate matter from roads and other paved areas under the control of the owner or operator of the facility to prevent re-entrainment, and from buildings or work areas to prevent particulate from becoming airborne.
  - Landscaping or planting of vegetation.
  - Use of hoods, fans, filters, and similar equipment to contain, capture and/or vent particulate matter.
  - Confining abrasive blasting where possible.
  - Enclosure or covering of conveyor systems.
- In determining what constitutes reasonable precautions for a particular source, the Department shall consider the cost of the control technique or work practice, the environmental impacts of the technique or practice, and the degree of reduction of emissions expected from a particular technique or practice.

[Rule 62-296.320(4)(c), F.A.C.]

ATTACHMENT OPP-FI-C5

FUGITIVE EMISSIONS IDENTIFICATION

ATTACHMENT OPP-FI-C5
FUGITIVE EMISSIONS IDENTIFICATION

Many fugitive emissions at the plant site have been classified as "trivial activities". As a result, these activities are not included as part of this permit application. For example, emissions from general plant maintenance and upkeep activities at the facility would be considered fugitive emissions, but have been judged to be trivial since these activities are not conducted as part of the electricity generation process, not related to the source's primary business activity, and do not otherwise trigger a permit modification.

Fugitive emissions that may result from the operation of activities that are not trivial at the facility are addressed in the unregulated emissions unit section (Emission Units 6 and 7). This emission unit section contains information on fugitive emissions that occur on a facility-wide basis. A summary of potential fugitive emission sources at the facility is presented in the following sections.

Criteria and Precursor Air Pollutants

Oleander Power has not identified fugitive emission of sulfur dioxide, nitrogen oxides, carbon monoxide, or lead compounds which would exceed the thresholds defined in the permit application instructions.

Volatile Organic Compounds (VOCs)

VOCs are emitted by the 1.8 million-gallon fuel oil storage tanks and electrical equipment that uses fuel oil on the plant property. This includes various lube oil tanks, various transformers, and the fuel oil unloading area. VOCs may also be emitted from the use of a parts cleaner unit in the maintenance building (insignificant unit).

Note: The two 1.8-million gallon fuel oil storage tanks were originally permitted as 2.8-million gallon tanks.

Particulate Matter (PM/PM_{10})

Particulate matter may be emitted as fugitive emissions in the maintenance building from the use of the following pieces of equipment (all insignificant units):

- Welding Machine
- Bench Grinder
- Forklift
- Drill Press

ATTACHMENT OPP-FI-C8

LIST OF PROPOSED INSIGNIFICANT ACTIVITIES

ATTACHMENT OPP-FI-C8
LIST OF UNREGULATED AND INSIGNIFICANT ACTIVITIES

Following are several pages of unregulated and insignificant activities associated with the Oleander Power Project. The insignificant activities identified in this application are provided for information only and are identified as examples of, but not limited to, the insignificant activities identified by the Division of Air Resources Management (DARM). It is understood that such activities do not have to be included with the Title V Application. The insignificant activities identified herein are consistent, in terms of amounts of emissions and types, with those activities listed in DARM's previous guidance.

Pursuant to Rule 62-210.300(3)(b)1., notice is herein provided that the emissions units listed below are not subject to a permit issued by the Department of Environmental Protection and are exempt from permitting until a final determination is made under the Title V permitting requirements (Rule 62-213 F.A.C.). These units would not have triggered review under Rules 62-212.400 or 62-212.500 or any new source performance standard listed in Rule 62-204.800 F.A.C..

ANCILLARY BUILDINGS/AREAS

Miscellaneous Buildings H.V.A.C.
Control Building: Offices, Kitchen, Toilets
C.E.M. Buildings (4)
Laboratory
Maintenance Building
CT Control Room (4)

Sanitary Vents/Stacks
Control Building
Maintenance Building
Laboratory

Miscellaneous Buildings Vent/Exhaust Systems
Lab Building
Switchyard Control Bldg
Paint & Lube Oil Storage Bldg
Maintenance Building
Administration Building

Miscellaneous Maintenance Facilities
Air Compressors
Sandblasting Units
Non-Halogenated Solvent Cleaning Operations
Lawn Maintenance Engine Emissions, Fertilizers
Cleaning, Painting, Welding, Coating Hand Held Tools & Equipment
Products Storage in Sealed Containers
Application of Fungicide; Herbicide & Pesticide
Vacuum Cleaning, Solvent Storage, Office Supplies/Equipment
Miscellaneous Gasoline & Diesel Engine Portable Tools & Equipment
C.E.M. Building Testing Equipment

Gas Bottle Storage
Nitrogen, Hydrogen, C02 Cylinders, Cryogenic H2 Storage tank Vent

Unpaved Roads
Fugitive Dust

Sumps
Oily Wastewater Separators

Fuel Oil, Light
Tanker Unloading Dock Area Fugitive Emissions

Waste Accumulation & Product Storage Area
Sealed Drums & Containers

Emergency Equipment
CO_2-Based Fire Protection System

COMBUSTION TURBINES

001 THROUGH 004

Fuel Gas Safety
Fuel Gas Coalescing Filter Vent
Fuel Gas Coalescing Filter Drain Tank
Fuel Gas Tube & Shell Heater Safety
Fuel Gas Tube & Shell Heater Gas Side Drain
Fuel Gas Tube & Shell Heater Gas Side Vent
Fuel Gas Tube & Shell Water Side Safety
Fuel Gas Tube & Shell Water Side Vent
Fuel Gas CT Control Gas Vent
Gas Line Drains
Gas Line Vents
CO_2 Fire Suppression System Drain
CO_2 Fire Suppression System Vent
CO_2 Fire Suppression System Discharge Points in the CT Building
Water Wash Skid Drain
Water Wash Collection Tank
Water Wash Casing drain
PEECC Building HVAC Drain
PEECC Building Floor Drain
Auxiliary Cabinet Explosion Diaphragms
Auxiliary Cabinet water Drains
Auxiliary Cabinet Oil Drains
Inlet Duct Drain
GEC Building HVAC
GEC Building Floor Drain
Lube Oil Storage Tank (6,200 gal)
Lube Oil Vents
Four 2.6-MMBtu/hr Indirect-Fired Fuel Gas Heaters. See following attachments for specifications.

INSIGNIFICANT ACTIVITY
FUEL GAS HEATER SPECIFICATIONS

Table 1. Fuel Gas Heater Emission Estimate and Exempt Status.

Pollutant	AP-42 Emission Factor[1]		Gas Heater Maximum Heat Input	Polutant Emissions			FDEP Exemption Level[2]	Exempt
	(lb/10^6 SCF)	(lb/MMBtu)	(MMBtu/hr)	(lb/hr)	(hours/year)	(ton/year)	(ton/yr)	(yes/no)
NO_x	100	9.80E-02	2.6	2.55E-01	3390	0.4321	25	yes
CO	84	8.24E-02	2.6	2.14E-01	3390	0.3629	25	yes
PM(total)	7.6	7.45E-03	2.6	1.94E-02	3390	0.0328	10	yes
SO_2	0.6	5.88E-04	2.6	1.53E-03	3390	0.0026	25	yes
VOC	5.5	5.39E-03	2.6	1.40E-02	3390	0.0238	10	yes
Lead	0.0005	4.90E-07	2.6	1.27E-06	3390	2.16E-06	0.05	yes

[1]Based on EPA AP-42 Table 1.4-1 and 1.4-2, Emission Factors from Natural Gas Combustion.

[2]Exemptions per F.A.C. 210.300 (3) (b) 2.

Project No.: 012022.01	LOCKWOOD GREENE — A J.A. JONES COMPANY — ENGINEERING & CONSTRUCTION	By: J. N. Fisher
Owner: Oleander Power		Date: 24-Aug-2001
Project, L.P.	EQUIPMENT DATA SHEET	Equipment No.: H100, H200, H300, H400
	Fuel Gas Heater	Quantity: Four

DESCRIPTION

Service:	Fuel Gas Heater	Design	Water Bath
Type:	Horizontal, Indirect-fired	Size:	5'Φ (OD) x 20'-0" Bl-Bl
Manufacturer:	GasTech	Model No:	*

PERFORMANCE OF ONE UNIT

Fluid Allocation:	Water Bath Side	Coil Side (3)	
Fluid Name:	75% Water/25% Glycol (6)	Fuel Gas (1)	
Fluid Qty, Total, Lb/Hr.:	* gallons	(Maximum) 80,480 (5)	
Temperature (In/Out), °F:	190 (Bath Temperature)	60 (2)	110 (4)
Heating Time req'd to bring water bath from 40 °F to 190 °F, minutes:	30	N/A	N/A
Density, Lb/Ft³:	64	*	1.44
Viscosity, Cp:	1.2	*	0.0123
Specific Heat, BTU/(Lb-°F):	0.93 @ 100 °F	*	0.57
Thermal Conductivity, BTU/(Ft-Hr-°F):	0.287	*	0.0224
Latent Heat, BTU/lb.:	N/A	*	*
Inlet Pressure, psig:	Atm	425 - 500	
Velocity, Ft/s:	N/A	73	
Pressure Drop, Allow./Calc'd, psi:	N/A	10/4.9	
Foul. Resist. (Min.), Ft²-Hr -°F/BTU:	N/A	0.001	
Heat Exchanged:	2.6 MM BTU/hr		
Heat Transfer Surface, Ft²:	N/A	1810	
MTD (Corrected), °F:	N/A	93	
Heat Transfer Coeff., BTU/(Ft²-Hr-°F):	N/A	75.2	
Fuel Gas Required (maximum), lb/hr:	*		

CONSTRUCTION

	Water Bath Side		Coil Side	
Design/Test Pressure, psig:	Atm	Hydrotest	550	825
Design Temperature, °F:	220		-20/250	
No. Passes per Shell:	One		5 path, 4 tubes/path	
Corrosion Allowance, in:	1/16		1/16	
Connections:	Size	Rating/Type	Size	Rating/Type
In:	N/A	N/A	8"	300 lb RF
Out:	N/A	N/A	8"	300 lb RF

Coil		**Heater Shell**	
Type:	Multipath, Multipass	Length:	20'-0" SS
Insulation:	2" Ca Si	OD:	5'-0" Φ
Size:	3"	Thickness:	*
Schedule:	40	Material:	A36
Length:	* ft-total CS	Design Code:	API-12K
Design Code:	ASME B & PV, Section 8, Div 1		

II. Indirect Forced Draft Heater

a. *Process Coil*

Gas flow rate (lbs./hr)	80,480.00
Inlet pressure (PSIG)	500
Inlet temperature (° F)	60
Outlet temperature (° F)	110
Specific gravity (air = 1.0)	0.59
Surface area (SQ. FT.)	355.07
Connection size/type (IN.)	8" / 300# RFWN
Design pressure (PSIG)	550
Design temperature (° F)	-20/150

b. *Water bath*

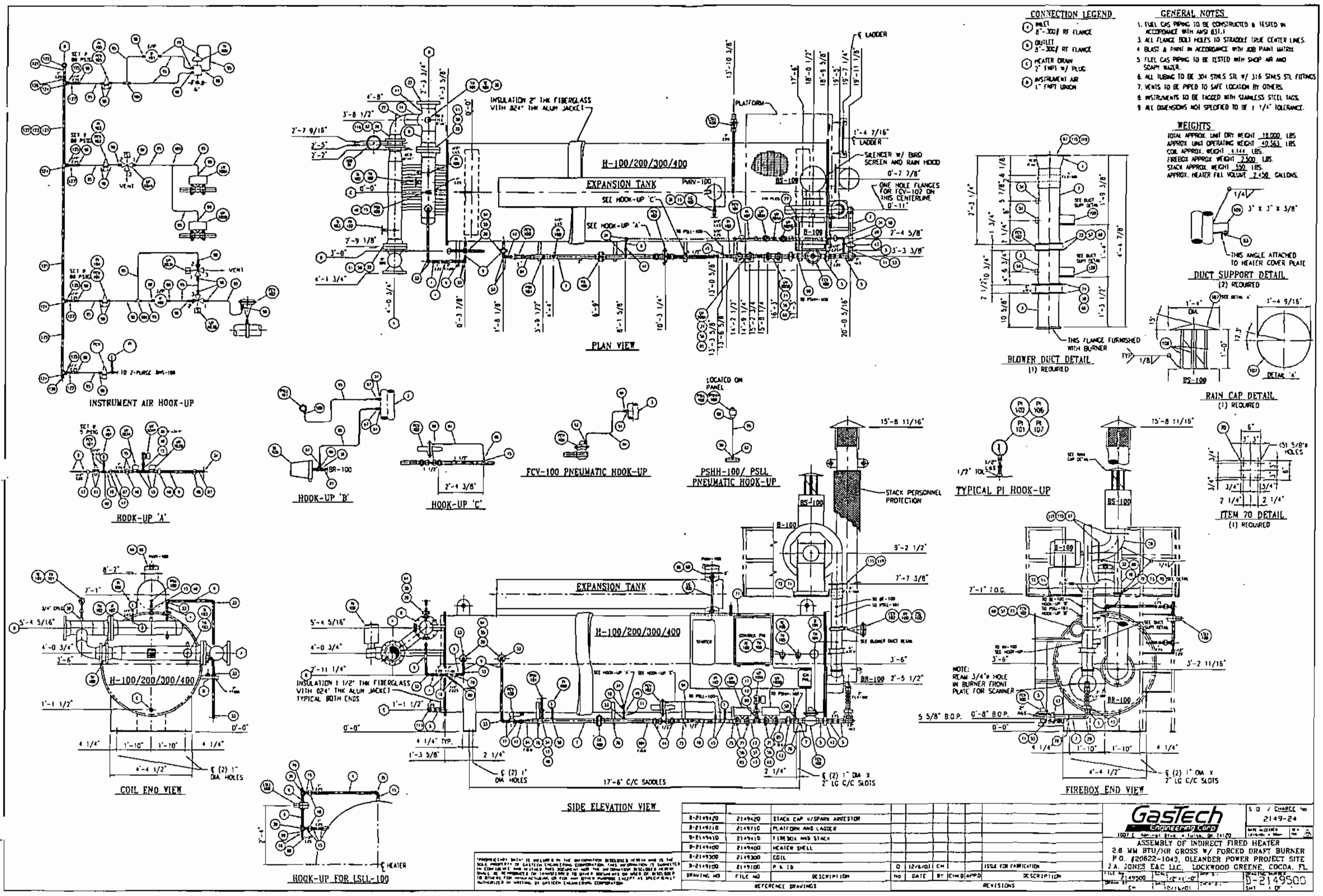
Heater duty (MMBTU/HR)	2.6
Fire-tube flux rate @ duty (BTU/HR-SQ.FT.)	14,215.41
Bath temperature (° F)	190
Approximate initial bath charge (gallons)*	2,483.68

**At 60 ° F.*

Preliminary Instrument Set Points

Tag #	Set Point	Description
PCV-100	25 PSIG	First cut pressure regulating valve
PSV-100	550 PSIG	Thermal relief valve
PSV-101	40 PSIG	Fuel gas pressure relief valve
PCV-101	5 PSIG	Pilot pressure regulating valve
PCV-102	1.5 PSIG	Second cut pressure regulating valve
PCV-103	80 PSIG	Instrument air pressure regulating valve
PCV-104	20 PSIG	Instrument air pressure regulating valve
PCV-105	80 PSIG	Instrument air pressure regulating valve
PSHH-100	15 PSIG	High fuel gas pressure shutdown
PSLL-100	0.5 PSIG	Low fuel gas pressure shutdown
PSLL-101	5" WC	Combustion blower pressure switch
TIC-101	110° F	Process temperature controller
TSH-101	120° F	High process temperature alarm
TIC-105	190° F	Bath temperature controller
TSHH-100	200° F	Bath high temperature shutdown

Best Available Copy



INSIGNIFICANT ACTIVITIES
MSDS SHEETS

A. FUEL GAS HEATER WATER ADDITIVE
B. PARTS CLEANER SOLVENT
C. LUBRICATION OIL

MATERIAL SAFETY DATA SHEET

STAR BRITE BIO-SAFE ANTI-FREEZE & COOLANT

PRODUCT NO. 31700, 317G55

PRODUCT: Star brite Bio-Safe -100° PG Anti-Freeze & Coolant

NFPA HAZARD IDENTIFICATION:

	0 - Least
Health: 0	1 - Slight
Fire: 1	2 - Moderate
Reactivity: 0	3 - High
	4 - Extreme

SECTION I - General Information

Star brite Distributing, Inc.
4041 S. W 47 Avenue
Ft. Lauderdale, FL 33314
Emergency - (800) 424-9300
Information - (954) 587-6280
Dated - January 1, 2000

SECTION II - Composition/Information on Ingredients

COMPONENT NAME / PEL MIST / PEL VAPOR	%	CAS
Sodium Nitrate	<1	7631-99-4
none established		
Sodium Silicate	<1	1344-09-8
none established		

NON-HAZARDOUS INGREDIENTS >1%

Propylene Glycol	93	57-55-6
none established		
Water	2	
Proprietary additives	4	

(Does not contain IARC, NTP, OSHA and ACGIH listed carcinogens greater than 0.1%).

SECTION III - Hazards Identification

EYE CONTACT: May cause minor eye irritation.

SKIN CONTACT: No significant adverse affects are expected under anticipated conditions of normal use. Repeated, prolonged exposure may cause slight flaking, tenderness, and softening of skin.

INHALATION: No significant adverse effects are expected under anticipated conditions of normal use. If effects do occur, refer to FIRST AID section.

INGESTION: No significant adverse effects are expected under anticipated conditions of normal use. Excessive ingestion may cause central nervous system effects.
SIGNS AND SYMPTOMS OF OVEREXPOSURE:
as above.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Material and/or its emissions may aggravate preexisting eye disease.

OTHER HEALTH INFORMATION: none.

SECTION IV - First Aid Procedures

EYE CONTACT: Immediately rinse with clean water for 20-30 minutes. Retract eyelids often. Obtain medical attention if pain, blinking, tears or redness persist.

SKIN CONTACT: Product is not expected to present a significant skin hazard under anticipated conditions of normal use.

INHALATION: If overcome by exposure, remove victim to fresh air immediately. Give oxygen or artificial respiration as needed. Obtain emergency medical attention. Prompt action is essential.

INGESTION: If large quantity is swallowed, give a pint of lukewarm water if victim is completely conscious and alert. If large quantities are consumed, induce vomiting. Obtain emergency medical attention.

SECTION V - Fire and Explosion Hazard Data

Flash Point (deg F): 211.

Flammable or Explosive Limits (approximate % by volume in air) LEL: 2.4 UEL; 17.4.

EXTINGUISHING MEDIA: carbon dioxide, dry chemical, alcohol type foam, water spray, water fog.

SPECIAL FIRE FIGHTING PROCEDURES: Wear positive pressure, self contained breathing apparatus and other protective apparatus as warranted. Fight fire from distance or protected location - heat may build up pressure and rupture closed containers. Liquid may form slippery film. Use water spray or fog for cooling, solid stream may spread fire as burning liquid will float on water. Avoid frothing/steam explosion. Notify authorities if liquid enters sewers/public waters.

Post-it® Fax Note 7671	Date 10/21/02 # of pages ▶ 3
To DAVE LACOCCA	From LJ HARRIS
Co./Dept.	Co.
Phone #	Phone #
Fax #	Fax #

UNUSUAL FIRE AND EXPLOSION HAZARDS: Heat from fire can generate flammable vapor. When mixed with air and exposed to ignition source, vapors can burn in open or explode if confined. Vapors may be heavier than air

UNUSUAL FIRE AND EXPLOSION HAZARDS (cont'd):

and travel long distances along ground before igniting and flashing back. Fine sprays and mists may be combustible at temperatures below normal flash point.

SECTION VI - Accidental Release Measures

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Prevent flow to sewers and public waters as it may contaminate said water. Restrict water usage to prevent slip/fall hazard. Soak up small spills and inert solids. Dike and recover large land spills. Notify appropriate authorities if product enters any waterway.

SECTION VII: Handling and Storage

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Store in tightly closed and properly vented containers, away from heat, sparks, open flame, and strong oxidizing agents.

SECTION VIII - Exposure Controls/Personal Protection

RESPIRATORY PROTECTION: No special respiratory protection equipment is recommended under normal conditions of anticipated use with adequate ventilation.

VENTILATION: Adequate general ventilation is required, local exhaust is recommended if possible.

PROTECTIVE GLOVES: not required.

EYE PROTECTION: Chemical splash goggles or full face shield must be worn when possibility exists for eye contact due to splashing or spraying liquid, airborne particles, or vapor. Contact lenses should not be worn.

OTHER PROTECTIVE EQUIPMENT: none.

WORK PRACTICES/ENGINEERING CONTROLS: Keep containers closed when not in use.

PERSONAL HYGIENE: If product handling results in skin contact, wash hands and other exposed areas with mild soap and water before eating, drinking, smoking or using toilet facilities. Promptly remove soiled clothing and wash thoroughly before reuse.

SECTION IX - Physical/Chemical Characteristics

Boiling Point (deg F): 365
Specific Gravity ($H_2O=1$): 1.04
Vapor Pressure (mm Hg): <0.1
Melting Point (deg F): -76
Vapor Density (Air=1): 2.6
Solubility in Water: complete

Evaporation Rate (n-butyl Acetate=1): slight

APPEARANCE AND ODOR: dark green, slightly viscous almost odorless liquid.

SECTION X - Reactivity Data

STABILITY: stable.

CONDITIONS TO AVOID: heat, sparks, open flame.

INCOMPATIBILITY (MATERIALS TO AVOID): strong alkalis, strong oxidizing agents.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS carbon monoxide and other toxic vapors.

HAZARDOUS POLYMERIZATION: not expected to occur

SECTION XI - Toxicological Information

See Section IV.

SECTION XII - Ecological Information

No chemicals in this product are subject to the reporting requirements of CIRCLE.

SECTION XIII - Disposal Considerations

WASTE DISPOSAL METHOD: Landfill solids at permitted sites using registered transporters. Burn concentrated liquids, avoiding flameouts, and assuring emissions comply with applicable regulations. Dilute aqueous waste may biodegrade, but avoid overloading plant bamboos and assuring effluent complies with applicable regulations.

This product is not regulated by DOT.

SECTION XV - Regulatory Information

WHIMS classification for product: n/a.

This product has been classified in accordance with the hazard criteria of the CAR and the MSDS contains all of the information required by the CFR.

This material safety data sheet and the information it contains is offered to you in good faith as accurate. We have reviewed any information contained in the data sheet which we received from sources outside our company and we believe that information to be correct, but cannot guarantee its accuracy or completeness. Health and safety precautions in this data sheet may not be adequate for all individuals and/or situations. It is the user's obligation to evaluate and use this product safety and to comply with all applicable laws and regulations. No statement made in this data sheet shall be construed as permission or recommendation for the use of any product in a manner that might infringe existing patents. No warranty is made, either expressed or implied.

REGULATORY INFORMATION: (Not meant to be all-inclusive – selected regulations represented).

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility in ensure that its activities comply with federal, state or provincial and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See MSD Sheet for health and safety information.

U. S. REGULATIONS

SARA 313 INFORMATION: To the best of our knowledge, this product contains no chemical subject to SARA Title III section 313 supplier notification requirements.

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

Not to have met any hazard category.

TOXIC SUBSTANCES CONTROL ACT (TSCA):

All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

CANADIAN REGULATIONS

WHMIS INFORMATION: The Canadian Workplace Hazardous Materials Information System (WHMIS) Classification for this product is:

This product is not a "Controlled Product" under WHMIS.

CANADIAN TDG INFORMATION: For guidance, the Transportation of Dangerous Goods Classification for this product is:

Not regulated.

0120334316 MATERIAL SAFETY DATA SHEET (MSDS) 2C682

This MSDS should be attached or kept with the respective product with which it is associated.

##

MATERIAL SAFETY DATA SHEET - A1859

Associated Grainger Items

1FRE9, 2C670, 2C674, 2C682

LPS LABORATORIES

MSDS

MATERIAL SAFETY DATA SHEET

------SECTION 1 - PRODUCT IDENTIFICATION AND USE ------

MANUFACTURER'S NAME:	TRADE NAME:
LPS LABORATORIES	LPS PRECISION CLEAN(TM)
ADDRESS (NUMBER STREET):	CHEMICAL FAMILY:
4647 HUGH HOWELL ROAD	BLENDED COMPOUND
ADDRESS (CITY, STATE, ZIP):	PART NUMBERS:
TUCKER, GA 30085-5052	02704, 02765, 02728, 02701, 02705, 02755

TELEPHONE NUMBER: 770-934-7800

EMERGENCY TELEPHONE NUMBER: 1-800-424-9300 CHEMTREC

OUTSIDE U.S.: (703) 527-3887

RECOMMENDED SHIPPING NAME:

COMPOUND, BOILER, PRESERVING LIQUID NMFC 50093 SUB 2 BRL/BXS CL55

TSCA INVENTORY:

ALL OF THE INGREDIENTS ARE LISTED ON THE TSCA INVENTORY.

HMIS LABELING:

HEALTH: 1

FLAMMABILITY: 0

REACTIVITY: 0

------SECTION 2 - HAZARDOUS INGREDIENTS / IDENTITY INFORMATION ------

INGREDIENTS	CAS NUMBERS	%WW	OSHA PEL	ACGIH STEL TLV	OTHER LIMITS
SODIUM METASILICATE	6834-92-0	<4	N.E.	N.E.	NONE
DIPROPYLENE GLYCOL METHYL ETHER	34590-94-8	<6	100 PPM	100 PPM	150 PPM

------SECTION 3 - PHYSICAL / CHEMICAL CHARACTERISTICS ------

BOILING POINT (DEG. F):

APPROX. 212 DEG. F

SPECIFIC GRAVITY (H20 = 1):

1.07 CONCENTRATE

VAPOR PRESSURE (MMHG) @ 100 DEG. F :

N.A. 1.017 READY-TO-USE

VAPOR DENSITY (AIR = 1):

N.A.

PERCENT VOLATILE BY VOLUME (%):

88 CONCENTRATE

SOLUBILITY IN WATER:

COMPLETE. 97 READY-TO-USE

APPEARANCE AND ODOR:

CLEAR, TURQUOISE LIQUID WITH CITRUS ODOR.

EVAPORATION RATE (WATER = 1):

1.0

------SECTION 4 - FIRE AND EXPLOSION HAZARD ------

FLASH POINT (METHOD USED):

NONE T.C.C.

FLAMMABLE LIMITS (BY VOLUME 25 DEG. C):

LEL N.A.

UEL N.A.

EXTINGUISHING MEDIA:

NONE

SPECIAL FIRE FIGHTING PROCEDURES:

NONE

UNUSUAL FIRE AND EXPLOSIVE HAZARDS:

NONE

------SECTION 5 - HEALTH HAZARD DATA ------

THRESHOLD LIMIT VALUE:

SEE SECTION 2.

PRIMARY ROUTE(S) OF ENTRY:

INHALATION, EYES, SKIN.

HEALTH HAZARD/EFFECTS OF OVER EXPOSURE:

INHALATION:

HEADACHE, DIZZINESS.

EYES:

LIQUID WILL CAUSE TEMPORARY IRRITATION.

SKIN:

REPEATED OR PROLONGED CONTACT MAY CAUSE DRYING AND DEPATTING OF SKIN.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:
NONE KNOWN AT THIS TIME.

CHEMICALS LISTED AS POTENTIAL CARCINOGEN:
NTP : NO
IARC: NO
OSHA: NO

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION:
MOVE TO FRESH AIR.

EYES:
FLUSH EYES WITH PLENTY OF WATER, LIFTING UPPER AND LOWER LIDS OCCASIONALLY. CONTACT A PHYSICIAN.

SKIN:
WASH WITH SOAP AND WATER; APPLY MEDICATED SKIN CREAM.

INGESTION:
UNLIKELY ROUTE OF ENTRY. HOWEVER, IF INGESTED, DRINK LARGE AMOUNTS OF WATER, FOLLOWED BY MILK AND CONTACT PHYSICIAN IMMEDIATELY.

------SECTION 6 - REACTIVITY DATA ------

STABILITY: STABLE   CONDITIONS TO AVOID: NONE

INCOMPATIBILITY (MATERIALS TO AVOID):
STRONG OXIDIZING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS:
NONE KNOWN AT THIS TIME.

HAZARDOUS POLYMERIZATION:
WILL NOT OCCUR.

------SECTION 7 - PRECAUTIONS FOR SAFE HANDLING AND USE ------

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
REMOVE LEAKING CONTAINER AND CONTAIN SPILL. SOAK UP OR MOP UP WITH ABSORBENT MATERIAL, SUCH AS SAND OR CLAY. DO NOT FLUSH TO SEWER.

WASTE DISPOSAL METHODS:
DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

CERCLA REPORTABLE QUANTITY:
N.A.

SARA TITLE III CHEMICALS:
NONE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:
PRODUCT SHOULD BE STORED ABOVE 20 DEG. F AND BELOW 120 DEG. F. KEEP CONTAINERS CLOSED WHEN NOT IN USE.

------SECTION 8 - CONTROL MEASURES ------

RESPIRATORY PROTECTION:
NONE REQUIRED IF GOOD VENTILATION IS MAINTAINED.

VENTILATION:
LOCAL EXHAUST SHOULD BE SUFFICIENT TO MAINTAIN A COMFORTABLE WORK ENVIRONMENT.

PROTECTIVE GLOVES:
USE RUBBER GLOVES.

EYE PROTECTION:
USE SAFETY GLASSES OR GOGGLES.

OTHER PROTECTIVE EQUIPMENT:
EYE WASHES AND SAFETY SHOWERS.

WORK/HYGIENIC PRACTICES:
WASH HANDS WITH SOAP AND WATER AFTER USE AND/OR BEFORE BREAKS, LUNCH AND AT THE END OF WORK PERIODS. REMOVE CONTAMINATED CLOTHING AND LAUNDER BEFORE REUSE.

------SECTION 9 - PREPARATION DATE OF MSDS ------

THE FOREGOING TECHNICAL INFORMATION AND RECOMMENDATIONS ARE COMPILED FROM SOURCES THAT ARE BELIEVED TO BE ACCURATE AND RELIABLE. HOWEVER, THEY ARE SUPPLIED WITHOUT WARRANTY OR GUARANTEE OF ANY KIND EITHER EXPRESSED OR IMPLIED. THE PURCHASER IS RESPONSIBLE FOR SELECTING AND DETERMINING THE SUITABILITY OF PRODUCTS FOR PURCHASER'S PARTICULAR NEEDS AND WE DISCLAIM ANY RESPONSIBILITY FOR IMPROPER APPLICATIONS OR MISUSE OF OUR PRODUCTS IN ANY MANNER WHATSOEVER.

JANUARY 31, 2000
FRED FUGITT, TECHNICAL SERVICES CHEMIST
ED WILLIAMS, MANAGER OF RESEARCH AND DEVELOPMENT FORM # 2524
LPS LABORATORIES MSDS LPS PRECISION CLEAN

This MSDS should be attached or kept with the respective product with which it is associated.

##

MATERIAL SAFETY DATA SHEET - 2SF66

Associated Grainger Items

2W352

2W352

GRAYMILLS CORPORATION

MATERIAL SAFETY DATA SHEET

CONFORMS TO OSHA FORM NO. 1218-0072		NFPA HAZARD RATING	
COMPLIES WITH OSHA HAZARD COMMUNICATION		HEALTH	1
STANDARD, 29CFR1910.1200		FLAMMABILITY	2
		REACTIVITY	0

IDENTITY: SUPER AGITENE

CHEMICAL FAMILY: CLEANING COMPOUND (COMBUSTIBLE LIQUID)

SECTION I

MANUFACTURER'S NAME: GRAYMILLS CORPORATION

ADDRESS: 3705 NORTH LINCOLN AVE.
CHICAGO, ILLINOIS 60613

EMERGENCY #: 1-800-424-9300 (CHEMTREC)

TELEPHONE #: 1-312-477-4100

DATE PREPARED: JANUARY 11, 1996

PREPARER'S SIGNATURE: R.C. PATEL

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

HAZARDOUS COMPONENTS (SPECIFIC CHEMICAL IDENTITY/COMMON NAME(S)):	OSHA PEL	ACGIH TLV	CAS#	CONCENTRATIO RANGE %
ALIPHATIC PETROLEUM DISTILLATE	100 PPM	100 PPM	64742-47-8	>97%
DPM (DIPROPYLENE GLYCOL METHYL ETHER)	100 PPM	100 PPM	34590-94-8	<1%

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING RANGE (FAHRENHEIT): 318-388

SPECIFIC GRAVITY (WATER=1): .78

VAPOR PRESSURE (MM HG @ 25C): 10.0
(PSI @ 100F): 0.4

MELTING POINT: N/A

EVAPORATION RATE (N-BUTYL ACETATE=1): <0.1

VAPOR DENSITY (AIR=1): 4.8

VOC CONTENT: 780 G/L

VISCOSITY (@ 25C): 1.12 CPS

PH: N/A

SOLUBILITY IN WATER: INSOLUBLE

APPEARANCE & ODOR: CLEAR GREEN LIQUID, MILD MINERAL SPIRITS ODOR.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED): 110F (TAG CC ASTM D56)

FLAMMABLE LIMITS: LEL: 0.6% UEL: 7.0%

EXTINGUISHING MEDIA: CO2, FOAM, DRY CHEMICALS, WATER SPRAY (FOG).

SPECIAL FIRE FIGHTING PROCEDURES: COOL SEALED DRUMS WITH WATER TO LESSEN CHANCE OF RUPTURE. WEAR SELF-CONTAINED BREATHING GEAR. MINIMIZE BREATHING OF GASES, VAPORS OR DECOMPOSITION PRODUCTS.

UNUSUAL FIRE AND EXPLOSION HAZARDS: COMBUSTIBLE LIQUID, DRUMS COULD FRACTURE IF HEATED. AUTOIGNITION TEMPERATURE APPROXIMATELY 450F (232C).

SECTION V - REACTIVITY DATA

STABILITY: UNSTABLE ( ) STABLE (X)

CONDITIONS TO AVOID: KEEP AWAY FROM HEAT, SPARKS AND OPEN FLAME.

INCOMPATIBILITY (MATERIAL TO AVOID): ACIDS, STRONG OXIDIZERS SUCH AS LIQUID CHLORINE, CONCENTRATED OXYGEN, SODIUM HYPOCHLORITE AND CALCIUM HYPOCHLORITE.

HAZARDOUS DECOMPOSITION OF BY-PRODUCTS: CARBON DIOXIDE, CARBON MONOXIDE, FUMES, SMOKE AND ALDEHYDES UPON INCOMPLETE COMBUSTION.

HAZARDOUS POLYMERIZATION: MAY OCCUR ( ) WILL NOT OCCUR (X)

CONDITIONS TO AVOID: NONE

SECTION VI - HEALTH HAZARD DATA

ROUTE(S) OF ENTRY: INHALATION (X) SKIN (X) INGESTION (X)

HEALTH HAZARDS (ACUTE & CHRONIC):

SKIN IRRITATION
ORAL: LD50 >4000 MG/KG - RAT
DERMAL: LD50 >2200 MG/KG - RABBIT
INHALATION: LD50 >5000 PPM - RAT

CARCINOGENICITY: NTP (NO) IARC MONOGRAPHS (NO) OSHA REGULATED (NO)

SIGNS & SYMPTOMS OF EXPOSURE: SKIN OR EYE IRRITATION, DIZZINESS, OR HEADACHE

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: SKIN OR RESPIRATORY ALLERGIES.

EMERGENCY & FIRST AID PROCEDURES:

EYE CONTACT: ONLY HIGH VAPOR CONCENTRATION MAY BE IRRITATING. IF LIQUID GET INTO EYE, IRRIGATE EYE WITH WATER FOR 15 MINUTES.

SKIN CONTACT: PROLONGED & REPEATED EXPOSURE MAY DRY THE SKIN. WASH EXPOSED AREA WITH WATER & APPLY SKIN LOTION OR LANOLIN CREAM.

INHALATION: EXCESSIVE INHALATION MAY RESULT IN IRRITATION TO NOSE, THROAT & RESPIRATORY TRACT. VERY HIGH VAPOR CONCENTRATION CAN CAUSE HEADACHE & DIZZINESS.

INGESTION: DO NOT INDUCE VOMITING. CALL DOCTOR. IF MORE THAN 2.0 ML/KG IS INGESTED AND VOMITING HAS NOT OCCURRED, THEN EMESIS SHOULD BE INDUCED WITH SUPERVISION. KEEP HEAD BELOW HIP TO PREVENT ASPIRATION.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: USE ABSORBENT MATERIAL OR SAND. SHOVEL INTO WASTE CONTAINER. DISPOSE OF PROPERLY.

WASTE DISPOSAL METHOD: RECLAIM BY DISTILLATION OR HAVE DISPOSAL PERFORMED BY A LICENSED WASTE HAULER. WASTE DISPOSAL #D001.

PRECAUTIONS TO BE TAKEN IN HANDLING & STORING: STORE IN COOL AREA AWAY FROM HEAT OR OPEN FLAMES. ALL PRECAUTIONS APPLY TO EMPTY CONTAINER.

OTHER PRECAUTIONS: NOT BIODEGRADABLE. SUFFICIENT VENTILATION IN VOLUME AND PATTERN TO KEEP WORK AREA CONCENTRATION BELOW APPLICABLE SAFETY LEVELS.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION (SPECIFY TYPE): NONE.

VENTILATION:

LOCAL EXHAUST: NONE

MECHANICAL (GENERAL): GENERAL ROOM VENTILATION

SPECIAL: NONE

PROTECTIVE GLOVES: NITRILE

EYE PROTECTION: CHEMICAL SPLASH GOGGLES

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: FOR CONSTANT USE, NITRILE GLOVES AND SOLVENT RESISTANT APRON ARE RECOMMENDED. WEAR GOGGLES AS APPROPRIATE.

WORK/HYGIENIC PRACTICES: USE SKIN LOTION OR CREAM IF GLOVES ARE NOT WORN.

SECTION IX - TRANSPORTATION INFORMATION

DOMESTIC (DOT)

GROUND: COMBUSTIBLE LIQUID, N.O.S., COMBUSTIBLE LIQUID, NA1993, III

AIR: USE INTERNATIONAL REGULATIONS

INTERNATIONAL (ICAO/IATA)

PETROLEUM DISTILLATES, N.O.S., 3, UN1268, III, CLASS 65.

EXCEPTIONS: LIMITED QUANTITY UP TO 5L (FOR PLASTIC, METAL AND ALUMINUM CONTAINERS; 2.5L FOR GLASS).

THE DATA PRESENTED IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF. NEITHER SELLER NOR PREPARER MAKES ANY WARRANTIES, EXPRESSED OR IMPLIED, CONCERNING THE INFORMATION PRESENTED, MERCHANTABILITY OR FITNESS OF PURPOSE.

This MSDS should be attached or kept with the respective product with which it is associated.

##

MATERIAL SAFETY DATA SHEET - 2SF66

Associated Grainger Items

2W352

2W352

GRAYMILLS CORPORATION

MATERIAL SAFETY DATA SHEET

CONFORMS TO OSHA FORM NO. 1218-0072	NFPA HAZARD RATING	
COMPLIES WITH OSHA HAZARD COMMUNICATION	HEALTH	1
STANDARD, 29CFR1910.1200	FLAMMABILITY	2
	REACTIVITY	0

IDENTITY: SUPER AGITENE

CHEMICAL FAMILY: CLEANING COMPOUND (COMBUSTIBLE LIQUID)

SECTION I

MANUFACTURER'S NAME: GRAYMILLS CORPORATION

ADDRESS: 3705 NORTH LINCOLN AVE.
CHICAGO, ILLINOIS 60613

EMERGENCY #: 1-800-424-9300 (CHEMTREC)

TELEPHONE #: 1-312-477-4100

DATE PREPARED: JANUARY 11, 1996

PREPARER'S SIGNATURE: R.C. PATEL

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

HAZARDOUS COMPONENTS (SPECIFIC CHEMICAL IDENTITY/COMMON NAME(S)):	OSHA PEL	ACGIB TLV	CAS#	CONCENTRATIO RANGE %
ALIPHATIC PETROLEUM DISTILLATE	100 PPM	100 PPM	64742-47-8	>97%
DPM (DIPROPYLENE GLYCOL METHYL ETHER)	100 PPM	100 PPM	34590-94-8	<1%

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING RANGE (FAHRENHEIT): 318-388 SPECIFIC GRAVITY (WATER=1): .78

VAPOR PRESSURE (MM HG @ 25C): 10.0 MELTING POINT: N/A

(PSI @ 100F): 0.4 EVAPORATION RATE (N-BUTYL ACETATE=1): <0.1

VAPOR DENSITY (AIR=1): 4.8

VOC CONTENT: 780 G/L VISCOSITY (@ 25C): 1.12 CPS

PH: N/A SOLUBILITY IN WATER: INSOLUBLE

APPEARANCE & ODOR: CLEAR GREEN LIQUID, MILD MINERAL SPIRITS ODOR.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED): 110F (TAG CC ASTM D56)

FLAMMABLE LIMITS: LEL: 0.6% UEL: 7.0%

EXTINGUISHING MEDIA: CO2, FOAM, DRY CHEMICALS, WATER SPRAY (FOG).

SPECIAL FIRE FIGHTING PROCEDURES: COOL SEALED DRUMS WITH WATER TO LESSEN CHANCE OF RUPTURE. WEAR SELF-CONTAINED BREATHING GEAR. MINIMIZE BREATHING OF GASES, VAPORS OR DECOMPOSITION PRODUCTS.

UNUSUAL FIRE AND EXPLOSION HAZARDS: COMBUSTIBLE LIQUID, DRUMS COULD FRACTURE IF HEATED. AUTOIGNITION TEMPERATURE APPROXIMATELY 450F (232C).

SECTION V - REACTIVITY DATA

STABILITY: UNSTABLE ( ) STABLE (X)

CONDITIONS TO AVOID: KEEP AWAY FROM HEAT, SPARKS AND OPEN FLAME.

INCOMPATIBILITY (MATERIAL TO AVOID): ACIDS, STRONG OXIDIZERS SUCH AS LIQUID CHLORINE, CONCENTRATED OXYGEN, SODIUM HYPOCHLORITE AND CALCIUM HYPOCHLORITE.

HAZARDOUS DECOMPOSITION OF BY-PRODUCTS: CARBON DIOXIDE, CARBON MONOXIDE, FUMES, SMOKE AND ALDEHYDES UPON INCOMPLETE COMBUSTION.

HAZARDOUS POLYMERIZATION: MAY OCCUR ( ) WILL NOT OCCUR (X)

CONDITIONS TO AVOID: NONE

SECTION VI - HEALTH HAZARD DATA

ROUTE(S) OF ENTRY: INHALATION (X) SKIN (X) INGESTION (X)

HEALTH HAZARDS (ACUTE & CHRONIC):

SKIN IRRITATION ORAL: LD50 >4000 MG/KG - RAT

DERMAL: LD50 >2200 MG/KG - RABBIT INHALATION: LD50 >5000 PPM - RAT

CARCINOGENICITY: NTP (NO) IARC MONOGRAPHS (NO) OSHA REGULATED (NO)

SIGNS & SYMPTOMS OF EXPOSURE: SKIN OR EYE IRRITATION, DIZZINESS, OR HEADACHE

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: SKIN OR RESPIRATORY ALLERGIES.

EMERGENCY & FIRST AID PROCEDURES:

EYE CONTACT: ONLY HIGH VAPOR CONCENTRATION MAY BE IRRITATING. IF LIQUID GET INTO EYE, IRRIGATE EYE WITH WATER FOR 15 MINUTES.

SKIN CONTACT: PROLONGED & REPEATED EXPOSURE MAY DRY THE SKIN. WASH EXPOSED AREA WITH WATER & APPLY SKIN LOTION OR LANOLIN CREAM.

INHALATION: EXCESSIVE INHALATION MAY RESULT IN IRRITATION TO NOSE, THROAT & RESPIRATORY TRACT. VERY HIGH VAPOR CONCENTRATION CAN CAUSE HEADACHE & DIZZINESS.

INGESTION: DO NOT INDUCE VOMITING. CALL DOCTOR. IF MORE THAN 2.0 ML/KG IS INGESTED AND VOMITING HAS NOT OCCURRED, THEN EMESIS SHOULD BE INDUCED WITH SUPERVISION. KEEP HEAD BELOW HIP TO PREVENT ASPIRATION.

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STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: USE ABSORBENT MATERIAL OR SAND. SHOVEL INTO WASTE CONTAINER. DISPOSE OF PROPERLY.

WASTE DISPOSAL METHOD: RECLAIM BY DISTILLATION OR HAVE DISPOSAL PERFORMED BY A LICENSED WASTE HAULER. WASTE DISPOSAL #D001.

PRECAUTIONS TO BE TAKEN IN HANDLING & STORING: STORE IN COOL AREA AWAY FROM HEAT OR OPEN FLAMES. ALL PRECAUTIONS APPLY TO EMPTY CONTAINER.

OTHER PRECAUTIONS: NOT BIODEGRADABLE. SUFFICIENT VENTILATION IN VOLUME AND PATTERN TO KEEP WORK AREA CONCENTRATION BELOW APPLICABLE SAFETY LEVELS.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION (SPECIFY TYPE): NONE.

VENTILATION:

LOCAL EXHAUST: NONE

MECHANICAL (GENERAL): GENERAL ROOM VENTILATION

SPECIAL: NONE

PROTECTIVE GLOVES: NITRILE

EYE PROTECTION: CHEMICAL SPLASH GOGGLES

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: FOR CONSTANT USE, NITRILE GLOVES AND SOLVENT RESISTANT APRON ARE RECOMMENDED. WEAR GOGGLES AS APPROPRIATE.

WORK/HYGIENIC PRACTICES: USE SKIN LOTION OR CREAM IF GLOVES ARE NOT WORN.

SECTION IX - TRANSPORTATION INFORMATION

DOMESTIC (DOT)

GROUND: COMBUSTIBLE LIQUID, N.O.S., COMBUSTIBLE LIQUID, NA1993, III

AIR: USE INTERNATIONAL REGULATIONS

INTERNATIONAL (ICAO/IATA)

PETROLEUM DISTILLATES, N.O.S., 3, UN1268, III, CLASS 65.

EXCEPTIONS: LIMITED QUANTITY UP TO 5L (FOR PLASTIC, METAL AND ALUMINUM CONTAINERS; 2.5L FOR GLASS).

THE DATA PRESENTED IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF. NEITHER SELLER NOR PREPARER MAKES ANY WARRANTIES, EXPRESSED OR IMPLIED, CONCERNING THE INFORMATION PRESENTED, MERCHANTABILITY OR FITNESS OF PURPOSE.

When shipment is complete, retain for daily Hazmat audit.

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GRAINGER SHIPPING INFORMATION

STOCK # : 2W352

MSDS # : 2SF66

FREIGHT CODE : 0206

DOT PROPER SHIP NAME : COMBUSTIBLE LIQUID, (PETROLEUM DISTILLATE MIXTURE), NOT REGULATED BY DOT AS A HAZARDOUS MATERIAL PER 49 CFR 173.150(F)(2)

UPS RESTRICTIONS :

HAZARDOUS CLASS NUMBER :

UN ID # :

PACKING GROUP :

SHIPPING LABEL :

:

LIMITED QUANTITY : N

CARTON INSTRUCTIONS : CAN REPACK IN GRAINGER S CARTON

EXCEPTION :

DOT/UPS EXEMPTION NO. :

COMMENTS 1 : HAZARDOUS MATERIAL. DO NOT SHIP AIR!!

COMMENTS 2 : ONLY ARROW UP LABEL(2S594) REQUIRED.

SHIPPING PAPERS : NONE REQUIRED.

PLACARD OFFERED ? YES ( ) NO ( ) PLEASE MARK ONE

ERG TO ACCOMPANY SHIPMENT

****

When shipment is complete, retain for daily Hazmat audit.

##

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GRAINGER SHIPPING INFORMATION

STOCK # : 2W352

MSDS # : 2SF66

FREIGHT CODE : 0206

DOT PROPER SHIP NAME : COMBUSTIBLE LIQUID, (PETROLEUM DISTILLATE MIXTURE), NOT REGULATED BY DOT AS A HAZARDOUS MATERIAL PER 49 CFR 173.150(F)(2)

UPS RESTRICTIONS :

HAZARDOUS CLASS NUMBER :

UN ID # :

PACKING GROUP :

SHIPPING LABEL :

:

LIMITED QUANTITY : N

CARTON INSTRUCTIONS : CAN REPACK IN GRAINGER S CARTON

EXCEPTION :

DOT/UPS EXEMPTION NO. :

COMMENTS 1 : HAZARDOUS MATERIAL. DO NOT SHIP AIR!!

COMMENTS 2 : ONLY ARROW UP LABEL(2S594) REQUIRED.

SHIPPING PAPERS : NONE REQUIRED.

PLACARD OFFERED ? YES ( ) NO ( ) PLEASE MARK ONE

ERG TO ACCOMPANY SHIPMENT

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DOD Hazardous Materials Information System
DoD 6050.5-L
AS OF July 1998

FSC: 9150
NIIN: 010439063
Manufacturer's CAGE: 29700
Part No. Indicator: A
Part Number/Trade Name: TERESSTIC 32; PRODUCT CODE:376000-01174

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General Information

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Item Name: LUBRICATING OIL
Company's Name: EXXON CO USA, A DIV OF EXXON CORP.
Company's Street: 800 BELL ST
Company's P. O. Box: 2180
Company's City: HOUSTON
Company's State: TX
Company's Country: US
Company's Zip Code: 77252-2180
Company's Emerg Ph #: 713-870-6000
Company's Info Ph #: 713-698-5948
Distributor/Vendor # 1: BORNE CHEMICAL CO
Distributor/Vendor # 1 Cage: 17425
Distributor/Vendor # 2:
Distributor/Vendor # 2 Cage:
Distributor/Vendor # 3:
Distributor/Vendor # 3 Cage:
Distributor/Vendor # 4:
Distributor/Vendor # 4 Cage:
Safety Data Action Code:
Safety Focal Point: D
Record No. For Safety Entry: 004
Tot Safety Entries This Stk#: 008
Status: SE
Date MSDS Prepared: 01JUN89
Safety Data Review Date: 06JUN91
Supply Item Manager: CX
MSDS Preparer's Name:
Preparer's Company:
Preparer's St Or P. O. Box:
Preparer's City:
Preparer's State:
Preparer's Zip Code:
Other MSDS Number:
MSDS Serial Number: BKBML
Specification Number: NONE
Spec Type, Grade, Class: N/R
Hazard Characteristic Code: N1
Unit Of Issue: GL
Unit Of Issue Container Qty: 1 GAL
Type Of Container: CAN
Net Unit Weight: N/K

Report for NIIN: 010439063

NRC/State License Number: N/R
Net Explosive Weight:
Net Propellant Weight-Ammo: N/R
Coast Guard Ammunition Code:

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Ingredients/Identity Information

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Proprietary: NO
Ingredient: DISTILLATES, HYDROTREATED HEAVY PARAFFINIC; PER EXXON MSDS CONTAINS EOTHER THIS INGRED OR #2 INGRED ABOUT 98%.
Ingredient Sequence Number: 01
Percent: >98
Ingredient Action Code:
Ingredient Focal Point: D
NIOSH (RTECS) Number: PY8035500
CAS Number: 64742-54-7
OSHA PEL: 300 PPM
ACGIH TLV: 300 PPM
Other Recommended Limit: NONE SPECIFIED

Proprietary: NO
Ingredient: MINERAL OIL (EXXON MSDS STATES THAT THEIR ITEM MAY CONTAIN EITHER INGREDIENT NO 1 OR 2 - (ABOUT 98% ONE OF THESE))
Ingredient Sequence Number: 02
Percent: >98%
Ingredient Action Code:
Ingredient Focal Point: D
NIOSH (RTECS) Number: PY8038500
CAS Number: 64742-65-0
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED
Other Recommended Limit: NONE SPECIFIED

Proprietary: NO
Ingredient: PROPRIETARY ADDITIVES (TYPE NOT SPECIFIED)
Ingredient Sequence Number: 03
Percent: <2.0
Ingredient Action Code:
Ingredient Focal Point: D
NIOSH (RTECS) Number: 1003263PA
CAS Number:
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED
Other Recommended Limit: NONE SPECIFIED

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Physical/Chemical Characteristics

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Appearance And Odor: OIL
Boiling Point: 560F,293C
Melting Point: N/R
Vapor Pressure (MM Hg/70 F): N/K
Vapor Density (Air=1): >5(AIR=1)
Specific Gravity: 0.88

Report for NIIN: 010439063

Decomposition Temperature: UNKNOWN
Evaporation Rate And Ref: <0.01
Solubility In Water: NEGLIGIBLE
Percent Volatiles By Volume: N/K
Viscosity: 32 CST @40C
pH: N/K
Radioactivity:
Form (Radioactive Matl):
Magnetism (Milligauss): N/P
Corrosion Rate (IPY): UNKNOWN
Autoignition Temperature: N/K

Fire and Explosion Hazard Data

Flash Point: 388F,198C
Flash Point Method: COC
Lower Explosive Limit: N/K
Upper Explosive Limit: N/K
Extinguishing Media: USE WATER FOG, CARBON DIOXIDE, FOAM, OR DRY CHEMICAL.
Special Fire Fighting Proc: WEAR FIRE FIGHTING PROTECTIVE EQUIPMENT AND A FULL FACED SELF CONTAINED BREATHING APPARATUS. EVACUATE AREA. COOL FIRE EXPOSED CONTAINERS WITH WATER SPRAY.
Unusual Fire And Expl Hazrds: COMBUSTION OR HEAT OF FIRE MAY PRODUCE HAZARDOUS DECOMPOSITION PRODUCTS AND VAPORS.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): HIGH HEAT, OPEN FLAMES AND OTHER SOURCES OF IGNITION
Materials To Avoid: STRONG OXIDIZING AGENTS
Hazardous Decomp Products: A MIXTURE OF AIRBORNE SOLID,LIQUID PARTICULATES & GASES SUCH AS OXIDES OF CARBON,SULFUR,ALDEHYDES WILL EVOLVE WHEN BURNT
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT APPLICABLE

Health Hazard Data

LD50-LC50 Mixture: LD50 (ORAL RAT) IS NOT AVAILABLE
Route Of Entry - Inhalation: NO
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: ACUTE: MAY BE MILDLY IRRITATING TO EYES AND SKIN. INHALATION:NOT EXPECTED TO BE A RELEVANT ROUTE OF EXPOSURE; HIGH TEMPERATURE VAPORS IRRITATE RESPIRATORY TRACT. INGESTION:LOW LEVEL OF TOXICITY.MAY CAUSE IRRITATION TO DIGESTIVE TRACK.CHRONIC: PROLONGED SKIN CONTACT CAN CAUSE IRRITATION AND DERMATITIS BY REMOVING SKIN.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE OF THE COMPOUNDS IN THIS PRODUCT IS LISTED BY IARC, NTP, OR OSHA AS A CARCINOGEN.
Signs/Symptoms Of Overexp: INGESTION:LOW ORAL TOXICITY PRODUCT. MAY CAUSE

Report for NIIN: 010439063

DIGESTIVE TRACK (GASTROINTESTINAL) IRRITATION,NAUSEA,VOMITING,& DIARRHEA. EYES:MAY CAUSE IRRITATION,REDNESS,BLURRED VISION. SKIN:PROLONGED OR REPEATED CONTACT MAY CAUSE IRRITATION AND DERMATITIS. INHALATION: EXPOSURE TO HEATED MIST/VAPORS MAY IRRITATE NOSE/THROAT.
Med Cond Aggravated By Exp: PRE-EXISTING SKIN DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT.
Emergency/First Aid Proc: INHALATION: REMOVE TO FRESH AIR.GET MEDICAL ATTENTION. EYES:FLUSH WITH WATER FOR AT LEAST 15 MINUTES WHILE HOLDING EYELIDS OPEN.GET MEDICAL ATTENTION. SKIN: WASH WITH SOAP & WATER OR USE A SUITABLE SKIN CLEANER.REMOVE CONTAMINATED CLOTHING.IF IRRITATION PERSISTS, GET MEDICAL ATTENTION. INGESTION: DO NOT INDUCE VOMITING. IN GENERAL,NO TREATMENT IS REQUIRED.KEEP WARM AND QUIET AND GET MEDICAL ADVICE.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: ELIMINATE IGNITION SOURCES.USE APPROPRIATE

PROTECTIVE GEARS.ABSORB WITH INERT ABSORBENT.SCOOP UP ABSORBED WASTE AND PLACE IN COVERED DRUMS. LARGE SPILL:CONTAIN BY DIKING.RECOVER FREE OIL AND REUSE/RECYCLE.DO NOT FLUSH LIQUID/RESIDUE TO SEWER.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: DISPOSE OF IN AN APPROPRIATE DISPOSAL FACILITY IN COMPLIANCE WITH LOCAL REGULATIONS. ENCLOSED-CONTROLLED INCINERATION IS RECOMMENDED UNLESS DIRECTED OTHERWISE BY APPLICABLE ORDINANCES.
Precautions-Handling/Storing: STORE IN A COOL, DRY PLACE WITH ADEQUATE VENTILATION. KEEP CONTAINERS TIGHTLY CLOSED WHEN NOT IN USE. KEEP AWAY FROM OPEN FLAMES & HIGH TEMPERATURES.
Other Precautions: MINIMIZE SKIN CONTACT. WASH WITH SOAP & WATER BEFORE EATING, DRINKING, SMOKING OR USING TOILET FACILITIES. LAUNDER CONTAMINATED CLOTHING BEFORE REUSE. PROPERLY DISPOSE OF CONTAMINATED LEATHER ARTICLES (SHOES) THAT CAN NOT BE DECONTAMINATED.

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Control Measures

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Respiratory Protection: IF VENTILATION DOES NOT MAINTAIN INHALATION EXPOSURES BELOW PEL(TLV), USE NIOSH APPROVED ORGANIC RESPIRATORS AS PER CURRENT 29 CFR 1910.134, INSTRUCTIONS/WARNINGS. RESPIRATORY PROTECTION NOT ORDINARILY REQUIRED.
Ventilation: IN GENERAL,NONE REQUIRED. FOR INDUSTRIAL USE, APPLY LOCAL EXHAUST TO KEEP BELOW TLV.KEEP
Protective Gloves: CHEMICAL RESISTANT,NEOPRENE, RUBBER
Eye Protection: SAFETY GLASSES OR GOGGLES RECOMMENDED.
Other Protective Equipment: EYE WASH STATION AND SAFETY SHOWER. INDUSTRIAL-TYPE WORK CLOTHING AND APRON AS REQUIRED.
Work Hygienic Practices: OBSERVE GOOD PERSONAL HYGIENE PRACTICES AND RECOMMENDED PROCEDURES. DO NOT WEAR CONTAMINATED CLOTHING OR FOOTWEAR.
Suppl. Safety & Health Data: NONE.

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Transportation Data

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Transportation Action Code:
Transportation Focal Point: D
Trans Data Review Date: 91140
DOT PSN Code: ZZZ

Report for NIIN: 010439063

DOT Symbol:
DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
DOT Class: N/R
DOT ID Number: N/R
DOT Pack Group:
DOT Label: N/R
DOT/DoD Exemption Number:
IMO PSN Code: ZZZ
IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION
IMO Regulations Page Number: N/R
IMO UN Number: N/R
IMO UN Class: N/R
IMO Subsidiary Risk Label: N/R
IATA PSN Code: ZZZ
IATA UN ID Number: N/R
IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
IATA UN Class: N/R
IATA Subsidiary Risk Class: N/R
IATA Label: N/R
AFI PSN Code: ZZZ
AFI Symbols:

AFI Prop. Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
AFI Class: N/R
AFI ID Number: N/R
AFI Pack Group:
AFI Label: N/R
AFI Special Prov:
AFI Basic Pac Ref:
MMAC Code:
N.O.S. Shipping Name:
Additional Trans Data:

Disposal Data

Disposal Data Action Code:
Disposal Data Focal Point:
Disposal Data Review Date:
Rec # For This Disp Entry:
Tot Disp Entries Per NSN:
Landfill Ban Item:
Disposal Supplemental Data:
1st EPA Haz Wst Code New:
1st EPA Haz Wst Name New:
1st EPA Haz Wst Char New:
1st EPA Acute Hazard New:
2nd EPA Haz Wst Code New:
2nd EPA Haz Wst Name New:
2nd EPA Haz Wst Char New:
2nd EPA Acute Hazard New:
3rd EPA Haz Wst Code New:
3rd EPA Haz Wst Name New:
3rd EPA Haz Wst Char New:
3rd EPA Acute Hazard New:

Report for NIIN: 010439063

Label Data

Label Required: YES
Technical Review Date: 06JUN91
Label Date:
MFR Label Number: UNKNOWN
Label Status: F
Common Name: TERESSTIC 32
Chronic Hazard: NO
Signal Word: CAUTION!
Acute Health Hazard-None:
Acute Health Hazard-Slight: X
Acute Health Hazard-Moderate:
Acute Health Hazard-Severe:
Contact Hazard-None:
Contact Hazard-Slight: X
Contact Hazard-Moderate:
Contact Hazard-Severe:
Fire Hazard-None:
Fire Hazard-Slight: X
Fire Hazard-Moderate:
Fire Hazard-Severe:
Reactivity Hazard-None: X
Reactivity Hazard-Slight:
Reactivity Hazard-Moderate:

Reactivity Hazard-Severe:
Special Hazard Precautions: ACUTE: MAY BE MILDLY IRRITATING TO EYES AND SKIN. INHALATION:NOT EXPECTED TO BE A RELEVANT ROUTE OF EXPOSURE; HIGH TEMPERATURE VAPORS IRRITATE RESPIRATORY TRACT. INGESTION:LOW LEVEL OF TOXICITY.MAY CAUSE IRRITATION TO DIGESTIVE TRACK.CHRONIC: PROLONGED SKIN CONTACT CAN CAUSE IRRITATION AND DERMATITIS BY REMOVING SKIN. STORE IN A COOL, DRY PLACE WITH ADEQUATE VENTILATION. KEEP CONTAINERS TIGHTLY CLOSED WHEN NOT IN USE. KEEP AWAY FROM OPEN FLAMES & HIGH TEMPERATURES. FIRST AID: INHALATION: REMOVE TO FRESH AIR.GET MEDICAL ATTENTION. EYES:FLUSH WITH WATER FOR AT LEAST 15 MINUTES WHILE HOLDING EYELIDS OPEN.GET MEDICAL ATTENTION.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory:
Label Name: EXXON CO USA, A DIV OF EXXON CORP.
Label Street: 800 BELL ST
Label P.O. Box: 2180
Label City: HOUSTON
Label State: TX
Label Zip Code: 77252-2180
Label Country: US
Label Emergency Number: 713-870-6000
Year Procured: 1991

ATTACHMENT OPP-FI-C9

LIST OF EQUIPMENT/ACTIVITIES REGULATED UNDER TITLE VI

ATTACHMENT OPP-FI-C9

EQUIPMENT/ACTIVITIES REGULATED UNDER TITLE VI

The Oleander Power Project currently has no equipment containing more than 50 pounds of CFCs. There are several air conditioning and refrigeration units on the plant site, but these contain less than the threshold quantity of CFCs.

ATTACHMENT OPP-FI-C10

ALTERNATIVE METHODS OF OPERATION

ATTACHMENT OPP-FI-C10
ALTERNATIVE METHODS OF OPERATION

The combustion turbines (CTs) shall be fired primarily with low sulfur (maximum 0.05 weight percent sulfur) No. 2 fuel oil or superior grade of distillate fuel oil and natural gas. The four stationary CTs will operate no more than an average of 3,390 hours per unit during any calendar year.

Fuel usage as heat input, while burning natural gas at the site, shall not exceed 29.188 x 10^{12} Btu (LHV) per year during any consecutive 12 month period. Fuel usage while burning fuel oil at the site, shall not exceed 9.595 x 10^{12} Btu (LHV) per year during any consecutive 12 month period.

Fuel Oil Operation

The maximum heat input rate, based on the lower heating value (LHV) of No. 2 fuel oil at ambient conditions of 59°F temperature, 60% relative humidity, 100% load, and 14.7 psi pressure will not exceed 1,919 MMBtu/hr when firing No. 2 or superior grade of distillate fuel oil. See III.B.6 in this application for overall maximum heat input rate and conditions.

The amount of fuel oil burned at this site (in BTU's) will not exceed the amount of natural gas burned at this site (in BTU's) during any consecutive 12-month period **[Rule 62-210.200, F.A.C. (BACT)]**.

Natural Gas Operation

The maximum heat input rate, based on the lower heating value (LHV) of natural gas at ambient conditions of 59°F temperature, 60% relative humidity, 100% load, and 14.7 psi pressure will not exceed 1,722 MMBtu/hr when firing natural gas. See III.B.6 in this application for overall maximum heat input rate and conditions.

ATTACHMENT OPP-FI-C12

IDENTIFICATION OF ADDITIONAL APPLICABLE REQUIREMENTS

GOLDER ASSOCIATES INC.
NOV 24 1999
GAINESVILLE

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NOTICE OF FINAL PERMIT

In the Matter of an
Application for Permit by:

Richard L. Wolfinger, Vice President
Oleander Power Project, L.P.
250 West Pratt Street, 23rd Floor
Baltimore, MD 21201

DEP File No. 0090180-001-AC, PSD-FL-258
Oleander Power Plant
Brevard County

Enclosed is Final Permit Number 0091080-001-AC. This permit authorizes Oleander Power Project, L.P. to construct the Oleander Power Project. This permit is issued pursuant to Chapter 403, Florida Statutes.

Any party to this 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.

AA Linero, P.E.
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 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 11-22-99 to the person(s) listed:

Richard L. Wolfinger, Oleander Power Project, L.P. *
Gregg Worley, EPA
John Bunyak, NPS
Len Kozlov, CD
Ken Kosky, P.E., Golder Associates
Chair, Brevard County Commission
Administrator, Brevard County
List of Requestors

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.

Kim Tober 11-22-99
(Clerk) (Date)

FINAL DETERMINATION

Oleander Power Project
Oleander Power Project, L.P.
DEP File No.0090180-001-AC, PSD-FL-258

The Department distributed a public notice package on March 26, 1999 to allow the applicant to construct a new plant known as the Oleander Power Plant located west of Cocoa, Brevard County. The Public Notice of Intent to Issue was published in The Florida Today on April 8, 1999.

COMMENTS/CHANGES

Comments were received from the applicant by letter dated May 6, 1999.

A public meeting was held on May 13, 1999, transcripts of which are on file.

An Administrative Hearing was held on August 30, 1999, transcripts of which are on file.

Recommended Order issued September 27, 1999 by Administrative Law Judge Daniel Manry.

Final Order issued November 10, 1999 by the Office of The Secretary.

CONCLUSION

No comments were received which alter the Draft BACT or Draft permit.

Accordingly, the final action of the Department is to issue the BACT and permit with no changes.

Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

PERMITTEE:

Oleander Power Project, L.P.
Oleander Power Project
250 West Pratt Street, 23rd Floor
Baltimore, MD 21201

File No.	0090180-001-AC
FID No.	0090180-001
SIC No.	4911
Permit No.	PSD-FL-258
Expires:	March 26, 2003

Authorized Representative:
Richard L. Wolfinger
Vice President

PROJECT AND LOCATION:

Permit for the construction of five 190-MW dual-fuel "F" class combustion turbines and two 2.8 million-gallon fuel oil storage tanks for back-up distillate fuel oil. The turbines are designated as Unit Nos. 1-5 and will be located at the Oleander Power Project, 527 Townsend Road, Cocoa, Brevard County. UTM coordinates are: Zone 17; 520.1 km E; 3137.6 km N.

STATEMENT OF BASIS:

This 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 permit is for the installation of five 190 MW simple cycle "F" class, gas and oil-fired, stationary combustion turbines, each with its own 60-foot stack and two 2.8 million gallon storage tank for back-up (0.05 percent sulfur) distillate fuel oil.

Emissions from the Oleander units will be controlled by Dry Low NO_X combustors while firing natural gas, wet injection when firing fuel oil, use of inherently clean fuels, and good combustion practices.

EMISSION UNITS

This permit addresses the following emission units:

ARMS EMISSION UNIT NO.	SYSTEM	EMISSION UNIT DESCRIPTION
001	Power Generation	190 Megawatt Combustion Turbine
002	Power Generation	190 Megawatt Combustion Turbine
003	Power Generation	190 Megawatt Combustion Turbine
004	Power Generation	190 Megawatt Combustion Turbine
005	Power Generation	190 Megawatt Combustion Turbine
006	Fuel Storage	2.8 Million Gallon Fuel Oil Storage Tank
007	Fuel Storage	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).

Because emissions are greater than 100 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). Per Table 62-212.400-2, modifications at the facility resulting in emissions increases greater than the following require review per the PSD rules as well as a determination for Best Available Control Technology (BACT) per Rule 62-212.410, F.A.C.: 40 TPY of NO_X, 40 TPY of SO_2, 25/15 TPY of PM/PM_{10}, 7 TPY of SAM, 100 TPY of CO or 40 TPY of VOC.

SECTION I. FACILITY INFORMATION

PERMIT SCHEDULE

- 11/22/99 Issued Permit
- 11/10/99 Final Order Issued by Secretary's Office
- 08/30/99 Administrative Hearing held
- 04/08/99 Notice of Intent published in The Florida Today
- 03/26/99 Distributed Intent to Issue Permit
- 02/02/99 Application deemed complete
- 11/24/98 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 November 24, 1998
- Department letters dated November 25, December 17 and December 22, 1998
- Comments from the National Park Service dated December 18, 1998
- Letter from Oleander (via Golder Associates) dated February 1, 1999 including revisions to original application.
- Letter from Oleander (via Golder Associates) dated March 17, 1999 including further revisions to application.
- Department's Intent to Issue and Public Notice Package dated March 26, 1999
- Department's Final Determination and Best Available Control Technology Determination issued concurrently with this permit.
- Administrative Hearing Officer's Recommended Order, dated September 27, 1999
- Department's Final Order from the Office of The Secretary, dated November 10, 1999

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) 488-1344. All documents related to reports, tests, and notifications should be submitted to the DEP Central District office, 3319 Maguire Boulevard, Orlando, Florida 32803 and phone number 407/894-7555.

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 paragraph (4) of 40 CFR 52.21(j) 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."

SECTION II. ADMINISTRATIVE REQUIREMENTS

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, short-term or annual emission limits, annual fuel heat input limits or similar changes. [40 CFR 52.21(j)(4), Rule 62-4.070 F.A.C.]

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 Central 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 Central 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) (1997 version), shall be submitted to the DEP's Central District office. Each excess emission report shall include the information required in 40 CFR 60.7(c) and 60.334.

SECTION III. EMISSION UNIT(S) 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 001-005, Power Generation, consisting of five 190 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 Units 006-007, Fuel Storage, consisting of two 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 Central District office.

GENERAL OPERATION REQUIREMENTS

7. <u>Fuels</u>: 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 this unit. [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 (1-5) at ambient conditions of 59°F temperature, 60% relative humidity, 100% load, and 14.7 psi pressure shall not exceed 1,722 million Btu per hour (MMBtu/hr) when firing natural gas, nor 1,919 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 Central District office 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 3390 hours (each) any calendar year. [Applicant Request, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]

14. Fuel usage as heat input, while burning natural gas at the site, shall not exceed 29.188×10^{12} BTU (LHV) per year during any consecutive 12 month period. [Applicant Request, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]

15. Fuel usage as heat input, while burning fuel oil at the site, shall not exceed 9.595×10^{12} BTU (LHV) per year during any consecutive 12 month period. Additionally, the amount of fuel oil

burned at the site (in BTU's) shall not exceed natural gas burned at the site (in BTU's) during any consecutive 12-month period.
[Applicant Request, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]

Control Technology

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

17. The permittee shall design each stationary combustion turbine, ducting, and stack(s) so as to not preclude installation of SCR equipment and/or oxidation catalyst in the event of a failure to achieve the NO_X limits given in Specific Condition No. 20 and 21 or the carbon monoxide (CO) limits given in Specific Condition 22. [Rule 62-4.070, F.A.C.]

18. 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.]

19. The DLN systems shall each be tuned upon initial operation to optimize emissions reductions and shall be maintained to minimize NO_X emissions and CO emissions. 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

20. The following table is a summary of the BACT determination and is followed by the applicable specific conditions. Values for NO_X are corrected to 15% O_2 on a dry basis. [Rule 62-212.400, F.A.C.]

Operational Mode (Fuel)	NO_X (15%O2)	CO	VOC	PM/Visibility (% Opacity)	SO_2/SAM	Technology and Comments
Natural Gas	9 ppm	12 ppm	3 ppm	10	1 grain S per 100 CF	Dry Low NOx Burners. Clean fuels, good combustion
Fuel Oil	42 ppm	20 ppm	6 ppm	10	0.05% sulfur oil	Water Injection. Units limited to 1000 hrs equivalent full load oil operation (per CT) annually. Clean fuels, good combustion

21. Nitrogen Oxides (NO_X) Emissions:

- When NO_X monitoring data is not available, substitution for missing data shall be handled as required by Title IV (40 CFR 75) to calculate any specified average time.
- While firing Natural Gas: The emission rate of NO_X in the exhaust gas shall not exceed 62.6 lb/hr (at ISO conditions) on a 24 hr block average as measured by the continuous

emission monitoring system (CEMS). In addition, NO_X emissions calculated as NO_2 (at ISO conditions) shall not exceed 9 ppm @15% O_2 to be demonstrated by stack test. Note: Basis for lb/hr limit is 9 ppm @ 15% O_2, full load. [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 as measured by the continuous emission monitoring system (CEMS). In addition, NO_X emissions calculated as NO_2 (at ISO conditions) shall not exceed 42 ppm @15% O_2 to be demonstrated by stack test. [Rule 62-212.400, F.A.C.]
- Within 18 months after the initial compliance test, the permittee shall prepare and submit for the Department's review and acceptance an engineering report regarding the lowest NO_X emission rate that can consistently be achieved when firing distillate oil. This lowest recommended rate shall include a reasonable operating margin, taking into account long-term performance expectations and good operating and maintenance practices. The Department may revise the NO_X emission rate based upon this report. [BACT determination; Applicant request]

22. Carbon Monoxide (CO) emissions: The concentration of CO in the exhaust gas when firing natural gas shall not exceed 12 ppmvd when firing natural gas and 20 ppmvd when firing fuel oil as measured by EPA Method 10. CO emissions (at ISO conditions) shall not exceed 41.0 lb/hr (when firing natural gas) and 66.9 lb/hr (when firing fuel oil). [Rule 62-212.400, F.A.C.]
23. Sulfur Dioxide (SO_2) emissions: SO_2 emissions (at ISO conditions) shall not exceed 5.5 pounds per hour when firing pipeline natural gas and 103.4 pounds per hour when firing maximum 0.05 percent sulfur No. 2 or superior grade distillate fuel oil as measured by applicable compliance methods described below. [Rule 62-212.400, F.A.C.]
24. Visible emissions (VE): VE emissions shall not exceed 10 percent opacity when firing natural gas or No. 2 or superior grade of fuel oil, except for during startup and shutdown at which time emissions shall not exceed 20 percent opacity. [Rule 62-296.320(4)(b), F.A.C.]
25. Volatile Organic Compounds (VOC) Emissions: The concentration of VOC in the exhaust gas when firing natural gas shall not exceed 3 ppmvd when firing natural gas and 6 ppmvd when firing fuel oil as assured by EPA Methods 18, and/or 25 A. VOC emissions (at ISO conditions) shall not exceed 5.9 lb/hr (when firing natural gas) and 11.5 lb/hr (when firing fuel oil). [Rule 62-212.400, F.A.C.]

EXCESS EMISSIONS

26. 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).

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.

27. Excess Emissions Report: If excess emissions occur due to malfunction, start-up or shut-down the owner or operator shall notify DEP's Central District office 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. Pursuant to the New Source Performance Standards, excess emissions shall also be reported in accordance with 40 CFR 60.7, Subpart A. [Rules 62-4.130 and 62-210.700(6), F.A.C.]

COMPLIANCE DETERMINATION

28. Compliance with the allowable emission limiting standards shall be determined within 60 days after achieving the maximum production rate, for each fuel, at which this unit will be operated, but not later than 180 days of initial operation of the unit for that fuel, and annually thereafter as indicated in this permit, by using the following reference methods as described in 40 CFR 60, Appendix A (1997 version), and adopted by reference in Chapter 62-204.800, F.A.C.

29. Initial (I) performance tests shall be performed on each unit while firing natural gas as well as while firing fuel oil. Initial tests shall also be conducted after any modifications (and shake down period not to exceed 100 days after starting the CT) to air pollution control equipment, including low NO_X burners or Hot SCR. 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 requirement).
- EPA Reference Method 18, 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 technology) or a 3-hr average (if SCR is used). For the 24-hr block average (lb/hr) emissions may be determined via EPA Method 19 or equivalent EPA approved methods. Based on CEMS data, a separate compliance determination is conducted at the end of each operating day (or 3-hr period when applicable) and a new average emission rate is calculated from the arithmetic average of all valid hourly emission rates from the previous operating day (or 3-hr period when applicable). Valid hourly emission rates shall not include periods of startup, shutdown, or malfunction as defined in Rule 62-210.200 F.A.C., where emissions exceed the applicable NO_X standard. These excess emissions periods shall be reported as required in Conditions 26 and 27. 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. [Rules 62-4.070 F.A.C., 62-210.700, F.A.C., and 40 CFR 75]

31. Compliance with the SO_2 and PM/PM_{10} emission limits: Notwithstanding the requirements of Rule 62-297.310(7), F.A.C., the use of pipeline natural gas and maximum 0.05 percent sulfur (by weight) No. 2 or superior grade distillate fuel oil, 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 and the 0.05% S limit, fuel oil analysis using ASTM D2880-941 or D4294-90 (or equivalent latest version) for the sulfur content of liquid fuels and D1072-80, D3031-81, D4084-82 or D3246-81 (or equivalent latest version) for sulfur content of gaseous fuel shall be utilized in accordance with the EPA-approved custom fuel monitoring schedule. The applicant is responsible for ensuring that the procedures above are used for determination of fuel sulfur content. 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) (1997 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 concurrent with the annual RATA testing for NO_X required pursuant to 40 CFR 75 (required for gas only).

33. Compliance with the VOC emission limit: An initial test is required to demonstrate compliance with the BACT VOC emission limit. Thereafter, CO emission limit 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 95-100 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 105 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. Test procedures shall meet all applicable requirements (i.e., testing time frequency, minimum compliance duration, etc.) of Chapter 62-204.800 F.A.C.

35. Test Notification: The DEP's Central District office 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). [40 CFR 60.11]

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 Central District office 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 Oleander 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. Emission Compliance Stack Test Reports: A test report indicating the results of the required compliance tests shall be filed as per Condition 37. 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.

40. Special Record Keeping Requirements: The owner or operator shall obtain, make, and keep the following records related to fuel usage:

    (1) Monthly Fuel usage as heat input, for natural gas and fuel oil at the site.

    (2) Fuel usage as heat input, for natural gas and fuel oil at the site for each consecutive 12-month period.

    (3) Fuel usage as heat input, for natural gas and fuel oil at the site during each calendar year shall be submitted with the Annual Operation Report (AOR).

    (4) Hours of operation for each combustion turbine shall be reported during each calendar year with the Annual Operation Report (AOR).

MONITORING REQUIREMENTS

41. 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 each (CT) unit. Periods when NO_X emissions are above the standards as listed in Specific Condition No 21, shall be reported to the DEP Central District Office pursuant to Rule 62-4.160(8), F.A.C. Following the format of 40 CFR 60.7, periods of startup, shutdown, malfunction, and fuel switching shall be monitored, recorded, and reported as excess emissions when emission levels exceed the standards listed in Specific Condition No. 21 except as noted in Specific Condition No. 30. [Rule 62-204.800 and 40 CFR 60.7 (1997 version)]

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 (1997 version). The calibration of the water/fuel-monitoring device required in 40 CFR 60.335 (c)(2) (1997 version) will be replaced by the 40 CFR 75 certification tests of the NO_X CEMS. Upon request from DEP, the CEMS emission rates for NO_X shall be corrected to ISO conditions to demonstrate compliance with the NO_X standard established in 40 CFR 60.332.

43. Continuous Monitoring System Reports: 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. Data on CEM equipment specifications, manufacturer, type, calibration and maintenance needs, and its proposed location shall be provided to the Department's Central District Office for review at least 90 days prior to installation.

44. 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 or superior grade fuel oil received at the Oleander Power Plant, 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).

45. Natural Gas Monitoring Schedule: The following custom monitoring schedule for natural gas is approved (pending EPA concurrence) in lieu of the daily sampling requirements of 40 CFR 60.334 (b)(2):

- The permittee shall apply for an Acid Rain permit when 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 of 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 USAEPA.
- Oleander shall notify DEP of any change in natural gas supply for reexamination of this monitoring schedule. A substantial change in natural gas quality (i.e., sulfur content variation of greater than 1 grain per 100 cubic foot of natural gas) shall be considered as a change in the natural gas supply. Sulfur content of the natural gas will be monitored weekly by the natural gas supplier during the interim period when this monitoring schedule is being reexamined.

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]

Oleander Power Project
Oleander Power Project, L.P.
PSD-FL-258 and 0090180-001-AC
Brevard County, Florida

BACKGROUND

The applicant, Oleander Power Project, L.P., proposes to install a nominal 950 megawatt (MW) independent power production facility (5 new simple cycle combustion turbines) at 527 Townsend Road, Cocoa, Brevard County. The proposed project will result in "significant increases" with respect to Table 62-212.400-2, Florida Administrative Code (F.A.C.) of emissions of particulate matter (PM and PM_{10}), carbon monoxide (CO), volatile organic compounds (VOC), sulfur dioxide (SO_2) and nitrogen oxides (NO_X). The project is therefore subject to review for the Prevention of Significant Deterioration (PSD) and a determination of Best Available Control Technology (BACT) in accordance with Rules 62-212.400, F.A.C.

The five units to be installed are 190-MW dual-fuel "F" class combustion turbines. Descriptions of the process, project, air quality effects, and rule applicability are given in the Technical Evaluation and Preliminary Determination dated March 26, 1999, accompanying the Department's Intent to Issue.

DATE OF RECEIPT OF A BACT APPLICATION:

The application was received on November 24, 1998 and included a proposed BACT prepared by the applicant's consultant, Golder Associates Inc. The application was revised on February 1, 1999 incorporating responses to completeness questions by FDEP and revised again on March 17, 1999 proposing lower emissions levels based upon vendor data and guarantees.

REVIEW GROUP MEMBERS:

Michael P. Halpin, P.E. and A. A. Linero, P.E.

BACT DETERMINATION REQUESTED BY THE APPLICANT:

POLLUTANT	CONTROL TECHNOLOGY	PROPOSED BACT LIMIT
Particulate Matter	Pipeline Natural Gas No. 2 Distillate Oil Use (1000 hr/yr.) Combustion Controls	9 lb/hr (Gas) 17 lb/hr, 0.05% sulfur (Oil)
Volatile Organic Compounds	As Above	3 ppm (Gas) 6 ppm (Oil)
Visibility	As Above	10 percent
Carbon Monoxide	As Above	12 ppm (Gas, baseload) 20 ppm (Oil, baseload)
Sulfuric Acid Mist	As Above	1 gr. S/100 scf of natural gas 0.05% sulfur oil
Nitrogen Oxides	Dry Low NO_X Burners (Gas) Water Injection (Oil)	9 ppm @ 15% O_2 (Gas, baseload) 42 ppm @ 15% O_2 (Oil, baseload)

According to the application, the maximum emissions from the facility will be approximately 1235 tons per year (TPY) of NO_X, 412 TPY of CO, 96 TPY of PM/PM_{10}, 291 TPY of SO_2 and 64 TPY of VOC.

BACT DETERMINATION PROCEDURE:

In accordance with Chapter 62-212, 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, and 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 ppm NO_X @ 15% O_2. (assuming 25 percent efficiency) and 150 ppm SO_2 @ 15% O_2.(or <0.8% sulfur in fuel). The BACT proposed by the applicant is more stringent than the NSPS. No National Emission Standard for Hazardous Air Pollutants exists for stationary gas turbines.

DETERMINATIONS BY EPA AND STATES:

Most recent stationary gas turbine BACT determinations made to-date by EPA and the states, including the State of Florida, have been much more stringent than the requirements of the NSPS. The following table is a sample of information on recent BACT and a few Lowest Achievable Emission Rate (LAER) determinations made by EPA and the States for stationary gas turbine projects as large or larger than the one under review. LAER is required in areas where the ambient air (unlike that Florida) does not attain the National Ambient Air Quality Standards (NAAQS).

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

Project Location	Power Output and Duty	NO_X Limit Ppm @ 15% O_2 and Fuel	Technology	Comments	F.O. LIMIT	Year Permit Issued
FPC DeBary **FL**	311 MW SC	N/A	None	6x51.9MW GE MS7000 CT	N/A	1974
	372 MW SC	25 – NG 42 – FO	WI	4x92.9MW GE PG7111EA CT	Total hrs/CT 3390 hrs/yr. gas or oil	1991
FPC Intercession City **FL**	385 MW SC	25 – NG 42 – FO	DLN WI	4x96.3MW GE PG7111EA CT	Total hrs/CT 3390 hrs/yr. gas or oil	1991
	171 MW SC	25 – NG 42 – FO	DLN WI	171 MW Siemens V84.3 CT	Total hrs/CT 3390 hrs/yr. gas or oil	1995
Kamine/Besicorp NY	79 MW CC	9 – NG 55 – FO	DLN	79 MW Siemens V64.2	2000 hrs/yr.	1992
Hart County, GA	318 MW SC	25 – NG 42 – FO	DLN & WI	2x159 MW GE7FA CT's	Total hrs/CT 2500 hrs/yr. gas or oil	1992
FPC Tiger Bay, **FL**	270 MW CC	15/10-NG 42 – FO	DLN &/or SCR WI	184 MW GE MS7001FA CT DLN/15 or SCR/10 ppm	3.7M gal/yr.	1993
Auburndale Power **FL**	156 MW CC	25/15 - NG 42 – FO	DLN & WI	1x156 MW WH 501D5 CT	400 hrs/yr.	1993
FPC Hines Polk, **FL**	485 MW CC	12 – NG * 42 – FO	DLN & SCR WI	2x165 MW WH 501FC CTs	1000 hrs/yr. out of 8760	1994
GRU Deerhaven **FL**	74 MW **SC**	15 – NG 42 – FO	DLN WI	CT #3; 74 MW	2000 hrs/yr. out of 3900	1995
PREPA, PR	248 MW **SC**	10 - FO	WI & Hot SCR	3x83 MW ABB GT11N CTs	2000 hrs/yr. < 60% output	1996
City Tallahassee, **FL**	260 MW CC	12 – NG 42 – FO	DLN WI	160 MW GE MS 7231FA CT DLN Guarantee is 9 ppm	NO_X site cap of 467 TPY	1997
Berkshire, MA	272 MW CC	3.5 – NG (LAER) 9.0 – FO	DLN & SCR WI & SCR	178 MW ABB GT24 CT	No oil from 5/1 thru 9/30; 3 hr <50% su/sd	1997
Lordsburg, L.P. NM	100 MW **SC**	15/25 – NG 42/60 - FO	DLN WI	100 MW WH 501D5A or equiv. (NO_X values are >/< 75% output)	1440 hrs/yr.	1997
City of Lakeland, **FL**	250 MW **SC**	9 – NG 42 – FO	ULN on gas, WI on oil 4/30/2002.	230 MW WH 501G CT	250 hrs/CT per year	1998
		9 – NG 15 – FO	Hot SCR if 9ppm not achievable by ULN 4/30/2002		250 hrs/CT per year	
TECO Polk, **FL**	330 MW **SC**	10.5 - NG 42 - FO	DLN WI	2x160 MW GE MS 7241FA CT's	876 hr/CT out of 4380	1999 proposed
RockGen, Wis.	525 MW **SC**	15 – NG 42 – FO	DLN WI	3x175 MW CT's	800 hr/CT out of 3800; not operated <50% continuously	1999

SC = Simple Cycle
CC = Combined Cycle
NG = Natural Gas
CT = Combustion Turbine
ULN = UltraDry Low NO_X
MW = Megawatt
FO = Fuel Oil
ISO = 59°F
DLN = Dry Low NO_X Combustion
SCR = Selective Catalytic Reduction
WI = Water or Steam Injection
* = Equivalent Basis
GE = General Electric
WH = Westinghouse
ABB = Asea Brown Bovari
ppm = parts per million

All determinations are BACT unless denoted as LAER. Factors in common with project are denoted with **bold** type. Data derived from appropriate BACT determination or permit conditions.

Project Location	CO – ppm (or lb/MMBtu)	VOC - ppm (or lb/MMBtu)	PM - lb/MMBtu (or gr./dscf or lb/hr)	Technology and Comments
FPC DeBary FL	None	None	None	Clean Fuels Good Combustion
	54 lb/hr	5 lb/hr	15 lb/hr	Clean Fuels Good Combustion
Intercession City FL	21.3 lb/hr - NG 25 - FO (25 ppm)	3 lb/hr - NG 5 lb/hr - FO	7.5 lb/hr - NG 15 lb/hr - FO	Clean Fuels Good Combustion
	30.9 lb/hr - NG 79 - FO (25 ppm)	5.3 lb/hr - NG 9 lb/hr - FO	7.5 lb/hr - NG 17 lb/hr - FO	Clean Fuels Good Combustion
Kamine/Besicorp NY	9.5 – NG 9.5 – FO	0.007 lb/MMBtu	0.008 - NG 0.03 - FO	Clean Fuels Good Combustion
Hart County, GA	25 – NG 25 – FO	None	0.0064 - NG 0.0156 - FO	Clean Fuels Good Combustion
Tiger Bay, FL	15 – NG 30 – FO	2.8 lb/hr - NG 7.5 lb/hr - FO	0.053 - NG 0.009 - FO	Clean Fuels Good Combustion
Auburndale Power FL	21/15 – NG 25 – FO	6 lb/hr – NG 10 lb/hr - FO	0.0134 – NG 0.0472 - FO	Clean Fuels Good Combustion
Hines Polk, FL	25 – NG 30 – FO	7 - NG 7 - FO	0.006 - NG 0.01 - FO	Clean Fuels Good Combustion
GRU Deerhaven FL	None	None	None	Clean Fuels Good Combustion
PREPA, PR	9 – FO	11 - FO	0.0171 gr./dscf	Clean Fuels Good Combustion
Tallahassee, FL	25 – NG 90 – FO	None	9 lb/hr - NG 17 lb/hr - FO	Clean Fuels Good Combustion
Berkshire, MA	4 - NG (LAER) 5 - FO (LAER)	4 - NG 16 - FO	0.0105 - NG 0.0468 - FO	Clean Fuels CO Catalyst
Lordsburg, L.P. NM	10/200 - NG (>/< 75%) 90/150 - FO (>/< 75%)	6/11 - NG 8/11 - FO	5.3 lb/hr - NG 40.6 lb/hr - FO	Clean Fuels CO Catalyst
Lakeland, FL	25 - NG or 10 by Ox Cat 90 – FO	4 - NG 10 - FO	0.01 gr./dscf	Clean Fuels Good Combustion
TECO Polk, FL	15 – NG 33 – FO	7 - NG 7 - FO	10 lb/hr - NG 27 lb/hr – FO	Clean Fuels Good Combustion
RockGen, Wis.	12 - NG 15 - FO	2 - NG 5 - FO	18 lb/hr – NG 44 lb/hr - FO	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 U.S. Fish and Wildlife Service, Air Quality Branch dated December 18, 1998 and February 10, 1999.
- DOE website information on Advanced Turbine Systems Project
- Mitsubishi website
- Oleander Power Website: http://www.oleanderpower.com/
- Alternative Control Techniques Document - NO_X Emissions from Stationary Gas Turbines
- Goal Line Environmental Technologies' Website: http://www.glet.com
- Catalytica Combustion System's Website: http://www.catalytica-inc.com/cs/

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 Oleander 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 equivalent 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 (ppm @15% O_2). The Department estimates uncontrolled emissions at approximately 200 ppm @15% O_2 for each turbine of the Oleander 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 about 42 ppm when firing fuel oil in large combustion turbines. These values may form the basis 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 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 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 combustor (cross section shown in Figure 1) wherein air usage (other than for premixing) was minimized. The venturi and the centerbody assembly were eliminated and the combustor has a single burning zone. So-called "quaternary fuel" is introduced through pegs located on the circumference of the outward combustion casing.

Further improvements in the DLN design were made by GE. The most recent version is the DLN-2.6 (proposed for Oleander). 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 ppm NO_X limit (by volume, dry corrected to at 15 percent oxygen) at Jacksonville Electric Authority'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 parts per million (ppm) at loads between 50 and 100 percent of capacity, but concentrations as high as 100 ppm 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 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 DLN-2.6 combustor to be installed at the Oleander 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, results in a lower achievable thermal efficiency.

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.

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 low as 9 ppm (and even lower) from gas turbines smaller than about 200 MW (simple cycle), such as the F class.

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 and excess oxygen yielding molecular nitrogen and water. The catalyst used in combined cycle, low temperature applications (conventional SCR), is usually vanadium or titanium oxide and accounts 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. Per the above table, only one combustion turbine project in Florida (FPC Hines Power Block 1) employs SCR (it is currently being started up). The equipment was installed on a temporary basis because Westinghouse had not yet demonstrated emissions as low as 12 ppm by DLN technology at the time the units were to start up in 1998. SCR is also proposed on a permanent basis for the expansion of the FPC Hines Facility (Power Block II). The Department was recently advised by Seminole Electric that SCR will be installed on the 501F unit at the Hardee Unit 3 project. Permit BACT limits as low as 3.5 ppm NO_X have been specified using SCR for several combined cycle F Class projects in Alabama and Mississippi. By comparison, a 6 ppm value at baseload facility proposed by FPC (Hines Energy Complex Power Block 2) is typical and is the lowest limit proposed to-date in Florida. According to that application, the 6 ppm value will be maintained at 80 percent load. FPC has estimated concentrations of 10 ppm at 50 percent load while firing gas.

Selective Non-Catalytic Combustion

Selective non-catalytic reduction (SNCR) reduction works on the same principle as SCR. The differences are that ammonia injection occurs closer to the turbine in 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 simple cycle 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 Santa Rosa Energy Center, which incorporates a large 600 MMBtu/hr duct burner in the HRSG and can provide the acceptable temperatures (between 1400 and 2000 °F) and residence times to support the reactions.

Emerging Technologies

•SCONOx - USEPA has identified an "achieved in practice" BACT value of 2.0 ppmv over a three-hour rolling average based upon the recent performance of a Vernon, California natural gas-fired 32 MW combined cycle turbine (without duct burners) equipped with the patented SCONOx system. Additional advantages of the SCONOx process include the elimination of ammonia and the control of some CO emissions. In a letter dated March 23, 1998 to Goal Line Environmental Technologies, the SCONOx 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 SCONOx for United States turbine applications > 100 MW, and ABB Power Generation has stated that scale up and engineering work will be required before SCONOx 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). SCONOx requires a much lower temperature regime that is not available in simple cycle units and is therefore not feasible for this project.

•XONON™ - 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 (NO_X), a primary air pollutant, to less than 3 parts per million.

Catalytica's XONON™ system is purported to be a powerful technology that essentially eliminates the formation of NO_X in gas turbines without impacting the turbine's operating performance. 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-class 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 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 will be used for no more than 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_{10} is a combination of good combustion practices, fuel quality, and filtration of inlet air. The applicant indicated that the PM_{10} emissions will not exceed 0.01 gr./scf when firing natural gas and pointed out that such a value is equal to a typical specification for baghouse design. Annual emissions of PM_{10} are expected to be approximately 20 tons per C.T. for the maximum case of 1000 hours of fuel oil and 2390 hours of natural gas firing.

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.

Most installations using catalytic oxidation are located in the Northeast. Among them are the 272 MW Berkshire, Massachusetts facility, 240 MW Brooklyn Navalyard Facility, the 240 MW Masspower facility, the 165 MW Pittsfield Generating Plant in Massachusetts, and the 345 MW Selkirk Generating Plant in New York. 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.

Most combustion turbines incorporate good combustion to minimize emissions of CO. These installations typically achieve emissions between 10 and 30 at full load, even as they achieve relatively low NO_X emissions by SCR or dry low NO_X means. By comparison, the projected actual values of 12 and 20 ppm for gas and oil respectively (at baseload) as proposed in Oleander's application appear typical or low. These values are given in the application as representative down to and including 50 percent load on each fuel respectively

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 as the combustion turbine itself is very efficient at destroying VOC. The limits proposed for this project are 3 and 6 ppm for gas and oil firing respectively.

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 such fuels with 0.05% sulfur oil and natural gas containing no more than 1 grain of sulfur per standard cubic foot (gr. S/f^3). This value is well below the "default" maximum value of 20 gr. S/f^3, but high enough to require a BACT determination. Emissions were estimated by the applicant to be 291 TPY of SO_2 and 45 TPY of SAM. However the Department expects the emissions to be lower because oil consumption will be further reduced and typical natural gas in Florida contains less than 1 gr. S/f^3.

BACKGROUND ON PROPOSED GAS TURBINE

In the original application, the applicant had not yet selected the supplier for the proposed five "F" class CT's and (via GolderAssociates) conducted its own BACT review assuming either a General Electric 7FA or a Westinghouse 501F. In a February 1, 1999 response to FDEP's completeness questions, the applicant stated that "Oleander Power Project, L.P. has selected General Electric Company (GE) as its primary vendor to supply the turbines for the project due to the ability of GE combustion turbines to meet a NO_X emission level of 9 ppmvd (corrected to 15 percent O_2). The applicant requests the ability to purchase a different manufacturer's machines, if they can meet the same emission characteristics as the GE machine and the emission limits approved by FDEP in the final permit. As indicated in the application, the machines will be the advanced Frame "7" class (or GE Frame 7 FA), which would be capable of achieving an NO_X emission rate of 9ppmvd @ 15% O_2 when firing natural gas."

In the submittal dated March 17, 1999 the applicant further affirmed its intentions to procure GE combustion turbines stating "... the updated forms and information reflect data representative of the General Electric (GE) Frame 7FA combustion turbine as the primary vendor..." as well as "Over the last several months, the applicant has recognized the concern by the Department and the general public over the higher emission rates when firing distillate fuel oil relative to natural gas. Both the reduction in hours of firing oil and the lower emission rates with the GE machine substantially reduce emissions, a desired goal."

Westinghouse and General Electric are counting on further advancement and refinement of DLN technology to provide sufficient NO_X control for their turbines. In the case of the WH501 G, steam cooling of the transition piece allows the unit to maintain the same NO_X formation potential as the WH501 F while achieving a higher turbine inlet (firing) temperature. Examples of Westinghouse combustors are shown in Figure 6. These include their second generation of Dry Low NO_X combustors including their fully pre-mixed Piloted Ring Combustor. Where required by BACT or LAER determinations of certain states, both companies incorporate SCR in combined cycle projects.

The approach of progressively refining such technology is a proven one, even on some relatively large units. Basically this was the strategy adopted in Florida throughout the 1990's. Recently GE Frame 7 FA units (160 MW gas turbines with firing temperatures of 2400 °F) reportedly met performance guarantees of 9 ppm with "DLN-2.6" burners at Fort St. Vrain, CO and Clark County, WA.

Westinghouse and General Electric are partners with the Department of Energy (DOE) in the Advanced Turbine Systems (ATS) Program. The Mission/Vision Statement of ATS is to "develop base-load advanced turbine systems for commercial offering in the year 2000." Among the goals of the Program is 60 percent combined cycle efficiency while achieving NO_X emissions of 8 ppm or less. The cost of producing the prototypes is estimated at $435,000,000 and $300,000,000 for the GE and Westinghouse projects respectively.

DEPARTMENT BACT DETERMINATION

Following are the BACT limits determined for the Oleander project assuming full load. Values for NO_X are corrected to 15% O_2. These limits or their equivalents in terms of pounds per hour, as well as the applicable averaging times are given in the permit Specific Conditions. The rationale for the averaging times is discussed in the Final Determination addressing comments by the applicant and EPA and which is being issued concurrently with this determination.

Operational Mode (Fuel)	NO_X (15%O2)	CO	VOC	PM/Visibility (% Opacity)	SO_2/SAM	Technology and Comments
Natural Gas	9 ppm	12 ppm	3 ppm	10	1 grain S per 100 CF	Dry Low NOx Burners. Clean fuels, good combustion
Fuel Oil	42 ppm	20 ppm	6 ppm	10	0.05% sulfur oil	Water Injection. Units limited to 1000 hrs equivalent full load oil operation (per CT) annually. Clean fuels, good combustion

RATIONALE FOR DEPARTMENT'S DETERMINATION

- The initial 9 and 42 ppm NO_X limits proposed by Oleander are guaranteed by General Electric.
- The units will be operated in simple cycle mode and therefore certain control options, which are feasible for combined cycle units, are not applicable. This rules out low temperature technologies such as SCONOx and conventional SCR, which can achieve lower limits.
- The 9 ppm limit while firing natural gas is the lowest known BACT value for an "F" frame combustion turbine operating in simple cycle mode and peaking duty. The initial 42 ppm limit while firing fuel oil is typical.
- There is a cost to Oleander for the 9 ppm guarantee compared to the 15 ppm guarantee provided by GE for an identical unit to be installed at Jacksonville Electric Authority's Kennedy Plant. There may be additional costs for the more frequent tuning needed to maintain the units at less than 9 ppm.

- Typical permit limits nation-wide for these units while operating in simple cycle mode and intermittent duty are 12-15 ppm. The lower limit will offset emissions while firing fuel oil.
- The simple cycle turbine has very high exhaust temperatures of up to 1200 °F, which is at the higher operating limit of Hot SCR zeolite catalyst (around 1050 °F). The PREPA continuous duty simple cycle turbines (referenced above) have exhaust temperatures ranging from 824 to 1024 °F and the Hot SCR catalyst (which must achieve 10 ppm NO_X) is located between the turbine and a "Once Through Steam Generator".
- The levelized costs of NO_X removal by Hot SCR were estimated by Golder Associates as $11,000 per ton of NO_X removed at 2000 hrs/yr. of oil operation, $14,000 per ton of NO_X removed at 1500 hrs/yr. of oil operation and $17,568 per ton removed at 1000 hrs/yr. of oil operation. Although the estimates appear to be high for this project (e.g.: 3 days of lost energy costs for peaking units operating at no more than 39% capacity factor; no indication of a continuation of the actual downward trend in catalyst prices, progressively improving performance, and typically longer-than-expected life), the actual per ton cost reasonably exceeds $10,000 at 1000 hrs/yr. of oil operation.
- Using much of the basic capital cost information developed by the City of Lakeland, The National Park Service estimated the cost of NO_X removal by Hot SCR at $3,802 per ton (excluding the energy penalty) for a *continuous duty* 501 G. A further refinement of the Park Service estimate by including the energy penalty, using the revised catalyst cost data obtained by the Department, and assuming a five year <u>estimated</u> life for the catalyst (per Engelhard) would yield a cost-effectiveness closer to $3,500 per ton of NO_X removed for that application. Hence, should the Oleander Project contemplate operation on a more continuous duty, the use of a Hot SCR may be appropriate.
- Comments from the National Park Service on the Oleander project suggested a reduction in the proposed NO_X emissions on oil from 42ppm to 25ppm (at the applicant's proposed 2000 hours of oil operation rate). Restricting the operation of these units to 1000 hours per year on oil at 42ppm will result in lower annual NO_X emissions than 2000 hours per year on oil at 25ppm.
- It is possible that the NO_X emissions while firing oil from may be reduced from 42ppm 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.
- Hot SCR has environmental and energy impacts including increased particulate emissions, undesirable (though unregulated) ammonia emissions, and energy penalties. Given the vendor guarantee of 9 ppm on natural gas, the limitation of total operating hours to 3390 per CT and the requirement that a majority of the operation be on natural gas, Hot SCR is not considered BACT for these simple cycle peaking units.
- It is possible and even likely, that Hot SCR catalysts will be improved and can be used to replace the initial catalyst as it degrades. Should the Oleander Project contemplate operation on a more continuous duty, or should actual emissions not achieve permitted levels such that energy, environmental and economic impacts (or other costs) may be reduced, the use of a Hot

SCR may be BACT. The Department has concluded that Hot SCR is both technically and economically feasible for certain applications (e.g. Lakeland, FL which is shown above).

- BACT for PM_{10} was determined to be good combustion practices consisting of: inlet air filtering; use of clean, low ash, low sulfur fuels; and operation of the unit in accordance with the manufacturer-provided manuals.
- PM_{10} emissions will be very low and difficult to measure at the high temperature exiting the stack in simple cycle operation. Additionally, the higher emission mode will involve fuel oil firing, which will occur no more than 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 FPL Fort Myers (Florida), Santa Rosa (Florida) and the City of Tallahassee (Florida) as well as the Berkshire (Massachusetts) projects in the above table.
- Annual CO emission estimates from the Oleander project are higher than for other pollutants except NO_X. However the impact on ambient air quality is lower compared to other pollutants because the allowable concentrations of CO are much greater than for NO_X, SO_2, or PM_{10}.
- Golder Associates evaluated the use of an oxidation catalyst designed for 75 percent reduction and having a three-year catalyst life. The oxidation catalyst control system was estimated to increase the capital cost of each unit by $1,829,777 with an annualized cost of $707,655 per year. Levelized costs for CO catalyst control were calculated at $11,437 per ton to control CO emission to 75% removal. Catalytic CO control is not cost-effective for the Oleander project.
- The applicant's proposed CO levels of 12 ppmvd while firing natural gas and 20 ppmvd while firing oil are on the lower end of other permitted units neglecting those units which employ oxidation catalysts. These values are assumed to be guaranteed down to 50% of unit output.
- CO limits achievable by good combustion will be set equal to or lower than those set for other recent projects. For example, the City of Tallahassee project (25 ppm on gas and 90 ppm on oil), the FPC Hines project (25 ppm on natural gas and 30 ppm on oil) and the Tiger Bay project (limited to 15 ppm on natural gas and 30 ppm on oil). The two latter projects are both permitted at 8760 hours per year on natural gas and up to 1000 hours per year on oil (Hines).
- VOC emission limits proposed by the applicant are at the lower end of values previously determined as BACT. Good Combustion is sufficient to achieve these low levels.
- The (BACT) levels above are guaranteed down to 50% output. It is presumed that emission levels for pollutants such as NO_X and CO will increase above these guaranteed ppm levels at lower outputs. Therefore, startup and shutdown hours are defined to be hours of operation below 50% output and these hours will be limited by specific condition.
- 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 and Sulfuric Acid Mist. Pipeline natural gas and very low (0.05%) sulfur oil are considered to be BACT for this project.

COMPLIANCE PROCEDURES

Pollutant	Compliance Procedure
Visible Emissions	Method 9
Volatile Organic Compounds	Method 18, 25, or 25A (initial tests only)
Carbon Monoxide	Annual Method 10 (can use RATA if at capacity)
NO_X (24/3-hr average)	NO_X CEMS, O_2 or CO_2 diluent monitor, and flow device as needed
NO_X (performance)	Annual Method 20 (can use RATA if at capacity)
Sulfur Dioxide	Custom Fuel Monitoring Schedule

DETAILS OF THE ANALYSIS MAY BE OBTAINED BY CONTACTING:

Michael P. Halpin, P.E., Review Engineer, New Source Review Section MPHalpin
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:

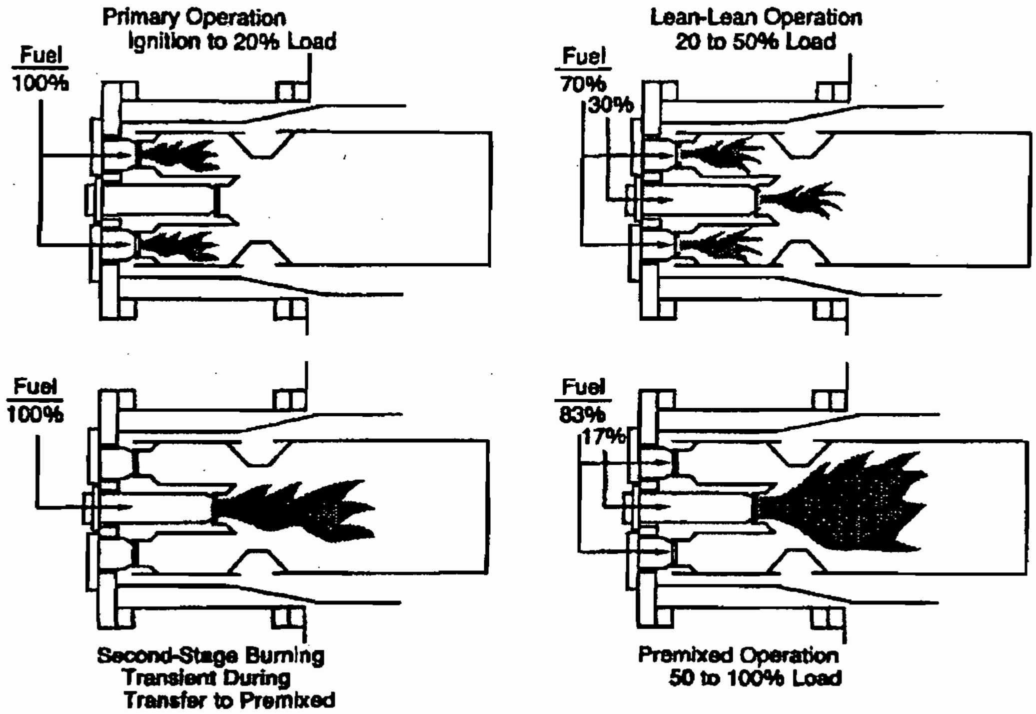
A A Linero P.E.
for C. H. Fancy, P.E., Chief
Bureau of Air Regulation

11/19/99
Date:

Approved By:

Howard L Rhodes
Howard L. Rhodes, Director
Division of Air Resources Management

11/19/99
Date:



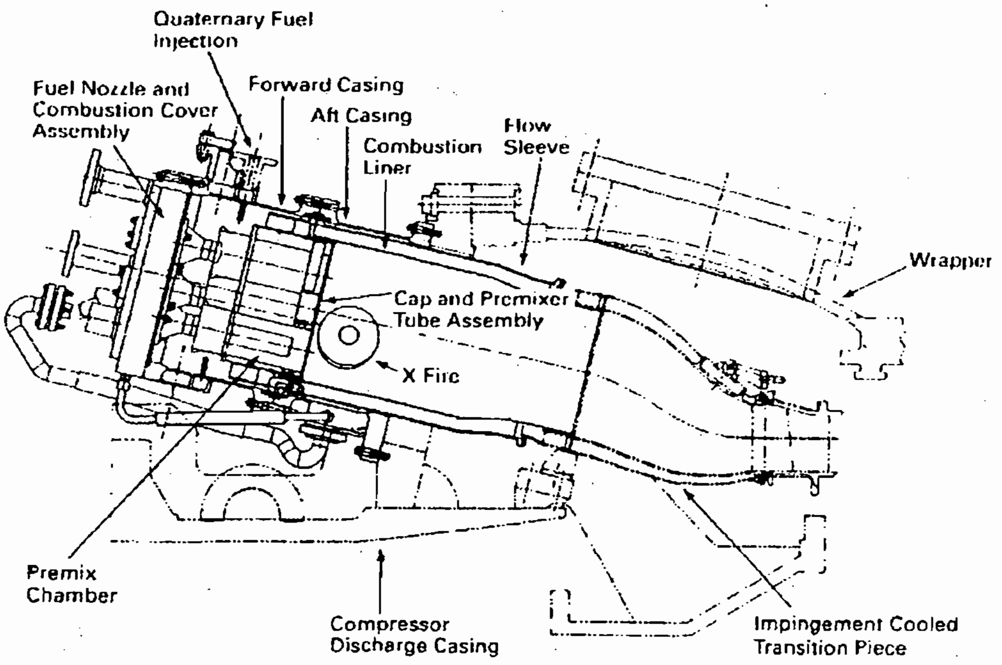


Figure 1 – Dry Low NO_X Operating Modes – DLN-1

Cross Section of GE DLN-2

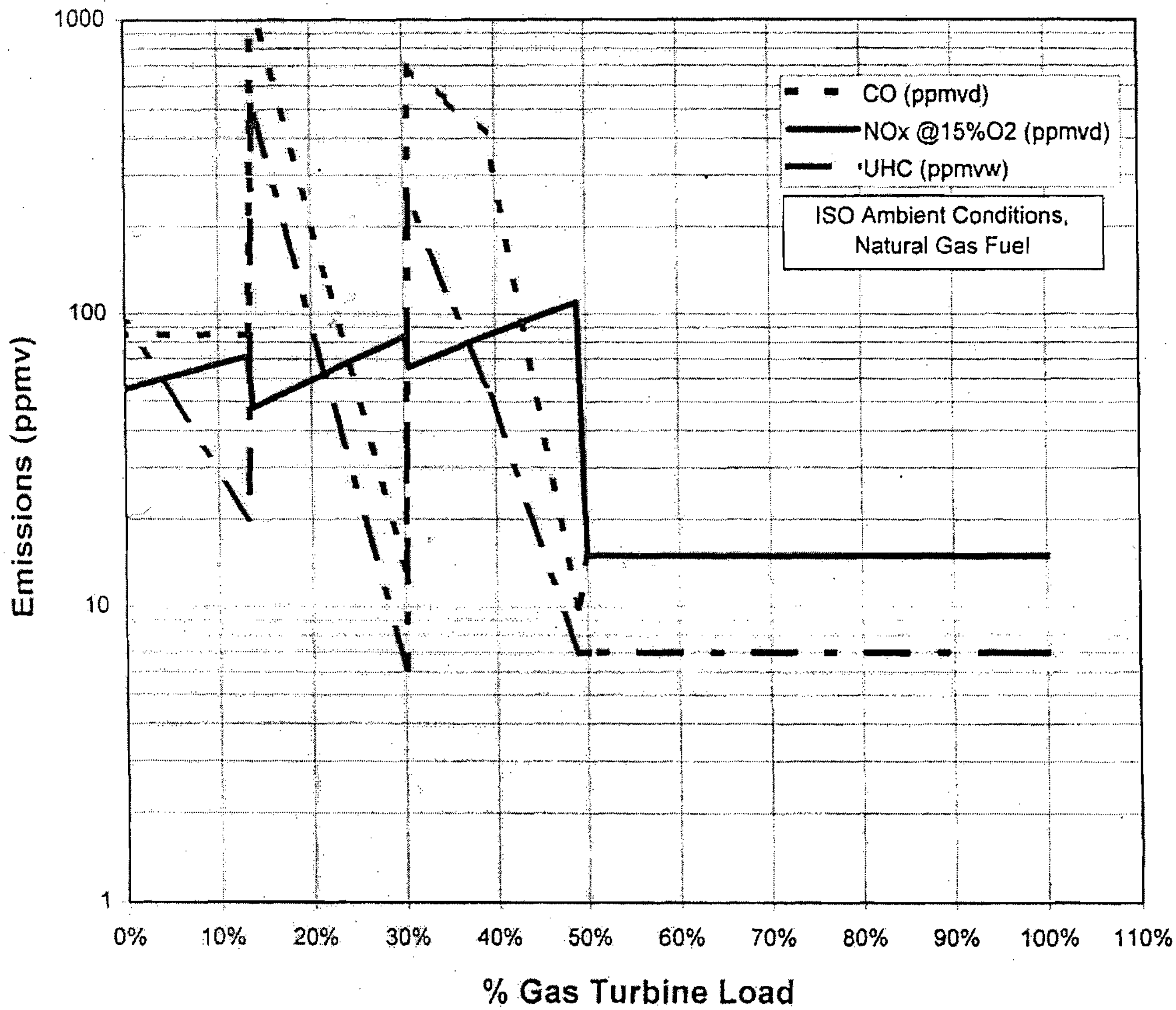


Figure 2 – Emissions Performance Curves for GE DLN-2.6 Combustor Firing Natural Gas in a Dual Fuel GE 7FA Combustion Turbine

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

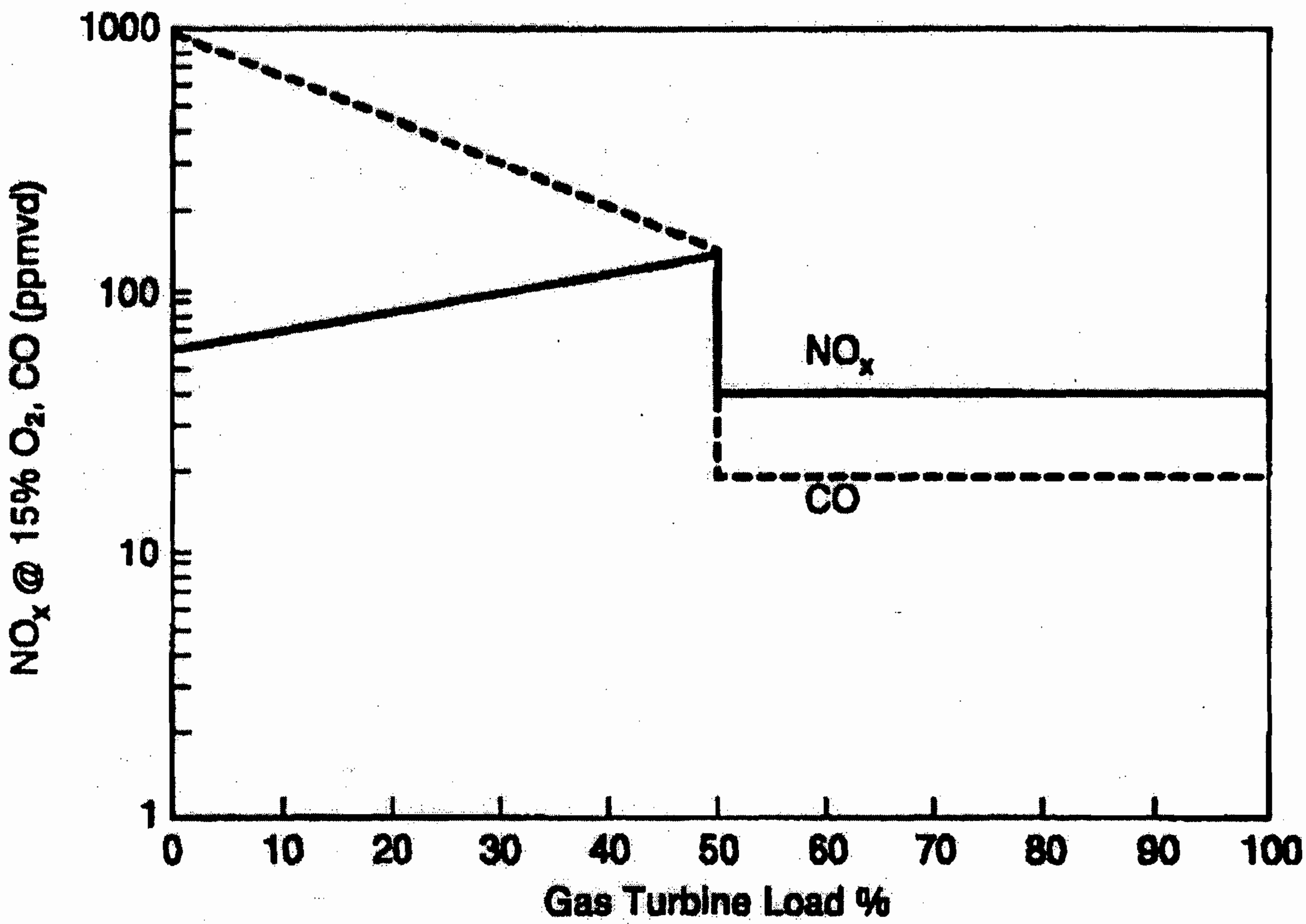


Figure 3 – Emissions Performance for DLN-2 Combustors Firing Fuel Oil in Dual Fuel GE 7FA Turbine

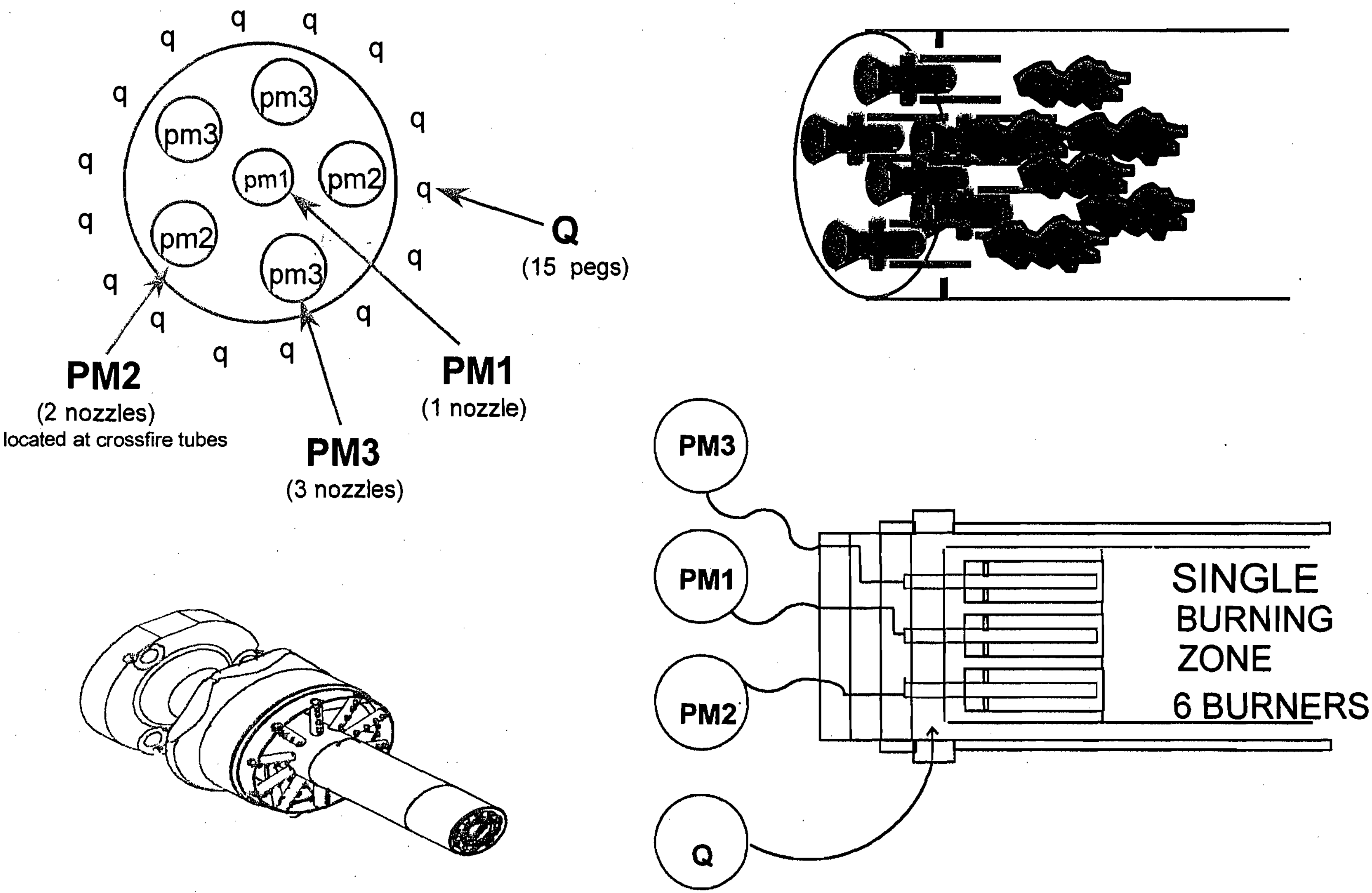


Figure 4 - DLN2.6 Fuel Nozzle Arrangement

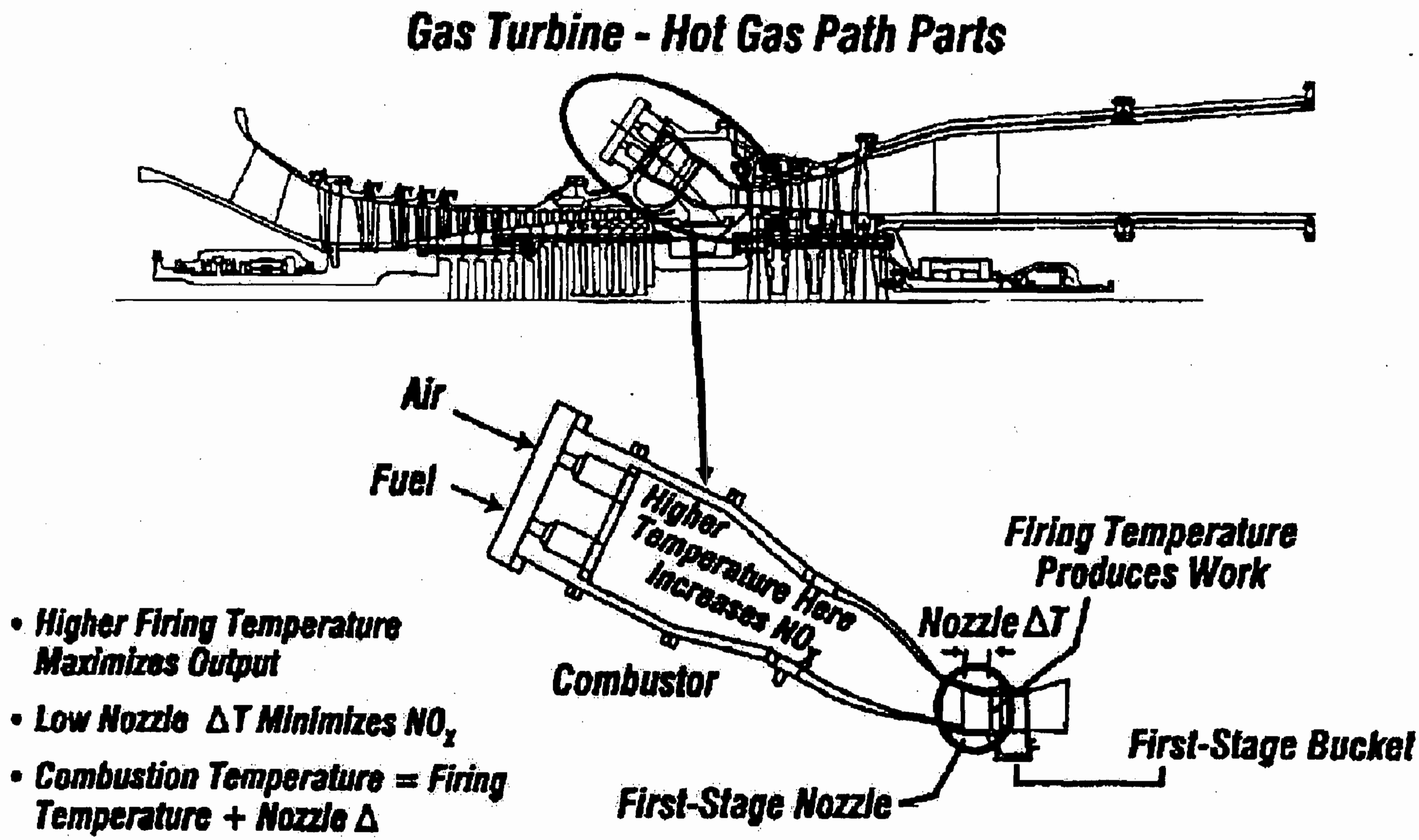


Figure 5 – Relation Between Flame Temperature and Firing Temperature

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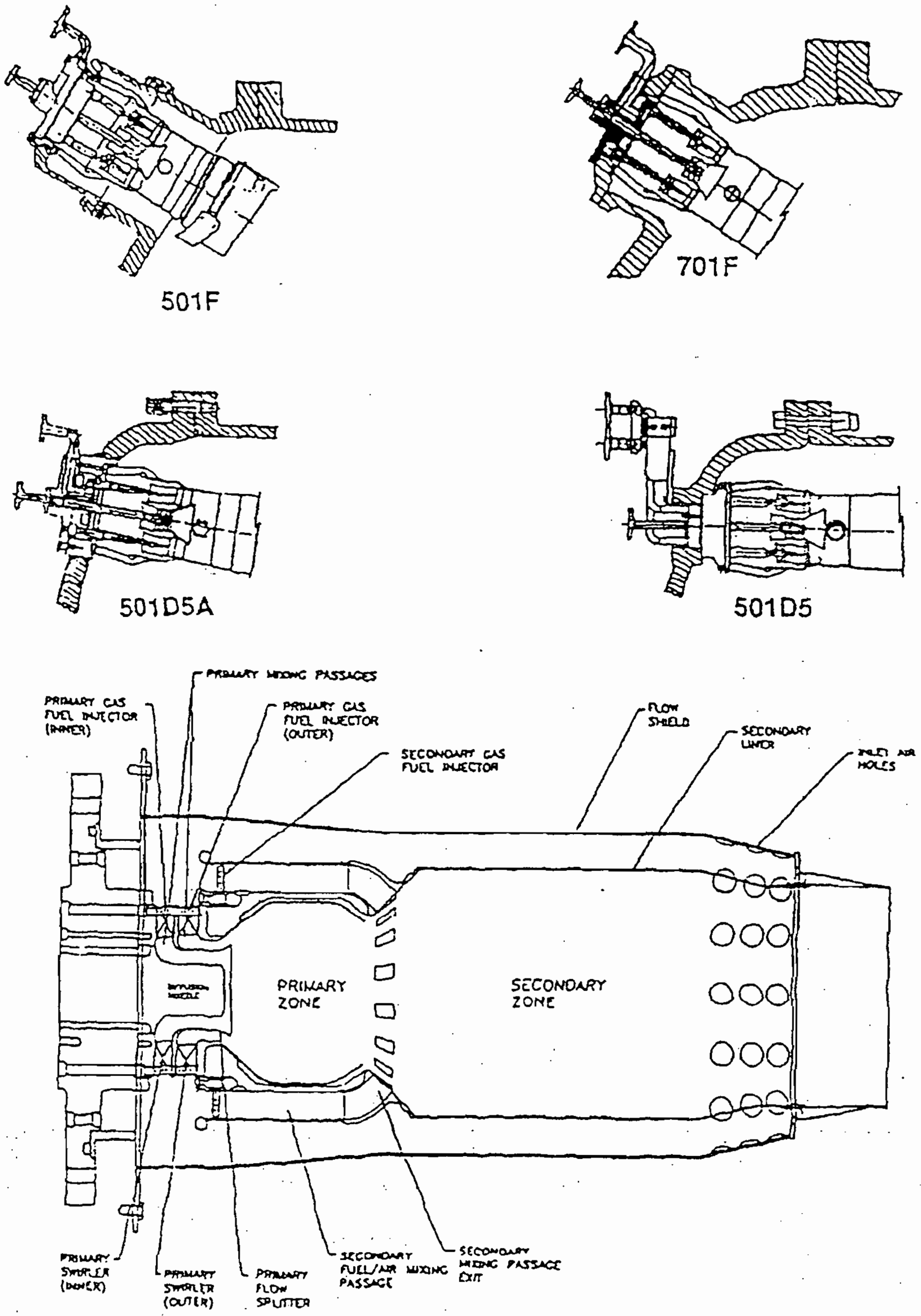


Figure 6 - Westinghouse Combustors Including

Piloted Ring (Under Development)

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.

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.

ATTACHMENT-OPP-FI-C14

COMPLIANCE REPORT AND PLAN

ATTACHMENT OPP-FI-C14

COMPLIANCE REPORT AND PLAN

The facility and emission units identified in this application are in compliance with the Applicable Requirements identified in Sections II.B. and III.D. of the application form and attachments referenced in Section III.L. 12 (if included). Compliance is certified as of the date this application is submitted to the Florida Department of Environmental Regulation as required in Rule 62-213.420(1)(a) F.A.C.

ATTACHMENT OPP-FI-C15

COMPLIANCE CERTIFICATION

ATTACHMENT OPP-FI-C15

COMPLIANCE CERTIFICATION

The facility and emission units identified in this application are in compliance with the Applicable Regulations identified in the application form and attachments referenced in the section. The compliance report for this facility will be submitted by March 1 of each year for the prior calendar year. The compliance statement is as follows:

> I, the undersigned, am the responsible official as defined in Chapter 62-210.200, F.A.C., of the Title V source for which this report is being submitted. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made and data contained in this report are true, accurate, and complete.

Signature, Responsible Official

11/4/02
Date

Department of
Environmental Protection
Division of Air Resource Management
STATEMENT OF COMPLIANCE - TITLE V SOURCE

REASON FOR SUBMISSION (Check one to indicate why this statement of compliance is being submitted)

☐ **Annual Requirement**	☐ **Transfer of Permit**	☐ **Permanent Facility Shutdown**

REPORTING PERIOD*	REPORT DEADLINE**
01/01 through **12/31** of **2002** (year)	Within 60 days after end of calendar year

*The statement of compliance must cover all conditions that were in effect during the indicated reporting period, including any conditions that were added, deleted, or changed through permit revision.
**See Rule 62-213.440(3)(a)2., F.A.C.

Facility Owner/Company Name: **Oleander Power Project, L.P.**

Site Name: **Oleander Power Project** Facility ID No. ______ County: **Brevard**

COMPLIANCE STATEMENT (Check only one of the following three options)

X **A.** This facility was in compliance with all terms and conditions of the Title V Air Operation Permit and, if applicable, the Acid Rain Part, and there were no reportable incidents of deviations from applicable requirements associated with any malfunction or breakdown of process, fuel burning or emission control equipment, or monitoring systems during the reporting period identified above.

____ **B.** This facility was in compliance with all terms and conditions of the Title V Air Operation Permit and, if applicable, the Acid Rain Part; however, there were one or more reportable incidents of deviations from applicable requirements associated with malfunctions or breakdowns of process, fuel burning or emission control equipment, or monitoring systems during the reporting period identified above, which were reported to the Department. For each incident of deviation, the following information is included:

1. Date of report previously submitted identifying the incident of deviation.
2. Description of the incident.

____ **C.** This facility was in compliance with all terms and conditions of the Title V Air Operation Permit and, if applicable, the Acid Rain Part, EXCEPT those identified in the pages attached to this report and any reportable incidents of deviations from applicable requirements associated with malfunctions or breakdowns of process, fuel burning or emission control equipment, or monitoring systems during the reporting period identified above, which were reported to the Department. For each item of noncompliance, the following information is included:

1. Emissions unit identification number.
2. Specific permit condition number (note whether the permit condition has been added, deleted, or changed during certification period).
3. Description of the requirement of the permit condition.
4. Basis for the determination of noncompliance (for monitored parameters, indicate whether monitoring was continuous, i.e., recorded at least every 15 minutes, or intermittent).
5. Beginning and ending dates of periods of noncompliance.
6. Identification of the probable cause of noncompliance and description of corrective action or preventative measures implemented.
7. Dates of any reports previously submitted identifying this incident of noncompliance.

For each incident of deviation, as described in paragraph **B.** above, the following information is included:

1. Date of report previously submitted identifying the incident of deviation.
2. Description of the incident.

STATEMENT OF COMPLIANCE - TITLE V SOURCE

RESPONSIBLE OFFICIAL CERTIFICATION

I, the undersigned, am a responsible official (Title V air permit application or responsible official notification form on file with the Department) of the Title V source for which this document is being submitted. With respect to all matters other than Acid Rain program requirements, I hereby certify, based on the information and belief formed after reasonable inquiry, that the statements made and data contained in this document are true, accurate, and complete.

S. Carroll ______ 11/4/02

(Signature of Title V Source Responsible Official) *(Date)*

Name: Steven Carroll Title: GM

DESIGNATED REPRESENTATIVE CERTIFICATION (only applicable to Acid Rain source)

I, the undersigned, am authorized to make this submission on behalf of the owners and operators of the Acid Rain source or Acid Rain units for which the submission is made. I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.

Edward F. Tracey Jr. ______ 11/01/02

(Signature of Acid Rain Source Designated Representative) *(Date)*

Name: Edward F. Tracey Jr. Title: Director

{Note: Attachments, if required, are created by a responsible official or designated representative, as appropriate, and should consist of the information specified and any supporting records. Additional information may also be attached by a responsible official or designated representative when elaboration is required for clarity. This report is to be submitted to both the compliance authority (DEP district or local air program) and the U.S. Environmental Protection Agency(EPA) (U.S. EPA Region 4, Air and EPCRA Enforcement Branch, 61 Forsyth Street, Atlanta GA 30303).}

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: **001** [ ] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
A	**12 APR 2002**	**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 OPP-EU1-A9.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Dry Low-NO_x combustion - Natural Gas** **Water Injection - Distillate Oil Firing**
2. Control Device or Method Code(s): **025, 028**

Emissions Unit Details

1. Package Unit: Manufacturer: **General Electric**	Model Number: **7FA**
2. Generator Nameplate Rating: **189** 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:		1,722	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		hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters): Maximum Heat Input Rate at ISO Conditions and natural gas firing (LHV); maximum for oil firing is 1,919 MMBtu/hr (ISO-LHV). PSD-FL-258.			

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

See Attachment OPP-EU1-C.	

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? **CT1**	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: **1,115** °F	9. Actual Volumetric Flow Rate: **2,565,050** acfm	10. Water Vapor: **8.7** %

11. Maximum Dry Standard Flow Rate: **1,092,180** dscfm	12. Nonstack Emission Point Height: feet
13. Emission Point UTM Coordinates: Zone: **17** East (km): **520.1** North (km): **3137.6**	
14. Emission Point Comment (limit to 200 characters): **Stack parameters for ISO operating conditions firing natural gas; for oil 1,109°F and 2,610,318 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): **2-01-001-01**	3. SCC Units: **1,000 gallons burned**	
4. Maximum Hourly Rate: **14.6**	5. Maximum Annual Rate: **14,560**	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.** **Has facility-wide fuel limit.**		

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): **2-01-002-01**	3. SCC Units: **Million cubic feet**	
4. Maximum Hourly Rate: **1.81**	5. Maximum Annual Rate: **6,145**	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.** **Has facility-wide fuel limit.**		

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 **23.75** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE Guarantee**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters):	
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: **10% opacity**	4. Equivalent Allowable Emissions: **17** lb/hour **8.5** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 9**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing- all loads; 1,000 hrs/yr. See PSD Air Construction Permit Application, 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: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

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% Opacity**	4. Equivalent Allowable Emissions: **9** lb/hour **15.3** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 9**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing- all loads; 3,390 hrs/yr. See PSD Air Construction Permit Application, 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: **103.4** lb/hour **58.3** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **PSD-FL-258**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters):	
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. 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: **103.4** lb/hour **51.7** 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 - 1,000 hrs/yr. See PSD Air Construction Permit PSD-FL-258.**	

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: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

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: **5.5** lb/hour **9.3** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel Sampling**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested Allowable Emissions and Units: Pipeline Natural Gas. Gas firing - 3,390 hrs/yr. See PSD Air Construction Permit PSD-FL-258.**	

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: **344** lb/hour **246.8** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **PSD-FL-258**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters):	
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: **42 ppmvd**	4. Equivalent Allowable Emissions: **344** lb/hour **172** tons/year
5. Method of Compliance (limit to 60 characters): **CEM - 3-hr block 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; 1,000 hrs/yr. See Air Construction Permit PSD-FL-258.**	

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: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

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: **62.6** lb/hour **106.1** tons/year
5. Method of Compliance (limit to 60 characters): **CEM - 24-hr block average.**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested Allowable Emissions and Units: Gas firing; 3,390 hrs/yr. See Air Construction Permit PSD-FL-258.**	

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: **66.9** lb/hour **82.4** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **PSD-FL-258**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **lb/hr based on oil firing. 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: **66.9** lb/hour **33.5** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10 (required for gas firing only)**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing, 59°F, 100% load; 1,000 hrs/yr. See PSD-FL-258.**	

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: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

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: **41** lb/hour **69.5** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10 (required for gas firing only)**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas Firing; 3,390 hrs/yr. See Air Construction Permit PSD-FL-258.**	

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: **11.5** lb/hour **12.8** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **PSD-FL-258**	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
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: **6 ppmvd**	4. Equivalent Allowable Emissions: **11.5** lb/hour **5.75** tons/year
5. Method of Compliance (limit to 60 characters): **CO emission limit employed as surrogate and no annual testing required.**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing; 1,000 hrs/yr. See Air Construction Permit PSD-FL-258.**	

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: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

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: **3 ppmvd**	4. Equivalent Allowable Emissions: **5.9** lb/hour **10** tons/year
5. Method of Compliance (limit to 60 characters): **CO emission limit employed as surrogate and no annual testing required.**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Additional Requested Allowable Emissions and Units: Gas firing, 100% load, 32°F; 3,390 hrs/yr. See Air Construction Permit PSD-FL-258.**	

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 **23.75** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE Guarantee**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters):	
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: **10% opacity**	4. Equivalent Allowable Emissions: **17** lb/hour **8.5** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 9**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing- all loads; 1,000 hrs/yr. See PSD Air Construction Permit Application, 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: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

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% opacity**	4. Equivalent Allowable Emissions: **9** lb/hour **15.3** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 9**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing- all loads; 3,390 hrs/yr. See PSD Air Construction Permit Application, 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 1

1. Visible Emissions Subtype: **VE10**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: **10** % 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): **See Air Construction Permit PSD-FL-258.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 1 of 1

1. Parameter Code: **VE99**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **FDEP Rule 62-210.700(1), Allowed for 2 hours (120 minutes) per 24-hours for startup, shutdown, and malfunction. PSD-FL-258**	

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements

1. Process Flow Diagram [X] Attached, Document ID: OPP-FI-C3 [ ] Not Applicable [ ] Waiver Requested
2. Fuel Analysis or Specification [X] Attached, Document ID: OPP-EU1-J2 [ ] Not Applicable [ ] Waiver Requested
3. Detailed Description of Control Equipment [X] Attached, Document ID: OPP-EU1-J3 [ ] Not Applicable [ ] Waiver Requested
4. Description of Stack Sampling Facilities [X] Attached, Document ID: OPP-EU1-J4 [ ] Not Applicable [ ] Waiver Requested
5. Compliance Test Report [X] Attached, Document ID: OPP-EU1-J5 [ ] Previously submitted, Date: ____ [ ] Not Applicable
6. Procedures for Startup and Shutdown [X] Attached, Document ID: OPP-EU1-J6 [ ] Not Applicable [ ] Waiver Requested
7. Operation and Maintenance Plan [X] Attached, Document ID: OPP-EU1-J7 [ ] Not Applicable [ ] Waiver Requested
8. Supplemental Information for Construction Permit Application [ ] Attached, Document ID: ____ [X] Not Applicable
9. Other Information Required by Rule or Statute [ ] Attached, Document ID: ____ [X] Not Applicable
10. Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation
[X] Attached, Document ID: OPP-FI-C10 [ ] Not Applicable

12. Alternative Modes of Operation (Emissions Trading)
[ ] Attached, Document ID:________ [X] Not Applicable

13. Identification of Additional Applicable Requirements
[X] Attached, Document ID: OPP-FI-C12 [ ] Not Applicable

14. Compliance Assurance Monitoring Plan
[X] Attached, Document ID: OPP-EU1-J14 [ ] Not Applicable

15. Acid Rain Part Application (Hard-copy Required)

[X] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a))
Attached, Document ID: OPP-EU1-J15

[ ] 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

ATTACHMENT OPP-EU1-A9

EMISSION UNIT COMMENT

Front View - Combustion Turbine and Natural Gas Fuel Line

Combustion Turbine Stack

Combustion Turbine Air Inlet

Fuel Gas Heater

ATTACHMENT OPP-EU1-C

APPLICABLE REQUIREMENTS

ATTACHMENT OPP-EU1-C

Applicable Requirements Listing

EMISSION UNIT ID: 001

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	All Acid Rain Units (Application Shield)
62-214.330(1)(a)	Compliance Options (if 214.430)
62-214.340	Exemptions (retired units)
62-214.350(2);(3);(5);(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)	All Units (Operating Rate)
62-297.310(3)	All Units (Calculation of Emission)
62-297.310(4)	All Units (Applicable Test Procedures)
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)3.	Permit Renewal Test Required
62-297.310(7)(a)4.	Annual Test
62-297.310(7)(a)5.	PM exemption if <400 hrs/yr
62-297.310(7)(a)8.	VE Compliance Test if > 400 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)(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)	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)	Recordkeeping (maintain records-2 yrs)
40 CFR 60.8(a)	Performance Test Requirements
40 CFR 60.8(b)	Performance Test Requirements
40 CFR 60.8(c)	Performance Tests (representative conditions)
40 CFR 60.8(d)	Performance Test Notification
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(d)(1)	Monitoring (CEMS; span, drift, etc.)
40 CFR 60.13(e)	Monitoring (frequency of operation)
40 CFR 60.13(f)	Monitoring (frequency of operation)

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)(iv)	SO_2 Allowances-Phase II Units
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(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
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(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(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(c)	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 75.21(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 75.22	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; CO_2
40 CFR 75.30(d)	General Missing Data Procedures; SO_2
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 75.53	Monitoring Plan; revisions
40 CFR 75.57(a)	Recordkeeping Requirements for Affected Sources
40 CFR 75.57(b)	Operating Parameter Record Provisions
40 CFR 75.57(d)	NO_x Emission Record Provisions
40 CFR 75.57(e)	CO_2 Emission Record Provisions
40 CFR 75.57(h)	Missing Data Records
40 CFR 75.58(c)	Specific SO_2 Emission Record Provisions
40 CFR 75.58(e)	Specific SO_2 Emission Record Provisions
40 CFR 75.59	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 75.64(f)	Method of Submission
40 CFR 75.64(g)	Submission Requirements
40 CFR 75.66	Petitions to the Administrator (if required)
Appendix A	Specifications and Test Procedures
Appendix B	QA/QC Procedures
Appendix C.	Missing Data Estimation Procedures
Appendix D	Optional SO_2; Oil-/gas-fired units
Appendix F	Conversion Procedures

Acid Rain Program-Excess Emissions:

40 CFR 77.3	Offset Plans
40 CFR 77.5(b)	Deductions of Allowances
40 CFR 77.6	Excess Emissions Penalties (SO_2)

ATTACHMENT OPP-EU1-J2

FUEL ANALYSIS OR SPECIFICATION

TABLE 2
GAS FUEL SPECIFICATION

FUEL PROPERTIES	MAX	MIN	NOTES
Lower Heating Value, Btu/lb	None	100 – 300	See note 3
Modified Wobbe Index Range	+5%	–5%	See Notes 4,5
Superheat, °F	–	50	See Note 6
Flammability	See Note 7	>2.2:1	Rich to lean fuel to air ratio, volume basis See Note 8
Gas Constituent Limits, % by volume:			
Methane	100	85	% of reactant species
Ethane	15	0	% of reactant species
Propane	15	0	% of reactant species
Butane + Paraffine (C4+)	5	0	% of reactant species
Hydrogen	0	0	% of reactant species
Carbon Monoxide	15	0	% of reactant species
Oxygen	10	0	% of reactant species
Carbon Dioxode	15	0	% total (reactants + inerts)
Nitrogen	30	0	% total (reactants + inerts)
Sulfur	–	–	See Note 9
Total Inerts (N_2 + CO_2+AR)	30	0	
Aromatics (Benzene, Toluene etc.)	Report	0	See Note 10
Gas Fuel Supply Pressure			See Note 11

CONTAMINANTS (See Notes 12,13)	FUEL LIMITS ppmw (See Note 14)				NOTES
Particulate	MS3000 MS5000	B/E Class	F Class	H Class	See Note 15
Total	35	32	23	23	
Above 10 Microns	0.4	0.3	0.2	0.2	
Trace Metals Sodium plus potassium	0.8				See Note 16
Liquids	0				No Liquids allowed, see superheat requirements and Note 17

Notes:

1. All fuel properties must meet the requirements from ignition to base load unless otherwise stated.
2. Values and limits apply at the inlet of the gas fuel control module.
3. Heating value ranges shown are provided as guidelines. Specific fuel analysis must be furnished to GE for proper analysis. (Reference Section III-A)
4. See section III-B. for definition of Modified Wobbe Index Range.

5. Variations of Modified Wobbe Index greater than + 5% or -5% may be acceptable for some applications, (i.e. On units that incorporate gas fuel heating). GE must analyze and approve all conditions where the 5% variation is to be exceeded.

6. Minimum fuel gas temperature shall be set at 50°F above the higher of the Hydrocarbon (including Glycol) or Water Dewpoints. (Reference Section III-C)

7. There is no defined maximum flammability ratio limit. Fuel with flammability ratio significantly larger than those of natural gas may require a start-up fuel.

8. The range of constituents are for typical natural gas. Fuels meeting these limits are approved for operation with the entire GE heavy-duty gas turbine product line, including those utilizing Dry Low NOx combustion systems. Candidate fuels which do not meet these limits should be referred to GE-for further review. All fuels will be reviewed by GE on a case by case basis. (Reference Section III-E)

9. The quantity of sulfur in gas fuels not limited by this specification. Experience has shown that oxidation/corrosion rates are not significantly affected by fuel sulfur levels up to 1% sulfur. Hot corrosion of hot gas path parts is controlled by the specified trace metal limits. Sulfur levels shall be considered when addressing HRSG Corrosion, Selective Catalytic Reduction (SCR) Deposition, Exhaust Emissions, System Material Requirements, Elemental Sulfur Deposition and Iron Sulfide. (Reference Section IV-D)

10. When fuel heating for thermal efficiency improvements is utilized (e.g. Tfuel > 300°F) there is a possibility of gum formation if excess aromatics are present. Contact GE for further information.

11. Minimum and maximum gas fuel supply pressure requirements are furnished by GE as part of the unit proposal.

12. The contamination limits identified represents the total allowable limit at the inlet to the turbine section. These limits will be reduced if comparable contaminants are present in the compressor inlet air and combustion steam/water injection.

13. The contamination limits and the identified method of calculating contamination limits apply to "typical" natural gases. Consult GE for contamination limits for gasification fuels.

14. Given contaminant limits are for pure methane gas. Actual maximum limits are determined by multiplying given limits by (Actual Fuel LHV/Methane LHV) where methane LHV is in 21,515 BTU/LB.

15. The fuel gas delivery system shall be designed to prevent the generation or the admittance of solid particulate to the gas turbine gas fuel system. This shall include but not be limited to particulate filtration and non corrosive (i.e. stainless steel) piping from the particulate filtration to the inlet of the gas turbine equipment. Fuel gas piping systems shall be properly cleaned/flushed and maintained prior to gas turbine operation. (Reference Section IV-A)

16. Sodium and potassium, from salt water, are the only corrosive trace metal contaminants normally found in natural gases. Other trace metal contaminants may be found in Gasification and Process Gases. These will be reviewed by GE on a case by case basis.

17. The fuel gas supply shall be 100% free of liquids. Admission of liquids can result in combustion and/or hot gas path component damage. (Reference Section IV-C)

FUEL SPECIFICATION

DISTILLATE OIL

Performance Fuel Analysis for Guaranteed Performance

Parameter	Range	Typical
Gravity, API 60 °F	30.0 – 35.0	31.1
Flash Point, °F	>135	150
Sulfur, wt%	0.05	0.05
Ash, wt%	<0.01	0.0025
Water and Sediment, vol %	<0.05	NA
HHV, BTU/gal	>138,000	139,732
*Caculated LHV, BUT/lbm	>18,361	18592
Kinematic Viscosity, 100 °F (Centistokes)	1.8 to 3.6	2.71
Pour Point	-	-
Lead, ppm	0.5 (max)	NA
Potassium + Sodium, ppm	0.5 (max)	NA
Calcium, ppm	0.5 (max)	NA
Copper, ppb	25 (max)	NA
Fuel-Bound Nitrogen	0.05 (max)	NA

* Assumes: Specific Gravity = 0.85 and HHV/LHV=1.06

ATTACHMENT OPP-EU1-J3

DETAILED DESCRIPTION OF CONTROL EQUIPMENT

ATTACHMENT OPP-EU1-J3

DETAILED DESCRIPTION OF CONTROL EQUIPMENT: WATER INJECTION SYSTEM

This attachment provides a general description of the water injection system's operation as recommended by General Electric. Actual operation will depend on operating conditions as determined by the facility.

GENERAL

The water injection system provides water to the combustion system of the gas turbine to limit the levels of nitrogen oxides (NO_X) in the turbine exhaust. This limitation is required by strict local and federal regulations. The water injection system schedules water flow to the turbine as a function of total fuel flow, relative humidity, and ambient temperature. The required water/fuel ratio is established through field compliance testing of the individual turbine. A final control schedule based on these tests is programmed in the SPEEDTRONIC control, which then regulates the system. The water injection system consists of both on-base components and an off-base water injection skid. This skid is a factory assembled and enclosed package. It receives water from the customer's treatment facility, and delivers filtered water at the pressure and flow rate required to meet the applicable emissions requirement at that operating condition. The filtered water is introduced to the turbine combustion system through a water supply manifold. The manifold supplies water to each of the 14 combustors on the gas turbine. The manifold inlet connection is located on the turbine base. The water is injected through identical nozzles in each of the combustors. The following is a brief functional description of the system as well as a control and monitoring description. More detailed information on individual items is given in the manufacturer's literature (Equipment Publications).

FUNCTIONAL DESCRIPTION

The water injection system supplies treated and filtered water at the required flow rate and pressure to the combustion system of the gas turbine. Water enters the skid and passes through a strainer (FW1-2), which protects the system components from damage by foreign objects. A pressure switch (63WN-1) senses pressure upstream of the Pump. The SPEEDTRONIC control system will trip the pump motor if the pressure sensed by this switch is too low. This protects the pump from damage due to cavitation. An electric motor (88WN-1) drives the centrifugal water injection pump (PW1-1). The speed of the electric motor is controlled by a Variable Frequency Drive unit or VFD (97WN-1). The VFD modulates the frequency of the AC power supplied to the motor (88WN-1). By varying the frequency of the AC power, the pump speed can be precisely controlled. By varying the pump speed, the pump discharge pressure, and hence the discharge flow rate are controlled. The VFD controls the pump speed in response to a 4-20 mA demand signal from the SPEEDTRONIC. A 0-10 V speed feedback signal (96WN-4) from the VFD is fed back to the SPEEDTRONIC for monitoring and fault detection purposes.

A discharge pressure transmitter (96WP-1) is located downstream of the pump. The signal from this transmitter is fed back to the SPEEDTRONIC or monitoring and fault detection. The flow then passes through a high pressure filter assembly (FW1-1). The filter elements are contained in a high pressure filter housing, with a vent and drain. A differential pressure gauge indicates the pressure drop across the filter. A differential pressure switch (63WN-3) also senses the differential pressure across the filter, and signals an alarm in the SPEEDTRONIC control if the pressure differential exceeds the pressure specified in the device summary. Downstream of the filter, the flow is split into a main line to the turbine, and a recirculation line, which returns to the pump inlet upstream of the inlet strainer via the "cascade" recirculation orifice. The recirculation flow allows the pump to run in a stable and safe condition when there is little or no flow being delivered to the turbine. It is important that the pump is not run only on recirculation flow for an extended period of time. Extended running on pump recirculation only may cause overheating of the pump, or damage to the pump seals. The water flow in the main line next passes through a turbine flowmeter (FM1-1), with triple pick-ups, each with its own Flow Transmitter (96WF-1, 96WF-2, and 96WF-3). The flowmeter provides a signal to the SPEEDTRONIC control system. A strainer (FW1-3) is installed downstream of the flowmeters, to protect the other system components in the event of a flowmeter failure. Manually operated bypass/isolation valves, and a bypass piping loop is provided to allow the flowmeter to be isolated (e.g. for flushing) or to be removed for maintenance (if necessary). Downstream of the flowmeters, the flow passes through a water actuated stop valve (VS2-1), with solenoid control valve (20WN-1), which shuts off water flow in response to a command from the control system. Downstream of the stop valve is a manual isolation valve, followed by the skid discharge connection ("WJ2"). Interconnecting piping (provided by the customer) carries the water flow from the skid discharge to the manifold connection on the turbine base ("WI2"). The manifold distributes flow equally to fourteen flow proportioning valves (VWP1-1 to 14). These valves have a 15 psid (1.0 kg/cm^2) cracking pressure, and provide a graduated flow restriction such that the flow resistance is relatively high at low flows. The purpose of the flow proportioning valves is to provide an even flow distribution at start-up and at low flows. The discharge from each of these valves is connected to tubing, which carries the flow of water to one of the combustors.

CONTROL AND MONITORING

Total water flow to the turbine is scheduled as a function of fuel flow to the turbine. A control schedule must be established during field compliance tests to meet emissions limits specified by the applicable local or federal standards. The compliance curve, determined as a result of these tests, is programmed into the SPEEDTRONIC control system. It is used as a reference for comparison to the actual water flow, in order to verify that emissions regulations are being met.

The electronic controllers (micro-computers R, S, and T) in the SPEEDTRONIC, control the flow of water in accordance with the control schedule and compliance control curve. The controllers generate a 4 to 20 mA demand signal to the Variable Frequency Drive, which accurately modulates pump speed to obtain the required flow. The control signal is generated in accordance with the control schedule, to achieve the required emissions levels at that particular operating condition. The skid flowmeter (FM1-1) generates a 4 to 20 mA output proportional to flow rate, which the SPEEDTRONIC uses in the flow control loop as a feedback signal.

ATTACHMENT OPP-EU1-J3

DETAILED DESCRIPTION OF CONTROL EQUIPMENT: FUEL GAS SYSTEM (DLN 2.6)

This attachment provides a general description of the Dry Low NO_x system's operation as recommended by General Electric. Actual operation will depend on operating conditions as determined by the facility.

GENERAL

The Stop/Speed Ratio Valve (SRV) and the Gas Control Valves (GCVs) work in conjunction to regulate the total fuel flow delivered to the gas turbine. This arrangement uses four separate Gas Control Valves to control the distribution of the fuel flow to a multi-nozzle combustion system. (See Gas Fuel System schematic) The GCVs control the desired fuel flow in response to a control system fuel command, Fuel Stroke Reference (FSR). The response of the fuel flow to GCVs' commands is made predictable by maintaining a predetermined pressure upstream of the GCVs. The GCVs' upstream pressure, P2 , is controlled by modulating the SRV based on turbine speed as a percentage of full speed, TNH, and feedback from the P2 pressure transducers, 96FG-2A, B, and C. Refer to the Gas Fuel System schematic. In a Dry Low NO_x 2.6 (DLN-2.6) combustion system there are four gas fuel system manifolds: Premix 1 (PM1), Premix 2 (PM2), Premix 3 (PM3), and Quarternary (Q). Each combustion chamber has a total of six fuel nozzles. The PM1 gas fuel delivery system consists of one diffusion type fuel nozzle for each combustion chamber. The PM2 gas fuel delivery system consists of two premix type fuel nozzles for each combustion chamber. The Quarternary gas fuel delivery system consists of injection pegs located in each combustion casing. The PM3 gas fuel delivery system consists of three premix type fuel nozzles for each combustion chamber. The GCVs regulate the percentage of the total fuel flow delivered to each of the gas fuel system manifolds.

FUEL GAS CONTROL SYSTEM

The GCVs and SRV are actuated by hydraulic cylinders moving against spring loaded valve plugs. Three coil servo valves are driven by electrical signals from the control system to regulate the hydraulic fluid in the actuator cylinders. Redundant sensors in the form of Linear Variable Differential Transformers (LVDTs) mounted on each valve provide the control system with valve position feedback for closed loop position control. A functional explanation of each part or subsystem is contained in subsequent paragraphs. For more detail on the electro-hydraulic circuits see the SPEEDTRONIC System text, Gas Fuel system schematics, and Control Sequence Programs furnished to the site.

Gas Control Valves

The plugs in the GCVs are contoured to provide the proper flow area in relation to valve stroke. The combined position of the control valves is intended to be proportional to FSR. The GCVs use a skirted valve disc and venturi seat to obtain adequate pressure recovery. High pressure recovery occurs at valve pressure ratios substantially less than the critical pressure ratio. The result is that the flow through the GCVs is independent of the pressure drop across the valves and is a function of valve inlet pressure, P2, and valve area only. The control system's fuel command, FSR, is the percentage of maximum fuel flow required by the control system to maintain either speed, load, or another setpoint. FSR is broken down into two parts which make up the fuel split setpoint, FSR1 and FSR2. FSR1 is the percentage of maximum fuel flow required from the Liquid Fuel System and FSR2 is the percentage of maximum fuel flow required from the Gas Fuel System. FSR2 is also broken down into four parts, FSRPM1, FSRPM2, FSRPM3 and FSRQT. FSRPM1 is the percentage of FSR2 controlling the GCV1 gas fuel valve. FSRPM2 is the percentage of FSR2 to be directed to the GCV2 gas fuel valves, and so on. FSRPM1 is used as a reference to a servo amplifier, which drives the coils of GCV #1. FSRPM2 is used to drive the coils of GCV #2, and so on.

SIZE B DWG NO 361B1036 SH 1 REV C

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	ADDED LOW POINT DRN TO MANIFOLD.AN# CD7B865 D.A.Y.	01-05-08	P.L.KUTAS
B	CLARIFIED N4, WAS "WHEN FLOWMETER IS NOT IN SERVICE". AN# CD82319 D.A.YOUNG	01-07-16	G.KELLERHOUSE
C	CHG'D TO GEK-101944 & D'TED "AND SKID RECIRC CONN (WJ9)". AN# CD88093 D.A.YOUNG	01-10-23	G.KELLERHOUSE

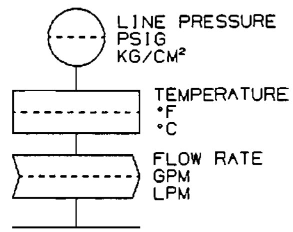
REVISE ON CAD ONLY
UG PART: 361B1036P001

NOTE(S):

1. SEE DEVICE SUMMARY (ML1 0414) FOR CONTROL DEVICE SETTINGS.
2. EXPOSED WATER PIPING AND COMPONENTS MUST BE INSULATED AND HEAT TRACED TO PREVENT WATER FROM FREEZING IF THE SKID IS INSTALLED IN AN AREA WHERE THE SURROUNDING TEMPERATURE COULD FALL BELOW 32°F (0°C).
3. WATER ENTERING THE SKID MUST MEET THE QUALITY REQUIREMENTS IN G.E. DRAWING #GEK-101944.
4. VALVE NORMALLY CLOSED. OPEN VALVE WHEN NEITHER FLOWMETER IS IN SERVICE. (BE SURE TO CLOSE THE CORRESPONDING FLOWMETER ISOLATION VALVES WHEN THIS IS DONE.
5. ALL INTERCONNECTING PIPING, FLANGES, VALVING & ETC. BOTH TO AND FROM THE WATER INJECTION SKID MUST BE STAINLESS STEEL. (AISI 304L OR 316L). THE WATER STORAGE FACILITY SHOULD BE STAINLESS OR SUITABLY COATED.
6. PUMP NOT TO BE RUN ON "RECIRCULATION ONLY" AT FULL SPEED, NOR FOR MORE THAN 20 MINUTES AT PART SPEED.
7. THE RANGES DEFINED IN CHART 1 COVER ALL NORMAL CONDITIONS, OPERATING AND NON-OPERATING. DURING SKID OPERATION, THE MINIMUM STEADY STATE WATER INJECTION FLOW (WJ2) IS 18 GPM (68 LPM). THE ACTUAL MAXIMUM LINE PRESSURES ARE INDICATED ON THE SCHEMATIC AND ARE LESS THAN THE CONNECTION POINT DESIGN PRESSURES IN THE TABLE.
8. CUSTOMER/OPERATOR IS RESPONSIBLE FOR MAINTAINING PROCESS CONDITIONS AT SKID INLET (WJ1) WITHIN THE LIMITS SPECIFIED IN THE RESPECTIVE PROCESS FLAGS. OPERATION OUTSIDE OF THESE LIMITS MAY CAUSE SKID MALFUNCTION.
9. LINE FROM STOP VALVE DRAIN CONNECTION TO SKID DRAIN SHALL BE AT LEAST 1.0 INCH DIAMETER TUBE. THIS IS IMPORTANT TO MINIMIZE RESTRICTION SO THAT STOP VALVE CLOSING IS NOT SLOWED DOWN. THE STOP VALVE SHALL CLOSE IN 0.75 SECONDS OR LESS WHEN INSTALLED IN THE SKID.
10. FLOWS ARE STATED IN U.S. GALLONS PER MINUTE (GPM) AND IN LITERS PER MINUTE (LPM).
11. FLOW PROPORTIONING VALVES VWP1-1T14 SHALL COMPLY WITH GE DRAWING 354A3606. LOCATE THE FLOW PROPORTIONING VALVE AND PURGE CONNECTION TEE AT THE COMBUSTOR END COVER FLANGE TO MINIMIZE LINE VOLUME DOWNSTREAM OF THE VALVE.
12. CASCADE ORIFICE TO BE PROCURED FROM PUMP SUPPLIER AND CONFIGURED TO PROVIDE A FLOW RATE OF 10 GPM AT A BACK PRESSURE OF 30 PSIG: WITH THE PUMP RUNNING AT ITS DESIGN POINT.
13. VOLUME OF PIPING SUPPLIED BY OTHERS BETWEEN A035 SKID AND TURBINE BASE SHALL NOT EXCEED EQUIVALENT OF 100 FEET (30.5 M) OF 4 INCH (102 MM) DIAMETER SCH 40 PIPE.
14. HIGH POINT VENT(S) TO BE LOCATED WHERE NEEDED IN THE INTERCONNECTING PIPING.
15. HEAT EXCHANGER, INTEGRAL WITH THE PUMP, IS SUPPLIED BY THE PUMP MANUFACTURER. 1.00" LINE CONNECTING HEAT EXCHANGER OUTLET TO PUMP INLET LINE TO BE SUPPLIED BY VENDOR.
16. THE WATER INJECTION SYSTEM SHALL BE CHARGED WITH WATER FROM THE WATER SKID SUPPLY CONNECTION (WJ1) TO UPSTREAM OF THE STOP VALVE NEAR WJ2 TO MINIMIZE FILL TIME AND PREVENT AIR FROM ENTERING THE SYSTEM.

CHART 1: DESIGN CONDITIONS FOR CUSTOMER CONNECTIONS - NOTE 7

CONNECTION	TEMPERATURE	PIPING DESIGN PRESSURE	FLOW (CONTINUOUS)	FLOW (INTERMITTENT)
WJ1	35-110°F (2-43°C)	150 PSIG (10.5 KG/CM²)	0-285 GPM (0-1078 LPM)	N/A
WJ5	35-110°F (2-43°C)	150 PSIG (10.5 KG/CM²)	LESS THAN 2 GPM (7.6 LPM)	5 GPM (18.9 LPM)
WJ2 WI2	35-110°F (2-43°C)	1100 PSIG (77.3 KG/CM²)	0-285 GPM (0-1078 LPM)	N/A



LEGEND

1	PIPING SYMBOLS	277A2415
IT.	NOMENCLATURE	IDENT

LIST OF COMPLEMENTARY DOCUMENTS

B	B	C	REV	REV STATUS OF SHEETS
3	2	1	SH	

THIRD ANGLE PROJECTION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES.
TOLERANCES ON:
2 PL DECIMALS ±
3 PL DECIMALS ±
ANGLES ±
FRACTIONS ±

SIGNATURES	DATE
DRAWN D.A.YOUNG	01-03-15
CHECKED D.A.YOUNG	01-03-15
ENGRG P.L.KUTAS	01-03-15
ISSUED D.A.YOUNG	01-03-15

APPLIED PRACTICES 348A9200

SIM TO: NONE

GE Power Generation
GENERAL ELECTRIC COMPANY
GAS TURBINE
Schenectady, NY

DIAG,SCHEM PP-WATER INJ SYSTEM

FIRST MADE FOR ML-7A1WFA203-1,2 0462

SIZE B CAGE CODE DWG NO 361B1036

SCALE NONE SHEET 1

DISTR TO

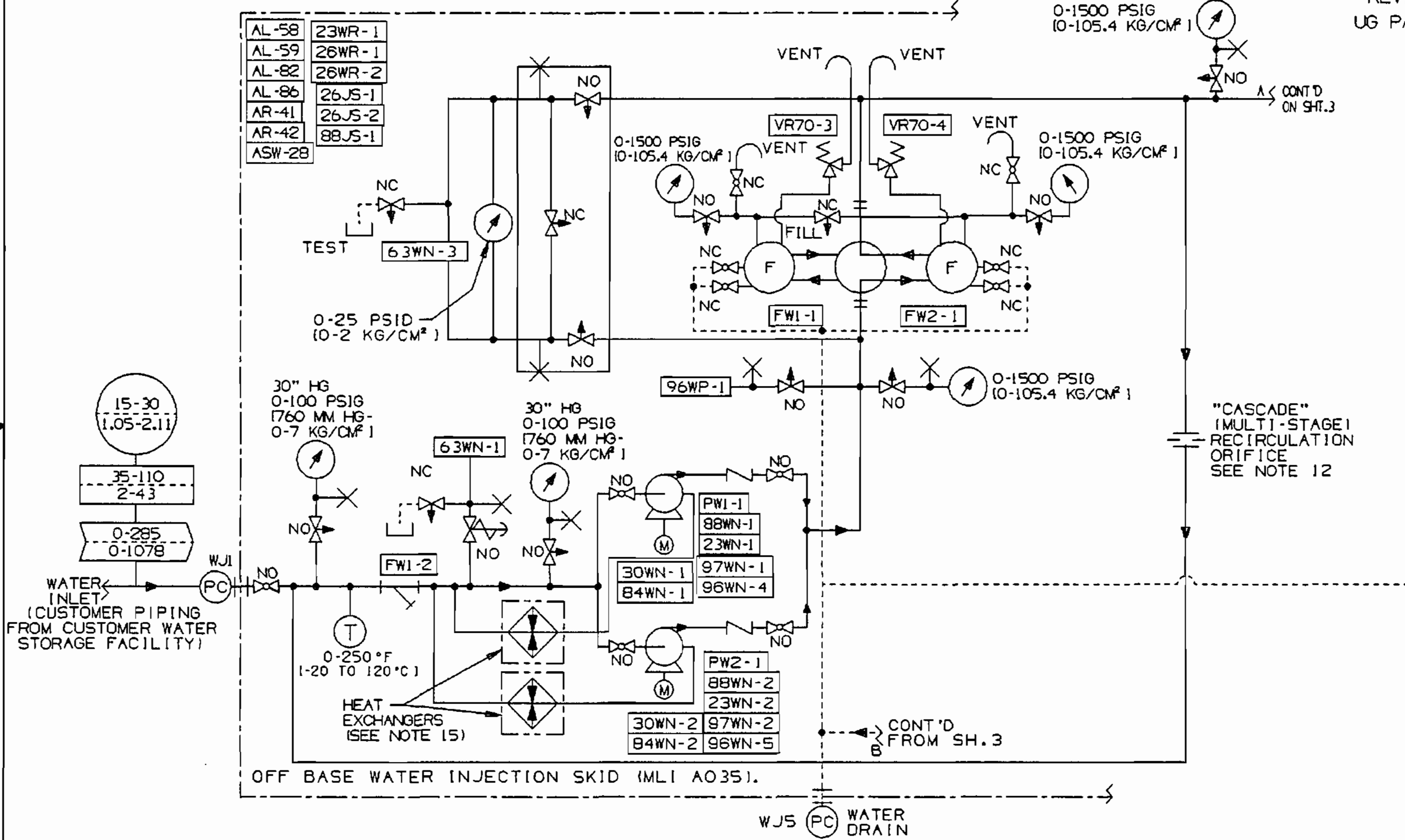
GR0679 AF2D

SIZE	DWG NO	SH	REV
B	361B1036	2	B

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
B	REMOVED PIPING & CHK VLVS BETWEEN PUMPS & MOVED RECIRC LINE BEFORE GAUGE. AN# CD82319 D.A.YOUNG	01-07-16	G.KELLERHOUSE

REVISE ON CAD ONLY
UG PART: 361B1036P001



GENERAL ELECTRIC COMPANY
GAS TURBINE
Schenectady, NY
GE Power Generation

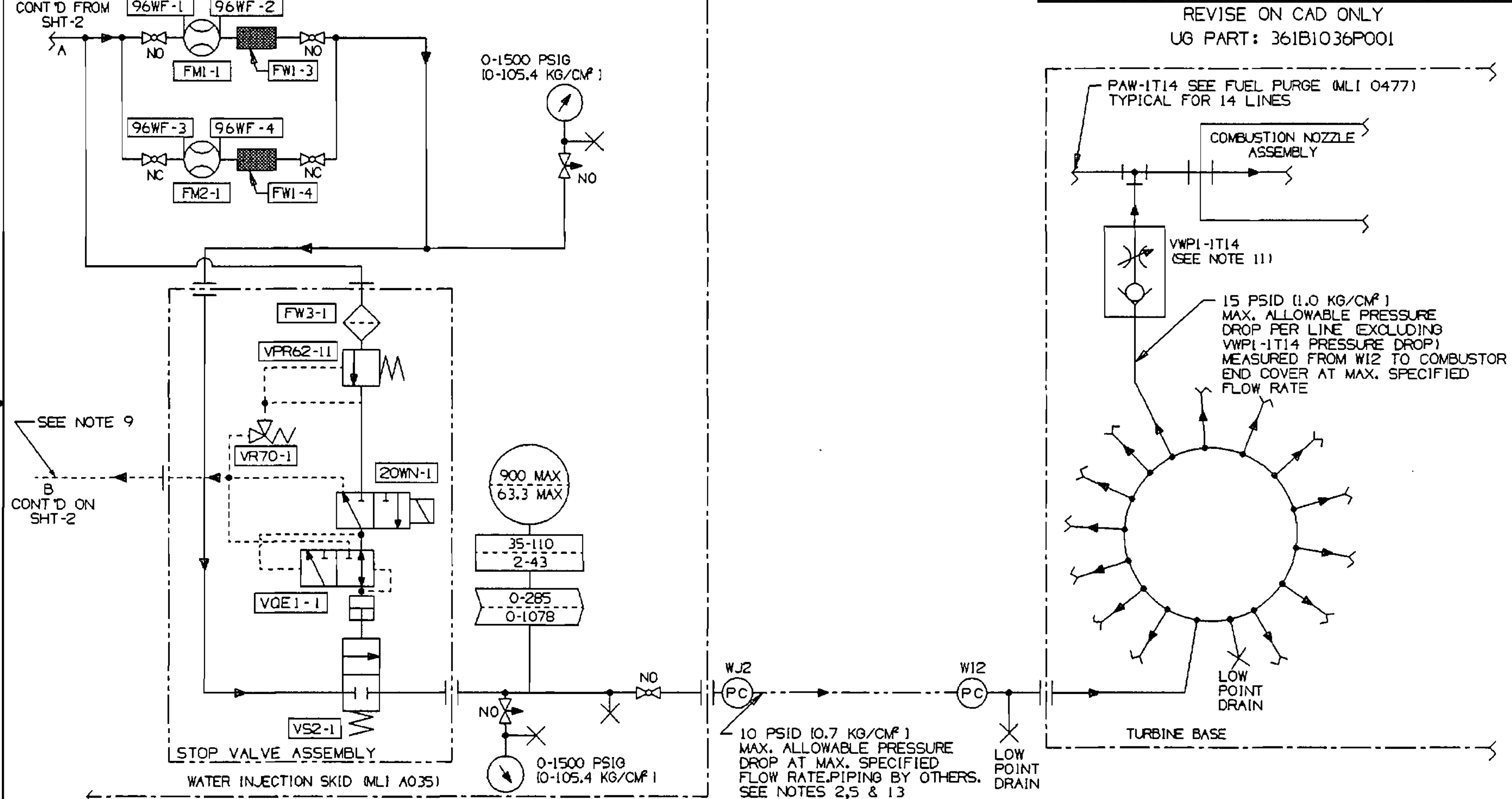
DRAWN	DEXTER A. YOUNG	01-03-15	SIZE: B
ISSUED	DEXTER A. YOUNG	01-03-15	CAGE CODE
DWG NO	361B1036		
SCALE	NONE	SHEET	2

DISTR TO

GR0679

REV	DESCRIPTION	DATE	APPROVED
A	ADDED LOW POINT DRN TO MANIFOLD.AN#CD78865 D.A.Y.	01-05-08	P.L.KUTAS
B	REMOVED BYPASS LINE FROM FM2-1. AN#CD82319 D.A.Y.	01-07-16	G.KELLERHOUSE

REVISE ON CAD ONLY
UG PART: 361B1036P001



GE Power Generation
GENERAL ELECTRIC COMPANY GAS TURBINE Schenectady, NY

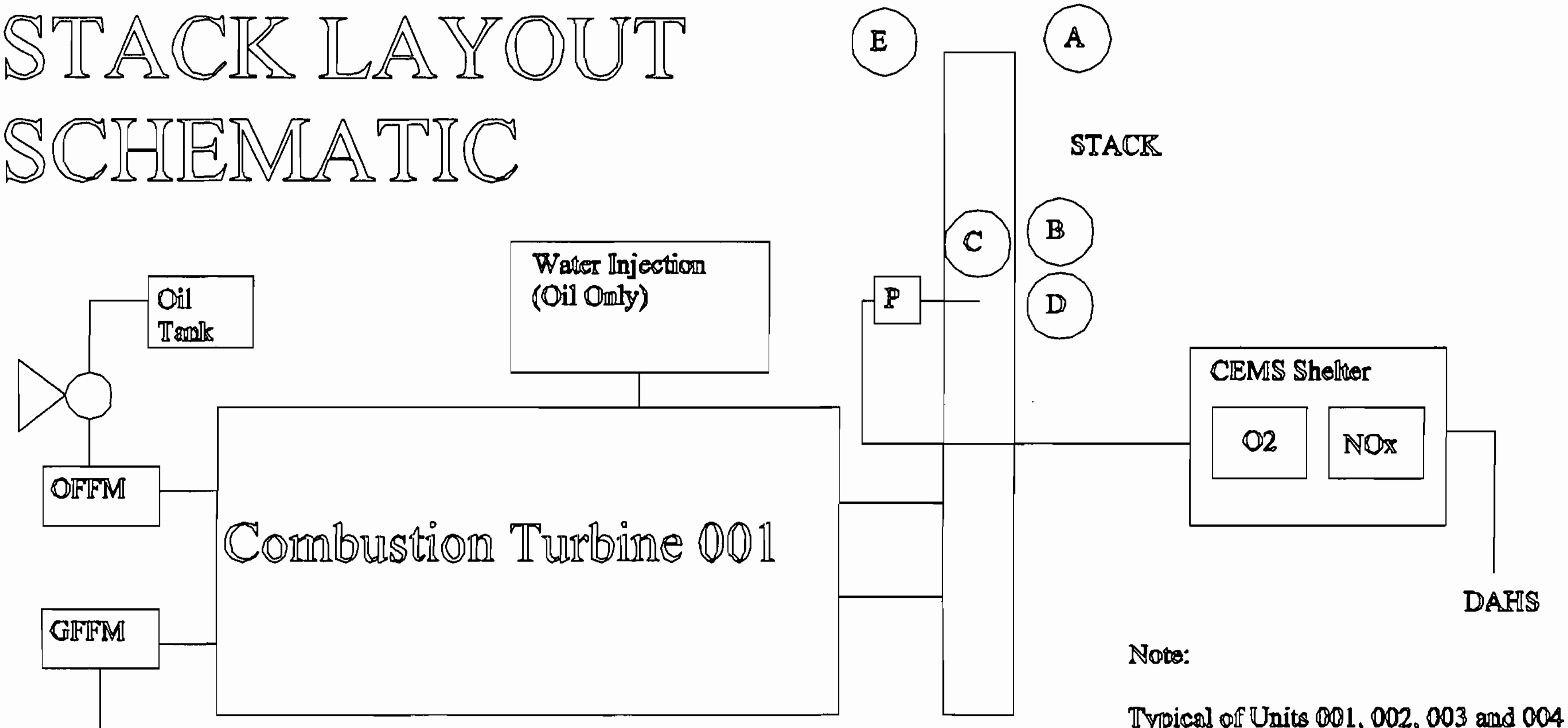
SIZE B	CAGE CODE	DWG NO 361B1036	DISTR TO
DRAWN DEXTER A. YOUNG 01-03-15			
ISSUED DEXTER A. YOUNG 01-03-15	SCALE NONE	SHEET 3	

GR0679

ATTACHMENT OPP-EU1-J4

DESCRIPTION OF STACK SAMPLING FACILITIES

STACK LAYOUT SCHEMATIC



Note:

Typical of Units 001, 002, 003 and 004

Monitoring Location Information Unit ID 001

A. Stack Height Above Grade - 60'
B. Stack Diameter at Test Ports - 19'
C. Inside Area at Test Ports - 284 sq/ft
D. Test Port Elevation
  1. Above Grade - 49'-6"
  2. Above Last Disturbance
    A. Feet - 30'
    B. Stack Diameters - 1.6
  3. Prior to Next Disturbance
    A. Feet - 11'-6"
    B. Stack Diameters 0.6
E. Inside Area at Flue Exit - 284 sq/ft

EMSI	EAGLE MOUNTAIN SCIENTIFIC, INC.
	Oleander Unit ID 001, 002, 003 and 004 Stack Layout
DRAWN L.Bessink	SIZE A · FSCM NO. · DWG NO. Horiba-00123 · REV 0
	SCALE N/A · SHEET 1 of 1

ATTACHMENT OPP-EU1-J5

COMPLIANCE TEST REPORT

Work Order No. 11383.005.001

Unit 1
Simple Cycle Combustion Turbine NO_x, CO, and VOC Compliance Emission Test Report

Oleander Power Plant
Cocoa, Florida
24-31 May 2002

Prepared For

CONSTELLATION POWER SOURCE GENERATION

Fort Smallwood Road Complex
1000 Brandon Shores Road
Baltimore, Maryland 21226

Gregory R. Sims
Project Manager
Approved for Transmittal
334-887-0622

Jon Howard
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334-887-0720

Prepared By

WESTON SOLUTIONS, INC.

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17 July 2002

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LIST OF TABLES

SECTION 1
INTRODUCTION

Weston Solutions, Inc. (WESTON®) was retained by Constellation Power Source Generation (CPSG) to conduct nitrogen oxides (NO_X), carbon monoxide (CO), and non-methane volatile organic compounds (NMVOC) emission testing on Unit 1 at the Oleander Power Plant (OPP) located in Cocoa, Florida. Unit 1 is a simple cycle combustion turbine operated as a peaking unit.

The purpose of the testing was to demonstrate compliance with applicable standards of 40 CFR, Part 60, Subpart GG and the Florida Department of Environmental Protection (FDEP) permit limits. Emission testing was conducted in accordance with the test protocol submitted to and approved by FDEP.

WESTON performed the emission testing during 24-31 May 2002. The project team was comprised of the following individuals.

Name	Project Role
Greg Sims	Project Manager/ Technical Manager/Test Team Leader
Gary Blackmon	Test Team Member
Susan Brown	Test Team Member
Steve Daughtry	Test Team Member
Jon Howard	Report Coordinator

Mr. Craig Fierstien and Mr. Ed Much of CPSG coordinated the testing with facility operations. Mr. Garry Kuberski of the FDEP was present during a portion of the testing.

SECTION 2
RESULTS AND DISCUSSION

Table 2-1 presents the mean results of the emission testing with comparison to the permit requirements. The results are less than the applicable standard(s) for the source.

According to the permit, the Best Available Control Technology (BACT) limits are more stringent than the New Source Performance Standards (NSPS) limits of Subpart GG, therefore compliance with BACT limits indicates the source was in compliance with NSPS limits during the test effort.

Sulfur dioxide sampling under gas and oil firing conditions is exempted by the permit; however, as required by subpart GG, fuel samples were collected and analyzed for sulfur. The concentration of sulfur at <1 ppm in the fuel sample meets the requirements of subpart GG that no fuel shall be fired that contains sulfur in excess of 0.8 percent by weight.

Tables 2-2 through 2-10 provide detailed summaries of the emission results at the various load levels under each fuel. Any differences between the calculated results presented in the appendices and the results reported in the summary tables are due to rounding for presentation.

In accordance with Method 20 requirements, an oxygen (O_2) traverse was performed prior to sampling to select the eight sample traverse points of the lowest O_2 concentration. The O_2 traverse was conducted such that at least one minute of actual stack gas was analyzed at each of the 48 total traverse points. The O_2 traverse was conducted in strict accordance with EPA Reference Method 20. Copies of the O_2 traverse measurements are included in the appendices.

TABLE 2-1
SUMMARY OF EMISSION TEST RESULTS

Operating Load	Mean Test Value	Permit Limit
50% Load – Firing Gas		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	8.0	9.0
Subpart GG, ppm @ 15% O_2 ISO	8.4	75
Emission Rate, lb/hr	35.6	62.6
Emission Rate, lb/MMBtu	0.029	----
66% Load – Firing Gas		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	8.3	9.0
Subpart GG, ppm @ 15% O_2 ISO	8.8	75
Emission Rate, lb/hr	42.3	62.6
Emission Rate, lb/MMBtu	0.030	----
83% Load – Firing Gas		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	6.9	9.0
Subpart GG, ppm @ 15% O_2 ISO	7.3	75
Emission Rate, lb/hr	39.5	62.6
Emission Rate, lb/MMBtu	0.025	----
100% Load – Firing Gas		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	6.5	9.0
Subpart GG, ppm @ 15% O_2 ISO	7.5	75
Emission Rate, lb/hr	40.9	62.6
Emission Rate, lb/MMBtu	0.024	----
Carbon Monoxide		
Concentration, ppm	1.3	12.0
Emission Rate, lb/hr	4.3	41
Emission Rate, lb/MMBtu	0.0025	----
Volatile Organic Compounds		
Concentration, ppm as C	<0.8	3.0
Emission Rate, lb/hr as C	<1.1	5.9
Emission Rate, lb/MMBtu	<0.001	----
Visible Emissions		
% Opacity	0	10

TABLE 2-1
SUMMARY OF EMISSION TEST RESULTS
(CONTINUED)

Operating Load	Mean Test Value	Permit Limit
50% Load – Firing Oil		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	34.3	42.0
Subpart GG, ppm @ 15% O_2 ISO	37.7	75
Emission Rate, lb/hr	147	----
Emission Rate, lb/MMBtu	0.133	----
66% Load – Firing Oil		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	34.0	42.0
Subpart GG, ppm @ 15% O_2 ISO	38.0	75
Emission Rate, lb/hr	172	----
Emission Rate, lb/MMBtu	0.132	----
83% Load – Firing Oil		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	33.8	42.0
Subpart GG, ppm @ 15% O_2 ISO	39.0	75
Emission Rate, lb/hr	193	----
Emission Rate, lb/MMBtu	0.131	----
100% Load – Firing Oil		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	33.5	42.0
Subpart GG, ppm @ 15% O_2 ISO	39.9	75
Emission Rate, lb/hr	217	----
Emission Rate, lb/MMBtu	0.130	----
Carbon Monoxide		
Concentration, ppm	1.8	20.0
Emission Rate, lb/hr	5.4	66.9
Emission Rate, lb/MMBtu	0.003	----
Volatile Organic Compounds		
Concentration, ppm as C	<0.7	6.0
Emission Rate, lb/hr as C	<0.9	11.5
Emission Rate, lb/MMBtu	<0.001	----
Visible Emissions		
% Opacity	0	10

TABLE 2-2
UNIT 1 – FIRING NATURAL GAS
50% LOAD-90 MW
SUMMARY OF NO_X (METHOD 20) EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	5/24/02	5/24/02	5/24/02	----
Time Began	0901	0923	0951	----
Time Ended	0916	0938	1006	----
Stack Gas Data				
O_2 Concentration, %	13.9	13.9	13.9	13.9
VFR, x 10^5 dscfm[a]	5.23	5.23	5.24	5.23
Heat Input Rate, MMBtu/hr	1206	1207	1210	1208
Nitrogen Oxides				
Concentration, ppm	9.5	9.5	9.5	9.5
Concentration, ppm @ 15% O_2	8.0	8.0	8.0	8.0
Permit Limit, ppm @ 15% O_2	----	----	----	*9.0*
Subpart GG, ppm @ 15% O_2 ISO	8.4	8.5	8.4	8.4
Permit Limit, ppm @ 15% O_2 ISO	----	----	----	*75*
Emission Rate, lb/hr	35.5	35.5	35.6	35.6
Permit Limit, lb/hr	----	----	----	*62.6*
Emission Rate, lb/MMBtu	0.029	0.029	0.029	0.029

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factors.

TABLE 2-3
UNIT 1 - FIRING NATURAL GAS
66% LOAD–117 MW
SUMMARY OF NO_X (METHOD 20) EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	5/24/02	5/24/02	5/24/02	----
Time Began	1033	1055	1116	----
Time Ended	1048	1110	1131	----
Stack Gas Data				
O_2 Concentration, %	13.8	13.8	13.8	13.8
VFR, x 10^5 dscfm[a]	5.95	5.96	5.94	5.95
Heat Input, MMBtu/hr	1392	1394	1390	1392
Nitrogen Oxides				
Concentration, ppm	9.9	9.9	10.0	9.9
Concentration, ppm @ 15% O_2	8.2	8.2	8.3	8.3
Permit Limit, ppm @ 15% O_2	----	----	----	*9.0*
Subpart GG, ppm @ 15% O_2 ISO	8.8	8.7	8.9	8.8
Permit Limit, ppm @ 15% O_2 ISO	----	----	----	*75*
Emission Rate, lb/hr	42.1	42.2	42.5	42.3
Permit Limit, lb/hr	----	----	----	*62.6*
Emission Rate, lb/MMBtu	0.030	0.030	0.031	0.030

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factors.

TABLE 2-4
UNIT 1 - FIRING NATURAL GAS
83% LOAD–143 MW
SUMMARY OF NO_X (METHOD 20) EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	5/24/02	5/24/02	5/24/02	----
Time Began	1202	1225	1246	----
Time Ended	1217	1240	1301	----
Stack Gas Data				
O_2 Concentration, %	13.7	13.7	13.7	13.7
VFR, x 10^5 dscfm[a]	6.63	6.59	6.60	6.61
Heat Input, MMBtu\hr	1574	1564	1567	1568
Nitrogen Oxides				
Concentration, ppm	8.5	8.3	8.3	8.4
Concentration, ppm @ 15% O_2	7.0	6.8	6.8	6.9
Permit Limit, ppm @ 15% O_2	----	----	----	*9.0*
Subpart GG, ppm @ 15% O_2 ISO	7.4	7.3	7.3	7.3
Permit Limit, ppm @ 15% O_2 ISO	----	----	----	*75*
Emission Rate, lb/hr	40.3	39.1	39.2	39.5
Permit Limit, lb/hr	----	----	----	*62.6*
Emission Rate, lb/MMBtu	0.026	0.025	0.025	0.025

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factors.

TABLE 2-5
UNIT 1 - FIRING NATURAL GAS
100% LOAD–163 MW
SUMMARY OF EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	5/29/02	5/29/02	5/29/02	----
Time Began	0746	1545	1709	----
Time Ended	0846	1646	1809	----
Stack Gas Data				
Moisture, %	8.4	8.8	9.3	8.8
CO_2 Concentration, %	3.9	4.1	4.1	4.1
O_2 Concentration, %	14.0	13.8	13.8	13.9
VFR, x 10^5 dscfm[a]	7.47	7.26	7.28	7.33
Heat Input, MMBtu/hr	1699	1698	1703	1700
Nitrogen Oxides				
Concentration, ppm	7.8	7.9	7.7	7.8
Concentration, ppm @ 15% O_2	6.7	6.6	6.4	6.5
Permit Limit, ppm @ 15% O_2	----	----	----	*9.0*
Subpart GG, ppm @ 15% O_2 ISO	7.9	7.3	7.4	7.5
Permit Limit, ppm @ 15% O_2 ISO	----	----	----	*75*
Emission Rate, lb/hr	41.7	41.0	40.1	40.9
Permit Limit, lb/hr	----	----	----	*62.6*
Emission Rate, lb/MMBtu	0.025	0.024	0.024	0.024
Carbon Monoxide				
Concentration, ppm	2.5	0.9	0.6	1.3
Permit Limit, ppm	----	----	----	*12.0*
Emission Rate, lb/hr	8.1	2.8	1.9	4.3
Permit Limit, lb/hr	----	----	----	*41.0*
Emission Rate, lb/MMBtu	0.0048	0.0017	0.0011	0.0025
Volatile Organic Compounds				
Concentration, ppm as C	1.1	<0.7	<0.7	<0.8
Permit Limit, ppm	----	----	----	*3.0*
Emission Rate, lb/hr as C	1.5	<0.9	<0.9	<1.1
Permit Limit, lb/hr	----	----	----	*5.9*
Emission Rate, lb/MMBtu	0.001	<0.001	<0.001	<0.001
Visible Emissions				
% Opacity	0	0	0	0
Permit Limit, %	----	----	----	*10*

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factors.

TABLE 2-6
UNIT 1 - FIRING OIL
50% LOAD–91 MW
SUMMARY OF NO_X (METHOD 20) EMISSION RESULTS

	Run 1	**Run 2**	**Run 3**	**Mean**
Date	5/31/02	5/31/02	5/31/02	----
Time Began	0726	0749	0812	----
Time Ended	0741	0804	0827	----
Stack Gas Data				
O_2 Concentration, %	13.0	13.5	13.5	13.3
VFR, x 10^5 dscfm[a]	4.47	4.77	4.77	4.67
Heat Input, MMBtu/hr	1104	1103	1103	1103
Nitrogen Oxides				
Concentration, ppm	46.4	43.0	42.7	44.0
Concentration, ppm @ 15% O_2	34.7	34.3	34.0	34.3
Permit Limit, ppm @ 15% O_2	----	----	----	*42.0*
Subpart GG, ppm @ 15% O_2 ISO	38.0	37.3	37.9	37.7
Permit Limit, ppm @ 15% O_2 ISO	----	----	----	*75*
Emission Rate, lb/hr	149	147	146	147
Emission Rate, lb/MMBtu	0.134	0.133	0.132	0.133

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factors.

TABLE 2-7
UNIT 1 - FIRING OIL
66% LOAD–121 MW
SUMMARY OF NO_x (METHOD 20) EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	5/31/02	5/31/02	5/31/02	----
Time Began	0851	0921	0946	----
Time Ended	0906	0936	1001	----
Stack Gas Data				
O_2 Concentration, %[a]	13.4	13.5	13.4	13.4
VFR, x 10^5 dscfm	5.57	5.65	5.55	5.59
Heat Input, MMBtu/hr	1304	1305	1301	1303
Nitrogen Oxides				
Concentration, ppm	43.2	42.8	43.1	43.0
Concentration, ppm @ 15% O_2	34.0	34.1	33.9	34.0
Permit Limit, ppm @ 15% O_2	----	----	----	*42.0*
Subpart GG, ppm @ 15% O_2 ISO	37.8	37.7	38.4	38.0
Permit Limit, ppm @ 15% O_2 ISO	----	----	----	*75*
Emission Rate, lb/hr	172	173	171	172
Emission Rate, lb/MMBtu	0.132	0.132	0.132	0.132

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factors.

TABLE 2-8
UNIT 1 - FIRING OIL
83% LOAD–143 MW
SUMMARY OF NO_X (METHOD 20) EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	5/31/02	5/31/02	5/31/02	----
Time Began	1016	1042	1105	----
Time Ended	1031	1057	1120	----
Stack Gas Data				
O_2 Concentration, %	13.4	13.3	13.3	13.3
VFR, x 10^5 dscfm[a]	6.25	6.20	6.21	6.22
Heat Input, MMBtu/hr	1465	1472	1475	1471
Nitrogen Oxides				
Concentration, ppm	43.3	43.5	43.3	43.4
Concentration, ppm @ 15% O_2	34.1	33.8	33.6	33.8
Permit Limit, ppm @ 15% O_2	----	----	----	*42.0*
Subpart GG, ppm @ 15% O_2 ISO	39.0	39.1	38.9	39.0
Permit Limit, ppm @ 15% O_2 ISO	----	----	----	*75*
Emission Rate, lb/hr	194	193	192	193
Emission Rate, lb/MMBtu	0.132	0.131	0.130	0.131

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factors.

TABLE 2-9
UNIT 1 - FIRING OIL
100% LOAD–173 MW
SUMMARY OF EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	5/30/02	5/30/02	5/30/02	----
Time Began	1015	1133	1256	----
Time Ended	1115	1233	1356	----
Stack Gas Data				
Moisture, %	13.6	11.7	12.2	12.5
CO_2 Concentration, %	5.8	5.7	5.7	5.7
O_2 Concentration, %	13.2	13.2	13.3	13.2
VFR, x 10^5 dscfm[a]	6.98	6.93	7.03	6.98
Heat Input, MMBtu/hr	1678	1668	1669	1672
Nitrogen Oxides				
Concentration, ppm	43.6	43.5	43.3	43.5
Concentration, ppm @ 15% O_2	33.4	33.3	33.6	33.5
Permit Limit, ppm @ 15% O_2	----	----	----	*42.0*
Subpart GG, ppm @ 15% O_2 ISO	40.4	40.3	39.1	39.9
Permit Limit, ppm @ 15% O_2 ISO	----	----	----	*75*
Emission Rate, lb/hr	218	216	218	217
Emission Rate, lb/MMBtu	0.130	0.129	0.130	0.130
Carbon Monoxide				
Concentration, ppm	1.8	1.7	1.8	1.8
Permit Limit, ppm	----	----	----	*20.0*
Emission Rate, lb/hr	5.5	5.1	5.5	5.4
Permit Limit, lb/hr	----	----	----	*66.9*
Emission Rate, lb/MMBtu	0.003	0.003	0.003	0.003
Volatile Organic Compounds				
Concentration, ppm as C	<0.7	<0.7	<0.7	<0.7
Permit Limit, ppm	----	----	----	*6*
Emission Rate, lb/hr as C	<1.0	<0.9	<0.9	<0.9
Permit Limit, lb/hr	----	----	----	*11.5*
Emission Rate, lb/MMBtu	<0.001	<0.001	<0.001	<0.001
Visible Emissions				
% Opacity	0	0	0	0
Permit Limit, %	----	----	----	*10*

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factors.

SECTION 3
SOURCE TESTING METHODOLOGY

The emission testing program was conducted in accordance with the U.S. EPA Reference Methods summarized in Table 3-1. Method descriptions and quality assurance data are provided in the referenced appendices.

TABLE 3-1
SOURCE TESTING METHODOLOGY

Parameter	Method Number	Appendix Reference		Comments
		Method Description	Quality Control Data	
Volumetric Flow Rate	19	B.1	L	Calculated from Method 19 Fuel-Factors
Gas Composition	3A	B.2	L	Instrumental
Nitrogen Oxides	20	B.3	L	Instrumental
Opacity	9	B.4	L	
Carbon Monoxide	10	B.5	L	Instrumental
Volatile Organic Compounds	25A	B.6	L	

APPENDIX A
SAMPLE CALCULATIONS

SAMPLE CALCULATIONS

Unit 1 (Full Load – Gas)
Run No. 1

Meter Pressure (Pm), in. Hg

$$Pm = Pb + \frac{\Delta H}{13.6\ in.\,H_2O/in.\,Hg}$$

where, Pb = barometric pressure, in. Hg
ΔH = Pressure differential of orifice in. H_2O

$$Pm = 29.91\,in.\,Hg + \frac{1.3\,in.\,H_2O}{13.6\ in.\,H_2O/in.\,Hg} = 30.0\,in.\,Hg$$

Standard Meter Volume (Vmstd), dscf

$$Vmstd = \frac{17.647\,^\circ R/in.\,Hg\ x\ Y\ x\ Vm\ x\ Pm}{Tm}$$

where, Y = meter correction factor
Vm = meter volume, cf
Pm = meter pressure, in. Hg
Tm = meter temperature, °R

$$Vmstd = \frac{17.647\,^\circ R/in.\,Hg\ x\ 1.024\ x\ 38.668\,cf\ x\ 30.0\,in.\,Hg}{540\,^\circ R} = 38.811\,dscf$$

Standard Wet Volume (Vwstd), scf

$$Vwstd = 0.04707\ ft^3/mL\ x\ Vlc$$

where, Vlc = volume of H_2O collected, mL

$$Vwstd = 0.04707\ ft^3/mL\ x\ 75.9\ mL = 3.579\,scf$$

Moisture Fraction (Measured), (Bws)

$$Bws = \frac{Vwstd}{(Vwstd + Vmstd)} = \frac{3.579\,scf}{3.579\,scf\ +\ 38.811\,dscf} = 0.084$$

where, Vwstd = standard wet volume, scf
Vmstd = standard meter volume, dscf

Moisture, %

$$Moisture = Bws \times 100 = 0.084 \times 100 = 8.4$$

where, Bws = moisture fraction, measured or at saturation, whichever is lowest

Molecular Weight (DRY) (Md), lb/lb-mole

$$Md = (0.44 \, x \, \% \, CO_2) + (0.32 \, x \, \% \, O_2) + (0.28 \, (100 - \% \, CO_2 - \% \, O_2))$$

$$Md = (0.44 \, x \, 3.9) + (0.32 \, x \, 14.0) + (0.28 \, (100 - 3.9 - 14.0)) = 29.18 \, lb/lb - mole$$

Molecular Weight (WET) (Ms), lb/lb-mole

$$Ms = Md \, (1 - Bws) + 18 \, (Bws)$$

where, Md = molecular weight (DRY), lb/lb-mole
Bws = moisture fraction, dimensionless

$$Ms = 29.18 \, lb/lb - mole \, (1 - 0.084) + 18 \, (0.084) = 28.24 \, lb/lb - mole$$

Average Stack Gas Flow at Standard Conditions (Qs), dscfm

$$Qs_h = Heat \, Input, MMBtu/hr \;\; x \;\; F - Factor \;\; x \;\; \frac{20.9}{20.9 - O_2}$$

where, Heat Input MMBtu/hr = obtained from process
F-Factor = obtained from CFR, dscf/MMBtu

$$Qs_h = 1699 \, MMBtu/hr \;\; x \;\; 8710 \, dscf/MMBtu \;\; x \;\; \frac{20.9}{20.9 - 14} = 44823806 \, dscfh$$

Average Stack Gas Flow at Standard Conditions (Qs_m) dscfm

$$Qs_m = \frac{Qs_m}{60 \, sec/min}$$

$$Qs_m = \frac{44823806 \, dscfh}{60 \, sec/min} = 747063 \, dscfm$$

Method 20

NO_x Concentration, ppm @ 15% O_2

$$ppm @ 15\% O_2 = Bias\ corrected\ conc., ppm\ x \frac{20.9 - 15\% O_2}{20.9 - Actual\ \% O_2}$$

$$ppm @ 15\% O_2 = 7.8\ x \frac{20.9 - 15}{20.9 - 14.0} = 6.7\ ppm @ 15\% O_2$$

NO_x Concentration Corrected to ISO Standard Ambient Condition, ppm (Subpart GG)

$$ppm @ ISO\ Cond. = (ppm @ 15\% O_2)(Pr/Po)^{0.5}(2.718)^{19(Ho-0.00633)}(288\,°K/Ta)^{1.53}$$

where, NO_{XO} = observed NO_X concentration, ppm by volume @ 15% O_2
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

$$ppm @ ISO\ Cond. = (6.7)(760\ mm\ Hg/760\ mmHg)^{0.5}(2.718)^{19(0.018-0.00633)}(288\,°K/301\,°K)^{1.53}$$

$$ppm @ ISO\ Cond. = 7.9\ ppm$$

NO_x Emission Rate (EMR), lb/MMBtu (correcting for O_2)

$$EMR = NO_x\ conc.\ dry\ x\ 1.194\,E - 7 \frac{lb/scf}{ppm}\ x\ F\ factor, \frac{dscf}{MMBtu}\ x\ \frac{20.9}{20.9 - \% O_2}$$

where, NO_x conc. dry = measured NO_x conc., dry ppm
1.194 E-7 lb/scf/ppm = constant (see below for calculation)
F factor = defined by client or CFR, scf/MMBtu
Bws = moisture fraction, dimensionless

$$EMR = 7.8\ ppm\ x\ 1.194\,E - 7 \frac{lb/scf}{ppm}\ x\ 8710\ \frac{dscf}{MMBtu}\ x\ \frac{20.9}{20.9\ -\ 14.0} = 0.025\ \frac{lb}{MMBtu}$$

Carbon Monoxide Emission Rate (EMR), lb/hr

$$EMR = \frac{conc.\ x\ MW\ x\ Qs\ \ x\ 60\frac{min}{hr}\ x\ 28.32\frac{L}{dscf}}{24.04\frac{L}{g\text{ - }mole}\ x\ 1.0\ x\ 10^{6}\frac{\mu L}{L}\ x\ 454\frac{g}{lb}}$$

where, conc. = CO conc., ppm (μL/L)
MW = molecular weight of CO, 28.0 g/g-mole
Qs = stack gas flow at std. cond., dscfm

$$EMR = \frac{2.5\ \frac{\mu L}{L}\ x\ 28.0\ \frac{g}{g\text{ - }mole}\ x\ 7.47\ E\ +\ 05\ \frac{dscf}{min}\ x\ 60\frac{min}{hr}\ x\ 28.32\frac{L}{dscf}}{24.04\frac{L}{g\text{ - }mole}\ x\ 1.0\ x\ 10^{6}\frac{\mu L}{L}\ x\ 454\frac{g}{lb}} = 8.1\ lb/hr$$

THC Emission Rate (THC EMR), lb/hr as Carbon

$$THC\ EMR = \frac{THC\ dry\ as\ Methane\ x\ MW\ x\ Qs\ \ x\ 60\frac{min}{hr}\ x\ 28.32\frac{L}{dscf}}{24.04\frac{L}{g\text{ - }mole}\ x\ 1.0\ x\ 10^{6}\frac{\mu L}{L}\ x\ 454\frac{g}{lb}}$$

where, THC dry as CH_4 = THC conc. dry as Methane, ppm (μL/L)
MW = molecular weight of carbon, 12.01 g/g-mole
Qs = stack gas flow at std. cond., dscfm

$$THC\ EMR = \frac{1.09\frac{\mu L}{L}\ x\ 12.01\frac{g}{g\text{ - }mole}\ x\ 7.47\ E+05\frac{dscf}{min}\ x\ 60\frac{min}{hr}\ x\ 28.32\frac{L}{dscf}}{24.04\frac{L}{g\text{ - }mole}\ x\ 1.0\ x\ 10^{6}\frac{\mu L}{L}\ x\ 454\frac{g}{lb}} = 1.53\ lb/hr$$

APPENDIX B
TEST METHODOLOGY

B.1 VOLUMETRIC FLOW RATE

Mass emission rates are calculated by multiplying measured target analyte concentrations by calculated volumetric flow rates. Volumetric flow rates are calculated using client supplied heat input data and fuel-factors from EPA Reference Method 19. The combustion gas volume is corrected for excess air using the measured oxygen concentration as shown below:

$$HI \ x \ F \ x \ \frac{20.9}{20.9 - O_2} \ x \ \frac{1}{60} = dscfm$$

where:
HI = heat input, MMBtu/hr
F = fuel-factor for fired fuel, dscf/MMBtu
O_2 = stack gas oxygen content, %
20.9 = O_2 concentration in ambient air
60 = conversion from hours to minutes

Gas Composition and Moisture Content

The oxygen and carbon dioxide concentration in the gas stream is measured instrumentally in accordance with EPA Reference Method 3A as described in Section B.2 or EPA Reference Method 20 as described in Section B.3.

Where appropriate for THC concentration correction, the moisture content of the gas stream is determined according to EPA Reference Method 4, by collecting an integrated sample of source gas from a single point on the gas stream. At the conclusion of each run the volume of condensed moisture collected in the impingers of the sampling train is measured and used to calculate the moisture content of the gas stream.

The molecular weight of the gas stream is calculated using the measured moisture, oxygen, and carbon dioxide concentrations. The balance of the gas stream is assumed to be nitrogen. The volumetric flow is then calculated at stack and standard conditions using the calculated molecular weight, the measured stack temperature, and measured velocity, stack and barometric pressures. Standard conditions are 68 °F and 29.92 inches of mercury and 0% moisture.

Data Acquisition and Reporting

Data are recorded at the time of collection on preprinted data sheets. Calculations are performed (where possible) with preprogrammed calculators or spreadsheet software.

Quality Control

Quality control procedures for moisture measurements involve leak checks of the sample train; calibration of gas metering systems; and periodic calibration checks of thermocouples and pyrometers.

Data transfers are minimized. Data sheets are checked for completeness and accuracy. Calculations are verified by a second person.

B.2 GAS COMPOSITION (INSTRUMENTAL)

Oxygen (O_2) and carbon dioxide (CO_2) testing is conducted in accordance with EPA Reference Method 3A.

Sampling Equipment and Procedures

Figure B-1 illustrates the sampling system. The sample is withdrawn continuously from the source through a heated probe, filter, and sample line to a sample conditioner, which removes moisture from the gas stream. The sample is then transported to a California Analytical Instruments, Inc. Model 300 analyzer.

Sample Analysis

The O_2 analyzer uses a paramagnetic detector and the CO_2 analyzer uses a non-dispersive infra-red (NDIR) detector to produce an electrical signal, which is linearly proportional to the O_2 and CO_2 concentration, respectively.

Data Acquisition and Reduction

Data is acquired electronically using an IBM compatible computer and software designed by WESTON for EPA Reference Method 3A analysis. This system generates a calibration curve, converts electronic signals into concentrations, and provides one-minute averages during the sample run and an average concentration over the duration of the sample run.

Quality Control

At the time of analysis, O_2 and CO_2 in nitrogen calibration gases certified according to EPA Protocol-1, are used to calibrate the analyzers and to determine a bias correction factor for the entire system bias in accordance with EPA Reference Method 3A. The calibration gases are introduced directly to the analyzer to generate the calibration curve. A zero gas and an upscale calibration gas is introduced at the probe and recovered through the sampling and analytical system. A bias correction factor is calculated using the ratio of the concentration measured from the sampling system and concentration measured directly at the analyzer. Sample run averages are corrected for system bias results.

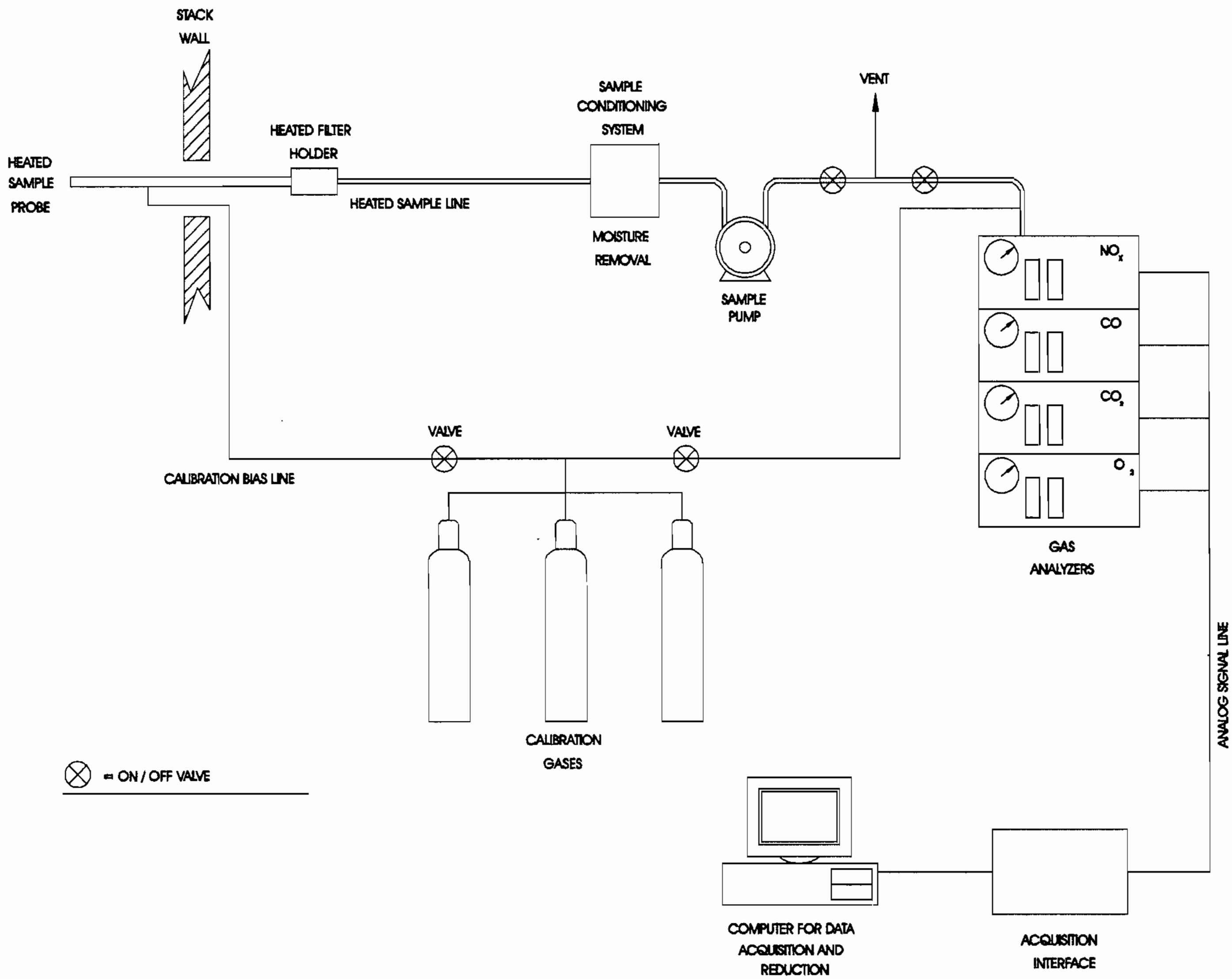

Figure B-1 Continuous Emission Monitoring System

B.3 NITROGEN OXIDES AND OXYGEN (INSTRUMENTAL)

Nitrogen oxides (NO_X) testing is conducted in accordance with EPA Reference Method 20.

Sampling Equipment and Procedures

Figure B-1 illustrates the sampling system. The sample is withdrawn from the source through a heated probe, filter, and sample line to a sample conditioner, which removes moisture from the gas stream. The sample is then being transported through a Teflon® sample line to a California Analytical Instruments, Inc. Model 400CLD NO_X Analyzer and a California Analytical Instruments, Inc. Model 300 paramagnetic oxygen analyzer.

After system calibration and bias determination and prior to initiation of the NO_X emission test, a preliminary O_2 traverse is conducted to determine the appropriate NO_X sample points. Up to 48 traverse points are selected according to the procedures of EPA Reference Method 1 for the O_2 traverse. The sampling system response time is determined by injecting NO_X and/or O_2 calibration gases to the probe and measuring the time required for the analytical measurement system to measure 95% of the expected step change from source gas concentration to calibration gas or zero gas concentration. The O_2 concentration is determined at each of the traverse points for a minimum of one (1) minute, plus the sample system response time.

To conduct the NO_X sample run, a minimum of eight sample points of the lowest O_2 concentration, as determined during the O_2 traverse, are selected for determination of NOx concentration. The sample run consists of a minimum of one (1) minute of data, plus the sample system response time, collected at each of the eight sample points.

Analytical Principal

The NO_X analyzer uses an oxidizing converter to produce nitric oxide (NO) molecules. A chemiluminescent reaction of NO and ozone is then used to produce nitrogen dioxide (NO_2), oxygen (O_2), and ultraviolet light. This ultraviolet light is measured using a highly sensitive optical filter/photomultiplier whose output is linearly proportional to the NO concentration.

The O_2 analyzer uses a paramagnetic sensor to determine O_2 molecular concentration and produces an output that is linearly proportional to the O_2 concentration.

Data Acquisition and Reduction

Data are acquired electronically using an IBM compatible computer and software designed by WESTON for EPA Reference Method 20 analysis. This system generates a calibration curve, converts electronic signals into concentrations, and provides bias-corrected hourly averages.

Quality Control

Prior to sampling, NO in nitrogen and O_2 in nitrogen calibration gases, certified according to EPA Protocol-1, are used to calibrate the analyzers and to determine a bias correction factor for the entire system. Calibration and system response is performed in accordance with EPA Reference Method 20.

The zero and mid-range NO_X calibration gases are introduced directly to the NO_X analyzer to generate the calibration curve. The low- and high-range NO_X calibration gases are then introduced to determine calibration error, which should be <2%. The zero and one calibration gas are introduced at the probe and recovered through the sampling and analytical system. A bias correction factor is calculated using the ratio of the measured concentration of the bias gas and concentration certified by the vendor. An interference response study was performed by the manufacturer of the analyzer. The data from this study are on file at WESTON.

An NO_2 to NO conversion efficiency test is performed on site in accordance with the procedure described in EPA Reference Method 20. The results from this study should indicate that the NO_2 to NO conversion efficiency is greater than 98%.

B.4 VISIBLE EMISSION (STACK OPACITY)

The opacity of emissions from stationary sources is determined visually by a qualified observer using EPA Reference Method 9.

Sampling and Analytical Objectives

- The observer will stand at a distance to provide a clear view of the emissions with the sun oriented in the 140° sector to his/her back.
- Observers' line of vision should be perpendicular to the plume direction.
- Line of sight should not include more than one plume.
- Observer to record all pertinent atmospheric conditions and pertinent client information.
- Opacity observations are made at the point of greatest opacity of the plume and at a point without condensed water vapor.
- For attached steam plumes the observations are made at a point where condensed water vapor can no longer be seen.
- For detached steam plumes, when the water vapor condenses and becomes visible at a distinct distance from the emission outlet, the plume is evaluated at the emission outlet.
- Each run is calculated as the average of 60 minutes of observations recorded at 15 second intervals.

Potential Problems and Limitations

- Luminescence and color contrast between the plume and the background against which the plume is viewed may exert an influence upon the appearance of a plume.
- For a strong contrast there may be a positive influence upon the observer.

B.5 CARBON MONOXIDE

Carbon monoxide testing is conducted in accordance with EPA Reference Method 10.

Sampling Equipment and Procedures

Figure B-1 illustrates the sampling system. Sampling is performed by continuous sample extraction and analysis withdrawn from the stack through a conditioning system for moisture removal, using a leak-tight sample pump. The dry gas sample is then transported through sample lines to a ThermoEnvrionmental Corporation (TECO) Model 48 Non-Dispersive Infrared (NDIR) CO analyzer for continuous on-line monitoring.

Sample Analysis

The analyzer uses gas filter correlation spectroscopy to measure the amount of CO present in the sample. Infrared radiation is chopped and passed through an alternating CO and N_2 correlation filter wheel and the sample stream. Carbon monoxide in the sample absorbs the infrared radiation, leaving the remaining radiation to be measured by a detector producing a linear output signal.

Data Acquisition and Reduction

Data are acquired electronically using an IBM compatible computer and software designed by WESTON for EPA Reference Method 10 analysis or alternatively the analyzer analog signal is recorded using a strip-chart recorder.

For data collection using a computer and acquisition interface, the software generates a calibration curve and continuous calculation of sample concentration. All subsequent calculation procedures required for compliance with EPA Reference Method 10 are performed electronically.

For data collection using a strip chart recorder, the calibration curve and subsequent calibration procedures are performed manually or by using pre-programmed calculators.

Quality Control

At the time of analysis, CO in nitrogen calibration gases, of at certified ($\pm$5%) or EPA Protocol-1 quality, are used to calibrate the analysis system. Calibration is performed in accordance with EPA Reference Method 10. Following each sample run, calibration gases are introduced to the sampling system to determine calibration drift.

A CO_2 interference response study was performed by the manufacturer of the analyzer. The data from this study are on file at WESTON.

B.6 VOLATILE ORGANIC COMPOUND CONCENTRATION

Volatile organic compound (VOC) concentrations are sampled according to EPA Reference Method 25A as total hydrocarbons (THC) and analyzed by WESTON on site with a flame ionization detector (FID) analyzer. It should be noted that Method 25A determines total organics, including methane, which is not a regulated volatile organic compound (VOC). In cases where significant levels of THC (at or near the permit limit) are determined, integrated bag samples of source gas may be collected for analysis for methane, which will be subtracted from the THC concentration.

Sampling Equipment and Procedures

Figure B-2 is a schematic of the EPA Reference Method 25A sampling system. Sample gas is withdrawn continuously from a single point and transported to the FID through a heated probe and heated Teflon® sample line to a J.U.M. Model VE-7 total hydrocarbon analyzer. All hydrocarbon measurements are made on a "hot, wet" basis and concentration results are determined as parts per million of carbon by volume, on a wet basis (ppmvw) .

Sample Analysis

The analyzer utilizes a FID as described by EPA Reference Method 25A. The technique is not selective between species, and the results are reported as carbon volume equivalents of the calibration gas.

Prior to each test, the sampling and analytical system are calibrated using two calibration gases (zero and 80 to 90 percent of span). This step is followed by a calibration error check utilizing two additional calibration gases at approximately 25 and 45 percent of the span value. The acceptance criterion for the calibration error check is less than 5% the certified gas value.

Data Acquisition and Reduction

Data is acquired electronically using an IBM compatible computer and software designed by WESTON for EPA Reference Method 25A analysis.

Quality Control

The calibration gases are either methane or propane, in either air or nitrogen, certified according to EPA Protocol-1. Following each sample run, the sampling system calibration drift is determined by introducing the zero gas and one upscale gas to the sampling system. The response is recorded and the difference in concentration must be within three percent of the full scale span value.

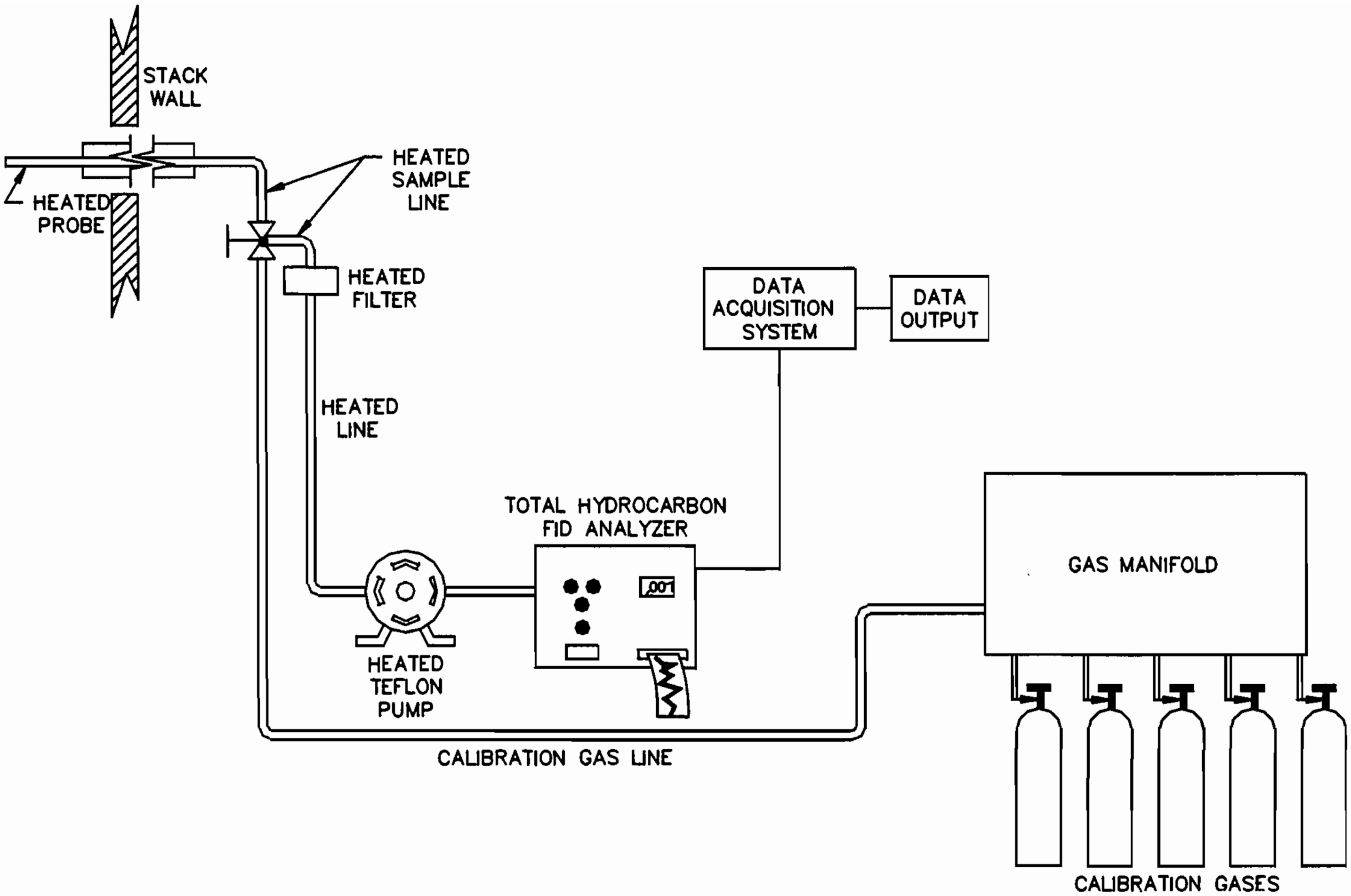

Figure B-2 EPA Reference Method 25A Sampling Train

ATTACHMENT OPP-EU1-J6

PROCEDURES FOR STARTUP/SHUTDOWN

This attachment provides a general description of the startup and shutdown procedures as recommended by General Electric. Actual operation will depend on operating conditions as determined by the facility.

ATTACHMENT OPP-EU1-J6

PROCEDURES FOR STARTUP/SHUTDOWN

START-UP

1. General

Operation of a single turbine/generator unit may be accomplished either locally or remotely.

The following description lists operator, control system and machine actions or events in starting the gas turbine.

Reference the section "Description of Panels and Terms — Turbine Control Panel" for description of turbine panel devices. The following assumes that the unit is off of cooldown, and in a ready to start condition.

2. Starting Procedure

a. Using the cursor positioning device, select "MAIN" display from the DEMAND DISPLAY menu.

(1) The display will indicate speed, temperature, various conditions etc. Three lines displayed on the <I> /HMI will read:

SHUTDOWN STATUS
OFF COOLDOWN
OFF

b. Select "AUTO" and "EXECUTE"

(1) The <I>/HMI display will change to:

STARTUP STATUS
READY TO START
AUTO

c. Select "START" and "EXECUTE"

(1) Unit auxiliaries will be started including a motor driven lube oil pump used to establish lube oil pressure. The <I>/HMI message SEQ IN PROGRESS will appear.

(2) When permissives are satisfied, the master protective logic (L4) will be satisfied. The <I>/HMI display will change to:

STARTUP STATUS
STARTING
AUTO; START

(3) The turbine shaft will begin to rotate on turning gear. The zero speed signal "14HR" will be displayed. When the unit reaches approximately 6 rpm, the

starting device will be energized and accelerate the unit. The <I> /HMI display will change to STARTUP STATUS/CRANKING.

(4) When the unit reaches approximately 15% speed, the minimum speed signal "14HM" will be displayed on the <I>/HMI. (For machines with cooling water fan motors receiving power from the generator terminals via the UCAT transformer, field flashing will be initiated to build up generator voltage to power the fans; otherwise, field flashing to build up generator voltage will occur at operating speed.)

(5) If the unit configuration requires purging of the gas path prior to ignition, the starting device will crank the gas turbine at purge speed for a period of time determined by the setting of the purge timer. See Control Specifications-Settings Drawing for purge timer settings.

(6) FSR will be set to firing value. (FSR, Fuel Stroke Reference, is the electrical signal that determines the amount of fuel delivered to the turbine combustion system.) Ignition sequence is initiated. The <I>/HMI display will change to START UP STATUS/FIRING.

(7) When flame is established, the <I>/HMI display will indicate flame in those combustors equipped with flame detectors.

(8) FSR is set back to warm-up value, and the <I> /HMI display will indicate STARTUP STATUS/WARMING UP. If the flame goes out during the 60 second firing period, FSR will be reset to firing value. (At the end of the ignition period, if flame has not been established, the unit will remain at firing speed. Refer to operation 8 in the Special Operations section for specific operating instructions for DLN 2.0 and DLN 2.6 configured machines.) At this time the operator may shut the unit down or attempt to fire again. To fire again select CRANK on the Main Display. The purge timer and firing timer are reinitialized. The purge timer will begin to time. Reselecting AUTO will cause the ignition sequence to repeat itself after the purge timer has timed out. If the unit is being operated remotely and multiple starts capability exists (REMOTE having previously been selected on the Main Display), and no fire has been established at the end of the ignition period, the unit will be purged of unburned fuel. At the end of the purge period ignition will be attempted again. If flame is not established at this time, the starting sequence will be terminated and the unit will shutdown.

At the end of the warmup period, with flame established, FSR will begin increasing. The <I>/HMI will indicate STARTUP STATUS/ ACCELERATING and the turbine will increase in speed. At approximately 50% speed, the accelerating speed signal "14HA" will be displayed on the <I> /HMI.

(9) The turbine will continue to accelerate. When it reaches 85–90% speed, the starting device will disengage and shutdown. The <I>/HMI will indicate the change in status from STARTUP CONTROL to SPEED CONTROL at approximately 60% speed.

(10) When the turbine reaches operating speed, the operating speed signal "14HS" will be displayed on the <I>/HMI. Field flashing is terminated. If the synchronizing selector switch (43S) on the generator control panel is in the OFF position and REMOTE is not selected on the <I>/HMI, as the turbine reaches operating speed, <I> /HMI will now read:

RUN STATUS
FULL SPEED NO LOAD
AUTO; START

If the synchronizing selector switch on the generator panel is in the AUTO position or REMOTE is selected on the <I>/HMI automatic synchronizing is initiated. The <I>/HMI will read SYNCHRONIZING.

The turbine speed is matched to the system (to less than 1/3 Hz difference) and when the proper phase relationship is achieved the generator breaker will close. The machine will load to Spinning Reserve unless a load control point BASE, PEAK or PRESELECTED LOAD has been selected.

The <I>/HMI will display SPINNING RESERVE, once the unit has reached this load point.

Synchronizing
When a gas turbine-driven synchronous generator is connected into a power transmission system, the phase angle of the generator going on-line must correspond to the phase angle of the existing line voltage at the moment of its introduction into the system. This is called synchronizing.

CAUTION: Before initiating synchronization procedures, be sure that all synchronization equipment is functioning properly, and that the phase sequence of the incoming unit corresponds to the existing line phase sequence and the potential transformers are connected correctly to proper phases. Initial synchronization and checkout after performing maintenance to synchronizing equipment should be performed with the breaker racked out.

NOTE: Synchronizing cannot take place unless AUTO or REMOTE has been selected on the <I>/HMI Main Display and the turbine has reached full speed.

Generator synchronization can be accomplished either automatically or manually. Manual synchronization is accomplished by the following procedure:

1. Place the synchronizing selector switch on the generator panel (43S) in the MANUAL position.
2. Select AUTO on the <I>/HMI Main Display.
3. Select START and EXECUTE on the <I>/HMI Main Display. This will start the turbine and accelerate it to full speed as previously described. At this point the CRT will indicate RUN STATUS, FULL SPEED NO LOAD.
4. Compare the generator voltage with the line voltage. (These voltmeters are located on the generator control panel.)
5. Make any necessary voltage adjustment by operating the RAISE- LOWER (90R4) switch on the generator panel until the generator voltage equals the line voltage.
6. Compare the generator and line frequency on the synchroscope (located on the generator control panel). If the pointer is rotating counterclockwise, the generator frequency is lower than the line frequency and should be raised by increasing the turbine-generator speed. The

brightness of the synchronizing lights will change with the rotation of the synchroscope. When the lights are their dullest the synchroscope will be at the 12 o'clock position. The lights should not be used to synchronize but only to verify proper operation of the synchroscope.

7. Adjust the speed until the synchroscope rotates clockwise at approximately five seconds per revolution or slower.
8. The generator circuit breaker "close" signal should be given when it reaches a point approximately one minute before the 12 o'clock position. This allows for a time lag for the breaker contacts to close after receiving the close signal.

Automatic synchronization is accomplished by the following steps:

1. Place the synchronizing selector switch (43S) in the AUTO position.
2. Select AUTO on the <I>/HMI Main Display.
3. Select START on the <I>/HMI Main Display.

This procedure will start the turbine, and upon attainment of "complete sequence", match generator voltage to line voltage (if equipped with optional voltage matching), synchronize the generator to the line frequency, and load the generator to the preselected value. A "breaker closed" indicator will actuate when the generator circuit breaker has closed placing the synchronized unit on-line.

Once the generator has been connected to the power system, the turbine fuel flow may be increased to pick up load, and the generator excitation may be adjusted to obtain the desired KVAR value.

WARNING: Failure to synchronize properly may result in equipment damage and/or failure, or the creation of circumstances which could result in the automatic removal of generating capacity from the power system.

In those cases where out-of-phase breaker closures are not so serious as to cause immediate equipment failure or system disruption, cumulative damage may result to the on-coming generator. Repeated occurrences of out-of-phase breaker closures can eventually result in generator failure because of the stresses created at the time of closure.

Out-of-phase breaker closure of a magnitude sufficient to cause either immediate or cumulative equipment damage mentioned above will usually result in annunciator drops to notify the operator of the problem. The following alarms have been displayed at various occurrences of known generator breaker malclosures:

1. High vibration trip
2. Loss of excitation
3. Various AC undervoltage drops

Out-of-phase breaker closure will result in abnormal generator noise and vibration at the time of closure. If there is reason to suspect such breaker malclosure, the equipment should be immediately inspected to determine the cause of the malclosure and for any damage to the generator.

Refer to the "Control and Protection" section of this volume for additional information on the synchronizing system.

SHUTDOWN AND COOLDOWN

1. Normal Shutdown

Normal shutdown is initiated by selecting STOP on the <I>/HMI Main Display. The shutdown procedure will follow automatically through generator unloading, turbine speed reduction, fuel shutoff at part speed and initiation of the cooldown sequence as the unit comes to rest.

2. Emergency Shutdown

Emergency shutdown is initiated by depressing the EMERGENCY STOP pushbutton. Cooldown operation after emergency shutdown is also automatic provided the permissives for this operation are met.

3. Cooldown

Immediately following a shutdown, after the turbine has been in the fired mode, the rotor is turned to provide uniform cooling. Uniform cooling of the turbine rotor prevents rotor bowing, resultant rubbing and imbalance, and related damage that might otherwise occur when subsequent starts are attempted without cooldown. The turbine can be started and loaded at any time during the cooldown cycle.

The cooldown cycle may be accelerated using the starting device; in which case it will be operated at cranking speed.

A rotor turning device is provided for cooldown rotation. A description of rotor turning operation and servicing can be found in the Starting System tab.

The minimum time required for turbine cooldown depends mainly on the turbine ambient temperature. Other factors, such as wind direction and velocity in outdoor installations and air drafts in indoor installations, can have an affect on the time required for cooldown. The cooldown times recommended in the following paragraphs are the result of General Electric Company operating experience in both factory and field testing of General Electric gas turbines. The purchaser may find that these times can be modified as experience is gained in operation of the gas turbine under his particular site conditions.

Cooldown times should not be accelerated by opening up the turbine compartment doors or the lagging panels since uneven cooling of the outer casings may result in excessive stress.

The unit must be on rotor turning operation immediately following a shutdown for at least 24 hours to ensure minimum protection against rubs and unbalance on a subsequent starting attempt. The General Electric Company, however, recommends that the rotor turning operation continue for 48 hours after shutdown to ensure uniform rotor cooling.

ATTACHMENT OPP-EU1-J7

OPERATION AND MAINTENANCE PLAN

FUEL GAS SYSTEM & LIQUID FUEL SYSTEM

ATTACHMENT OPP-EU1-J7

OPERATION AND MAINTENANCE PLAN: FUEL GAS SYSTEM

This attachment provides a general description of operation and maintenance procedures as recommended by General Electric. Actual operation will depend on operating conditions as determined by the facility.

GENERAL

The dry low NO_x 2.6 (DLN-2.6) control system regulates the distribution of fuel delivered to a multi-nozzle, total premix combustor arrangement. The fuel flow distribution to each combustion chamber fuel nozzle assembly is calculated to maintain unit load and fuel split for optimal turbine emissions.

GAS FUEL SYSTEM

The DLN 2.6 Combustion system consists of six fuel nozzles per combustion can, each operating us a fully premixed combustor, five located radially, one located in the center. The center nozzle, identified as PM 1, (PreMix 1), two outer nozzles located adjacent to the crossfire tubes, identified as PM2, (PreMix 2), and the remaining three outer nozzles, identified as PM3, (PreMix 3). Another fuel passage, located in the airflow upstream of the premix nozzles, circurnferentially around the combustion can, is identified as the quaternary fuel pegs, The fuel flow to the six fuel nozzles and quaternary pegs are controlled by four independent control valves, each controlling flow split and unit load. The gas fuel system consists of the gas fuel stop/ratio valve, gas control valve one, (PM1), gas control valve two (PM2), gas control valve three, (PM3), and gas control valve four, (Quat). The stop/ratio valve (SRV) is designed to maintain a predetermined pressure, (P2), at the inlet of the gas control valves. Gas control valves one through four, (GCVI-4), regulate the desired gas fuel flow delivered to the turbine in response to the command signal FSR, (Fuel Stroke Reference), from the SPEEDTRONIC panel. The DLN 2.6 control system is designed to ratio FSR into a Flow Control Reference. This flow control philosophy is performed in a cascading routine, scheduling a percentage flow reference for a particular valve, and driving the remainder of the percentage to the next valve reference parenthetically downstream in the control software. The stop ratio valve and gas control valves are monitored for their ability to track the command setpoint. If the valve command setpoint differs from the actual valve position by a prescribed amount for a period of time, an alarm will annunciate to Warn the operator. If the condition persists for an extended amount of time, the turbine will be tripped and another alarm will annunciate the trip.

CHAMBER ARRANGEMENT

The 7F machine employs 14 combustors while the 9F employs 18 similar but slightly larger combustors. For each machine there are two spark plugs and four flame detectors in selected chambers with crossfire tubes connecting adjacent combustors. Each combustor consists of a six nozzle/endcover assembly, forward and aft combustion casings, flow sleeve assembly, multi-nozzle cap assembly, liner assembly, and transition piece assembly. A quaternary nozzle arrangement penetrates the circumference of the combustion can, porting fuel to casing injection pegs located radially around the casing.

ATTACHMENT OPP-EU1-J7

OPERATION AND MAINTENANCE PLAN: LIQUID FUEL SYSTEM

This attachment provides a general description of operation and maintenance procedures as recommended by General Electric. Actual operation will depend on operating conditions as determined by the facility.

GENERAL

The liquid fuel (distillate oil) system filters, pressurizes, controls, and equally distributes fuel flow to the fourteen turbine combustion chambers. Flow is regulated by controlling the position of 3-way valve VC3-1. The entire liquid fuel system must be pressurized, with all valves in the open position, before starting the gas turbine. The liquid fuel system should be operated for a minimum of one half hour every week to prevent binding of the components. This is best achieved by operation of the turbine on liquid fuel for a minimum of one half hour per week with either 100% fuel oil or fuel gas mixed mode with fuel oil. The fuel system is comprised of the following major components:

1. Duplex low-pressure fuel filter FF1-l, -2 with transfer valve VM5-l and thermal pressure relief valves VR41-1, -2.
2. Fuel pump PF1-l with driving motor 88FP-1 and motor heater 23FP-l and discharge pressure relief valve VR4-1.
3. Fuel flow control valve VC3-1.
4. Fuel stop valve VS1-1.
5. Fuel flow divider FD1-1.
6. Nozzle pressure selector valve VH17-l.
7. Check valves VCKI-l through 14.
8. Fuel nozzle assemblies.

Except for the check valves and fuel nozzles all components are mounted in the off-base liquid, fuel/atomizing air module.

FUNCTIONAL DESCRIPTION

Duplex Low-Pressure Fuel Filter

Fuel oil forwarded to the liquid fuel module within specified pressure and temperature ranges enters the low pressure filter FF1-l or FFI-2 via transfer valve VM5-1 prior to entering the fuel pumps. The low-pressure filter consists of multiple five-micron synthetic elements with oversize contamination capacity. These elements retain contaminants, which could damage downstream components. The filter vessels are protected from thermal overpressure by relief valves VR41-1, -2. Differential pressure switch 63LF-5 gives a signal when the pressure drop across the filter reaches 15 psid (103 kPad). The ditty filter should then be serviced by replacing the dirty elements with clean ones.

Fuel Pump

Fuel pump PFI-1 is of the axial flow, positive displacement, rotary, screw type with one power rotor (driven screw) and two intermeshing idler rotors. The single ball bearing positions the power rotor for proper operation of the mechanical seal. The bearing is permanently "'grease packed and external to the pumped fuel. The motor driven fuel pump 88FP/PFI-1 is rated at one hundred percent capacity of the maximum turbine fuel requirement. The pump motor is equipped with an integral heater 23FP-l. The pump is protected from insufficient suction pressure by permissive-to-start pressure switch 63FL.2. During normal operation this switch functions as a low-pressure alarm. The fuel system is protected from excessive pressure by pump discharge relief valve VR4-1 that relieves pressure back to filter inlet.

Fuel Flow Control Valve

Pump discharge flow is modulated by the servocontrolled three-way control valve assembly VC3-1. Components of this assembly include the valve body, electrohydraulic servovalve 65FP-1, hydraulic oil filter FH3-1 and the cylinder. The valve controls the flow to the turbine by throttling the main port while opening the bypass port, returning the bypass flow to pump suction.

Liquid Fuel Stop Valve

Hydraulically operated three-way fuel oil stop valve VS1-1 shuts off the supply of fuel to the turbine during normal or emergency shutdowns. During normal turbine operation, the valve is held open (bypass closed) by high-pressure hydraulic oil that passes through a hydraulic trip relay (dump) valve VH4-1. This dump valve, located between the hydraulic supply and the stop valve hydraulic cylinder, is hydraulically operated by trip oil acting through solenoid valve 20FL-l. During a normal shutdown or emergency trip, low trip oil pressure will cause valve VH4-1 to shift position, dumping high-pressure hydraulic oil from the stop valve actuating cylinder, allowing the stop valve spring to close the valve. During an electrical trip, solenoid valve 20FL-l causes the dump valve to shift with the same results as above. The stop valve will be fully closed within 0.5 second of the trip signal. Limit switch 33FL-l signals stop valve closed position.

Flow Divider

Flow divider FD1-1 equally distributes filtered fuel to the 14 combustors. It is a continuous flow, free wheeling device consisting of fourteen gear pump elements in a circular or linear arrangement having a common inlet with a single timing gear or shaft. This timing (sun) gear or shaft maintains the speed of each flow element synchronous with all the other elements.

The speed of each flow divider gear element is directly proportional to the total flow through the flow divider. Magnetic pickup assemblies 77FD-l, -2 and -3, fitted to the flow divider, produce a flow feedback signal at a frequency proportional to the fuel delivered to the combustion chambers. This signal is fed to the SPEEDTRONIC control panel where it is used in the fuel control system.

Pressure Selector Valve

An eighteen position pressure selector valve VH17-l allows monitoring of individually selected line pressures on a local gauge. These include: anyone of the fourteen combustor fuel lines; pump discharge pressure; and flow divider inlet pressure.

Check Valves

Check valves VCKI-l through 14 isolate the fuel nozzles during shutdown periods to prevent line drainage and flow communication between combustors.

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REV	DESCRIPTION	DATE	APPROVED
A	UPDATED NOTE 13 & ADDED NOTE 19. (C084251) CIAT/A.HERNANDEZ	01-08-20	VH

REVISE ON CAD ONLY
UG PART: 118E2775P001

NOTE(S):

1. SEE DEVICE SUMMARY (ML1 0414) FOR CONTROL DEVICE SETTINGS.
2. MAX. VELOCITY: 12 FPS (40 MPS)
MAX. ΔP TO TURBINE PC: 15 PSI (1.06 KG/CM2)
3. THIS PC MUST BE CONNECTED TO AN UNPRESSURIZED VESSEL AND MUST REMAIN OPEN.
4. VALVE IN THE CROSSOVER FILL LINE MUST BE OPEN TO EQUALIZE THE PRESSURE IN BOTH FILTERS PRIOR TO OPERATING THE FILTER TRANSFER VALVE.
5. VALVE MANIFOLD ASSEMBLIES MOUNTED ON INSTRUMENT PANEL WITH RELATED SWITCH AND GAUGE.
6. FLOW DIVIDER TO BE ORIENTATED TO INCLUDE HIGH POINT AIR VENT AND LOW POINT WATER SUMP.
7. PURGE AIR TO GO THROUGH RUN OF TEE. LIQUID FUEL TO GO THROUGH BRANCH OF TEE.
8. LIQUID FUEL LEAK TEST AND BLOWDOWN PROCEDURE PER GE DRAWING 381A5550
9. AIR VENTING PROCEDURE FOR THE LIQUID FUEL SYSTEM PER GE DRAWING 360A6343.
10. LIQUID FUEL SPECIFICATION GEI-41047H, LIGHT DISTILLATE:
SPECIFIC GRAVITY: .82-.85
VISCOSITY: 32-58 SSU (1.8-10 CST)
11. CUSTOMER TO PROVIDE ISOLATION VALVE IN INTERCONNECTING PIPING TO LF1 LIQUID FUEL SUPPLY. LOCATE VALVE IN OPEN AREA NEAR MODULE FOR FIRE FIGHTER USE.
12. MODULE SPILL DRAIN. CUSTOMER TO PROVIDE TRAP AND ISOLATION VALVE TO UNPRESSURIZED VESSEL.
13. THE OIL RELEASED FROM THIS DRAIN MAY BE AS HOT AS 180°F (82°C) IN ADDITION, AIR AS HOT AS 250°F (121°C) MAY ALSO BE RELEASED.
14. ACCORDANCE WITH ANSI B133.4 3.1.1 (GT CONTROL & PROTECTION SYSTEM) AND API 616 5.4.4.3 (ALARMS & SHUTDOWNS) API 616 5.8.1.4.1 (LIQUID FUEL SYSTEM) STANDARDS, A FUEL FORWARDING STOP VALVE (20FD-1) SHALL BE PROVIDED TO MEET THE "AFTER SHUTDOWN REDUNDANT POSITIVE SHUTOFF VALVES" REQUIREMENT IN CONCERT WITH THE FAST ACTING STOP VALVE (VS1-1). THE VS1-1 MEETS THE REQUIREMENT "TO STOP VALVE FLOW TO THE TURBINE ON ANY SHUTDOWN CONDITION". THE CONTROL VALVE (VC3-1) IN CONJUCTION WITH THE STOP VALVE (VS1-1) MEETS THE REQUIREMENT "IN ADDITION TO THE FUEL GOVERNOR VALVE, THE FUEL CONTROL SYSTEM SHALL INCLUDE A SEPARATE STOP VALVE".
15. THE FUEL FOWARDING 20FD-1 SOLENOID VALVE MUST BE LOCATED UPSTREAM OF CONNECTION LF1 IN AN INDEPENDENT FIRE ZONE FROM THE VS1-1 VALVE.
16. SITE FLUSH THE LIQUID FUEL SYSTEM IN ACCORDANCE WITH GE DRAWING 586A1072.
17. REFERENCE TO TIL-1107-3 "OPERATIONAL RELIABILITY ON OIL FUEL IN DUEL FUEL GAS/LIQUID TURBINES. "THE LIQUID FUEL SYSTEM SHOULD BE OPERATED AT A MINIMUM OF ONE-HALF HOUR EVERY WEEK TO PREVENT POSSIBLE BINDING OF COMPONENTS. MIXED MODE GAS/LIQUID GAS TURBINE OPERATION IS ALLOWED.
18. INTERSEAL DRAIN TUBING PER VALVE MANUFACTURES REQUIREMENTS AS NEEDED.
19. SUPPLY PRESSURE: 75 PSIG (5.27 KG/CM2) MAX
35 PSIG (2.46 KG/CM2) MIN
AT A FLOW RATE OF 6 TO 280 GPM (23 TO 1060 LPM) WITH PRESSURE OSCILLATION NOT TO EXCEED 10 PSIG IN 10 SECONDS AT STARTUP AND 9 PSIG PER MINUTE AFTER IGNITION.

INTERFACE POINT NAME	DWG ZONE/ SHT NO.	FLUID TYPE	NORMAL PRESSURE PSIG (KG/CM2)	NORMAL TEMPERATURE °F (°C)	NORMAL FLOW GPM (LPM)	MAXIMUM PRESSURE PSIG (KG/CM2)	MAXIMUM TEMPERATURE °F (°C)	MAXIMUM FLOW GPM (LPM)	CONNECTION DESCRIPTION	INTERFACE TYPE
LF1	F-8, SH-2	DISTILLATE	35 (2.46)-75 (5.27)	70 (20.9)	6-280 (23-1060)	150 (10.55)	122 (49.5)	200 (1060)	LIQUID FUEL SUPPLY SEE NOTE 11	OTHERS-GEPGE
LF9	D-8, SH-2	DISTILLATE	0 (0)	70 (20.9)	0 (0)	150 (10.55)	122 (49.5)	5 (19)	LIQUID FUEL DRAIN SEE NOTE 3	GEPGE-OTHERS
LF17	C-5, SH-3	DISTILLATE	0 (0)	70 (20.9)	———	150 (10.55)	180 (82) OIL 250 (120) AIR	.5 (1.89)	LIQUID FUEL DRAIN SEE NOTE 13	GEPGE-OTHERS
LF53	B-6, SH-2	SPILLS	———	———	———	———	———	———	MODULE DRAIN SEE NOTE 12	GEPGE-OTHERS
LFO-1	F-1, SH-2	DISTILLATE	1000 (70.3)	70 (20.9)	20 (76)	1200 (84.36)	122 (49.5)	20 (76)	TO LIQUID FUEL NOZZLES SEE NOTE 2	GEPGE-GEPGE
LFO-2	F-1, SH-2	DISTILLATE	1000 (70.3)	70 (20.9)	20 (76)	1200 (84.36)	122 (49.5)	20 (76)	TO LIQUID FUEL NOZZLES SEE NOTE 2	GEPGE-GEPGE
LFO-3	F-1, SH-2	DISTILLATE	1000 (70.3)	70 (20.9)	20 (76)	1200 (84.36)	122 (49.5)	20 (76)	TO LIQUID FUEL NOZZLES SEE NOTE 2	GEPGE-GEPGE
LFO-4	E-1, SH-2	DISTILLATE	1000 (70.3)	70 (20.9)	20 (76)	1200 (84.36)	122 (49.5)	20 (76)	TO LIQUID FUEL NOZZLES SEE NOTE 2	GEPGE-GEPGE
LFO-5	E-1, SH-2	DISTILLATE	1000 (70.3)	70 (20.9)	20 (76)	1200 (84.36)	122 (49.5)	20 (76)	TO LIQUID FUEL NOZZLES SEE NOTE 2	GEPGE-GEPGE
LFO-6	E-1, SH-2	DISTILLATE	1000 (70.3)	70 (20.9)	20 (76)	1200 (84.36)	122 (49.5)	20 (76)	TO LIQUID FUEL NOZZLES SEE NOTE 2	GEPGE-GEPGE
LFO-7	E-1, SH-2	DISTILLATE	1000 (70.3)	70 (20.9)	20 (76)	1200 (84.36)	122 (49.5)	20 (76)	TO LIQUID FUEL NOZZLES SEE NOTE 2	GEPGE-GEPGE
LFO-8	E-1, SH-2	DISTILLATE	1000 (70.3)	70 (20.9)	20 (76)	1200 (84.36)	122 (49.5)	20 (76)	TO LIQUID FUEL NOZZLES SEE NOTE 2	GEPGE-GEPGE
LFO-9	E-1, SH-2	DISTILLATE	1000 (70.3)	70 (20.9)	20 (76)	1200 (84.36)	122 (49.5)	20 (76)	TO LIQUID FUEL NOZZLES SEE NOTE 2	GEPGE-GEPGE
LFO-10	E-1, SH-2	DISTILLATE	1000 (70.3)	70 (20.9)	20 (76)	1200 (84.36)	122 (49.5)	20 (76)	TO LIQUID FUEL NOZZLES SEE NOTE 2	GEPGE-GEPGE
LFO-11	E-1, SH-2	DISTILLATE	1000 (70.3)	70 (20.9)	20 (76)	1200 (84.36)	122 (49.5)	20 (76)	TO LIQUID FUEL NOZZLES SEE NOTE 2	GEPGE-GEPGE
LFO-12	E-2, SH-2	DISTILLATE	1000 (70.3)	70 (20.9)	20 (76)	1200 (84.36)	122 (49.5)	20 (76)	TO LIQUID FUEL NOZZLES SEE NOTE 2	GEPGE-GEPGE
LFO-13	E-1, SH-2	DISTILLATE	1000 (70.3)	70 (20.9)	20 (76)	1200 (84.36)	122 (49.5)	20 (76)	TO LIQUID FUEL NOZZLES SEE NOTE 2	GEPGE-GEPGE
LFO-14	E-1, SH-2	DISTILLATE	1000 (70.3)	70 (20.9)	20 (76)	1200 (84.36)	122 (49.5)	20 (76)	TO LIQUID FUEL NOZZLES SEE NOTE 2	GEPGE-GEPGE

THIRD ANGLE PROJECTION

APPLIED PRACTICES 34DA9200

GE Power Generation

DIAG, SCHEM PP-LIQUID FUEL

FIRST MADE FOR ML-7A1(FA203-1,2 0424

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SCALE NONE | SHEET 1

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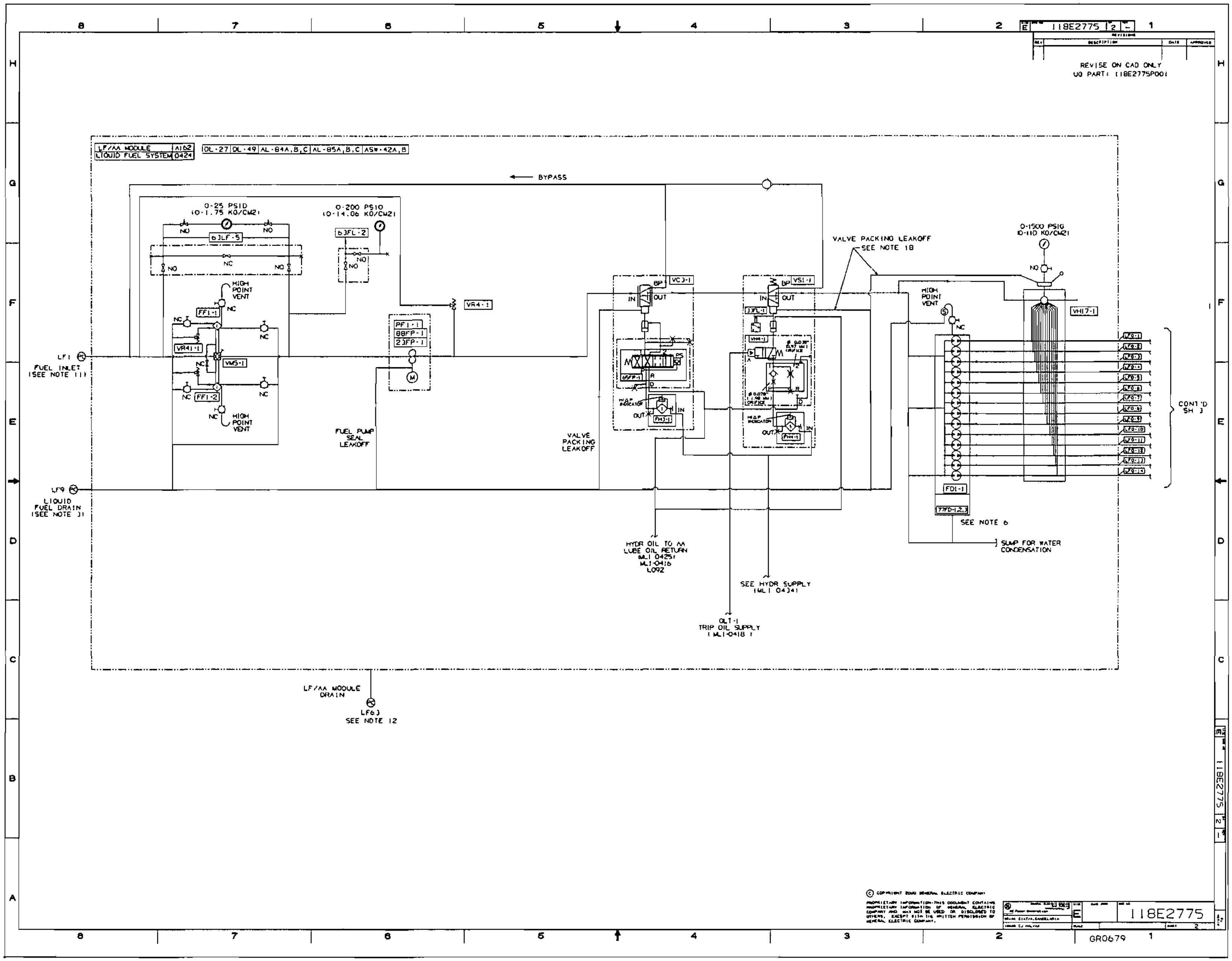

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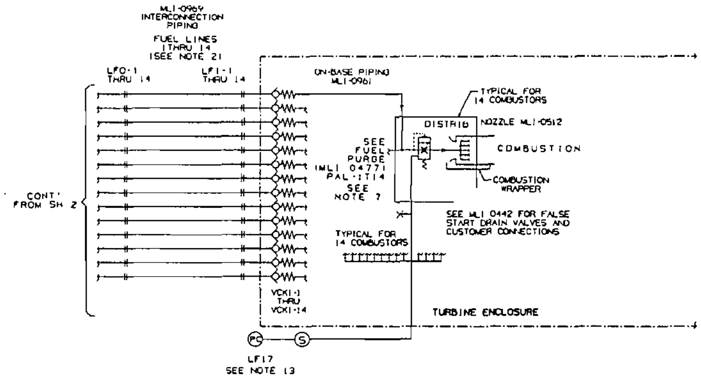
UG PART: 118E2775P001



GE Power Generation

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ATTACHMENT OPP-EU1-J14

COMPLIANCE ASSURANCE MONITORING PLAN

ATTACHMENT OPP-EU1-J14

COMPLIANCE ASSURANCE MONITORING PLAN

The only control device as defined in 40 CFR Part 64 for the CT is water injection for NO_x control.

The applicable compliance method for NO_x when firing oil is a CEM, a continuous emission compliance determination method. Pursuant to Section 64.2(b)(vi), the requirements of CAM are not applicable when the Title V permit contains the conditions from PSD-FL-258. A CAM plan is therefore not required for the project.

ATTACHMENT OPP-EU1-J15

ACID RAIN PART APPLICATION

BEST AVAILABLE COPY

Department of Environmental Protection

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

Jeb Bush
Governor

David B. Struhs
Secretary

April 26, 2000

Mr. Richard Wolfinger
Vice President and Project Manager
Oleander Power Project, L.P.
111 Market Place, Suite 200
Baltimore, MD 21202

Dear Mr. Wolfinger:

Re: Acid Rain Phase II Permit Application Forms for the Oleander Power Project, L.P. Facility

Thank you for submitting the referenced forms for this facility. However, our rules require that Florida DEP forms be used in place of the U.S. EPA versions. They can be downloaded from our following Web address:

http://www.dep.state.fl.us/air/forms/acidforms.htm

Please resubmit the application using our forms. If you have any questions, please contact Tom Cascio at 850/921-9526.

Sincerely,

Scott M. Sheplak

Scott M. Sheplak, P.E.
Administrator
Title V Program

cc: Jenny Jachim, U.S. EPA, Region 4

Maureen Farr
Legal Advertising Specialist
(321) 242-3832

Gannett Plaza • P.O. Box 419000
Melbourne, FL 32941-9000

Toll Free: 1-800-633-8449
Fax: (321) 255-0350
E-Mail: mfarr@brevard.gannett.com

Published Daily

STATE OF FLORIDA
COUNTY OF BREVARD

Before the undersigned authority personally appeared **MAUREEN FARR** who on oath says that she is **LEGAL ADVERTISING CLERK** of the **FLORIDA TODAY**, a newspaper published in Brevard County, Florida; that the attached copy of advertising being a LEGAL NOTICE in the matter of OLEANDER POWER PROJECT, L.P. in the Court CERTIFICATION OF REPRESENTATION was published in the **FLORIDA TODAY NEWSPAPER** in the issues of APRIL 4, 2000

TO-L8798-1T-4/4,2000-TUES

Oleander Power Project, L.P., a Florida Limited Partnership company, will submit a Certification of Representation to the U.S. Environmental Protection Agency identifying Richard L. Wolfinger as the Designated Representative, and Douglas S. Perry as the Alternative Designated Representative, for the proposed Oleander Power Project, L.P., in Brevard County, Florida. This Certificate of Representation covers proposed Units OG-1 through OG-5 at the plant (each consisting of a General Electric Frame 7FA simple cycle combustion turbine), under a proposed Phase II Acid Rain Permit. This notice complies with the requirements of the Acid Rain Program, 40 CFR Part 72.24(a)(5).

File

Affiant further says that the said **FLORIDA TODAY NEWSPAPER** is a newspaper in said Brevard County, Florida, and that the said newspaper has heretofore been continuously published in said Brevard County, Florida, regularly as stated above, and has been entered as periodicals matter at the post office in **MELBOURNE** in said Brevard 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, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in said newspaper.

Maureen Farr
(Signature of Affiant)

Sworn to and subscribed before me this 4th day of APRIL 2000.

OFFICIAL NOTARY SEAL
LINDA L. BRAUD

Linda L. Braud
(Signature of Notary Public)

LINDA L. BRAUD
(Name of Notary Typed, Printed or Stamped)

Personally Known ✓ or Produced Identification ______

Type of Identification Produced ______

Acid Rain Program
Instructions for
Phase II Permit Application
(40 CFR 72.30- 72.31 and Rule 62-214.320, F.A.C.)

The Acid Rain Program regulations require the designated representative to submit an Acid Rain part application for Phase II for each source with an Acid Rain unit. A complete Phase II part application is binding on the owners and operators of the Acid Rain source and is enforceable in the absence of a permit until the permitting authority either issues a permit with an Acid Rain part to the source or disapproves the application.

Please type or print. The alternate designated representative may sign in lieu of the designated representative. If assistance is needed, contact the permitting authority.

STEP 1 NADB is the National Allowance Data Base for the Acid Rain Program. To obtain the database on diskette, call the Acid Rain Hotline at (202) 233-9620. This data file is in dBase format for use on an IBM-compatible PC. It requires 2 megabytes of hard drive memory. If the unit is not listed in NADB, use the plant name, ORIS Code, and Boiler ID listed on the certificate of representation for the plant.

STEP 2 The monitor certification deadline is determined in accordance with 40 CFR 75.4. If the commence operation date or monitor certification date changes after the Phase II permit is issued, the source must submit a request for an administrative permit amendment.

STEP 5 "AIRS" is the Aerometric Information Retrieval System operated by EPA's Office of Air Quality Planning and Standards. The AIRS number for a source has 12 digits. "FINDS" is the Facility Indexing System. It provides an Agency-wide ID number to cross-identify facilities in all EPA data systems. Please enter these numbers if they are available; this step is optional.

Submission Instructions

For initial Phase II permit applications: If, by **November 15, 1995**, the State or local jurisdiction (*e.g.*, District, County, or City) in which the source is located has both (1) an acid rain program identified in a Federal Register notice as acceptable to the Administrator and (2) an operating permits program granted full or interim approval by the Administrator in a Federal Register notice, mail this form and three copies to that state or local authority. If not, mail this form and one copy to the EPA regional office and two copies to the State or local jurisdiction in which the source is located.

If you have questions regarding this form, contact your local, State, or EPA regional representative, or call EPA's Acid Rain Hotline at (202) 233-9620.

STEP 5 (optional) Enter the source AIRS FINDS identification	AIRS
	FINDS

Plant Name (from Step 1) **Oleander Power Project, L.P.**

Recordkeeping and Reporting Requirements (cont)

(iv) Copies of all documents used to complete an Acid Rain part application and any other submission under the Acid Rain Program or to demonstrate compliance with the requirements of the Acid Rain Program.

(2) The designated representative of an Acid Rain source and each Acid Rain unit at the source shall submit the reports and compliance certifications required under the Acid Rain Program, including those under 40 CFR part 72 subpart I and 40 CFR part 75.

Liability.

(1) Any person who knowingly violates any requirement or prohibition of the Acid Rain Program, a complete Acid Rain part application, an Acid Rain part, or a written exemption under 40 CFR 72.7 or 72.8, including any requirement for the payment of any penalty owed to the United States, shall be subject to enforcement pursuant to section 113(c) of the Act.
(2) Any person who knowingly makes a false, material statement in any record, submission, or report under the Acid Rain Program shall be subject to criminal enforcement pursuant to section 113(c) of the Act and 18 U.S.C. 1001.
(3) No permit revision shall excuse any violation of the requirements of the Acid Rain Program that occurs prior to the date that the revision takes effect.
(4) Each Acid Rain source and each Acid Rain unit shall meet the requirements of the Acid Rain Program.
(5) Any provision of the Acid Rain Program that applies to an Acid Rain source (including a provision applicable to the designated representative of an Acid Rain source) shall also apply to the owners and operators of such source and of the Acid Rain units at the source.
(6) Any provision of the Acid Rain Program that applies to an Acid Rain unit (including a provision applicable to the designated representative of an Acid Rain unit) shall also apply to the owners and operators of such unit. Except as provided under 40 CFR 72.44 (Phase II repowering extension plans), and except with regard to the requirements applicable to units with a common stack under 40 CFR part 75 (including 40 CFR 75.16, 75.17, and 75.18), the owners and operators and the designated representative of one Acid Rain unit shall not be liable for any violation by any other Acid Rain unit of which they are not owners or operators or the designated representative and that is located at a source of which they are not owners or operators or the designated representative.
(7) Each violation of a provision of 40 CFR parts 72, 73, 75, 77, and 78 by an Acid Rain source or Acid Rain unit, or by an owner or operator or designated representative of such source or unit, shall be a separate violation of the Act.

Effect on Other Authorities. No provision of the Acid Rain Program, an Acid Rain part application, an Acid Rain part, or a written exemption under 40 CFR 72.7 or 72.8 shall be construed as:

(1) Except as expressly provided in title IV of the Act, exempting or excluding the owners and operators and, to the extent applicable, the designated representative of an Acid Rain source or Acid Rain unit from compliance with any other provision of the Act, including the provisions of title I of the Act relating to applicable National Ambient Air Quality Standards or State Implementation Plans;
(2) Limiting the number of allowances a unit can hold; *provided,* that the number of allowances held by the unit shall not affect the source's obligation to comply with any other provisions of the Act;
(3) Requiring a change of any kind in any State law regulating electric utility rates and charges, affecting any State law regarding such State regulation, or limiting such State regulation, including any prudence review requirements under such State law;
(4) Modifying the Federal Power Act or affecting the authority of the Federal Energy Regulatory Commission under the Federal Power Act; or,
(5) Interfering with or impairing any program for competitive bidding for power supply in a State in which such program is established.

Certification

I am authorized to make this submission on behalf of the owners and operators of the Acid Rain source or Acid Rain units for which the submission is made. I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.

Name	Richard Wolfinger	
Signature		Date 5/4/00

APY

OLEANDER POWER PROJECT, L.P.

111 Market Place, Suite 200
Baltimore, MD 21202

May 3, 2000

Scott Sheplak
Florida Department of Environmental Protection
Air Resources Management
2600 Blair Stone Road
Tallahassee, FL 32399

RE: Oleander Power Project, L.P.

Dear Mr. Sheplak:

Enclosed please find our Phase II Permit Application (Florida DEP Form No. 62-210.900 (1)(a)), for a new 950 MW natural gas and oil fired peaking power station located at 532 Townsend Road, Cocoa, Florida. We have recently submitted a construction air permit for this facility.

Please note that this project is a fast-tracked peaking power plant project, and is scheduled for commercial operations in March 2002. Development efforts began only in mid 1999.

Please call Richard Wolfinger at (410) 230-4614, if you have any questions regarding this submission.

We look forward to receiving your completeness review notification.

Very truly yours,

Richard Wolfinger
Vice President and Project Manager

cc: Tomas Casio

Plant Name (from Step 1) Oleander Power Project, L.P.

STEP 4
Read the standard requirements and certification, enter the name of the designated representative, and sign and date

Standard Requirements

Permit Requirements.

(1) The designated representative of each Acid Rain source and each Acid Rain unit at the source shall:
(i) Submit a complete Acid Rain part application (including a compliance plan) under 40 CFR part 72, Rules 62-214.320 and 330, F.A.C. in accordance with the deadlines specified in Rule 62-214.320, F.A.C.; and
(ii) Submit in a timely manner any supplemental information that the permitting authority determines is necessary in order to review an Acid Rain part application and issue or deny an Acid Rain permit;
(2) The owners and operators of each Acid Rain source and each Acid Rain unit at the source shall:
(i) Operate the unit in compliance with a complete Acid Rain part application or a superseding Acid Rain part issued by the permitting authority; and
(ii) Have an Acid Rain Part.

Monitoring Requirements.

(1) The owners and operators and, to the extent applicable, designated representative of each Acid Rain source and each Acid Rain unit at the source shall comply with the monitoring requirements as provided in 40 CFR part 75, and Rule 62-214.420, F.A.C.
(2) The emissions measurements recorded and reported in accordance with 40 CFR part 75 shall be used to determine compliance by the unit with the Acid Rain emissions limitations and emissions reduction requirements for sulfur dioxide and nitrogen oxides under the Acid Rain Program.
(3) The requirements of 40 CFR part 75 shall not affect the responsibility of the owners and operators to monitor emissions of other pollutants or other emissions characteristics at the unit under other applicable requirements of the Act and other provisions of the operating permit for the source.

Sulfur Dioxide Requirements.

(1) The owners and operators of each source and each Acid Rain unit at the source shall:
(i) Hold allowances, as of the allowance transfer deadline, in the unit's compliance subaccount (after deductions under 40 CFR 73.34(c)) not less than the total annual emissions of sulfur dioxide for the previous calendar year from the unit; and
(ii) Comply with the applicable Acid Rain emissions limitations for sulfur dioxide.
(2) Each ton of sulfur dioxide emitted in excess of the Acid Rain emissions limitations for sulfur dioxide shall constitute a separate violation of the Act.
(3) An Acid Rain unit shall be subject to the requirements under paragraph (1) of the sulfur dioxide requirements as follows:
(i) Starting January 1, 2000, an Acid Rain unit under 40 CFR 72.6(a)(2); or
(ii) Starting on the later of January 1, 2000 or the deadline for monitor certification under 40 CFR part 75, an Acid Rain unit under 40 CFR 72.6(a)(3).
(4) Allowances shall be held in, deducted from, or transferred among Allowance Tracking System accounts in accordance with the Acid Rain Program.
(5) An allowance shall not be deducted in order to comply with the requirements under paragraph (1)(i) of the sulfur dioxide requirements prior to the calendar year for which the allowance was allocated.
(6) An allowance allocated by the Administrator under the Acid Rain Program is a limited authorization to emit sulfur dioxide in accordance with the Acid Rain Program. No provision of the Acid Rain Program, the Acid Rain permit application, the Acid Rain permit, or the written exemption under 40 CFR 72.7 and 72.8 and no provision of law shall be construed to limit the authority of the United States to terminate or limit such authorization.
(7) An allowance allocated by the Administrator under the Acid Rain Program does not constitute a property right.

Nitrogen Oxides Requirements. The owners and operators of the source and each Acid Rain unit at the source shall comply with the applicable Acid Rain emissions limitation for nitrogen oxides.

Excess Emissions Requirements.

(1) The designated representative of an Acid Rain unit that has excess emissions in any calendar year shall submit a proposed offset plan, as required under 40 CFR part 77.
(2) The owners and operators of an Acid Rain unit that has excess emissions in any calendar year shall:
(i) Pay without demand the penalty required, and pay upon demand the interest on that penalty, as required by 40 CFR part 77; and
(ii) Comply with the terms of an approved offset plan, as required by 40 CFR part 77.

Recordkeeping and Reporting Requirements.

(1) Unless otherwise provided, the owners and operators of the source and each Acid Rain unit at the source shall keep on site at the source each of the following documents for a period of 5 years from the date the document is created. This period may be extended for cause, at any time prior to the end of 5 years, in writing by the Administrator or permitting authority:
(i) The certificate of representation for the designated representative for the source and each Acid Rain unit at the source and all documents that demonstrate the truth of the statements in the certificate of representation, in accordance with Rule 62-214.350, F.A.C.; provided that the certificate and documents shall be retained on site at the source beyond such 5-year period until such documents are superseded because of the submission of a new certificate of representation changing the designated representative;
(ii) All emissions monitoring information, in accordance with 40 CFR part 75;
(iii) Copies of all reports, compliance certifications, and other submissions and all records made or required under the Acid Rain Program; and,

Phase II Permit Application

Page 1

For more information, see instructions and refer to 40 CFR 72.30 and 72.31 and Chapter 62-214, F.A.C.

This submission is: [X] New [ ] Revised

STEP 1
Identify the source by plant name, State, and ORIS code from NADB

Plant Name	State	ORIS Code
Oleander Power Project, L.P.	FL	55286

STEP 2 Enter the boiler ID# from NADB for each affected unit and indicate whether a repowering plan is being submitted for the unit by entering "yes" or "no" at column c. For new units, enter the requested information in columns d and e.

a Boiler ID#	b (Compliance Plan) Unit will hold allowances in accordance with 40 CFR 72.9(c)(1)	c (Compliance Plan) Repowering Plan	d New Units Commence Operation Date	e New Units Monitor Certification Deadline
0-1	Yes		March 2002	June 2002
0-2	Yes		"	"
0-3	Yes		"	"
0-4	Yes		"	"
0-5	Yes		"	"
	Yes			
	Yes			
	Yes			
	Yes			
	Yes			
	Yes			
	Yes			

STEP 3
Check the box if the response in column c of Step 2 is "Yes for any unit

[ ] For each unit that will be repowered, the Repowering Extension Plan form is included and the Repowering Technology Petition form has been submitted or will be submitted by June 1, 1997.

Department of Environmental Protection

Al Picardi
FYI
R

Jeb Bush
Governor

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

David B. Struhs
Secretary

June 12, 2000

Mr. Richard Wolfinger
Vice President and Project Manager
Oleander Power Project, L.P.
111 Market Place, Suite 200
Baltimore, MD 21202

Dear Mr. Wolfinger:

Re: Acid Rain Phase II Permit Application Form for the Oleander Power Project, L.P. Facility

Thank you for resubmitting the referenced form for this facility using the State of Florida version. We have reviewed the materials and deem your application complete. If you have any questions, please contact Tom Cascio at 850/921-9526.

Sincerely,

Scott M. Sheplak, P.E.
Administrator
Title V Program

cc: Jenny Jachim, U.S. EPA, Region 4

BEST AVAILABLE COPY

Allowance Tracking System Report

ENVIRONMENTAL PROTECTION AGENCY
ACID RAIN DIVISION
ALLOWANCE TRACKING SYSTEM

Date: 6/7/2000

AUTHORIZED ACCOUNT REPRESENTATIVE INFORMATION

AAR Number	1806
AAR Name	Richard Wolfinger
Firm Name	Constellation Power
Address 1	111 Market Place
Address 2	Suite 200
City/State/Zip	Baltimore, MD 21202
Phone	410 - 230 - 4614
Fax	410 - 230 - 4847

Account Number	Plant/Account Name	AAR/Alternate	AAR Start Date
05528400GS01	Big Sandy Peaker Plant	AAR	06/06/2000
05528400GS02	Big Sandy Peaker Plant	AAR	06/06/2000
05528400GS03	Big Sandy Peaker Plant	AAR	06/06/2000
05528400GS04	Big Sandy Peaker Plant	AAR	06/06/2000
05528400GS05	Big Sandy Peaker Plant	AAR	06/06/2000
05528400GS06	Big Sandy Peaker Plant	AAR	06/06/2000
05528400GS07	Big Sandy Peaker Plant	AAR	06/06/2000
05528400GS08	Big Sandy Peaker Plant	AAR	06/06/2000
05528400GS09	Big Sandy Peaker Plant	AAR	06/06/2000
05528400GS10	Big Sandy Peaker Plant	AAR	06/06/2000
05528400GS11	Big Sandy Peaker Plant	AAR	06/06/2000
05528400GS12	Big Sandy Peaker Plant	AAR	06/06/2000
055286000OZ1	Oleander Power Project, LP	AAR	04/18/2000
055286000OZ2	Oleander Power Project, LP	AAR	04/18/2000
055286000OZ3	Oleander Power Project, LP	AAR	04/18/2000
055286000OZ4	Oleander Power Project, LP	AAR	04/18/2000
055286000OZ5	Oleander Power Project, LP	AAR	04/18/2000

Please review the information shown above and report any errors, along with supporting documentation, to the address listed below, or call the Acid Rain Hotline.

ACID RAIN
PROGRAM

Acid Rain Hotline: (202) 564-9620

U.S. Environmental Protection Agency
Clean Air Markets Division
U.S. mail address: 1200 Pennsylvania Ave., NW
Washington, DC 20460
Overnight mail address: 501 3rd Street, NW
Washington, DC 20001

Allowance Tracking System Report

ENVIRONMENTAL PROTECTION AGENCY
ACID RAIN DIVISION
ALLOWANCE TRACKING SYSTEM

ACCOUNT INFORMATION

Account	055286000OZ1
Plant/Account Name	Oleander Power Project, LP
AAR ID Number	1806
AAR Name	Richard Wolfinger
AAR Address	111 Market Place
AAR Address	Suite 200
AAR City	Baltimore
AAR State	MD
AAR Zip	21202
AAR Phone	410 - 230 - 4614
AAR Fax	410 - 230 - 4847
ALT ID Number	1786
ALT Name	Douglas S. Perry
ALT Phone	410 - 230 - 4611
ALT Fax	410 - 230 - 4847

Binding Party Information	Binding Party Name	Binding Party Type
	Oleander Power Project, LP	Owner/Operator

AAR HISTORY:

AAR NAME	AAR/ ALTERNATE	START	END
Richard Wolfinger	AAR	04/18/2000	CURRENT
Douglas S. Perry	ALT	04/18/2000	CURRENT

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Allowance Tracking System Report

ENVIRONMENTAL PROTECTION AGENCY
ACID RAIN DIVISION
ALLOWANCE TRACKING SYSTEM

ACCOUNT INFORMATION

Account	055286000OZ2
Plant/Account Name	Oleander Power Project, LP
AAR ID Number	1806
AAR Name	Richard Wolfinger
AAR Address	111 Market Place
AAR Address	Suite 200
AAR City	Baltimore
AAR State	MD
AAR Zip	21202
AAR Phone	410 - 230 - 4614
AAR Fax	410 - 230 - 4847
ALT ID Number	1786
ALT Name	Douglas S. Perry
ALT Phone	410 - 230 - 4611
ALT Fax	410 - 230 - 4847

Binding Party Information	Binding Party Name	Binding Party Type
	Oleander Power Project, LP	Owner/Operator

AAR HISTORY:

AAR NAME	AAR/ ALTERNATE	START	END
Richard Wolfinger	AAR	04/18/2000	CURRENT
Douglas S. Perry	ALT	04/18/2000	CURRENT

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Allowance Tracking System Report

ENVIRONMENTAL PROTECTION AGENCY
ACID RAIN DIVISION
ALLOWANCE TRACKING SYSTEM

ACCOUNT INFORMATION

Account	055286000OZ3
Plant/Account Name	Oleander Power Project, LP
AAR ID Number	1806
AAR Name	Richard Wolfinger
AAR Address	111 Market Place
AAR Address	Suite 200
AAR City	Baltimore
AAR State	MD
AAR Zip	21202
AAR Phone	410 - 230 - 4614
AAR Fax	410 - 230 - 4847
ALT ID Number	1786
ALT Name	Douglas S. Perry
ALT Phone	410 - 230 - 4611
ALT Fax	410 - 230 - 4847

Binding Party Information	Binding Party Name	Binding Party Type
	Oleander Power Project, LP	Owner/Operator

AAR HISTORY:

AAR NAME	AAR/ ALTERNATE	START	END
Richard Wolfinger	AAR	04/18/2000	CURRENT
Douglas S. Perry	ALT	04/18/2000	CURRENT

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Clean Air Markets Division
U.S. mail address: 1200 Pennsylvania Ave., NW
Washington, DC 20460
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Washington, DC 20001

Allowance Tracking System Report

ENVIRONMENTAL PROTECTION AGENCY
ACID RAIN DIVISION
ALLOWANCE TRACKING SYSTEM

ACCOUNT INFORMATION

Account	055286000OZ4
Plant/Account Name	Oleander Power Project, LP
AAR ID Number	1806
AAR Name	Richard Wolfinger
AAR Address	111 Market Place
AAR Address	Suite 200
AAR City	Baltimore
AAR State	MD
AAR Zip	21202
AAR Phone	410 - 230 - 4614
AAR Fax	410 - 230 - 4847
ALT ID Number	1786
ALT Name	Douglas S. Perry
ALT Phone	410 - 230 - 4611
ALT Fax	410 - 230 - 4847

Binding Party Information	Binding Party Name	Binding Party Type
	Oleander Power Project, LP	Owner/Operator

AAR HISTORY:

AAR NAME	AAR/ ALTERNATE	START	END
Richard Wolfinger	AAR	04/18/2000	CURRENT
Douglas S. Perry	ALT	04/18/2000	CURRENT

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PROGRAM

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U.S. Environmental Protection Agency
Clean Air Markets Division
U.S. mail address: 1200 Pennsylvania Ave., NW
Washington, DC 20460
Overnight mail address: 501 3rd Street, NW
Washington, DC 20001

Allowance Tracking System Report

ENVIRONMENTAL PROTECTION AGENCY
ACID RAIN DIVISION
ALLOWANCE TRACKING SYSTEM

ACCOUNT INFORMATION

Account	055286000OZ5
Plant/Account Name	Oleander Power Project, LP
AAR ID Number	1806
AAR Name	Richard Wolfinger
AAR Address	111 Market Place
AAR Address	Suite 200
AAR City	Baltimore
AAR State	MD
AAR Zip	21202
AAR Phone	410 - 230 - 4614
AAR Fax	410 - 230 - 4847
ALT ID Number	1786
ALT Name	Douglas S. Perry
ALT Phone	410 - 230 - 4611
ALT Fax	410 - 230 - 4847

Binding Party Information

Binding Party Name	Binding Party Type
Oleander Power Project, LP	Owner/Operator

AAR HISTORY:

AAR NAME	AAR/ ALTERNATE	START	END
Richard Wolfinger	AAR	04/18/2000	CURRENT
Douglas S. Perry	ALT	04/18/2000	CURRENT

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Acid Rain Hotline: (202) 564-9620

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U.S. mail address: 1200 Pennsylvania Ave., NW
Washington, DC 20460
Overnight mail address: 501 3rd Street, NW
Washington, DC 20001

United States
Environmental Protection Agency
Acid Rain Program

OMB No. 2060-0258

EPA

Certificate of Representation

For more information, see instructions and refer to 40 CFR 72.24

This submission is: ☐ New ☒ Revised (revised submissions must be complete; see instructions)

This submission includes combustion or process sources under 40 CFR part 74 ☐

STEP 1
Identify the source by plant name, State, and ORIS code.

Plant Name	State	ORIS Code
Oleander Power Project, LP	FL	55286

STEP 2
Enter requested information for the designated representative.

Name	Craig Fierstein
Address	111 Market Place, fifth floor Baltimore, MD 21202
Phone Number	410-230-4636
Fax Number	410-230-4847
E-mail address (if available)	craig.fierstein@constellation.com

STEP 3
Enter requested information for the alternate designated representative, if applicable.

Name	Edward F. Tracey Jr
Phone Number	410-787-6530
Fax Number	410-787-5065
E-mail address (if available)	edward.f.tracey@constellation.com

STEP 4
Complete Step 5, read the certifications, and sign and date. For a designated representative of a combustion or process source under 40 CFR part 74, the references in the certifications to "affected unit" or "affected units" also apply to the combustion or process source under 40 CFR part 74 and the references to "affected source" also apply to the source at which the combustion or process source is located.

I certify that I was selected as the designated representative or alternate designated representative, as applicable, by an agreement binding on the owners and operators of the affected source and each affected unit at the source.

I certify that I have given notice of the agreement, selecting me as the 'designated representative' for the affected source and each affected unit at the source identified in this certificate of representation, in a newspaper of general circulation in the area where the source is located or in a State publication designed to give general public notice.

I certify that I have all necessary authority to carry out my duties and responsibilities under the Acid Rain Program on behalf of the owners and operators of the affected source and of each affected unit at the source and that each such owner and operator shall be fully bound by my actions, inactions, or submissions.

I certify that I shall abide by any fiduciary responsibilities imposed by the agreement by which I was selected as designated representative or alternate designated representative, as applicable.

I certify that the owners and operators of the affected source and of each affected unit at the source shall be bound by any order issued to me by the Administrator, the permitting authority, or a court regarding the source or unit.

Where there are multiple holders of a legal or equitable title to, or a leasehold interest in, an affected unit, or where a utility or industrial customer purchases power from an affected unit under life-of-the-unit, firm power contractual arrangements, I certify that:

> I have given a written notice of my selection as the designated representative or alternate designated representative, as applicable, and of the agreement by which I was selected to each owner and operator of the affected source and of each affected unit at the source; and
>
> Allowances and the proceeds of transactions involving allowances will be deemed to be held or distributed in proportion to each holder's legal, equitable, leasehold, or contractual reservation or entitlement or, if such multiple holders have expressly provided for a different distribution of allowances by contract, that allowances and the proceeds of transactions involving allowances will be deemed to be held or distributed in accordance with the contract.

The agreement by which I was selected as the alternate designated representative, if applicable, includes a procedure for the owners and operators of the source and affected units at the source to authorize the alternate designated representative to act in lieu of the designated representative.

Oleander Power Project, LP
Plant Name (from Step 1)

I am authorized to make this submission on behalf of the owners and operators of the affected source or affected units for which the submission is made. I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.

Signature (designated representative)	Date 2/21/02
Signature (alternate designated representative)	Date 2/26/02

STEP 5
Provide the name of every owner and operator of the source and identify each affected unit (or combustion or process source) they own and/or operate.

Name: Oleander Power Project, LP					☒ Owner	☒ Operator
OGZ1 ID#	OGZ2 ID#	OGZ3 ID#	OGZ4 ID#	OGZ5 ID#	ID#	ID#
ID#	ID#	ID#	ID#	ID#	ID#	ID#

Name					☐ Owner	☐ Operator
ID#	ID#	ID#	ID#	ID#	ID#	ID#
ID#	ID#	ID#	ID#	ID#	ID#	ID#

Name					☐ Owner	☐ Operator
ID#	ID#	ID#	ID#	ID#	ID#	ID#
ID#	ID#	ID#	ID#	ID#	ID#	ID#

Name					☐ Owner	☐ Operator
ID#	ID#	ID#	ID#	ID#	ID#	ID#
ID#	ID#	ID#	ID#	ID#	ID#	ID#

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: **002** [ ] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
A	**20 MAY 2002**	**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 OPP-EU1-A9.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Dry Low-NO_x combustion - Natural Gas** **Water Injection - Distillate Oil Firing**	
2. Control Device or Method Code(s): **025, 028**	

Emissions Unit Details

1. Package Unit: Manufacturer: **General Electric**	Model Number: **7FA**	
2. Generator Nameplate Rating: **189** 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:		**1,722**	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		hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters): **Maximum Heat Input Rate at ISO Conditions and natural gas firing (LHV); maximum for oil firing is 1,919 MMBtu/hr (ISO-LHV). PSD-FL-258.**			

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

See Attachment OPP-EU1-C.	

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? **CT1**	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: **1,115** °F	9. Actual Volumetric Flow Rate: **2,565,050** acfm	10. Water Vapor: **8.7** %

11. Maximum Dry Standard Flow Rate: **1,092,180** dscfm	12. Nonstack Emission Point Height: feet
13. Emission Point UTM Coordinates: Zone: **17** East (km): **520.1** North (km): **3137.6**	
14. Emission Point Comment (limit to 200 characters): **Stack parameters for ISO operating conditions firing natural gas; for oil 1,109°F and 2,610,318 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): **2-01-001-01**	3. SCC Units: **1,000 gallons burned**	
4. Maximum Hourly Rate: **14.6**	5. Maximum Annual Rate: **14,560**	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.
    Has facility-wide fuel limit.

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): **2-01-002-01**	3. SCC Units: **Million cubic feet**	
4. Maximum Hourly Rate: **1.81**	5. Maximum Annual Rate: **6,145**	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.
    Has facility-wide fuel limit.

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 **23.75** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE Guarantee**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters):	
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: **10% opacity**	4. Equivalent Allowable Emissions: **17** lb/hour **8.5** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 9**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing- all loads; 1,000 hrs/yr. See PSD Air Construction Permit Application, 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: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

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% Opacity**	4. Equivalent Allowable Emissions: **9** lb/hour **15.3** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 9**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing- all loads; 3,390 hrs/yr. See PSD Air Construction Permit Application, 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: 103.4 lb/hour 58.3 tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: PSD-FL-258	7. Emissions Method Code: 0
8. Calculation of Emissions (limit to 600 characters):	
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. 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: 103.4 lb/hour 51.7 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 - 1,000 hrs/yr. See PSD Air Construction Permit PSD-FL-258.	

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: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

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: **5.5** lb/hour **9.3** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel Sampling**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested Allowable Emissions and Units: Pipeline Natural Gas. Gas firing - 3,390 hrs/yr. See PSD Air Construction Permit PSD-FL-258.**	

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: **344** lb/hour **246.8** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **PSD-FL-258**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters):	
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: **42 ppmvd**	4. Equivalent Allowable Emissions: **344** lb/hour **172** tons/year
5. Method of Compliance (limit to 60 characters): **CEM - 3-hr block 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; 1,000 hrs/yr. See Air Construction Permit PSD-FL-258.**	

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: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

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: **62.6** lb/hour **106.1** tons/year
5. Method of Compliance (limit to 60 characters): **CEM - 24-hr block average.**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested Allowable Emissions and Units: Gas firing; 3,390 hrs/yr. See Air Construction Permit PSD-FL-258.**	

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: **66.9** lb/hour **82.4** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **PSD-FL-258**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **lb/hr based on oil firing. 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: **66.9** lb/hour **33.5** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10 (required for gas firing only)**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing, 59°F, 100% load; 1,000 hrs/yr. See PSD-FL-258.**	

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: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

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: **41** lb/hour **69.5** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10 (required for gas firing only)**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas Firing; 3,390 hrs/yr. See Air Construction Permit PSD-FL-258.**	

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: **11.5** lb/hour **12.8** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **PSD-FL-258**	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
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: **6 ppmvd**	4. Equivalent Allowable Emissions: **11.5** lb/hour **5.75** tons/year
5. Method of Compliance (limit to 60 characters): **CO emission limit employed as surrogate and no annual testing required.**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing; 1,000 hrs/yr. See Air Construction Permit PSD-FL-258.**	

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: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

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: **3 ppmvd**	4. Equivalent Allowable Emissions: **5.9** lb/hour **10** tons/year
5. Method of Compliance (limit to 60 characters): **CO emission limit employed as surrogate and no annual testing required.**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Additional Requested Allowable Emissions and Units: Gas firing, 100% load, 32°F; 3,390 hrs/yr. See Air Construction Permit PSD-FL-258.**	

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 23.75 tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: GE Guarantee	7. Emissions Method Code: 0
8. Calculation of Emissions (limit to 600 characters):	
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: 10% opacity	4. Equivalent Allowable Emissions: 17 lb/hour 8.5 tons/year
5. Method of Compliance (limit to 60 characters): EPA Method 9	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): Oil firing- all loads; 1,000 hrs/yr. See PSD Air Construction Permit Application, 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: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

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% opacity**	4. Equivalent Allowable Emissions: **9** lb/hour **15.3** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 9**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing- all loads; 3,390 hrs/yr. See PSD Air Construction Permit Application, 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 1

1. Visible Emissions Subtype: **VE10**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: **10** % 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): **See Air Construction Permit PSD-FL-258.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 1 of 1

1. Parameter Code: **VE99**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **FDEP Rule 62-210.700(1), Allowed for 2 hours (120 minutes) per 24-hours for startup, shutdown, and malfunction. PSD-FL-258**	

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements

1. Process Flow Diagram [X] Attached, Document ID: OPP-FI-C3 [ ] Not Applicable [ ] Waiver Requested
2. Fuel Analysis or Specification [X] Attached, Document ID: OPP-EU1-J2 [ ] Not Applicable [ ] Waiver Requested
3. Detailed Description of Control Equipment [X] Attached, Document ID: OPP-EU1-J3 [ ] Not Applicable [ ] Waiver Requested
4. Description of Stack Sampling Facilities [X] Attached, Document ID: OPP-EU1-J4 [ ] Not Applicable [ ] Waiver Requested
5. Compliance Test Report [X] Attached, Document ID: OPP-EU2-J5 [ ] Previously submitted, Date: ________ [ ] Not Applicable
6. Procedures for Startup and Shutdown [X] Attached, Document ID: OPP-EU1-J6 [ ] Not Applicable [ ] Waiver Requested
7. Operation and Maintenance Plan [X] Attached, Document ID: OPP-EU1-J7 [ ] Not Applicable [ ] Waiver Requested
8. Supplemental Information for Construction Permit Application [ ] Attached, Document ID: ________ [X] Not Applicable
9. Other Information Required by Rule or Statute [ ] Attached, Document ID: ________ [X] Not Applicable
10. Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation [X] Attached, Document ID: OPP-FI-C10 [ ] Not Applicable
12. Alternative Modes of Operation (Emissions Trading) [ ] Attached, Document ID:________ [X] Not Applicable
13. Identification of Additional Applicable Requirements [X] Attached, Document ID: OPP-FI-C12 [ ] Not Applicable
14. Compliance Assurance Monitoring Plan [X] Attached, Document ID: OPP-EU1-J14 [ ] Not Applicable
15. Acid Rain Part Application (Hard-copy Required) [X] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID: OPP-EU1-J15 [ ] 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

ATTACHMENT OPP-EU2-J5

COMPLIANCE TEST REPORT

Work Order No. 11383.005.001

Unit 2
Simple Cycle Combustion Turbine NO_x, CO, and VOC Compliance Emission Test Report
Oleander Power Plant
Cocoa, Florida
5 June and 10-11 June 2002

Prepared For

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17 July 2002

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SECTION 1
INTRODUCTION

Weston Solutions, Inc. (WESTON®) was retained by Constellation Power Source Generation (CPSG) to conduct nitrogen oxides (NO_X), carbon monoxide (CO), and non-methane volatile organic compounds (NMVOC) emission testing on Unit 2 at the Oleander Power Plant (OPP) located in Cocoa, Florida. Unit 2 is a simple cycle combustion turbine operated as a peaking unit.

The purpose of the testing was to demonstrate compliance with applicable standards of 40 CFR, Part 60, Subpart GG and the Florida Department of Environmental Protection (FDEP) permit limits.

WESTON performed the emission testing on 5 June and 10-11 June 2002. The project team was comprised of the following individuals.

Name	Project Role
Greg Sims	Project Manager/Technical Manager/Test Team Leader
Gary Blackmon	Test Team Member
Susan Brown	Test Team Member
Jon Howard	Report Coordinator

Mr. Craig Fierstien and Mr. Ed Much of CPSG coordinated the testing with facility operations. Mr. Garry Kuberski of the FDEP was present during a portion of the testing.

Table 2-1 presents the mean results of the emission testing with comparison to the permit requirements. The results are less than the applicable standard(s) for the source.

According to the permit, the Best Available Control Technology (BACT) limits are more stringent than the New Source Performance Standards (NSPS) limits of Subpart GG, therefore compliance with BACT limits indicates the source was in compliance with NSPS limits during the test effort.

Sulfur dioxide sampling under gas and oil firing conditions is exempted by the permit, however, as required by subpart GG, fuel samples were collected and analyzed for sulfur. The concentration of sulfur at <1 ppm in the fuel sample meets the requirements of subpart GG that no fuel shall be fired that contains sulfur in excess of 0.8 percent by weight.

Tables 2-2 through 2-9 provide detailed summaries of the emission results. Any differences between the calculated results presented in the appendices and the results reported in the summary tables are due to rounding for presentation.

In accordance with Method 20 requirements, an oxygen (O_2) traverse was performed prior to sampling to select the eight sample traverse points of the lowest O_2 concentration. The O_2 traverse was conducted such that at least one minute of actual stack gas was analyzed at each of the 48 total traverse points. The O_2 traverse was conducted in strict accordance with EPA Reference Method 20. Copies of the O_2 traverse measurements are included in the appendices.

TABLE 2-1
SUMMARY OF EMISSION TEST RESULTS

Operating Load	Mean Test Value	Permit Limit
50% Load – Firing Gas		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	7.2	9.0
Subpart GG, ppm @ 15% O_2 ISO	8.2	75
Emission Rate, lb/hr	31	62.6
Emission Rate, lb/MMBtu	0.027	----
66% Load – Firing Gas		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	6.9	9.0
Subpart GG, ppm @ 15% O_2 ISO	7.9	75
Emission Rate, lb/hr	35	62.6
Emission Rate, lb/MMBtu	0.025	----
83% Load – Firing Gas		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	7.0	9.0
Subpart GG, ppm @ 15% O_2 ISO	7.9	75
Emission Rate, lb/hr	40	62.6
Emission Rate, lb/MMBtu	0.026	----
100% Load – Firing Gas		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	6.5	9.0
Subpart GG, ppm @ 15% O_2 ISO	7.5	75
Emission Rate, lb/hr	41	62.6
Emission Rate, lb/MMBtu	0.024	----
Carbon Monoxide		
Concentration, ppm	0.9	12.0
Emission Rate, lb/hr	2.9	41.0
Emission Rate, lb/MMBtu	0.002	----
Volatile Organic Compounds		
Concentration, ppm as C	<0.7	3.0
Emission Rate, lb/hr as C	<0.9	5.9
Emission Rate, lb/MMBtu	<0.001	----
Visible Emissions		
% Opacity	0	10

TABLE 2-1
SUMMARY OF EMISSION TEST RESULTS
(CONTINUED)

Operating Load	Mean Test Value	Permit Limit
50% Load – Firing Oil		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	35.7	42.0
Subpart GG, ppm @ 15% O_2 ISO	41.8	75
Emission Rate, lb/hr	155	----
Emission Rate, lb/MMBtu	0.138	----
66% Load – Firing Oil		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	35.8	42.0
Subpart GG, ppm @ 15% O_2 ISO	41.9	75
Emission Rate, lb/hr	182	----
Emission Rate, lb/MMBtu	0.139	----
83% Load – Firing Oil		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	33.9	42.0
Subpart GG, ppm @ 15% O_2 ISO	39.8	75
Emission Rate, lb/hr	196	----
Emission Rate, lb/MMBtu	0.132	----
100% Load – Firing Oil		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	29.5	42.0
Subpart GG, ppm @ 15% O_2 ISO	34.9	75
Emission Rate, lb/hr	196	----
Emission Rate, lb/MMBtu	0.115	----
Carbon Monoxide		
Concentration, ppm	1.1	20.0
Emission Rate, lb/hr	3.3	66.9
Emission Rate, lb/MMBtu	0.0019	----
Volatile Organic Compounds		
Concentration, ppm as C	<0.7	6.0
Emission Rate, lb/hr as C	<0.9	11.5
Emission Rate, lb/MMBtu	<0.001	----
Visible Emissions		
% Opacity	0	10

TABLE 2-2
UNIT 2 – FIRING NATURAL GAS
50% LOAD-90 MW
SUMMARY OF NO_X (METHOD 20) EMISSION RESULTS

	Run 1	**Run 2**	**Run 3**	**Mean**
Date	6/5/02	6/5/02	6/5/02	----
Time Began	0653	0715	0738	----
Time Ended	0708	0730	0753	----
Stack Gas Data				
O_2 Concentration, %	13.8	13.8	13.8	13.8
VFR, x 10^5 dscfm[a]	5.03	5.06	5.06	5.05
Heat Input, MMBtu/hr	1178	1184	1185	1182
Nitrogen Oxides				
Concentration, ppm	8.7	8.7	8.7	8.7
Concentration, ppm @ 15% O_2	7.2	7.2	7.2	7.2
Permit Limit, ppm @ 15% O_2	----	----	----	*9.0*
Subpart GG, ppm @ 15% O_2 ISO	8.1	8.2	8.2	8.2
Permit Limit, ppm @ 15% O_2 ISO	----	----	----	*75*
Emission Rate, lb/hr	31	32	32	31
Permit Limit, lb/hr	----	----	----	*62.6*
Emission Rate, lb/MMBtu	0.027	0.027	0.027	0.027

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factor.

TABLE 2-3
UNIT 2 - FIRING NATURAL GAS
66% LOAD-117 MW
SUMMARY OF NO_x (METHOD 20) EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	6/5/02	6/5/02	6/5/02	----
Time Began	0816	0843	0904	----
Time Ended	0832	0858	0919	----
Stack Gas Data				
O_2 Concentration, %	13.7	13.7	13.7	13.7
VFR, x 10^5 dscfm[a]	5.79	5.79	5.76	5.78
Heat Input, MMBtu/hr	1374	1375	1368	1372
Nitrogen Oxides				
Concentration, ppm	8.3	8.4	8.6	8.4
Concentration, ppm @ 15% O_2	6.8	6.9	7.0	6.9
Permit Limit, ppm @ 15% O_2	----	----	----	*9.0*
Subpart GG, ppm @ 15% O_2 ISO	7.8	7.8	8.1	7.9
Permit Limit, ppm @ 15% O_2 ISO	----	----	----	*75*
Emission Rate, lb/hr	34	35	36	35
Permit Limit, lb/hr	----	----	----	*62.6*
Emission Rate, lb/MMBtu	0.025	0.025	0.026	0.025

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factor.

TABLE 2-4
UNIT 2 - FIRING NATURAL GAS
83% LOAD-142 MW
SUMMARY OF NO_X (METHOD 20) EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	6/5/02	6/5/02	6/5/02	----
Time Began	0936	1000	1024	----
Time Ended	0951	1015	1039	----
Stack Gas Data				
O_2 Concentration, %	13.6	13.6	13.6	13.6
VFR, x 10^5 dscfm[a]	6.53	6.50	6.51	6.51
Heat Input, MMBtu/hr	1571	1564	1567	1567
Nitrogen Oxides				
Concentration, ppm	8.7	8.6	8.5	8.6
Concentration, ppm @ 15% O_2	7.0	7.0	6.9	7.0
Permit Limit, ppm @ 15% O_2	----	----	----	*9.0*
Subpart GG, ppm @ 15% O_2 ISO	8.0	7.9	7.9	7.9
Permit Limit, ppm @ 15% O_2 ISO	----	----	----	*75*
Emission Rate, lb/hr	41	40	40	40
Permit Limit, lb/hr	----	----	----	*62.6*
Emission Rate, lb/MMBtu	0.026	0.026	0.025	0.026

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factor.

TABLE 2-5
UNIT 2 - FIRING NATURAL GAS
100% LOAD-161 MW
SUMMARY OF EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	6/10/02	6/10/02	6/10/02	----
Time Began	0815	1220	1339	----
Time Ended	0915	1320	1439	----
Stack Gas Data				
Moisture, %	8.8	9.1	9.0	9.0
CO_2 Concentration, %	4.1	4.1	4.1	4.1
O_2 Concentration, %	13.7	13.6	13.7	13.7
VFR, x 10^5 dscfm[a]	7.28	7.13	7.22	7.21
Heat Input, MMBtu/hr	1728	1715	1714	1719
Nitrogen Oxides				
Concentration, ppm	8.1	7.9	7.8	7.9
Concentration, ppm @ 15% O_2	6.6	6.4	6.4	6.5
Permit Limit, ppm @ 15% O_2	----	----	----	*9.0*
Subpart GG, ppm @ 15% O_2 ISO	7.5	7.4	7.4	7.5
Permit Limit, ppm @ 15% O_2 ISO	----	----	----	*75*
Emission Rate, lb/hr	42	40	40	41
Permit Limit, lb/hr	----	----	----	*62.6*
Emission Rate, lb/MMBtu	0.024	0.023	0.024	0.024
Carbon Monoxide				
Concentration, ppm	0.8	1.0	1.0	0.9
Permit Limit, ppm	----	----	----	*12.0*
Emission Rate, lb/hr	2.5	3.1	3.2	2.9
Permit Limit, lb/hr	----	----	----	*41.0*
Emission Rate, lb/MMBtu	0.002	0.002	0.002	0.002
Volatile Organic Compounds				
Concentration, ppm as C	<0.7	<0.7	<0.7	<0.7
Permit Limit, ppm	----	----	----	*3.0*
Emission Rate, lb/hr as C	<0.9	<0.9	<0.9	<0.9
Permit Limit, lb/hr	----	----	----	*5.9*
Emission Rate, lb/MMBtu	<0.001	<0.001	<0.001	<0.001
Visible Emissions				
% Opacity	0	0	0	0
Permit Limit, %	----	----	----	*10*

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factor.

TABLE 2-6
UNIT 2 - FIRING OIL
50% LOAD -90 MW
SUMMARY OF NO_X (METHOD 20) EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	6/5/02	6/5/02	6/5/02	----
Time Began	1141	1204	1228	----
Time Ended	1156	1219	1243	----
Stack Gas Data				
O_2 Concentration, %	12.8	12.9	12.9	12.9
VFR, x 10^5 dscfm[a]	4.51	4.47	4.41	4.47
Heat Input, MMBtu/hr	1140	1118	1104	1121
Nitrogen Oxides				
Concentration, ppm	49.1	48.3	48.3	48.6
Concentration, ppm @ 15% O_2	35.8	35.6	35.6	35.7
Permit Limit, ppm @ 15% O_2	----	----	----	*42.0*
Subpart GG, ppm @ 15% O_2 ISO	42.2	41.7	41.4	41.8
Permit Limit, ppm @ 15% O_2 ISO	----	----	----	*75*
Emission Rate, lb/hr	158	154	153	155
Emission Rate, lb/MMBtu	0.139	0.138	0.138	0.138

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factor.

TABLE 2-7
UNIT 2 - FIRING OIL
66% LOAD -117 MW
SUMMARY OF NO_X (METHOD 20) EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	6/5/02	6/5/02	6/5/02	----
Time Began	1324	1349	1411	----
Time Ended	1341	1404	1426	----
Stack Gas Data				
O_2 Concentration, %	12.6	12.6	12.6	12.6
VFR, x 10^5 dscfm[a]	5.06	5.05	5.06	5.06
Heat Input, MMBtu/hr	1311	1310	1312	1311
Nitrogen Oxides				
Concentration, ppm	50.6	50.1	50.2	50.3
Concentration, ppm @ 15% O_2	36.0	35.6	35.7	35.8
Permit Limit, ppm @ 15% O_2	----	----	----	*42.0*
Subpart GG, ppm @ 15% O_2 ISO	42.4	41.6	41.6	41.9
Permit Limit, ppm @ 15% O_2 ISO	----	----	----	*75*
Emission Rate, lb/hr	183	181	182	182
Emission Rate, lb/MMBtu	0.140	0.138	0.138	0.139

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factor.

TABLE 2-8
UNIT 2 - FIRING OIL
83% LOAD-143 MW
SUMMARY OF NO_X (METHOD 20) EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	6/5/02	6/5/02	6/5/02	----
Time Began	1444	1506	1527	----
Time Ended	1459	1521	1542	----
Stack Gas Data				
O_2 Concentration, %	12.4	12.4	12.4	12.4
VFR, x 10^5 dscfm[a]	5.61	5.62	5.62	5.62
Heat Input, MMBtu/hr	1490	1493	1491	1491
Nitrogen Oxides				
Concentration, ppm	48.8	48.8	49.1	48.9
Concentration, ppm @ 15% O_2	33.9	33.9	34.1	33.9
Permit Limit, ppm @ 15% O_2	----	----	----	*42.0*
Subpart GG, ppm @ 15% O_2 ISO	39.7	39.7	39.9	39.8
Permit Limit, ppm @ 15% O_2 ISO	----	----	----	*75*
Emission Rate, lb/hr	196	196	197	196
Emission Rate, lb/MMBtu	0.131	0.131	0.132	0.132

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factor.

TABLE 2-9
UNIT 2 - FIRING OIL
100% LOAD-172 MW
SUMMARY OF EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	6/11/02	6/11/02	6/11/02	----
Time Began	0645	0802	0917	----
Time Ended	0745	0902	1017	----
Stack Gas Data				
Moisture, %	10.5	11.5	11.6	11.3
CO_2 Concentration, %	6.1	6.1	6.0	6.1
O_2 Concentration, %	12.6	12.7	12.9	12.7
VFR, x 10^5 dscfm[a]	6.59	6.66	6.85	6.70
Heat Input, MMBtu/hr	1709	1707	1711	1709
Nitrogen Oxides				
Concentration, ppm	41.6	41.0	40.1	40.9
Concentration, ppm @ 15% O_2	29.6	29.5	29.6	29.5
Permit Limit, ppm @ 15% O_2	----	----	----	*42.0*
Subpart GG, ppm @ 15% O_2 ISO	35.0	34.6	35.0	34.9
Permit Limit, ppm @ 15% O_2 ISO	----	----	----	*75*
Emission Rate, lb/hr	196	195	196	196
Emission Rate, lb/MMBtu	0.115	0.114	0.115	0.115
Carbon Monoxide				
Concentration, ppm	1.2	1.3	0.9	1.1
Permit Limit, ppm	----	----	----	*20.0*
Emission Rate, lb/hr	3.5	3.8	2.7	3.3
Permit Limit, lb/hr	----	----	----	*66.9*
Emission Rate, lb/MMBtu	0.0020	0.0022	0.0016	0.0019
Volatile Organic Compounds				
Concentration, ppm as C	<0.7	<0.7	<0.7	<0.7
Permit Limit, ppm	----	----	----	*6.0*
Emission Rate, lb/hr as C	<0.8	<0.8	<0.9	<0.9
Permit Limit, lb/hr	----	----	----	*11.5*
Emission Rate, lb/MMBtu	<0.001	<0.001	<0.001	<0.001
Visible Emissions				
% Opacity	0	0	0	0
Permit Limit, %	----	----	----	*10*

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factor.

SECTION 3
SOURCE TESTING METHODOLOGY

The emission testing program was conducted in accordance with the U.S. EPA Reference Methods summarized in Table 3-1. Method descriptions and quality assurance data are provided in the referenced appendices.

TABLE 3-1
SOURCE TESTING METHODOLOGY

Parameter	Method Number	Appendix Reference		Comments
		Method Description	Quality Control Data	
Volumetric Flow Rate	19	B.1	L	Calculated from Method 19 Fuel-Factors
Gas Composition	3A	B.2	L	Instrumental
Nitrogen Oxides	20	B.3	L	Instrumental
Opacity	9	B.4	L	
Carbon Monoxide	10	B.5	L	Instrumental
Volatile Organic Compounds	25A	B.6	L	

APPENDIX A
SAMPLE CALCULATIONS

SAMPLE CALCULATIONS

Unit 2 (Full Load-Gas)
Run No. 1

Meter Pressure (Pm), in. Hg

$$Pm = Pb + \frac{\Delta H}{13.6\ in.\ H_2O/in.\ Hg}$$

where, Pb = barometric pressure, in. Hg
ΔH = Pressure differential of orifice in. H_2O

$$Pm = 30.0\ in.\ Hg + \frac{1.0\ in.\ H_2O}{13.6\ in.\ H_2O/in.\ Hg} = 30.07\ in.\ Hg$$

Standard Meter Volume (Vmstd), dscf

$$Vmstd = \frac{17.647\ ^\circ R/in.\ Hg\ \ x\ \ Y\ \ x\ \ Vm\ \ x\ \ Pm}{Tm}$$

where, Y = meter correction factor
Vm = meter volume, cf
Pm = meter pressure, in. Hg
Tm = meter temperature, °R

$$Vmstd = \frac{17.647\ ^\circ R/in.\ Hg\ \ x\ \ 1.024\ \ x\ \ 34.440\ cf\ \ x\ \ 30.07\ in.\ Hg}{551\ ^\circ R} = 33.954\ dscf$$

Standard Wet Volume (Vwstd), scf

$$Vwstd = 0.04707\ ft^3/mL\ \ x\ \ Vlc \square$$

where, Vlc = volume of H_2O collected, mL

$$Vwstd = 0.04707\ ft^3/mL\ \ x\ \ 69.9\ \ mL\ = 3.294\ scf \square$$

Moisture Fraction (Measured), (Bws)

$$Bws = \frac{Vwstd}{(Vwstd + Vmstd)} = \frac{3.294\ scf}{3.294\ scf\ +\ 33.954\ dscf} = 0.088$$

where, Vwstd = standard wet volume, scf
Vmstd = standard meter volume, dscf

Moisture, %

$$Moisture = Bws \times 100 = 0.088 \times 100 = 8.8$$

where, Bws = moisture fraction, measured or at saturation, whichever is lowest

Molecular Weight (DRY) (Md), lb/lb-mole

$$Md = (0.44 x \% CO_2) + (0.32 x \% O_2) + (0.28 (100 - \% CO_2 - \% O_2))$$

$$Md = (0.44 x 4.1) + (0.32 x 13.7) + (0.28 (100 - 4.1 - 13.7)) = 29.2 lb/lb - mole$$

Molecular Weight (WET) (Ms), lb/lb-mole

$$Ms = Md\ (1 - Bws) + 18 (Bws)$$

where, Md = molecular weight (DRY), lb/lb-mole
Bws = moisture fraction, dimensionless

$$Ms = 29.2 lb/lb - mole\ (1 - 0.088) + 18 (0.088) = 28.21 lb/lb - mole$$

Average Stack Gas Flow at Standard Conditions (Qs_h), dscfh

$$Qs_h = Heat\ Input, MMBtu/hr\ x\ F - Factor\ x\ \frac{20.9}{20.9 - O_2}$$

where, Heat Input MMBtu/hr = obtained from process
F-Factor = obtained from CFR, dscf/MMBtu

$$Qs_h = 1728\ MMBtu/hr\ x\ 8710\ x\ \frac{dscf}{MMBtu}\ x\ \frac{20.9}{20.9 - 13.7} = 43689360$$

$$Qs_m = \frac{Qsh}{60\ sec/min}$$

$$Qs_m = \frac{43689360\ dscfh}{60\ sec/min} = 728156\ dscfm$$

Method 20

NO_x Concentration, ppm @ 15% O_2

$$ppm @ 15\% O_2 = Bias\ corrected\ conc., ppm\ x \frac{20.9 - 15\% O_2}{20.9 - Actual\ \% O_2}$$

$$ppm @ 15\% O_2 = 8.1\ x \frac{20.9 - 15}{20.9 - 13.7} = 6.6\ ppm @ 15\% O_2$$

NO_x Concentration Corrected to ISO Standard Ambient Condition, ppm (Subpart GG)

$$ppm @ ISO\ Cond. = (ppm @ 15\% O_2)(Pr/Po)^{0.5}(2.718)^{19(Ho-0.00633)}(288\,°K/Ta)^{1.53}$$

where, NO_{XO} = observed NO_X concentration, ppm by volume @ 15% O_2
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

$$ppm @ ISO\ Cond. = (6.6)(760\ mm\ Hg/762\ mmHg)^{0.5}(2.718)^{19(0.017-0.00633)}(288\,°K/303\,°K)^{1.53}$$

$$ppm @ ISO\ Cond. = 7.5\ ppm$$

NO_x Emission Rate (EMR), lb/MMBtu (correcting for O_2)

$$EMR = NO_x\ conc.\ dry\ x\ 1.194\ E-7 \frac{lb/scf}{ppm}\ x\ F\ factor, \frac{dscf}{MMBtu}\ x \frac{20.9}{20.9 - \% O_2}$$

where, NO_x conc. dry = measured NO_x conc., dry ppm
1.194 E-7 lb/scf/ppm = constant (see below for calculation)
F factor = defined by client or CFR, scf/MMBtu
Bws = moisture fraction, dimensionless

$$EMR = 8.1\ ppm\ x\ 1.194\ E-7 \frac{lb/scf}{ppm}\ x\ 8710 \frac{dscf}{MMBtu}\ x \frac{20.9}{20.9 - 13.7} = 0.024 \frac{lb}{MMBtu}$$

Carbon Monoxide Emission Rate (EMR), lb/hr

$$EMR = \frac{conc.\ x\ MW\ x\ Qs\ \ x\ 60\frac{min}{hr}\ x\ 28.32\frac{L}{dscf}}{24.04\frac{L}{g\text{ - }mole}\ x\ 1.0\ x\ 10^{6}\ \frac{\mu L}{L}\ x\ 454\frac{g}{lb}}$$

where, conc. = CO conc., ppm (μL/L)
MW = molecular weight of CO, 28.0 g/g-mole
Qs = stack gas flow at std. cond., dscfm

$$EMR = \frac{0.8\ \frac{\mu L}{L}\ x\ 28.0\ \frac{g}{g\text{ - }mole}\ x\ 7.28\ E + 05\ \frac{dscf}{min}\ x\ 60\frac{min}{hr}\ x\ 28.32\frac{L}{dscf}}{24.04\frac{L}{g\text{ - }mole}\ x\ 1.0\ x\ 10^{6}\ \frac{\mu L}{L}\ x\ 454\frac{g}{lb}} = 2.5\ lb/hr$$

THC Emission Rate (THC EMR), lb/hr as Carbon

$$THC\ EMR = \frac{THC\ dry\ as\ Methane\ x\ MW\ x\ Qs\ \ x\ 60\frac{min}{hr}\ x\ 28.32\frac{L}{dscf}}{24.04\frac{L}{g\text{ - }mole}\ x\ 1.0\ x\ 10^{6}\ \frac{\mu L}{L}\ x\ 454\frac{g}{lb}}$$

where, THC dry as CH_4 = THC conc. dry as Methane, ppm (μL/L)
MW = molecular weight of carbon, 12.01 g/g-mole
Qs = stack gas flow at std. cond., dscfm

$$THC\ EMR = \frac{< 0.6\ \frac{\mu L}{L}\ x\ 12.01\frac{g}{g\text{ - }mole}\ x\ 7.28\ E + 05\frac{dscf}{min}\ x\ 60\frac{min}{hr}\ x\ 28.32\frac{L}{dscf}}{24.04\frac{L}{g\text{ - }mole}\ x\ 1.0\ x\ 10^{6}\ \frac{\mu L}{L}\ x\ 454\frac{g}{lb}} = < 0.82\ lb/hr$$

APPENDIX B
TEST METHODOLOGY

B.1 VOLUMETRIC FLOW RATE

B.2 GAS COMPOSITION

B.3 NITROGEN OXIDES

B.4 OPACITY

B.5 CARBON MONOXIDE

B.6 VOLATILE ORGANIC COMPOUNDS

B.1 VOLUMETRIC FLOW RATE

Mass emission rates are calculated by multiplying measured target analyte concentrations by calculated volumetric flow rates. Volumetric flow rates are calculated using client supplied heat input data and fuel-factors from EPA Reference Method 19. The combustion gas volume is corrected for excess air using the measured oxygen concentration as shown below:

$$HI \times F \times \frac{20.9}{20.9 - O_2} \times \frac{1}{60} = dscfm$$

where: HI = heat input, MMBtu/hr
F = fuel-factor for fired fuel, dscf/MMBtu
O_2 = stack gas oxygen content, %
20.9 = O2 concentration in ambient air
60 = conversion from hours to minutes

Gas Composition and Moisture Content

The oxygen and carbon dioxide concentration in the gas stream is measured instrumentally in accordance with EPA Reference Method 3A as described in Section B.2 or EPA Reference Method 20 as described in Section B.3.

Where appropriate for THC concentration correction, the moisture content of the gas stream is determined according to EPA Reference Method 4, by collecting an integrated sample of source gas from a single point on the gas stream. At the conclusion of each run the volume of condensed moisture collected in the impingers of the sampling train is measured and used to calculate the moisture content of the gas stream.

The molecular weight of the gas stream is calculated using the measured moisture, oxygen, and carbon dioxide concentrations. The balance of the gas stream is assumed to be nitrogen. The volumetric flow is then calculated at stack and standard conditions using the calculated molecular weight, the measured stack temperature, and measured velocity, stack and barometric pressures. Standard conditions are 68 °F and 29.92 inches of mercury and 0% moisture.

Data Acquisition and Reporting

Data are recorded at the time of collection on preprinted data sheets. Calculations are performed (where possible) with preprogrammed calculators or spreadsheet software.

Quality Control

Quality control procedures for moisture measurements involve leak checks of the sample train; calibration of gas metering systems; and periodic calibration checks of thermocouples and pyrometers.

Data transfers are minimized. Data sheets are checked for completeness and accuracy. Calculations are verified by a second person.

B.2 GAS COMPOSITION (INSTRUMENTAL)

Oxygen (O_2) and carbon dioxide (CO_2) testing is conducted in accordance with EPA Reference Method 3A.

Sampling Equipment and Procedures

Figure B-1 illustrates the sampling system. The sample is withdrawn continuously from the source through a heated probe, filter, and sample line to a sample conditioner, which removes moisture from the gas stream. The sample is then transported to a California Analytical Instruments, Inc. Model 300 analyzer.

Sample Analysis

The O_2 analyzer uses a paramagnetic detector and the CO_2 analyzer uses a non-dispersive infra-red (NDIR) detector to produce an electrical signal, which is linearly proportional to the O_2 and CO_2 concentration, respectively.

Data Acquisition and Reduction

Data is acquired electronically using an IBM compatible computer and software designed by WESTON for EPA Reference Method 3A analysis. This system generates a calibration curve, converts electronic signals into concentrations, and provides one-minute averages during the sample run and an average concentration over the duration of the sample run.

Quality Control

At the time of analysis, O_2 and CO_2 in nitrogen calibration gases certified according to EPA Protocol-1, are used to calibrate the analyzers and to determine a bias correction factor for the entire system bias in accordance with EPA Reference Method 3A. The calibration gases are introduced directly to the analyzer to generate the calibration curve. A zero gas and an upscale calibration gas is introduced at the probe and recovered through the sampling and analytical system. A bias correction factor is calculated using the ratio of the concentration measured from the sampling system and concentration measured directly at the analyzer. Sample run averages are corrected for system bias results.

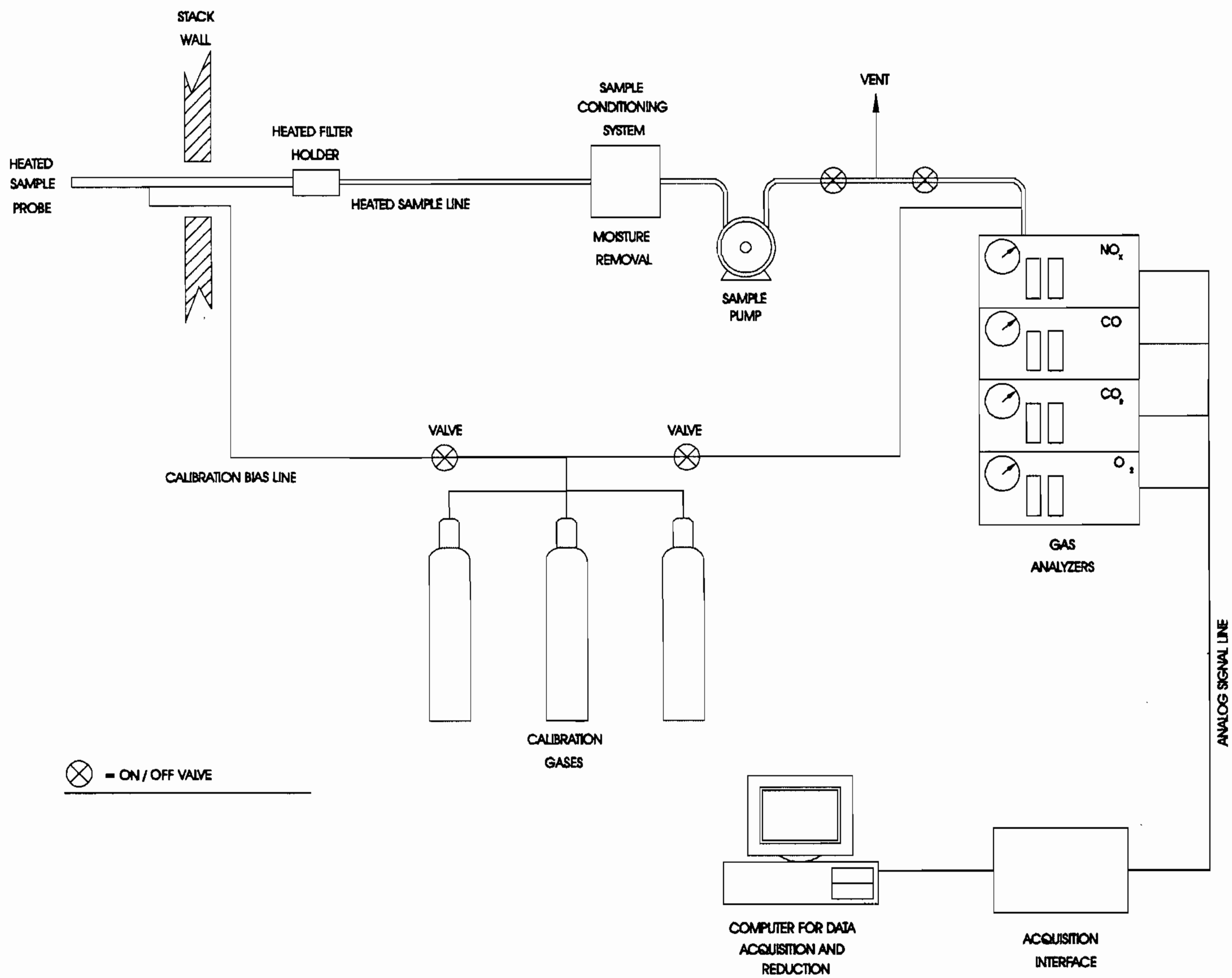

Figure B-1 Continuous Emission Monitoring System

B.3 NITROGEN OXIDES AND OXYGEN (INSTRUMENTAL)

Nitrogen oxides (NO_x) testing is conducted in accordance with EPA Reference Method 20.

Sampling Equipment and Procedures

Figure B-1 illustrates the sampling system. The sample is withdrawn from the source through a heated probe, filter, and sample line to a sample conditioner, which removes moisture from the gas stream. The sample is then being transported through a Teflon® sample line to a California Analytical Instruments, Inc. Model 400CLD NO_X Analyzer and a California Analytical Instruments, Inc. Model 300 paramagnetic oxygen analyzer.

After system calibration and bias determination and prior to initiation of the NO_X emission test, a preliminary O_2 traverse is conducted to determine the appropriate NO_X sample points. Up to 48 traverse points are selected according to the procedures of EPA Reference Method 1 for the O_2 traverse. The sampling system response time is determined by injecting NO_X and/or O_2 calibration gases to the probe and measuring the time required for the analytical measurement system to measure 95% of the expected step change from source gas concentration to calibration gas or zero gas concentration. The O_2 concentration is determined at each of the traverse points for a minimum of one (1) minute, plus the sample system response time.

To conduct the NO_X sample run, a minimum of eight sample points of the lowest O_2 concentration, as determined during the O_2 traverse, are selected for determination of NOx concentration. The sample run consists of a minimum of one (1) minute of data, plus the sample system response time, collected at each of the eight sample points.

Analytical Principal

The NO_X analyzer uses an oxidizing converter to produce nitric oxide (NO) molecules. A chemiluminescent reaction of NO and ozone is then used to produce nitrogen dioxide (NO_2), oxygen (O_2), and ultraviolet light. This ultraviolet light is measured using a highly sensitive optical filter/photomultiplier whose output is linearly proportional to the NO concentration.

The O_2 analyzer uses a paramagnetic sensor to determine O_2 molecular concentration and produces an output that is linearly proportional to the O_2 concentration.

Data Acquisition and Reduction

Data are acquired electronically using an IBM compatible computer and software designed by WESTON for EPA Reference Method 20 analysis. This system generates a calibration curve, converts electronic signals into concentrations, and provides bias-corrected hourly averages.

Quality Control

Prior to sampling, NO in nitrogen and O_2 in nitrogen calibration gases, certified according to EPA Protocol-1, are used to calibrate the analyzers and to determine a bias correction factor for the entire system. Calibration and system response is performed in accordance with EPA Reference Method 20.

The zero and mid-range NO_X calibration gases are introduced directly to the NO_X analyzer to generate the calibration curve. The low- and high-range NO_X calibration gases are then introduced to determine calibration error, which should be <2%. The zero and one calibration gas are introduced at the probe and recovered through the sampling and analytical system. A bias correction factor is calculated using the ratio of the measured concentration of the bias gas and concentration certified by the vendor. An interference response study was performed by the manufacturer of the analyzer. The data from this study are on file at WESTON.

An NO_2 to NO conversion efficiency test is performed on site in accordance with the procedure described in EPA Reference Method 20. The results from this study should indicate that the NO_2 to NO conversion efficiency is greater than 98%.

B.4 VISIBLE EMISSION (STACK OPACITY)

The opacity of emissions from stationary sources is determined visually by a qualified observer using EPA Reference Method 9.

Sampling and Analytical Objectives

- The observer will stand at a distance to provide a clear view of the emissions with the sun oriented in the 140° sector to his/her back.
- Observers' line of vision should be perpendicular to the plume direction.
- Line of sight should not include more than one plume.
- Observer to record all pertinent atmospheric conditions and pertinent client information.
- Opacity observations are made at the point of greatest opacity of the plume and at a point without condensed water vapor.
- For attached steam plumes the observations are made at a point where condensed water vapor can no longer be seen.
- For detached steam plumes, when the water vapor condenses and becomes visible at a distinct distance from the emission outlet, the plume is evaluated at the emission outlet.
- Each run is calculated as the average of 60 minutes of observations recorded at 15 second intervals.

Potential Problems and Limitations

- Luminescence and color contrast between the plume and the background against which the plume is viewed may exert an influence upon the appearance of a plume.
- For a strong contrast there may be a positive influence upon the observer.

B.5 CARBON MONOXIDE

Carbon monoxide testing is conducted in accordance with EPA Reference Method 10.

Sampling Equipment and Procedures

Figure B-1 illustrates the sampling system. Sampling is performed by continuous sample extraction and analysis withdrawn from the stack through a conditioning system for moisture removal, using a leak-tight sample pump. The dry gas sample is then transported through sample lines to a Thermo Environmental Corporation (TECO) Model 48 Non-Dispersive Infrared (NDIR) CO analyzer for continuous on-line monitoring.

Sample Analysis

The analyzer uses gas filter correlation spectroscopy to measure the amount of CO present in the sample. Infrared radiation is chopped and passed through an alternating CO and N_2 correlation filter wheel and the sample stream. Carbon monoxide in the sample absorbs the infrared radiation, leaving the remaining radiation to be measured by a detector producing a linear output signal.

Data Acquisition and Reduction

Data are acquired electronically using an IBM compatible computer and software designed by WESTON for EPA Reference Method 10 analysis or alternatively the analyzer analog signal is recorded using a strip-chart recorder.

For data collection using a computer and acquisition interface, the software generates a calibration curve and continuous calculation of sample concentration. All subsequent calculation procedures required for compliance with EPA Reference Method 10 are performed electronically.

For data collection using a strip chart recorder, the calibration curve and subsequent calibration procedures are performed manually or by using pre-programmed calculators.

Quality Control

At the time of analysis, CO in nitrogen calibration gases, of at certified ($\pm$5%) or EPA Protocol-1 quality, are used to calibrate the analysis system. Calibration is performed in accordance with EPA Reference Method 10. Following each sample run, calibration gases are introduced to the sampling system to determine calibration drift.

A CO_2 interference response study was performed by the manufacturer of the analyzer. The data from this study are on file at WESTON.

B.6 VOLATILE ORGANIC COMPOUND CONCENTRATION

Volatile organic compound (VOC) concentrations are sampled according to EPA Reference Method 25A as total hydrocarbons (THC) and analyzed by WESTON on site with a flame ionization detector (FID) analyzer. It should be noted that Method 25A determines total organics, including methane, which is not a regulated volatile organic compound (VOC). In cases where significant levels of THC (at or near the permit limit) are determined, integrated bag samples of source gas may be collected for analysis for methane, which will be subtracted from the THC concentration.

Sampling Equipment and Procedures

Figure B-2 is a schematic of the EPA Reference Method 25A sampling system. Sample gas is withdrawn continuously from a single point and transported to the FID through a heated probe and heated Teflon® sample line to a J.U.M. Model VE-7 total hydrocarbon analyzer. All hydrocarbon measurements are made on a "hot, wet" basis and concentration results are determined as parts per million of carbon by volume, on a wet basis (ppmvw) .

Sample Analysis

The analyzer utilizes a FID as described by EPA Reference Method 25A. The technique is not selective between species, and the results are reported as carbon volume equivalents of the calibration gas.

Prior to each test, the sampling and analytical system are calibrated using two calibration gases (zero and 80 to 90 percent of span). This step is followed by a calibration error check utilizing two additional calibration gases at approximately 25 and 45 percent of the span value. The acceptance criterion for the calibration error check is less than 5% the certified gas value.

Data Acquisition and Reduction

Data is acquired electronically using an IBM compatible computer and software designed by WESTON for EPA Reference Method 25A analysis.

Quality Control

The calibration gases are either methane or propane, in either air or nitrogen, certified according to EPA Protocol-1. Following each sample run, the sampling system calibration drift is determined by introducing the zero gas and one upscale gas to the sampling system. The response is recorded and the difference in concentration must be within three percent of the full scale span value.

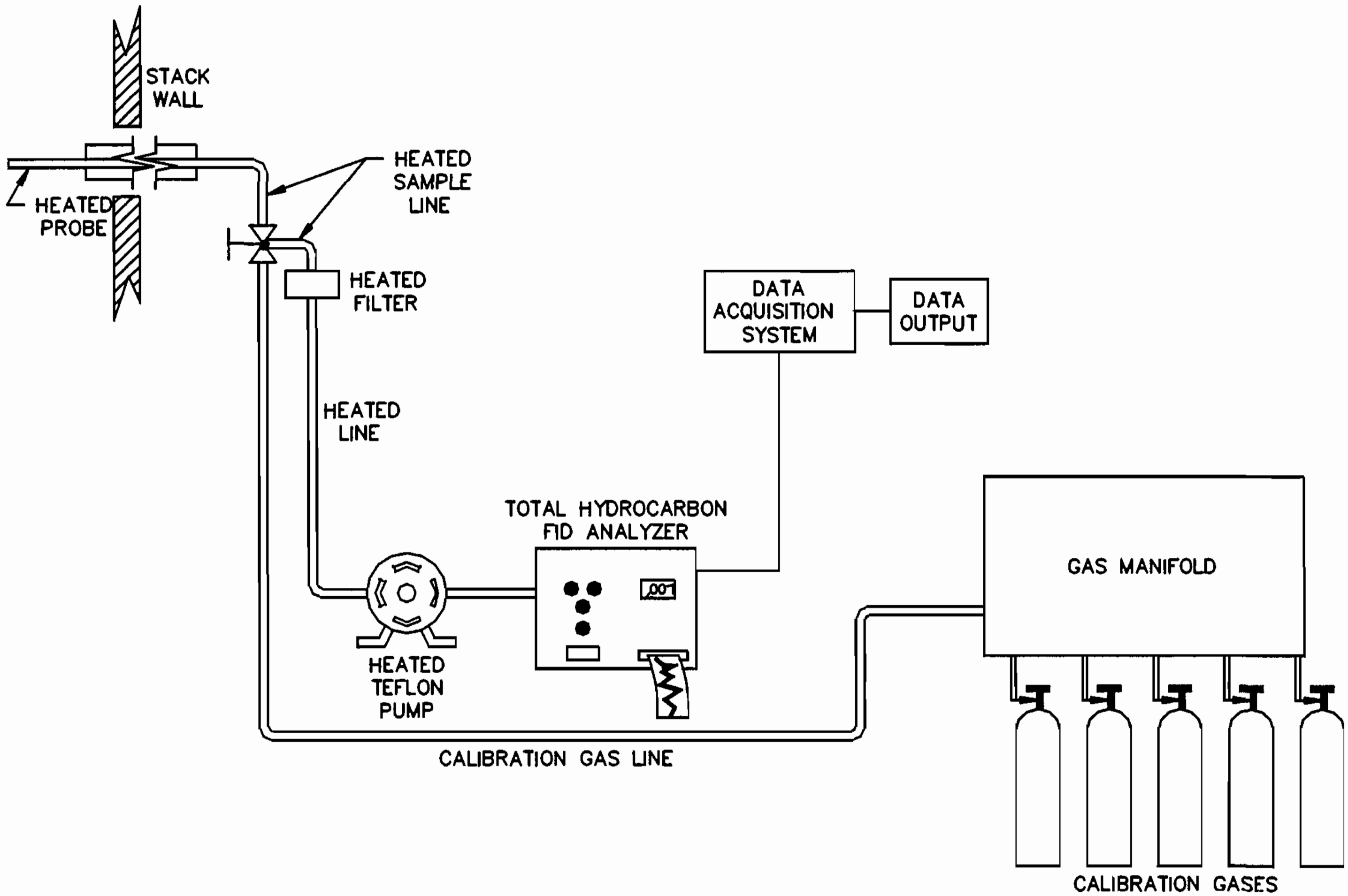

Figure B-2 EPA Reference Method 25A Sampling Train

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: **003**

[ ] No ID
[ ] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
A	**20 JUNE 2002**	**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 OPP-EU1-A9.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Dry Low-NO_x combustion - Natural Gas** **Water Injection - Distillate Oil Firing**
2. Control Device or Method Code(s): **025, 028**

Emissions Unit Details

1. Package Unit: Manufacturer: **General Electric**	Model Number: **7FA**	
2. Generator Nameplate Rating:	**189** 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:			**1,722**	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		hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters): **Maximum Heat Input Rate at ISO Conditions and natural gas firing (LHV); maximum for oil firing is 1,919 MMBtu/hr (ISO-LHV). PSD-FL-258.**				

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

See Attachment OPP-EU1-C.	

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? **CT1**	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: **1,115** °F	9. Actual Volumetric Flow Rate: **2,565,050** acfm	10. Water Vapor: **8.7** %

11. Maximum Dry Standard Flow Rate: **1,092,180** dscfm	12. Nonstack Emission Point Height: feet

13. Emission Point UTM Coordinates:

Zone: **17** East (km): **520.1** North (km): **3137.6**

14. Emission Point Comment (limit to 200 characters):

Stack parameters for ISO operating conditions firing natural gas; for oil 1,109°F and 2,610,318 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): **2-01-001-01**	3. SCC Units: **1,000 gallons burned**	
4. Maximum Hourly Rate: **14.6**	5. Maximum Annual Rate: **14,560**	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.** **Has facility-wide fuel limit.**		

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): **2-01-002-01**	3. SCC Units: **Million cubic feet**	
4. Maximum Hourly Rate: **1.81**	5. Maximum Annual Rate: **6,145**	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.** **Has facility-wide fuel limit.**		

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 **23.75** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE Guarantee**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters):	
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: **10% opacity**	4. Equivalent Allowable Emissions: **17** lb/hour **8.5** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 9**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing- all loads; 1,000 hrs/yr. See PSD Air Construction Permit Application, 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: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

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% Opacity**	4. Equivalent Allowable Emissions: **9** lb/hour **15.3** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 9**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing- all loads; 3,390 hrs/yr. See PSD Air Construction Permit Application, 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: **103.4** lb/hour **58.3** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **PSD-FL-258**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters):	
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. 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: **103.4** lb/hour **51.7** 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 - 1,000 hrs/yr. See PSD Air Construction Permit PSD-FL-258.**	

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: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

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: **5.5** lb/hour **9.3** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel Sampling**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested Allowable Emissions and Units: Pipeline Natural Gas. Gas firing - 3,390 hrs/yr. See PSD Air Construction Permit PSD-FL-258.**	

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: **344** lb/hour **246.8** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **PSD-FL-258**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters):	
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: **42 ppmvd**	4. Equivalent Allowable Emissions: **344** lb/hour **172** tons/year
5. Method of Compliance (limit to 60 characters): **CEM - 3-hr block 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; 1,000 hrs/yr. See Air Construction Permit PSD-FL-258.**	

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: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

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: **62.6** lb/hour **106.1** tons/year
5. Method of Compliance (limit to 60 characters): **CEM - 24-hr block average.**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested Allowable Emissions and Units: Gas firing; 3,390 hrs/yr. See Air Construction Permit PSD-FL-258.**	

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: **66.9** lb/hour **82.4** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **PSD-FL-258**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **lb/hr based on oil firing. 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: **66.9** lb/hour **33.5** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10 (required for gas firing only)**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing, 59°F, 100% load; 1,000 hrs/yr. See PSD-FL-258.**	

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: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

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: **41** lb/hour **69.5** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10 (required for gas firing only)**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas Firing; 3,390 hrs/yr. See Air Construction Permit PSD-FL-258.**	

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: **11.5** lb/hour **12.8** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **PSD-FL-258**	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
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: **6 ppmvd**	4. Equivalent Allowable Emissions: **11.5** lb/hour **5.75** tons/year
5. Method of Compliance (limit to 60 characters): **CO emission limit employed as surrogate and no annual testing required.**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing; 1,000 hrs/yr. See Air Construction Permit PSD-FL-258.**	

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: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

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: **3 ppmvd**	4. Equivalent Allowable Emissions: **5.9** lb/hour **10** tons/year
5. Method of Compliance (limit to 60 characters): **CO emission limit employed as surrogate and no annual testing required.**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Additional Requested Allowable Emissions and Units: Gas firing, 100% load, 32°F; 3,390 hrs/yr. See Air Construction Permit PSD-FL-258.**	

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 **23.75** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE Guarantee**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters):	
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: **10% opacity**	4. Equivalent Allowable Emissions: **17** lb/hour **8.5** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 9**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing- all loads; 1,000 hrs/yr. See PSD Air Construction Permit Application, 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: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

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% opacity**	4. Equivalent Allowable Emissions: **9** lb/hour **15.3** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 9**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing- all loads; 3,390 hrs/yr. See PSD Air Construction Permit Application, 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 1

1. Visible Emissions Subtype: **VE10**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: **10** % 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): **See Air Construction Permit PSD-FL-258.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 1 of 1

1. Parameter Code: **VE99**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **FDEP Rule 62-210.700(1), Allowed for 2 hours (120 minutes) per 24-hours for startup, shutdown, and malfunction. PSD-FL-258**	

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements

1. Process Flow Diagram [X] Attached, Document ID: OPP-FI-C3 [ ] Not Applicable [ ] Waiver Requested	
2. Fuel Analysis or Specification [X] Attached, Document ID: OPP-EU1-J2 [ ] Not Applicable [ ] Waiver Requested	
3. Detailed Description of Control Equipment [X] Attached, Document ID: OPP-EU1-J3 [ ] Not Applicable [ ] Waiver Requested	
4. Description of Stack Sampling Facilities [X] Attached, Document ID: OPP-EU1-J4 [ ] Not Applicable [ ] Waiver Requested	
5. Compliance Test Report [X] Attached, Document ID: OPP-EU3-J5 [ ] Previously submitted, Date: ______ [ ] Not Applicable	
6. Procedures for Startup and Shutdown [X] Attached, Document ID: OPP-EU1-J6 [ ] Not Applicable [ ] Waiver Requested	
7. Operation and Maintenance Plan [X] Attached, Document ID: OPP-EU1-J7 [ ] Not Applicable [ ] Waiver Requested	
8. Supplemental Information for Construction Permit Application [ ] Attached, Document ID: ______ [X] Not Applicable	
9. Other Information Required by Rule or Statute [ ] Attached, Document ID: ______ [X] Not Applicable	
10. Supplemental Requirements Comment:	

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation [X] Attached, Document ID: OPP-FI-C10 [ ] Not Applicable
12. Alternative Modes of Operation (Emissions Trading) [ ] Attached, Document ID:________ [X] Not Applicable
13. Identification of Additional Applicable Requirements [X] Attached, Document ID: OPP-FI-C12 [ ] Not Applicable
14. Compliance Assurance Monitoring Plan [X] Attached, Document ID: OPP-EU1-J14 [ ] Not Applicable
15. Acid Rain Part Application (Hard-copy Required) [X] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID: OPP-EU1-J15 [ ] 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

ATTACHMENT OPP-EU3-J5

COMPLIANCE TEST REPORT

Weston Solutions, Inc.
1625 Pumphrey Avenue
Auburn, Alabama 36832-4303
(334)826-6100 ♦ Fax (334-826-8232
www.westonsolutions.com

6 August 2002

Mr. Ed Much
Constellation Power Source Generation
Fort Smallwood Road Complex
1000 Brandon Shores Road
Baltimore, Maryland 21226

Work Order No. 11383.005.001

Re: Unit 3 Simple Cycle Combustion Turbine NO_X, CO, and VOC Compliance Emission Test Report

Dear Mr. Much:

Enclosed are two copies of the above-referenced test report. Submission of this report completes the work authorized by your Purchase Order No. 214213. An invoice has been forwarded under separate cover.

We appreciate the cooperation and help you and your staff provided during the project. If there are any questions regarding the report or if we can be of additional assistance to you in any way, contact me at 334-887-0622. We look forward to working with you in the future.

Very truly yours,

WESTON SOLUTIONS, INC.

Gregory R. Sims
Project Manager

jb

Enclosure

Work Order No. 11383.005.001

Unit 3
Simple Cycle Combustion
Turbine NO_x, CO, and VOC
Compliance Emission Test Report
Oleander Power Plant
Cocoa, Florida
9-11 July 2002

Prepared For

CONSTELLATION POWER SOURCE GENERATION

Fort Smallwood Road Complex
1000 Brandon Shores Road
Baltimore, Maryland 21226

Gregory R. Sims
Project Manager
Approved for Transmittal
334-887-0622

Jon Howard
Quality Assurance Manager
Approved for Transmittal
334-887-0720

Prepared By

WESTON SOLUTIONS, INC.

1625 Pumphrey Ave.
Auburn, Alabama 36832-4303
Phone: 334-826-6100 Fax: 334-826-8232

6 August 2002

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LIST OF TABLES

SECTION 1
INTRODUCTION

Weston Solutions, Inc. (WESTON®) was retained by Constellation Power Source Generation (CPSG) to conduct nitrogen oxides (NO_X), carbon monoxide (CO), and non-methane volatile organic compounds (NMVOC) emission testing on Unit 3 at the Oleander Power Plant (OPP) located in Cocoa, Florida. Unit 3 is a simple cycle combustion turbine operated as a peaking unit.

The purpose of the testing was to demonstrate compliance with applicable standards of 40 CFR, Part 60, Subpart GG and the Florida Department of Environmental Protection (FDEP) permit limits. Emission testing was conducted in accordance with the test protocol submitted to and approved by FDEP.

WESTON performed the emission testing during 9-11 July 2002. The project team was comprised of the following individuals.

Name	Project Role
Greg Sims	Project Manager/ Technical Manager/Test Team Leader
Billy Routhier	Test Team Member
Susan Brown	Test Team Member
Steve Daughtry	Test Team Member
Jon Howard	Report Coordinator

Mr. Craig Fierstien and Mr. Warren Harris of CPSG coordinated the testing with facility operations. Mr. Garry Kuberski of the FDEP was present during a portion of the testing.

SECTION 2
RESULTS AND DISCUSSION

Table 2-1 presents the mean results of the emission testing with comparison to the permit requirements. The results are less than the applicable standard(s) for the source.

According to the permit, the Best Available Control Technology (BACT) limits are more stringent than the New Source Performance Standards (NSPS) limitations of subpart GG, therefore, compliance with the BACT limits indicates compliance with NSPS limitations.

Sulfur dioxide sampling under gas firing conditions is exempted by the permit, however, as required by subpart GG, fuel samples were collected and analyzed for sulfur. The concentration of sulfur at 3-5 ppm in the natural gas samples and <0.03 percent by weight in the fuel oil sample meets the requirements of subpart GG that no fuel shall be fired that contains sulfur in excess of 0.8 percent by weight.

Tables 2-2 through 2-9 provide detailed summaries of the emission results at the various load levels under each fuel. Any differences between the calculated results presented in the appendices and the results reported in the summary tables are due to rounding for presentation.

In accordance with Method 20 requirements, an oxygen (O_2) traverse was performed prior to sampling to select the eight sample traverse points of the lowest O_2 concentration. The O_2 traverse was conducted such that at least one minute of actual stack gas was analyzed at each of the 48 total traverse points. The O_2 traverse was conducted in strict accordance with EPA Reference Method 20. Copies of the O_2 traverse measurements are included in the appendices.

TABLE 2-1
SUMMARY OF EMISSION TEST RESULTS

Operating Load	Mean Test Value	Permit Limit
50% Load – Firing Gas		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	7.6	9.0
Subpart GG, ppm @ 15% O_2 ISO	8.7	----
Emission Rate, lb/hr	32.7	62.6
Emission Rate, lb/MMBtu	0.028	----
66% Load – Firing Gas		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	6.7	9.0
Subpart GG, ppm @ 15% O_2 ISO	7.8	----
Emission Rate, lb/hr	33.6	62.6
Emission Rate, lb/MMBtu	0.025	----
83% Load – Firing Gas		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	6.5	9.0
Subpart GG, ppm @ 15% O_2 ISO	7.5	----
Emission Rate, lb/hr	36.9	62.6
Emission Rate, lb/MMBtu	0.024	----
100% Load – Firing Gas		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	6.0	9.0
Subpart GG, ppm @ 15% O_2 ISO	7.0	----
Emission Rate, lb/hr	37.2	62.6
Emission Rate, lb/MMBtu	0.022	----
Carbon Monoxide		
Concentration, ppm	2.6	12.0
Emission Rate, lb/hr	8.0	41
Emission Rate, lb/MMBtu	0.0047	----
Volatile Organic Compounds		
Concentration, ppm as C	<0.8	3.0
Emission Rate, lb/hr as C	<1.1	5.9
Emission Rate, lb/MMBtu	<0.001	----
Visible Emissions		
% Opacity	0	10

TABLE 2-1
SUMMARY OF EMISSION TEST RESULTS
(CONTINUED)

Operating Load	Mean Test Value	Permit Limit
50% Load – Firing Oil		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	38.0	42.0
Subpart GG, ppm @ 15% O_2 ISO	43.6	----
Emission Rate, lb/hr	165	----
Emission Rate, lb/MMBtu	0.147	----
66% Load – Firing Oil		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	38.6	42.0
Subpart GG, ppm @ 15% O_2 ISO	44.4	----
Emission Rate, lb/hr	197	----
Emission Rate, lb/MMBtu	0.150	----
83% Load – Firing Oil		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	37.8	42.0
Subpart GG, ppm @ 15% O_2 ISO	43.3	----
Emission Rate, lb/hr	222	----
Emission Rate, lb/MMBtu	0.147	----
100% Load – Firing Oil		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	35.9	42.0
Subpart GG, ppm @ 15% O_2 ISO	41.4	----
Emission Rate, lb/hr	240	----
Emission Rate, lb/MMBtu	0.139	----
Carbon Monoxide		
Concentration, ppm	3.8	20.0
Emission Rate, lb/hr	11	66.9
Emission Rate, lb/MMBtu	0.006	----
Volatile Organic Compounds		
Concentration, ppm as C	<0.7	6.0
Emission Rate, lb/hr as C	<0.9	11.5
Emission Rate, lb/MMBtu	<0.001	----
Visible Emissions		
% Opacity	0	10

TABLE 2-2
UNIT 3 – FIRING NATURAL GAS
50% LOAD – 90 MW
SUMMARY OF NO_X (METHOD 20) EMISSION RESULTS

	Run 1	**Run 2**	**Run 3**	**Mean**
Date	7/11/02	7/11/02	7/11/02	----
Time Began	0648	0708	0730	----
Time Ended	0703	0723	0745	----
Stack Gas Data				
O_2 Concentration, %	13.8	13.8	13.8	13.8
VFR, x 10^5 dscfm[a]	5.02	5.01	5.03	5.02
Heat Input Rate, MMBtu/hr	1174	1173	1177	1175
Nitrogen Oxides				
Concentration, ppm	9.2	9.1	9.0	9.1
Concentration, ppm @ 15% O_2	7.6	7.6	7.5	7.6
Permit Limit, ppm @ 15% O_2	----	----	----	*9.0*
Subpart GG, ppm @ 15% O_2 ISO	8.8	8.7	8.7	8.7
Emission Rate, lb/hr	33.0	32.6	32.4	32.7
Permit Limit, lb/hr	----	----	----	*62.6*
Emission Rate, lb/MMBtu	0.028	0.028	0.028	0.028

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factors.

TABLE 2-3
UNIT 3 - FIRING NATURAL GAS
66% LOAD – 117 MW
SUMMARY OF NO_X (METHOD 20) EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	7/11/02	7/11/02	7/11/02	----
Time Began	0756	0815	0835	----
Time Ended	0811	0830	0850	----
Stack Gas Data				
O_2 Concentration, %	13.7	13.7	13.7	13.7
VFR, x 10^5 dscfm[a]	5.74	5.74	5.73	5.74
Heat Input, MMBtu/hr	1361	1363	1360	1361
Nitrogen Oxides				
Concentration, ppm	8.3	8.1	8.2	8.2
Concentration, ppm @ 15% O_2	6.8	6.6	6.7	6.7
Permit Limit, ppm @ 15% O_2	----	----	----	*9.0*
Subpart GG, ppm @ 15% O_2 ISO	7.9	7.8	7.9	7.8
Emission Rate, lb/hr	34.0	33.3	33.6	33.6
Permit Limit, lb/hr	----	----	----	*62.6*
Emission Rate, lb/MMBtu	0.025	0.024	0.025	0.025

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factors.

TABLE 2-4
UNIT 3 - FIRING NATURAL GAS
83% LOAD – 143 MW
SUMMARY OF NO_X (METHOD 20) EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	7/11/02	7/11/02	7/11/02	----
Time Began	0856	0916	0936	----
Time Ended	0911	0931	0951	----
Stack Gas Data				
O_2 Concentration, %	13.7	13.7	13.7	13.7
VFR, x 10^5 dscfm[a]	6.51	6.51	6.51	6.51
Heat Input, MMBtu\hr	1545	1543	1544	1544
Nitrogen Oxides				
Concentration, ppm	7.9	7.9	8.0	7.9
Concentration, ppm @ 15% O_2	6.5	6.5	6.6	6.5
Permit Limit, ppm @ 15% O_2	----	----	----	*9.0*
Subpart GG, ppm @ 15% O_2 ISO	7.4	7.5	7.6	7.5
Emission Rate, lb/hr	36.8	36.7	37.2	36.9
Permit Limit, lb/hr	----	----	----	*62.6*
Emission Rate, lb/MMBtu	0.024	0.024	0.024	0.024

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factors.

TABLE 2-5
UNIT 3 - FIRING NATURAL GAS
100% LOAD – 161 MW
SUMMARY OF EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	7/9/02	7/9/02	7/9/02	----
Time Began	1413	1552	1712	----
Time Ended	1513	1652	1812	----
Stack Gas Data				
Moisture, %	9.1	9.2	9.3	9.2
O_2 Concentration, %	13.7	13.7	13.7	13.7
VFR, x 10^5 dscfm[a]	7.18	7.16	7.14	7.16
Heat Input, MMBtu/hr	1704	1700	1695	1700
Nitrogen Oxides				
Concentration, ppm	7.7	7.2	6.9	7.3
Concentration, ppm @ 15% O_2	6.3	5.9	5.7	6.0
Permit Limit, ppm @ 15% O_2	----	----	----	*9.0*
Subpart GG, ppm @ 15% O_2 ISO	7.4	6.9	6.6	7.0
Emission Rate, lb/hr	39.5	36.9	35.2	37.2
Permit Limit, lb/hr	----	----	----	*62.6*
Emission Rate, lb/MMBtu	0.023	0.022	0.021	0.022
Carbon Monoxide				
Concentration, ppm	2.1	2.1	3.5	2.6
Permit Limit, ppm	----	----	----	*12.0*
Emission Rate, lb/hr	6.6	6.6	10.9	8.0
Permit Limit, lb/hr	----	----	----	*41.0*
Emission Rate, lb/MMBtu	0.0039	0.0039	0.0064	0.0047
Volatile Organic Compounds				
Concentration, ppm as C	<0.7	<0.7	<0.7	<0.7
Permit Limit, ppm	----	----	----	*3.0*
Emission Rate, lb/hr as C	<0.9	<0.9	<0.9	<0.9
Permit Limit, lb/hr	----	----	----	*5.9*
Emission Rate, lb/MMBtu	<0.001	<0.001	<0.001	<0.001
Visible Emissions				
% Opacity	0	0	0	0
Permit Limit, %	----	----	----	*10*

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factors.

TABLE 2-6
UNIT 3 - FIRING OIL
50% LOAD – 90 MW
SUMMARY OF NO_X (METHOD 20) EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	7/11/02	7/11/02	7/11/02	----
Time Began	1320	1339	1359	----
Time Ended	1335	1354	1414	----
Stack Gas Data				
O_2 Concentration, %	12.9	12.9	12.9	12.9
VFR, x 10^5 dscfm[a]	4.47	4.48	4.45	4.47
Heat Input, MMBtu/hr	1117	1120	1113	1117
Nitrogen Oxides				
Concentration, ppm	51.7	51.8	51.1	51.5
Concentration, ppm @ 15% O_2	38.1	38.2	37.7	38.0
Permit Limit, ppm @ 15% O_2	----	----	----	*42.0*
Subpart GG, ppm @ 15% O_2 ISO	43.7	44.1	43.2	43.6
Emission Rate, lb/hr	165	166	163	165
Emission Rate, lb/MMBtu	0.148	0.148	0.146	0.147

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factors.

TABLE 2-7
UNIT 3 - FIRING OIL
66% LOAD – 117 MW
SUMMARY OF NO_X (METHOD 20) EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	7/11/02	7/11/02	7/11/02	----
Time Began	1208	1231	1251	----
Time Ended	1223	1246	1306	----
Stack Gas Data				
O_2 Concentration, %	12.6	12.6	12.6	12.6
VFR, x 10^5 dscfm[a]	5.09	5.06	5.06	5.07
Heat Input, MMBtu/hr	1319	1313	1313	1315
Nitrogen Oxides				
Concentration, ppm	54.3	54.3	54.3	54.3
Concentration, ppm @ 15% O_2	38.6	38.6	38.6	38.6
Permit Limit, ppm @ 15% O_2	----	----	----	*42.0*
Subpart GG, ppm @ 15% O_2 ISO	44.5	44.5	44.2	44.4
Emission Rate, lb/hr	198	197	197	197
Emission Rate, lb/MMBtu	0.150	0.150	0.150	0.150

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factors.

TABLE 2-8
UNIT 3 - FIRING OIL
83% LOAD – 143 MW
SUMMARY OF NO_X (METHOD 20) EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	7/11/02	7/11/02	7/11/02	----
Time Began	1104	1124	1144	----
Time Ended	1119	1139	1159	----
Stack Gas Data				
O_2 Concentration, %	12.5	12.4	12.4	12.4
VFR, x 10^5 dscfm[a]	5.74	5.70	5.72	5.72
Heat Input, MMBtu/hr	1507	1513	1519	1513
Nitrogen Oxides				
Concentration, ppm	54.4	54.2	54.3	54.3
Concentration, ppm @ 15% O_2	38.2	37.6	37.7	37.8
Permit Limit, ppm @ 15% O_2	----	----	----	*42.0*
Subpart GG, ppm @ 15% O_2 ISO	43.1	42.9	43.8	43.3
Emission Rate, lb/hr	223	221	222	222
Emission Rate, lb/MMBtu	0.148	0.146	0.146	0.147

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factors.

TABLE 2-9
UNIT 3 - FIRING OIL
100% LOAD – 171 MW
SUMMARY OF EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	7/10/02	7/10/02	7/10/02	----
Time Began	1512	1626	1734	----
Time Ended	1612	1726	1834	----
Stack Gas Data				
Moisture, %	11.6	11.0	9.9	10.8
O_2 Concentration, %	12.6	12.6	12.6	12.6
VFR, x 10^5 dscfm[a]	6.67	6.66	6.66	6.66
Heat Input, MMBtu/hr	1729	1726	1728	1728
Nitrogen Oxides				
Concentration, ppm	50.5	50.4	50.5	50.5
Concentration, ppm @ 15% O_2	35.9	35.8	35.9	35.9
Permit Limit, ppm @ 15% O_2	----	----	----	*42.0*
Subpart GG, ppm @ 15% O_2 ISO	41.2	41.5	41.4	41.4
Emission Rate, lb/hr	241	240	241	240
Emission Rate, lb/MMBtu	0.139	0.139	0.139	0.139
Carbon Monoxide				
Concentration, ppm	4.4	3.4	3.6	3.8
Permit Limit, ppm	----	----	----	*20.0*
Emission Rate, lb/hr	12.8	9.9	10.5	11.0
Permit Limit, lb/hr	----	----	----	*66.9*
Emission Rate, lb/MMBtu	0.007	0.006	0.006	0.006
Volatile Organic Compounds				
Concentration, ppm as C	<0.7	<0.7	<0.7	<0.7
Permit Limit, ppm	----	----	----	*6*
Emission Rate, lb/hr as C	<0.9	<0.9	<0.9	<0.9
Permit Limit, lb/hr	----	----	----	*11.5*
Emission Rate, lb/MMBtu	<0.001	<0.001	<0.001	<0.001
Visible Emissions				
% Opacity	*0*	0	0	0
Permit Limit, %	----	----	----	*10*

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factors.

SECTION 3
SOURCE TESTING METHODOLOGY

The emission testing program was conducted in accordance with the U.S. EPA Reference Methods summarized in Table 3-1. Method descriptions and quality assurance data are provided in the referenced appendices.

TABLE 3-1
SOURCE TESTING METHODOLOGY

Parameter	Method Number	Appendix Reference: Method Description	Appendix Reference: Quality Control Data	Comments
Volumetric Flow Rate	19	B.1	L	Calculated from Method 19 Fuel-Factors
Gas Composition	3A	B.2	L	Instrumental
Nitrogen Oxides	20	B.3	L	Instrumental
Opacity	9	B.4	L	
Carbon Monoxide	10	B.5	L	Instrumental
Volatile Organic Compounds	25A	B.6	L	

Original process data provided for Low-mid and High-mid load testing while firing fuel oil contains some heat input data points which appear anomalous and unreasonable for the load levels tested. These data have been revised to reflect the most reasonable heat input for the given loads. Results have been calculated using the revised heat input data. Original and revised process data are presented in Appendix M.

APPENDIX A
SAMPLE CALCULATIONS

SAMPLE CALCULATIONS

Unit 3 (Full Load – Gas)
Run No. 1

Meter Pressure (Pm), in. Hg

$$Pm = Pb + \frac{\Delta H}{13.6\ in.\ H_2O/in.\ Hg}$$

where, Pb = barometric pressure, in. Hg
ΔH = Pressure differential of orifice in. H_2O

$$Pm = 30.15\ in.\ Hg + \frac{1.0\ in.\ H_2O}{13.6\ in.\ H_2O/in.\ Hg} = 30.22\ in.\ Hg$$

Standard Meter Volume (Vmstd), dscf

$$Vmstd = \frac{17.647\ {}^{\circ}R/in.\ Hg\ \ x\ \ Y\ \ x\ \ Vm\ \ x\ \ Pm}{Tm}$$

where, Y = meter correction factor
Vm = meter volume, cf
Pm = meter pressure, in. Hg
Tm = meter temperature, $^{\circ}$R

$$Vmstd = \frac{17.647\ {}^{\circ}R/in.\ Hg\ \ x\ \ 1.024\ \ x\ \ 20.737\ cf\ \ x\ \ 30.22\ in.\ Hg}{550\ {}^{\circ}R} = 20.584\ dscf$$

Standard Wet Volume (Vwstd), scf

$$Vwstd = 0.04707\ ft^3/mL\ \ x\ \ Vlc$$

where, Vlc = volume of H_2O collected, mL

$$Vwstd = 0.04707\ ft^3/mL\ \ x\ \ 43.7\ \ mL\ = \ 2.06\ scf$$

Moisture Fraction (Measured), (Bws)

$$Bws = \frac{Vwstd}{(Vwstd + Vmstd)} = \frac{2.06\ scf}{2.06\ scf\ +\ 20.58\ dscf} = 0.091$$

where, Vwstd = standard wet volume, scf
Vmstd = standard meter volume, dscf

Moisture, %

$$Moisture = Bws \ x \ 100 = 0.091 \ x \ 100 = 9.1$$

where, Bws = moisture fraction, measured or at saturation, whichever is lowest

Average Stack Gas Flow at Standard Conditions (Qsh), dscfh

$$Qs_h = Heat\ Input, MMBtu/hr \ x \ F\text{-}Factor \ x \ \frac{20.9}{20.9 - O_2}$$

where, Heat Input MMBtu/hr = obtained from process
F-Factor = obtained from CFR, dscfh/MMBtu

$$Qs_h = 1704 \ MMBtu/hr \ x \ 8710 \ dscfh/MMBtu \ x \ \frac{20.9}{20.9 - 13.7} = 43,082,563 \ dscfh$$

Average Stack Gas Flow at Standard Conditions (Qs_m) dscfm

$$Qs_m = \frac{Qsh}{60 \ sec/min}$$

$$Qs_m = \frac{43,082,563 \ dscfh}{60 \ sec/min} = 718,043 \ dscfm$$

Method 20

NO_x Concentration, ppm @ 15% O_2

$$ppm @ 15\% O_2 = Bias\ corrected\ conc., ppm \ x \frac{20.9 - 15\% O_2}{20.9 - Actual \% O_2}$$

$$ppm @ 15\% O_2 = 7.7 \ x \frac{20.9 - 15}{20.9 - 13.7} = 6.3 \ ppm @ 15\% O_2$$

NO_x Concentration Corrected to ISO Standard Ambient Condition, ppm (Subpart GG)

$$ppm@ISO\,Cond. = (ppm@15\%\,O_2)(Pr/Po)^{0.5}(2.718)^{19(Ho-0.00633)}(288\,°K/Ta)^{1.53}$$

where, NO_{XO} = observed NO_X concentration, ppm by volume @ 15% O_2
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

$$ppm@ISO\,Cond. = (6.3)(760\,mm\,Hg/766\,mmHg)^{0.5}(2.718)^{19(0.019-0.00633)}(288\,°K/302\,°K)^{1.53}$$

$$ppm@ISO\,Cond. = 7.4\,ppm$$

NO_x Emission Rate (EMR), lb/MMBtu (correcting for O_2)

$$EMR = NO_x\ conc.\ dry\ x\ 1.194\,E\text{-}7\,\frac{lb/scf}{ppm}\ x\ F\ factor,\frac{dscf}{MMBtu}\ x\ \frac{20.9}{20.9 - \%O_2}$$

where, NO_x conc. dry = measured NO_x conc., dry ppm
1.194 E-7 lb/scf/ppm = constant (see below for calculation)
F factor = defined by client or CFR, scf/MMBtu
Bws = moisture fraction, dimensionless

$$EMR = 7.7\ ppm\ x\ 1.194\,E\text{-}7\,\frac{lb/scf}{ppm}\ x\ 8710\ \frac{dscf}{MMBtu}\ x\ \frac{20.9}{20.9\ -\ 13.7} = 0.023\ \frac{lb}{MMBtu}$$

Carbon Monoxide Emission Rate (EMR), lb/hr

$$EMR = \frac{conc.\ x\ MW\ x\ Qs\ x\ 60\frac{min}{hr}\ x\ 28.32\frac{L}{dscf}}{24.04\frac{L}{g\text{-}mole}\ x\ 1.0\,x\,10^6\frac{\mu L}{L}\ x\ 454\frac{g}{lb}}$$

where, conc. = CO conc., ppm (μL/L)
MW = molecular weight of CO, 28.0 g/g-mole
Qs = stack gas flow at std. cond., dscfm

$$EMR = \frac{2.1\,\frac{\mu L}{L}\ x\ 28.0\,\frac{g}{g\text{-}mole}\ x\ 7.18\,E+05\,\frac{dscf}{min}\ x\ 60\frac{min}{hr}\ x\ 28.32\frac{L}{dscf}}{24.04\frac{L}{g\text{-}mole}\ x\ 1.0\,x\,10^6\frac{\mu L}{L}\ x\ 454\frac{g}{lb}} = 6.6\ lb/hr$$

THC Emission Rate (THC EMR), lb/hr as Carbon

$$THC\ EMR = \frac{THC\ dry\ as\ Methane\ x\ MW\ x\ Qs\ \ x\ 60\frac{min}{hr}\ x\ 28.32\frac{L}{dscf}}{24.04\frac{L}{g\text{ - }mole}\ x\ 1.0\ x\ 10^{6}\frac{\mu L}{L}\ x\ 454\frac{g}{lb}}$$

where, THC dry as CH_4 = THC conc. dry as Methane, ppm (µL/L)
MW = molecular weight of carbon, 12.01 g/g-mole
Qs = stack gas flow at std. cond., dscfm

$$THC\ EMR = \frac{0.66\frac{\mu L}{L}\ x\ 12.01\frac{g}{g\text{ - }mole}\ x\ 7.18\ E+05\frac{dscf}{min}\ x\ 60\frac{min}{hr}\ x\ 28.32\frac{L}{dscf}}{24.04\frac{L}{g\text{ - }mole}\ x\ 1.0\ x\ 10^{6}\frac{\mu L}{L}\ x\ 454\frac{g}{lb}} = 0.89\ lb/hr$$

APPENDIX B
TEST METHODOLOGY

B.1 VOLUMETRIC FLOW RATE

Mass emission rates are calculated by multiplying measured target analyte concentrations by calculated volumetric flow rates. Volumetric flow rates are calculated using client supplied heat input data and fuel-factors from EPA Reference Method 19. The combustion gas volume is corrected for excess air using the measured oxygen concentration as shown below:

$$HI \ x \ F \ x \ \frac{20.9}{20.9 - O_2} \ x \ \frac{1}{60} = dscfm$$

where: HI = heat input, MMBtu/hr
F = fuel-factor for fired fuel, dscf/MMBtu
O_2 = stack gas oxygen content, %
20.9 = O2 concentration in ambient air
60 = conversion from hours to minutes

Gas Composition and Moisture Content

The oxygen and carbon dioxide concentration in the gas stream is measured instrumentally in accordance with EPA Reference Method 3A as described in Section B.2 or EPA Reference Method 20 as described in Section B.3.

Where appropriate for THC concentration correction, the moisture content of the gas stream is determined according to EPA Reference Method 4, by collecting an integrated sample of source gas from a single point on the gas stream. At the conclusion of each run the volume of condensed moisture collected in the impingers of the sampling train is measured and used to calculate the moisture content of the gas stream.

The molecular weight of the gas stream is calculated using the measured moisture, oxygen, and carbon dioxide concentrations. The balance of the gas stream is assumed to be nitrogen. The volumetric flow is then calculated at stack and standard conditions using the calculated molecular weight, the measured stack temperature, and measured velocity, stack and barometric pressures. Standard conditions are 68 °F and 29.92 inches of mercury and 0% moisture.

Data Acquisition and Reporting

Data are recorded at the time of collection on preprinted data sheets. Calculations are performed (where possible) with preprogrammed calculators or spreadsheet software.

Quality Control

Quality control procedures for moisture measurements involve leak checks of the sample train; calibration of gas metering systems; and periodic calibration checks of thermocouples and pyrometers.

Data transfers are minimized. Data sheets are checked for completeness and accuracy. Calculations are verified by a second person.

B.2 GAS COMPOSITION (INSTRUMENTAL)

Oxygen (O_2) and carbon dioxide (CO_2) testing is conducted in accordance with EPA Reference Method 3A.

Sampling Equipment and Procedures

Figure B-1 illustrates the sampling system. The sample is withdrawn continuously from the source through a heated probe, filter, and sample line to a sample conditioner, which removes moisture from the gas stream. The sample is then transported to a California Analytical Instruments, Inc. Model 300 analyzer.

Sample Analysis

The O_2 analyzer uses a paramagnetic detector and the CO_2 analyzer uses a non-dispersive infra-red (NDIR) detector to produce an electrical signal, which is linearly proportional to the O_2 and CO_2 concentration, respectively.

Data Acquisition and Reduction

Data is acquired electronically using an IBM compatible computer and software designed by WESTON for EPA Reference Method 3A analysis. This system generates a calibration curve, converts electronic signals into concentrations, and provides one-minute averages during the sample run and an average concentration over the duration of the sample run.

Quality Control

At the time of analysis, O_2 and CO_2 in nitrogen calibration gases certified according to EPA Protocol-1, are used to calibrate the analyzers and to determine a bias correction factor for the entire system bias in accordance with EPA Reference Method 3A. The calibration gases are introduced directly to the analyzer to generate the calibration curve. A zero gas and an upscale calibration gas is introduced at the probe and recovered through the sampling and analytical system. A bias correction factor is calculated using the ratio of the concentration measured from the sampling system and concentration measured directly at the analyzer. Sample run averages are corrected for system bias results.

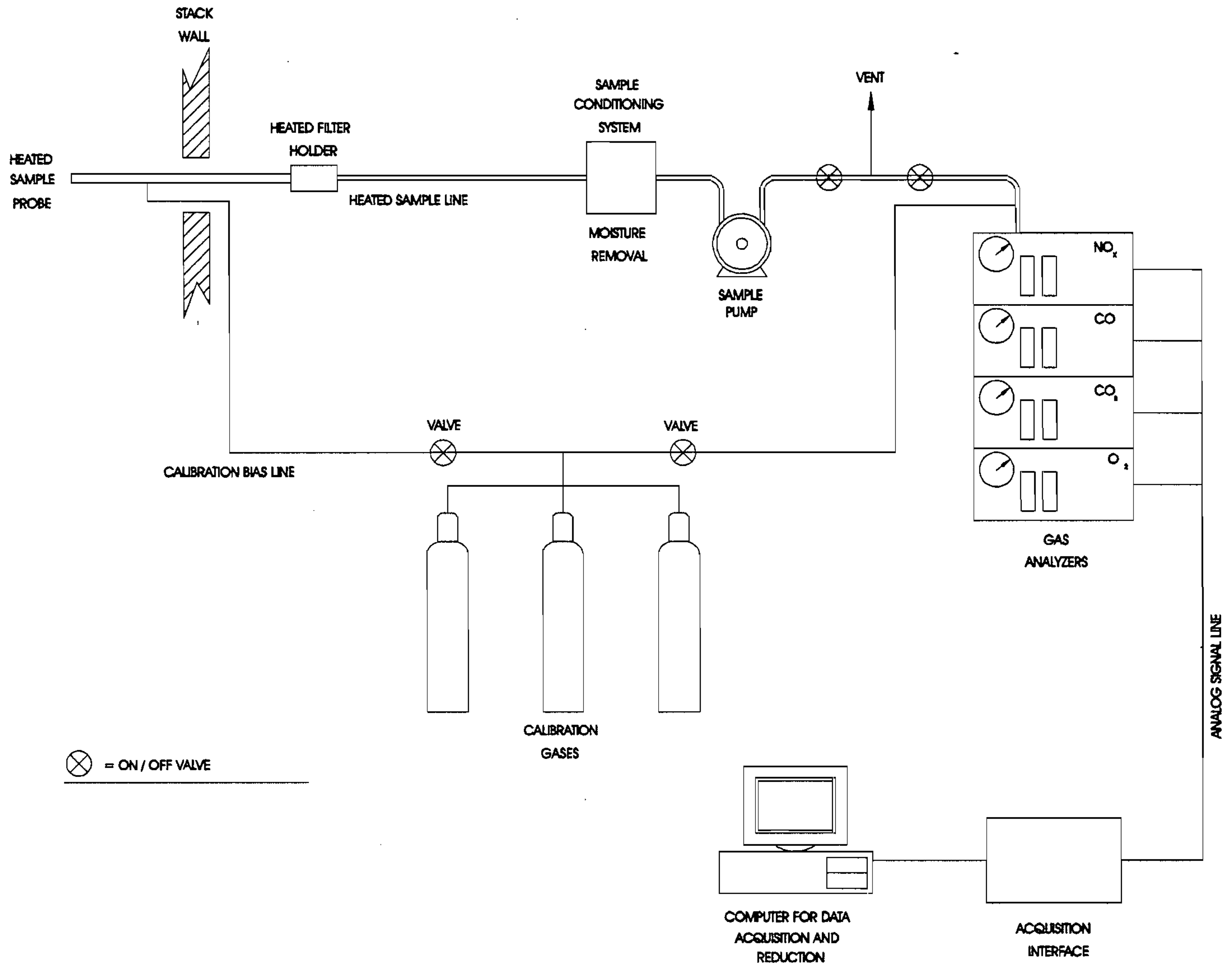

Figure B-1 Continuous Emission Monitoring System

B.3 NITROGEN OXIDES AND OXYGEN (INSTRUMENTAL)

Nitrogen oxides (NO_x) testing is conducted in accordance with EPA Reference Method 20.

Sampling Equipment and Procedures

Figure B-1 illustrates the sampling system. The sample is withdrawn from the source through a heated probe, filter, and sample line to a sample conditioner, which removes moisture from the gas stream. The sample is then being transported through a Teflon® sample line to a California Analytical Instruments, Inc. Model 400CLD NO_X Analyzer and a California Analytical Instruments, Inc. Model 300 paramagnetic oxygen analyzer.

After system calibration and bias determination and prior to initiation of the NO_X emission test, a preliminary O_2 traverse is conducted to determine the appropriate NO_X sample points. Up to 48 traverse points are selected according to the procedures of EPA Reference Method 1 for the O_2 traverse. The sampling system response time is determined by injecting NO_X and/or O_2 calibration gases to the probe and measuring the time required for the analytical measurement system to measure 95% of the expected step change from source gas concentration to calibration gas or zero gas concentration. The O_2 concentration is determined at each of the traverse points for a minimum of one (1) minute, plus the sample system response time.

To conduct the NO_X sample run, a minimum of eight sample points of the lowest O_2 concentration, as determined during the O_2 traverse, are selected for determination of NOx concentration. The sample run consists of a minimum of one (1) minute of data, plus the sample system response time, collected at each of the eight sample points.

Analytical Principal

The NO_X analyzer uses an oxidizing converter to produce nitric oxide (NO) molecules. A chemiluminescent reaction of NO and ozone is then used to produce nitrogen dioxide (NO_2), oxygen (O_2), and ultraviolet light. This ultraviolet light is measured using a highly sensitive optical filter/photomultiplier whose output is linearly proportional to the NO concentration.

The O_2 analyzer uses a paramagnetic sensor to determine O_2 molecular concentration and produces an output that is linearly proportional to the O_2 concentration.

Data Acquisition and Reduction

Data are acquired electronically using an IBM compatible computer and software designed by WESTON for EPA Reference Method 20 analysis. This system generates a calibration curve, converts electronic signals into concentrations, and provides bias-corrected hourly averages.

Quality Control

Prior to sampling, NO in nitrogen and O_2 in nitrogen calibration gases, certified according to EPA Protocol-1, are used to calibrate the analyzers and to determine a bias correction factor for the entire system. Calibration and system response is performed in accordance with EPA Reference Method 20.

The zero and mid-range NO_X calibration gases are introduced directly to the NO_X analyzer to generate the calibration curve. The low- and high-range NO_X calibration gases are then introduced to determine calibration error, which should be <2%. The zero and one calibration gas are introduced at the probe and recovered through the sampling and analytical system. A bias correction factor is calculated using the ratio of the measured concentration of the bias gas and concentration certified by the vendor. An interference response study was performed by the manufacturer of the analyzer. The data from this study are on file at WESTON.

An NO_2 to NO conversion efficiency test is performed on site in accordance with the procedure described in EPA Reference Method 20. The results from this study should indicate that the NO_2 to NO conversion efficiency is greater than 98%.

B.4 VISIBLE EMISSION (STACK OPACITY)

The opacity of emissions from stationary sources is determined visually by a qualified observer using EPA Reference Method 9.

Sampling and Analytical Objectives

- The observer will stand at a distance to provide a clear view of the emissions with the sun oriented in the 140° sector to his/her back.
- Observers' line of vision should be perpendicular to the plume direction.
- Line of sight should not include more than one plume.
- Observer to record all pertinent atmospheric conditions and pertinent client information.
- Opacity observations are made at the point of greatest opacity of the plume and at a point without condensed water vapor.
- For attached steam plumes the observations are made at a point where condensed water vapor can no longer be seen.
- For detached steam plumes, when the water vapor condenses and becomes visible at a distinct distance from the emission outlet, the plume is evaluated at the emission outlet.
- Each run is calculated as the average of 60 minutes of observations recorded at 15 second intervals.

Potential Problems and Limitations

- Luminescence and color contrast between the plume and the background against which the plume is viewed may exert an influence upon the appearance of a plume.
- For a strong contrast there may be a positive influence upon the observer.

B.5 CARBON MONOXIDE

Carbon monoxide testing is conducted in accordance with EPA Reference Method 10.

Sampling Equipment and Procedures

Figure B-1 illustrates the sampling system. Sampling is performed by continuous sample extraction and analysis withdrawn from the stack through a conditioning system for moisture removal, using a leak-tight sample pump. The dry gas sample is then transported through sample lines to a Thermo Environmental Corporation (TECO) Model 48 Non-Dispersive Infrared (NDIR) CO analyzer for continuous on-line monitoring.

Sample Analysis

The analyzer uses gas filter correlation spectroscopy to measure the amount of CO present in the sample. Infrared radiation is chopped and passed through an alternating CO and N_2 correlation filter wheel and the sample stream. Carbon monoxide in the sample absorbs the infrared radiation, leaving the remaining radiation to be measured by a detector producing a linear output signal.

Data Acquisition and Reduction

Data are acquired electronically using an IBM compatible computer and software designed by WESTON for EPA Reference Method 10 analysis or alternatively the analyzer analog signal is recorded using a strip-chart recorder.

For data collection using a computer and acquisition interface, the software generates a calibration curve and continuous calculation of sample concentration. All subsequent calculation procedures required for compliance with EPA Reference Method 10 are performed electronically.

For data collection using a strip chart recorder, the calibration curve and subsequent calibration procedures are performed manually or by using pre-programmed calculators.

Quality Control

At the time of analysis, CO in nitrogen calibration gases, of at certified ($\pm$5%) or EPA Protocol-1 quality, are used to calibrate the analysis system. Calibration is performed in accordance with EPA Reference Method 10. Following each sample run, calibration gases are introduced to the sampling system to determine calibration drift.

A CO_2 interference response study was performed by the manufacturer of the analyzer. The data from this study are on file at WESTON.

B.6 VOLATILE ORGANIC COMPOUND CONCENTRATION

Volatile organic compound (VOC) concentrations are sampled according to EPA Reference Method 25A as total hydrocarbons (THC) and analyzed by WESTON on site with a flame ionization detector (FID) analyzer. It should be noted that Method 25A determines total organics, including methane, which is not a regulated volatile organic compound (VOC). In cases where significant levels of THC (at or near the permit limit) are determined, integrated bag samples of source gas may be collected for analysis for methane, which will be subtracted from the THC concentration.

Sampling Equipment and Procedures

Figure B-2 is a schematic of the EPA Reference Method 25A sampling system. Sample gas is withdrawn continuously from a single point and transported to the FID through a heated probe and heated Teflon® sample line to a J.U.M. Model VE-7 total hydrocarbon analyzer. All hydrocarbon measurements are made on a "hot, wet" basis and concentration results are determined as parts per million of carbon by volume, on a wet basis (ppmvw) .

Sample Analysis

The analyzer utilizes a FID as described by EPA Reference Method 25A. The technique is not selective between species, and the results are reported as carbon volume equivalents of the calibration gas.

Prior to each test, the sampling and analytical system are calibrated using two calibration gases (zero and 80 to 90 percent of span). This step is followed by a calibration error check utilizing two additional calibration gases at approximately 25 and 45 percent of the span value. The acceptance criterion for the calibration error check is less than 5% the certified gas value.

Data Acquisition and Reduction

Data is acquired electronically using an IBM compatible computer and software designed by WESTON for EPA Reference Method 25A analysis.

Quality Control

The calibration gases are either methane or propane, in either air or nitrogen, certified according to EPA Protocol-1. Following each sample run, the sampling system calibration drift is determined by introducing the zero gas and one upscale gas to the sampling system. The response is recorded and the difference in concentration must be within three percent of the full scale span value.

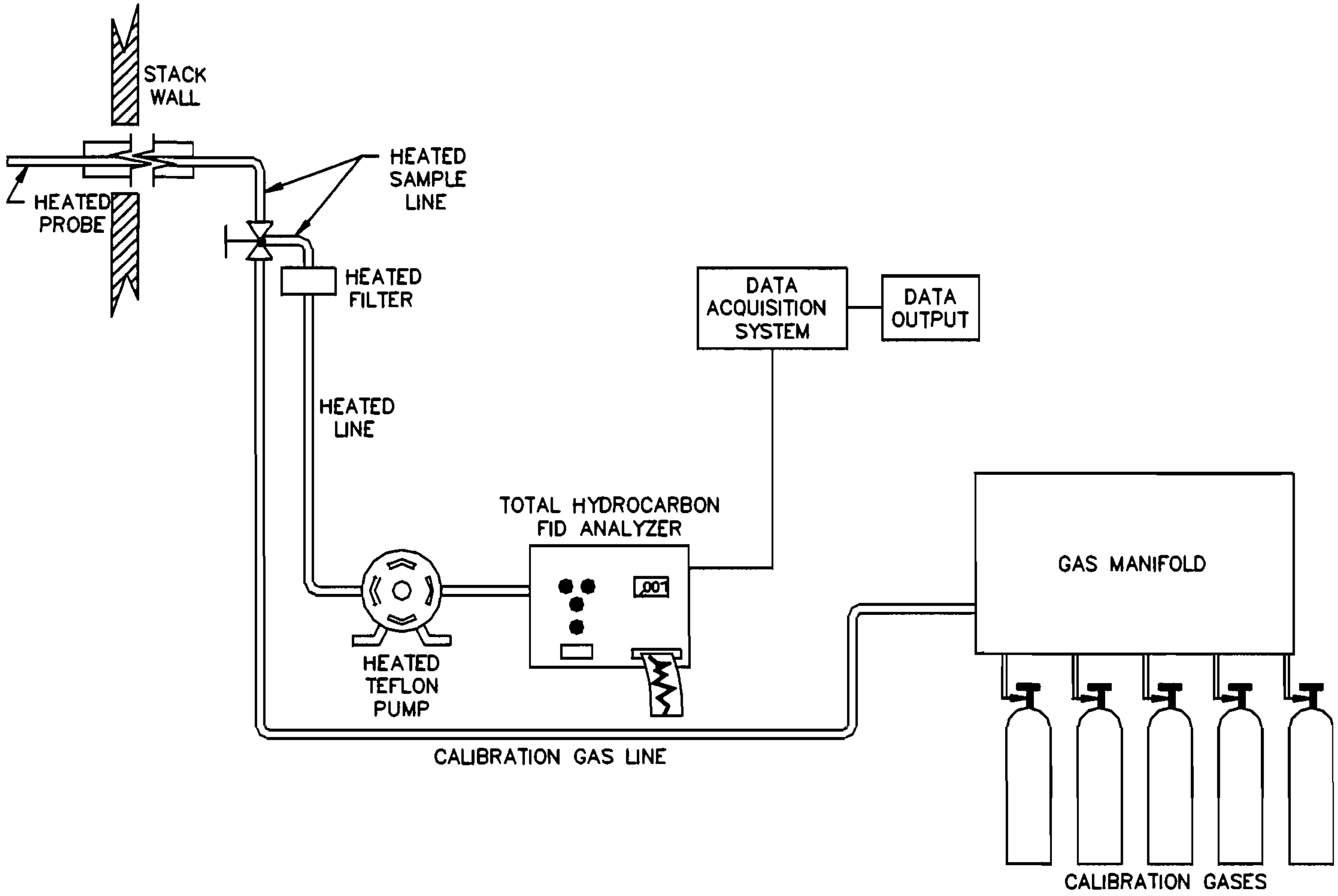

Figure B-2 EPA Reference Method 25A Sampling Train

APPENDIX C
FIELD DATA – 50% LOAD
FIRING GAS

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: **004** [ ] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
A	**22 JULY 2002**	**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 OPP-EU1-A9.

Emissions Unit Control Equipment

1.	Control Equipment/Method Description (Limit to 200 characters per device or method): **Dry Low-NO_x combustion - Natural Gas** **Water Injection - Distillate Oil Firing**
2.	Control Device or Method Code(s): **025, 028**

Emissions Unit Details

1.	Package Unit: Manufacturer: **General Electric** Model Number: **7FA**
2.	Generator Nameplate Rating: **189** 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:		**1,722**	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		hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters): **Maximum Heat Input Rate at ISO Conditions and natural gas firing (LHV); maximum for oil firing is 1,919 MMBtu/hr (ISO-LHV). PSD-FL-258.**			

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

See Attachment OPP-EU1-C.	

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? **CT1**	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: **1,115** °F	9. Actual Volumetric Flow Rate: **2,565,050** acfm	10. Water Vapor: **8.7** %

11. Maximum Dry Standard Flow Rate: **1,092,180** dscfm	12. Nonstack Emission Point Height: feet

13. Emission Point UTM Coordinates:

Zone: **17** East (km): **520.1** North (km): **3137.6**

14. Emission Point Comment (limit to 200 characters):

Stack parameters for ISO operating conditions firing natural gas; for oil 1,109°F and 2,610,318 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): **2-01-001-01**	3. SCC Units: **1,000 gallons burned**	
4. Maximum Hourly Rate: **14.6**	5. Maximum Annual Rate: **14,560**	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.** **Has facility-wide fuel limit.**		

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): **2-01-002-01**	3. SCC Units: **Million cubic feet**	
4. Maximum Hourly Rate: **1.81**	5. Maximum Annual Rate: **6,145**	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.** **Has facility-wide fuel limit.**		

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 **23.75** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE Guarantee**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters):	
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: **10% opacity**	4. Equivalent Allowable Emissions: **17** lb/hour **8.5** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 9**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing- all loads; 1,000 hrs/yr. See PSD Air Construction Permit Application, 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: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

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% Opacity**	4. Equivalent Allowable Emissions: **9** lb/hour **15.3** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 9**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing- all loads; 3,390 hrs/yr. See PSD Air Construction Permit Application, 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: **103.4** lb/hour **58.3** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **PSD-FL-258**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters):	
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. 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: **103.4** lb/hour **51.7** 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 - 1,000 hrs/yr. See PSD Air Construction Permit PSD-FL-258.**	

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: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

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: **5.5** lb/hour **9.3** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel Sampling**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested Allowable Emissions and Units: Pipeline Natural Gas. Gas firing - 3,390 hrs/yr. See PSD Air Construction Permit PSD-FL-258.**	

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: **344** lb/hour **246.8** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **PSD-FL-258**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters):	
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: **42 ppmvd**	4. Equivalent Allowable Emissions: **344** lb/hour **172** tons/year
5. Method of Compliance (limit to 60 characters): **CEM - 3-hr block 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; 1,000 hrs/yr. See Air Construction Permit PSD-FL-258.**	

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: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

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: **62.6** lb/hour **106.1** tons/year
5. Method of Compliance (limit to 60 characters): **CEM - 24-hr block average.**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested Allowable Emissions and Units: Gas firing; 3,390 hrs/yr. See Air Construction Permit PSD-FL-258.**	

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: **66.9** lb/hour **82.4** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **PSD-FL-258**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **lb/hr based on oil firing. 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: **66.9** lb/hour **33.5** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10 (required for gas firing only)**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing, 59°F, 100% load; 1,000 hrs/yr. See PSD-FL-258.**	

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: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

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: **41** lb/hour **69.5** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10 (required for gas firing only).**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas Firing; 3,390 hrs/yr. See Air Construction Permit PSD-FL-258.**	

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: **11.5** lb/hour **12.8** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **PSD-FL-258**	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
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: **6 ppmvd**	4. Equivalent Allowable Emissions: **11.5** lb/hour **5.75** tons/year
5. Method of Compliance (limit to 60 characters): **CO emission limit employed as surrogate and no annual testing required.**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing; 1,000 hrs/yr. See Air Construction Permit PSD-FL-258.**	

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: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

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: **3 ppmvd**	4. Equivalent Allowable Emissions: **5.9** lb/hour **10** tons/year
5. Method of Compliance (limit to 60 characters): **CO emission limit employed as surrogate and no annual testing required.**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Additional Requested Allowable Emissions and Units: Gas firing, 100% load, 32°F; 3,390 hrs/yr. See Air Construction Permit PSD-FL-258.**	

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 23.75 tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: GE Guarantee	7. Emissions Method Code: 0
8. Calculation of Emissions (limit to 600 characters):	
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: 10% opacity	4. Equivalent Allowable Emissions: 17 lb/hour 8.5 tons/year
5. Method of Compliance (limit to 60 characters): EPA Method 9	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing- all loads; 1,000 hrs/yr. See PSD Air Construction Permit Application, 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: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

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% opacity**	4. Equivalent Allowable Emissions: **9** lb/hour **15.3** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 9**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing- all loads; 3,390 hrs/yr. See PSD Air Construction Permit Application, 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 1

1. Visible Emissions Subtype: **VE10**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: **10** % 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): **See Air Construction Permit PSD-FL-258.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 1 of 1

1. Parameter Code: **VE99**	2. Pollutant(s):
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **FDEP Rule 62-210.700(1), Allowed for 2 hours (120 minutes) per 24-hours for startup, shutdown, and malfunction. PSD-FL-258**	

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements

1. Process Flow Diagram [X] Attached, Document ID: OPP-FI-C3 [ ] Not Applicable [ ] Waiver Requested
2. Fuel Analysis or Specification [X] Attached, Document ID: OPP-EU1-J2 [ ] Not Applicable [ ] Waiver Requested
3. Detailed Description of Control Equipment [X] Attached, Document ID: OPP-EU1-J3 [ ] Not Applicable [ ] Waiver Requested
4. Description of Stack Sampling Facilities [X] Attached, Document ID: OPP-EU1-J4 [ ] Not Applicable [ ] Waiver Requested
5. Compliance Test Report [X] Attached, Document ID: OPP-EU4-J5 [ ] Previously submitted, Date: ________ [ ] Not Applicable
6. Procedures for Startup and Shutdown [X] Attached, Document ID: OPP-EU1-J6 [ ] Not Applicable [ ] Waiver Requested
7. Operation and Maintenance Plan [X] Attached, Document ID: OPP-EU1-J7 [ ] Not Applicable [ ] Waiver Requested
8. Supplemental Information for Construction Permit Application [ ] Attached, Document ID: ________ [X] Not Applicable
9. Other Information Required by Rule or Statute [ ] Attached, Document ID: ________ [X] Not Applicable
10. Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation [X] Attached, Document ID: OPP-FI-C10 [ ] Not Applicable
12. Alternative Modes of Operation (Emissions Trading) [ ] Attached, Document ID:________ [X] Not Applicable
13. Identification of Additional Applicable Requirements [X] Attached, Document ID: OPP-FI-C12 [ ] Not Applicable
14. Compliance Assurance Monitoring Plan [X] Attached, Document ID: OPP-EU1-J14 [ ] Not Applicable
15. Acid Rain Part Application (Hard-copy Required) [X] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID: OPP-EU1-J15 [ ] 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

ATTACHMENT OPP-EU4-J5

COMPLIANCE TEST REPORT

Work Order No. 11383.005.001

Unit 4
Simple Cycle Combustion Turbine NO_x, CO, and VOC Compliance Emission Test Report
Oleander Power Plant
Cocoa, Florida
13-15 August 2002

Prepared For

CONSTELLATION POWER SOURCE GENERATION
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Baltimore, Maryland 21226

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9 September 2002

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SECTION 1
INTRODUCTION

Weston Solutions, Inc. (WESTON®) was retained by Constellation Power Source Generation (CPSG) to conduct nitrogen oxides (NO_X), carbon monoxide (CO), and non-methane volatile organic compounds (NMVOC) emission testing on Unit 4 at the Oleander Power Plant (OPP) located in Cocoa, Florida. Unit 4 is a simple cycle combustion turbine operated as a peaking unit.

The purpose of the testing was to demonstrate compliance with applicable standards of 40 CFR, Part 60, Subpart GG and the Florida Department of Environmental Protection (FDEP) permit limits. Emission testing was conducted in accordance with the test protocol submitted to and approved by FEDP.

WESTON performed the emission testing during 13-15 August 2002. The project team was comprised of the following individuals.

Name	Project Role
Greg Sims	Project Manager/Technical Manager
Billy Routhier	Test Team Leader
Susan Brown	Test Team Member
Matthew Sharmon	Test Team Member
Jon Howard	Report Coordinator

Mr. Ed Much, Mr. Craig Fierstien, and Mr. Warren Harris of CPSG coordinated the testing with facility operations. A representative of the FDEP was not present during the testing.

SECTION 2
RESULTS AND DISCUSSION

Table 2-1 presents the mean results of the emission testing with comparison to the permit requirements. The results are less than the applicable standard(s) for the source.

According to the permit, the Best Available Control Technology (BACT) limits are more stringent than the New Source Performance Standards (NSPS) limitations of Subpart GG, therefore, compliance with the BACT limits indicates compliance with NSPS limitations.

Sulfur dioxide sampling under gas firing conditions is exempted by the permit, however, as required by Subpart GG, fuel samples were collected and analyzed for sulfur. The concentration of sulfur at 3-4 ppm in the natural gas samples and <0.03 percent by weight in the fuel oil sample meets the requirements of Subpart GG that no fuel shall be fired that contains sulfur in excess of 0.8 percent by weight. Those data are presented in Appendix K.

Tables 2-2 through 2-9 provide detailed summaries of the emission results at the various load levels under each fuel. Any differences between the calculated results presented in the appendices and the results reported in the summary tables are due to rounding for presentation.

In accordance with Method 20 requirements, an oxygen (O_2) traverse was performed prior to sampling to select the eight sample traverse points of the lowest O_2 concentration. The O_2 traverse was conducted such that at least one minute of actual stack gas was analyzed at each of the 48 total traverse points. The O_2 traverse was conducted in strict accordance with EPA Reference Method 20. Copies of the O_2 traverse measurements are included in the appendices.

TABLE 2-1
SUMMARY OF EMISSION TEST RESULTS

Operating Load	Mean Test Value	Permit Limit
50% Load – Firing Gas		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	7.3	9.0
Subpart GG, ppm @ 15% O_2 ISO	8.7	75
Emission Rate, lb/hr	25	62.6
Emission Rate, lb/MMBtu	0.027	----
66% Load – Firing Gas		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	7.4	9.0
Subpart GG, ppm @ 15% O_2 ISO	8.8	75
Emission Rate, lb/hr	29	62.6
Emission Rate, lb/MMBtu	0.027	----
83% Load – Firing Gas		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	7.5	9.0
Subpart GG, ppm @ 15% O_2 ISO	9.0	75
Emission Rate, lb/hr	34	62.6
Emission Rate, lb/MMBtu	0.028	----
100% Load – Firing Gas		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	6.6	9.0
Subpart GG, ppm @ 15% O_2 ISO	7.9	75
Emission Rate, lb/hr	42	62.6
Emission Rate, lb/MMBtu	0.024	----
Carbon Monoxide		
Concentration, ppm	2.6	12.0
Emission Rate, lb/hr	8.0	41
Emission Rate, lb/MMBtu	0.0046	----
Volatile Organic Compounds		
Concentration, ppm as C	<0.7	3.0
Emission Rate, lb/hr as C	<0.9	5.9
Emission Rate, lb/MMBtu	<0.001	----
Visible Emissions		
% Opacity	0	10

TABLE 2-1
SUMMARY OF EMISSION TEST RESULTS
(CONTINUED)

Operating Load	Mean Test Value	Permit Limit
50% Load – Firing Oil		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	34.8	42.0
Subpart GG, ppm @ 15% O_2 ISO	42.4	75
Emission Rate, lb/hr	151	----
Emission Rate, lb/MMBtu	0.135	----
66% Load – Firing Oil		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	35.7	42.0
Subpart GG, ppm @ 15% O_2 ISO	41.7	75
Emission Rate, lb/hr	178	----
Emission Rate, lb/MMBtu	0.138	----
83% Load – Firing Oil		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	36.2	42.0
Subpart GG, ppm @ 15% O_2 ISO	43.2	75
Emission Rate, lb/hr	207	----
Emission Rate, lb/MMBtu	0.141	----
100% Load – Firing Oil		
Nitrogen Oxides		
Concentration, ppm @ 15% O_2	34.6	42.0
Subpart GG, ppm @ 15% O_2 ISO	42.8	75
Emission Rate, lb/hr	228	----
Emission Rate, lb/MMBtu	0.134	----
Carbon Monoxide		
Concentration, ppm	2.7	20.0
Emission Rate, lb/hr	7.5	66.9
Emission Rate, lb/MMBtu	0.0044	----
Volatile Organic Compounds		
Concentration, ppm as C	<0.7	6.0
Emission Rate, lb/hr as C	<0.9	11.5
Emission Rate, lb/MMBtu	<0.001	----
Visible Emissions		
% Opacity	0	10

TABLE 2-2
UNIT 4 – FIRING NATURAL GAS
50% LOAD – 89 MW
SUMMARY OF NO_X (METHOD 20) EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	8/15/02	8/15/02	8/15/02	----
Time Began	1837	1856	1917	----
Time Ended	1852	1911	1932	----
Stack Gas Data				
O_2 Concentration, %	13.7	13.7	13.7	13.7
VFR, x 10^5 dscfm[a]	3.86	3.86	3.86	3.86
Heat Input Rate, MMBtu/hr	916	916	917	916
Nitrogen Oxides				
Concentration, ppm	9.3	8.6	8.9	8.9
Concentration, ppm @ 15% O_2	7.6	7.0	7.3	7.3
Permit Limit, ppm @ 15% O_2	----	----	----	*9.0*
Subpart GG, ppm @ 15% O_2 ISO	9.1	8.3	8.6	8.7
Permit Limit, ppm @ 15% O_2 ISO	----	----	----	*75*
Emission Rate, lb/hr	26	24	25	25
Permit Limit, lb/hr	----	----	----	*62.6*
Emission Rate, lb/MMBtu	0.028	0.026	0.027	0.027

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factors.

TABLE 2-3
UNIT 4 - FIRING NATURAL GAS
66% LOAD – 114 MW
SUMMARY OF NO_X (METHOD 20) EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	8/15/02	8/15/02	8/15/02	----
Time Began	1948	2007	2026	----
Time Ended	2003	2022	2041	----
Stack Gas Data				
O_2 Concentration, %	13.6	13.6	13.6	13.6
VFR, x 10^5 dscfm[a]	4.41	4.40	4.40	4.40
Heat Input, MMBtu/hr	1060	1059	1059	1059
Nitrogen Oxides				
Concentration, ppm	9.5	9.2	8.6	9.1
Concentration, ppm @ 15% O_2	7.7	7.4	7.0	7.4
Permit Limit, ppm @ 15% O_2	----	----	----	*9*
Subpart GG, ppm @ 15% O_2 ISO	9.2	8.9	8.4	8.8
Permit Limit, ppm @ 15% O_2 ISO	----	----	----	*75*
Emission Rate, lb/hr	30	29	27	29
Permit Limit, lb/hr	----	----	----	*62.6*
Emission Rate, lb/MMBtu	0.028	0.027	0.026	0.027

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factors.

TABLE 2-4
UNIT 4 - FIRING NATURAL GAS
83% LOAD – 143 MW
SUMMARY OF NO_X (METHOD 20) EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	8/15/02	8/15/02	8/15/02	----
Time Began	2058	2120	2139	----
Time Ended	2113	2135	2154	----
Stack Gas Data				
O_2 Concentration, %	13.5	13.5	13.5	13.5
VFR, x 10^5 dscfm[a]	5.03	5.03	5.05	5.04
Heat Input, MMBtu\hr	1227	1228	1232	1229
Nitrogen Oxides				
Concentration, ppm	9.4	9.8	9.0	9.4
Concentration, ppm @ 15% O_2	7.5	7.8	7.2	7.5
Permit Limit, ppm @ 15% O_2	----	----	----	*9.0*
Subpart GG, ppm @ 15% O_2 ISO	9.0	9.4	8.7	9.0
Permit Limit, ppm @ 15% O_2 ISO	----	----	----	*75*
Emission Rate, lb/hr	34	35	33	34
Permit Limit, lb/hr	----	----	----	*62.6*
Emission Rate, lb/MMBtu	0.028	0.029	0.026	0.028

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factors.

TABLE 2-5
UNIT 4 - FIRING NATURAL GAS
100% LOAD – 158 MW
SUMMARY OF EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	8/13/02	8/14/02	8/14/02	----
Time Began	1205	0626	0742	----
Time Ended	1305	0726	0842	----
Stack Gas Data				
Moisture, %	8.3	8.7	9.0	8.7
O_2 Concentration, %	13.5	13.5	13.5	13.5
VFR, x 10^5 dscfm[a]	6.97	7.07	7.00	7.01
Heat Input, MMBtu/hr	1699	1724	1708	1710
Nitrogen Oxides				
Concentration, ppm	8.6	8.2	8.0	8.3
Concentration, ppm @ 15% O_2	6.9	6.5	6.4	6.6
Permit Limit, ppm @ 15% O_2	----	----	----	*9.0*
Subpart GG, ppm @ 15% O_2 ISO	8.2	7.8	7.8	7.9
Permit Limit, @ 15% O_2 ISO	----	----	----	*75*
Emission Rate, lb/hr	43	42	40	42
Permit Limit, lb/hr	----	----	----	*62.6*
Emission Rate, lb/MMBtu	0.025	0.024	0.023	0.024
Carbon Monoxide				
Concentration, ppm	2.6	2.7	2.5	2.6
Permit Limit, ppm	----	----	----	*12.0*
Emission Rate, lb/hr	7.9	8.3	7.6	8.0
Permit Limit, lb/hr	----	----	----	*41.0*
Emission Rate, lb/MMBtu	0.005	0.005	0.005	0.005
Volatile Organic Compounds				
Concentration, ppm as C	<0.7	<0.7	<0.7	<0.7
Permit Limit, ppm	----	----	----	*3.0*
Emission Rate, lb/hr as C	<0.9	<0.9	<0.9	<0.9
Permit Limit, lb/hr	----	----	----	*5.9*
Emission Rate, lb/MMBtu	<0.001	<0.001	<0.001	<0.001
Visible Emissions				
% Opacity	0	0	0	0
Permit Limit, %	----	----	----	*10*

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factors.

TABLE 2-6
UNIT 4 - FIRING OIL
50% LOAD – 89 MW
SUMMARY OF NO_X (METHOD 20) EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	8/15/02	8/15/02	8/15/02	----
Time Began	1709	1728	1747	----
Time Ended	1724	1743	1802	----
Stack Gas Data				
O_2 Concentration, %	12.8	12.8	12.8	12.8
VFR, x 10^5 dscfm[a]	4.42	4.41	4.41	4.42
Heat Input, MMBtu/hr	1119	1117	1117	1118
Nitrogen Oxides				
Concentration, ppm	46.9	47.8	48.5	47.7
Concentration, ppm @ 15% O_2	34.2	34.8	35.3	34.8
Permit Limit, ppm @ 15% O_2	----	----	----	*42.0*
Subpart GG, ppm @ 15% O_2 ISO	41.5	42.3	43.3	42.4
Permit Limit, ppm @ 15% O_2 ISO	----	----	----	*75*
Emission Rate, lb/hr	148	151	153	151
Emission Rate, lb/MMBtu	0.133	0.135	0.137	0.135

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factors.

TABLE 2-7
UNIT 4 - FIRING OIL
66% LOAD – 113 MW
SUMMARY OF NO_x (METHOD 20) EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	8/15/02	8/15/02	8/15/02	----
Time Began	1559	1618	1636	----
Time Ended	1614	1633	1651	----
Stack Gas Data				
O_2 Concentration, %	12.6	12.5	12.5	12.5
VFR, x 10^5 dscfm[a]	4.96	4.91	4.90	4.92
Heat Input, MMBtu/hr	1285	1288	1287	1287
Nitrogen Oxides				
Concentration, ppm	50.7	50.5	50.6	50.6
Concentration, ppm @ 15% O_2	36.0	35.5	35.5	35.7
Permit Limit, ppm @ 15% O_2	----	----	----	*42*
Subpart GG, ppm @ 15% O_2 ISO	41.9	41.5	41.6	41.7
Permit Limit, ppm @ 15% O_2 ISO	----	----	----	*75*
Emission Rate, lb/hr	180	177	176	178
Emission Rate, lb/MMBtu	0.140	0.138	0.138	0.138

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factors.

TABLE 2-8
UNIT 4 - FIRING OIL
83% LOAD – 140 MW
SUMMARY OF NO_X (METHOD 20) EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	8/15/02	8/15/02	8/15/02	----
Time Began	1444	1503	1523	----
Time Ended	1459	1518	1538	----
Stack Gas Data				
O_2 Concentration, %	12.5	12.5	12.5	12.5
VFR, x 10^5 dscfm[a]	5.58	5.60	5.60	5.60
Heat Input, MMBtu/hr	1465	1470	1470	1468
Nitrogen Oxides				
Concentration, ppm	51.2	52.1	51.5	51.6
Concentration, ppm @ 15% O_2	36.0	36.6	36.2	36.2
Permit Limit, ppm @ 15% O_2	----	----	----	*42.0*
Subpart GG, ppm @ 15% O_2 ISO	42.1	43.8	43.6	43.2
Permit Limit, ppm @ 15% O_2 ISO	----	----	----	*75*
Emission Rate, lb/hr	204	209	206	207
Emission Rate, lb/MMBtu	0.140	0.142	0.140	0.141

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factors.

TABLE 2-9
UNIT 4 - FIRING OIL
100% LOAD – 170 MW
SUMMARY OF EMISSION RESULTS

	Run 1	Run 2	Run 3	Mean
Date	8/15/02	8/15/02	8/15/02	----
Time Began	0951	1100	1211	----
Time Ended	1051	1200	1311	----
Stack Gas Data				
Moisture, %	10.7	8.2	11.1	10.0
O_2 Concentration, %	12.4	12.5	12.4	12.4
VFR, x 10^5 dscfm[a]	6.40	6.49	6.40	6.43
Heat Input, MMBtu/hr	1699	1702	1699	1700
Nitrogen Oxides				
Concentration, ppm	49.2	49.7	49.9	49.6
Concentration, ppm @ 15% O_2	34.2	34.9	34.6	34.6
Permit Limit, ppm @ 15% O_2	----	----	----	*42.0*
Subpart GG, ppm @ 15% O_2 ISO	42.0	42.3	44.2	42.8
Permit Limit, ppm @ 15% O_2 ISO	----	----	----	*75*
Emission Rate, lb/hr	225	231	228	228
Emission Rate, lb/MMBtu	0.133	0.135	0.134	0.134
Carbon Monoxide				
Concentration, ppm	2.4	3.4	2.2	2.7
Permit Limit, ppm	----	----	----	*20.0*
Emission Rate, lb/hr	6.7	9.6	6.1	7.5
Permit Limit, lb/hr	----	----	----	*66.9*
Emission Rate, lb/MMBtu	0.004	0.006	0.004	0.004
Volatile Organic Compounds				
Concentration, ppm as C	<0.7	<0.7	<0.7	<0.7
Permit Limit, ppm	----	----	----	*6*
Emission Rate, lb/hr as C	<0.8	<0.8	<0.9	<0.9
Permit Limit, lb/hr	----	----	----	*11.5*
Emission Rate, lb/MMBtu	<0.001	<0.001	<0.001	<0.001
Visible Emissions				
% Opacity	0	0	0	0
Permit Limit, %	----	----	----	*10*

[a]Stack gas volumetric flow rate calculated from heat input and Method 19 F-Factors.

SECTION 3
SOURCE TESTING METHODOLOGY

The emission testing program was conducted in accordance with the U.S. EPA Reference Methods summarized in Table 3-1. Method descriptions and quality assurance data are provided in the referenced appendices.

TABLE 3-1
SOURCE TESTING METHODOLOGY

Parameter	Method Number	Appendix Reference: Method Description	Appendix Reference: Quality Control Data	Comments
Volumetric Flow Rate	19	B.1	L	Calculated from Method 19 Fuel-Factors
Gas Composition	3A	B.2	L	Instrumental
Nitrogen Oxides	20	B.3	L	Instrumental
Opacity	9	B.4	L	
Carbon Monoxide	10	B.5	L	Instrumental
Volatile Organic Compounds	25A	B.6	L	

APPENDIX A
SAMPLE CALCULATIONS

SAMPLE CALCULATIONS

Unit 4 (Full Load – Gas)
Run No. 1

Meter Pressure (Pm), in. Hg

$$Pm = Pb + \frac{\Delta H}{13.6\ in.\ H_2O/in.\ Hg}$$

where, Pb = barometric pressure, in. Hg
ΔH = Pressure differential of orifice in. H_2O

$$Pm = 30.15\ in.\ Hg + \frac{1.0\ in.\ H_2O}{13.6\ in.\ H_2O/in.\ Hg} = 30.22\ in.\ Hg$$

Standard Meter Volume (Vmstd), dscf

$$Vmstd = \frac{17.647\,^{\circ}R/in.\ Hg\ x\ Y\ x\ Vm\ x\ Pm}{Tm}$$

where, Y = meter correction factor
Vm = meter volume, cf
Pm = meter pressure, in. Hg
Tm = meter temperature, °R

$$Vmstd = \frac{17.647\,^{\circ}R/in.\ Hg\ x\ 1.024\ x\ 34.963\ cf\ x\ 30.22\ in.\ Hg}{555\,^{\circ}R} = 34.392\ dscf$$

Standard Wet Volume (Vwstd), scf

$$Vwstd = 0.04707\ ft^3/mL\ x\ Vlc$$

where, Vlc = volume of H_2O collected, mL

$$Vwstd = 0.04707\ ft^3/mL\ x\ 66.4\ mL = 3.13\ scf$$

Moisture Fraction (Measured), (Bws)

$$Bws = \frac{Vwstd}{(Vwstd + Vmstd)} = \frac{3.13\ scf}{3.13\ scf + 34.392\ dscf} = 0.083$$

where, Vwstd = standard wet volume, scf
Vmstd = standard meter volume, dscf

Moisture, %

$$Moisture = Bws \ x \ 100 = 0.083 \ x \ 100 = 8.3$$

where, Bws = moisture fraction, measured or at saturation, whichever is lowest

Average Stack Gas Flow at Standard Conditions (Qsh), dscfh

$$Qs_h = Heat\ Input, MMBtu/hr \ x \ \ F\text{-}Factor \ x \ \frac{20.9}{20.9 - O_2}$$

where, Heat Input MMBtu/hr = obtained from process
F-Factor = obtained from CFR, dscfh/MMBtu

$$Qs_h = 1699\ MMBtu/hr \ x \ 8710\ dscfh/MMBtu \ x \ \frac{20.9}{20.9 - 13.5} = 41,795,170\ dscfh$$

Average Stack Gas Flow at Standard Conditions (Qs_m) dscfm

$$Qs_m = \frac{Qsh}{60\ sec/min}$$

$$Qs_m = \frac{41,795,170\ dscfh}{60\ sec/min} = 696,586\ dscfm$$

Method 20

NO_x Concentration, ppm @ 15% O_2

$$ppm @ 15\%\ O_2 = Bias\ corrected\ conc., ppm\ x \frac{20.9 - 15\%\ O_2}{20.9 - Actual\ \%\ O_2}$$

$$ppm @ 15\%\ O_2 = 8.6\ x \frac{20.9 - 15}{20.9 - 13.5} = 6.9\ ppm @ 15\%\ O_2$$

NO_x Concentration Corrected to ISO Standard Ambient Condition, ppm (Subpart GG)

$$ppm @ ISO\ Cond. = (ppm @ 15\%\ O_2)(Pr/Po)^{0.5}(2.718)^{19(Ho-0.00633)}(288\,°K/Ta)^{1.53}$$

where, NO_{XO} = observed NO_X concentration, ppm by volume @ 15% O_2
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

$$ppm @ ISO\ Cond. = (6.9)(760\ mm\ Hg/766\ mmHg)^{0.5}(2.718)^{19(0.021-0.00633)}(288\,°K/304\,°K)^{1.53}$$

$$ppm @ ISO\ Cond. = 8.2\ ppm$$

NO_x Emission Rate (EMR), lb/MMBtu (correcting for O_2)

$$EMR = NO_x\ conc.\ dry\ x\ 1.194\ E-7\frac{lb/scf}{ppm}\ x\ F\ factor, \frac{dscf}{MMBtu}\ x\ \frac{20.9}{20.9 - \%O_2}$$

where, NO_x conc. dry = measured NO_x conc., dry ppm
1.194 E-7 lb/scf/ppm = constant (see below for calculation)
F factor = defined by client or CFR, scf/MMBtu
Bws = moisture fraction, dimensionless

$$EMR = 8.6\ ppm\ x\ 1.194\ E-7\frac{lb/scf}{ppm}\ x\ 8710\ \frac{dscf}{MMBtu}\ x\ \frac{20.9}{20.9\ -\ 13.5} = 0.025\ \frac{lb}{MMBtu}$$

Carbon Monoxide Emission Rate (EMR), lb/hr

$$EMR = \frac{conc.\ x\ MW\ x\ Qs\ x\ 60\frac{min}{hr}\ x\ 28.32\frac{L}{dscf}}{24.04\frac{L}{g-mole}\ x\ 1.0\ x\ 10^6\ \frac{\mu L}{L}\ x\ 454\frac{g}{lb}}$$

where, conc. = CO conc., ppm (μL/L)
MW = molecular weight of CO, 28.0 g/g-mole
Qs = stack gas flow at std. cond., dscfm

$$EMR = \frac{8.6\ \frac{\mu L}{L}\ x\ 28.0\ \frac{g}{g-mole}\ x\ 6.97\ E+05\ \frac{dscf}{min}\ x\ 60\frac{min}{hr}\ x\ 28.32\frac{L}{dscf}}{24.04\frac{L}{g-mole}\ x\ 1.0\ x\ 10^6\ \frac{\mu L}{L}\ x\ 454\frac{g}{lb}} = 7.9\ lb/hr$$

THC Emission Rate (THC EMR), lb/hr as Carbon

$$THC\ EMR = \frac{THC\ dry\ as\ Methane\ \ x\ \ MW\ \ x\ \ Qs\ \ x\ \ 60\,\frac{min}{hr}\ \ x\ \ 28.32\,\frac{L}{dscf}}{24.04\,\frac{L}{g\text{ - }mole}\ \ x\ \ 1.0\ x\ 10^{6}\,\frac{\mu L}{L}\ \ x\ \ 454\,\frac{g}{lb}}$$

where, THC dry as CH_4 = THC conc. dry as Methane, ppm (μL/L)
MW = molecular weight of carbon, 12.01 g/g-mole
Qs = stack gas flow at std. cond., dscfm

$$THC\ EMR = \frac{<0.7\,\frac{\mu L}{L}\ \ x\ \ 12.01\,\frac{g}{g\text{ - }mole}\ \ x\ \ 6.97\ E+05\,\frac{dscf}{min}\ \ x\ \ 60\,\frac{min}{hr}\ \ x\ \ 28.32\,\frac{L}{dscf}}{24.04\,\frac{L}{g\text{ - }mole}\ \ x\ \ 1.0\ x\ 10^{6}\,\frac{\mu L}{L}\ \ x\ \ 454\,\frac{g}{lb}} = <0.85\ lb/hr$$

APPENDIX B
TEST METHODOLOGY

B.1 VOLUMETRIC FLOW RATE

Mass emission rates are calculated by multiplying measured target analyte concentrations by calculated volumetric flow rates. Volumetric flow rates are calculated using client supplied heat input data and fuel-factors from EPA Reference Method 19. The combustion gas volume is corrected for excess air using the measured oxygen concentration as shown below:

$$HI \ x \ F \ x \ \frac{20.9}{20.9 - O_2} \ x \ \frac{1}{60} = dscfm$$

where: HI = heat input, MMBtu/hr
F = fuel-factor for fired fuel, dscf/MMBtu
O_2 = stack gas oxygen content, %
20.9 = O2 concentration in ambient air
60 = conversion from hours to minutes

Gas Composition and Moisture Content

The oxygen and carbon dioxide concentration in the gas stream is measured instrumentally in accordance with EPA Reference Method 3A as described in Section B.2 or EPA Reference Method 20 as described in Section B.3.

Where appropriate for THC concentration correction, the moisture content of the gas stream is determined according to EPA Reference Method 4, by collecting an integrated sample of source gas from a single point on the gas stream. At the conclusion of each run the volume of condensed moisture collected in the impingers of the sampling train is measured and used to calculate the moisture content of the gas stream.

The molecular weight of the gas stream is calculated using the measured moisture, oxygen, and carbon dioxide concentrations. The balance of the gas stream is assumed to be nitrogen. The volumetric flow is then calculated at stack and standard conditions using the calculated molecular weight, the measured stack temperature, and measured velocity, stack and barometric pressures. Standard conditions are 68 °F and 29.92 inches of mercury and 0% moisture.

Data Acquisition and Reporting

Data are recorded at the time of collection on preprinted data sheets. Calculations are performed (where possible) with preprogrammed calculators or spreadsheet software.

Quality Control

Quality control procedures for moisture measurements involve leak checks of the sample train; calibration of gas metering systems; and periodic calibration checks of thermocouples and pyrometers.

Data transfers are minimized. Data sheets are checked for completeness and accuracy. Calculations are verified by a second person.

B.2 GAS COMPOSITION (INSTRUMENTAL)

Oxygen (O_2) and carbon dioxide (CO_2) testing is conducted in accordance with EPA Reference Method 3A.

Sampling Equipment and Procedures

Figure B-1 illustrates the sampling system. The sample is withdrawn continuously from the source through a heated probe, filter, and sample line to a sample conditioner, which removes moisture from the gas stream. The sample is then transported to a California Analytical Instruments, Inc. Model 300 analyzer.

Sample Analysis

The O_2 analyzer uses a paramagnetic detector and the CO_2 analyzer uses a non-dispersive infra-red (NDIR) detector to produce an electrical signal, which is linearly proportional to the O_2 and CO_2 concentration, respectively.

Data Acquisition and Reduction

Data is acquired electronically using an IBM compatible computer and software designed by WESTON for EPA Reference Method 3A analysis. This system generates a calibration curve, converts electronic signals into concentrations, and provides one-minute averages during the sample run and an average concentration over the duration of the sample run.

Quality Control

At the time of analysis, O_2 and CO_2 in nitrogen calibration gases certified according to EPA Protocol-1, are used to calibrate the analyzers and to determine a bias correction factor for the entire system bias in accordance with EPA Reference Method 3A. The calibration gases are introduced directly to the analyzer to generate the calibration curve. A zero gas and an upscale calibration gas is introduced at the probe and recovered through the sampling and analytical system. A bias correction factor is calculated using the ratio of the concentration measured from the sampling system and concentration measured directly at the analyzer. Sample run averages are corrected for system bias results.

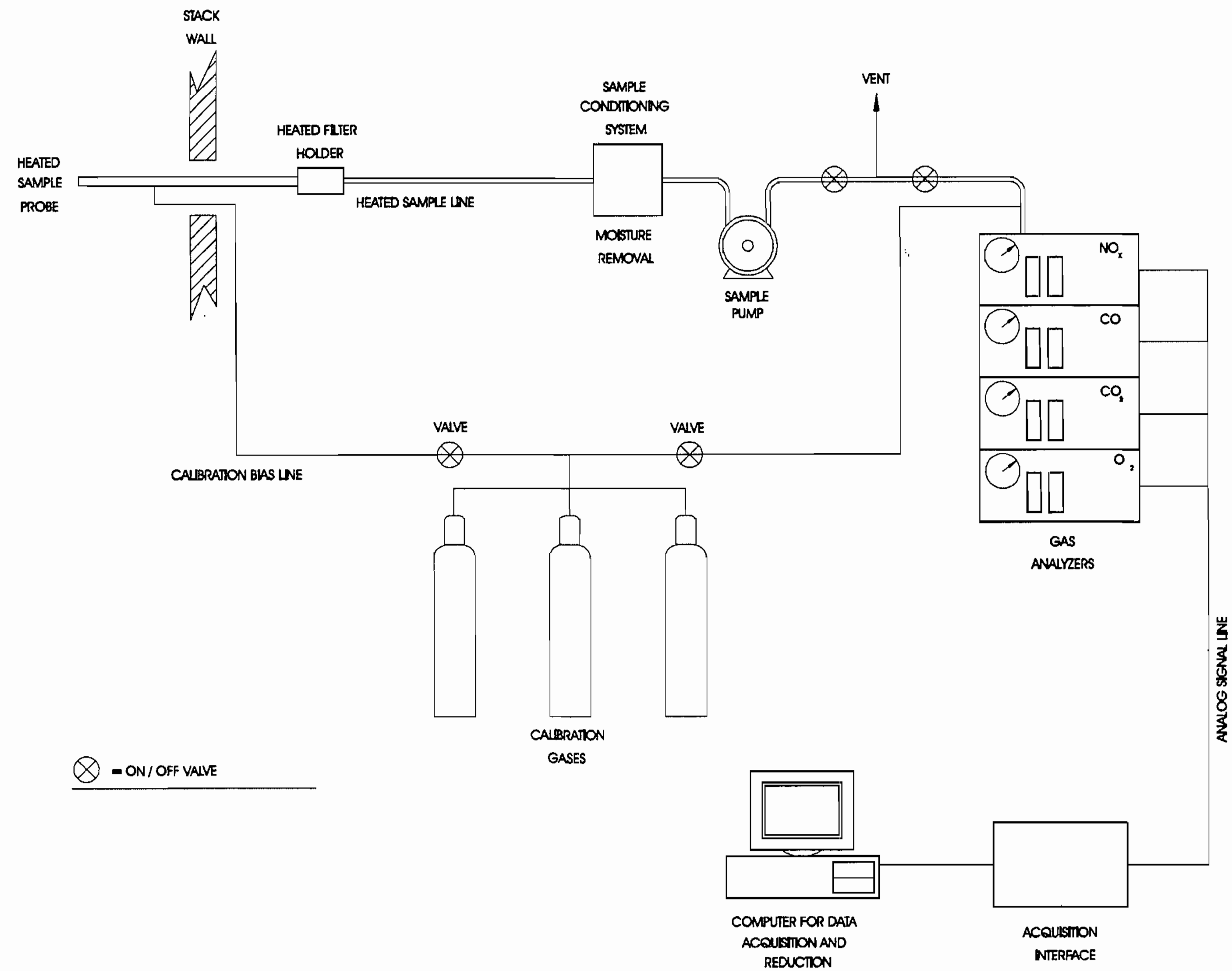


Figure B-1 Continuous Emission Monitoring System

B.3 NITROGEN OXIDES AND OXYGEN (INSTRUMENTAL)

Nitrogen oxides (NO_x) testing is conducted in accordance with EPA Reference Method 20.

Sampling Equipment and Procedures

Figure B-1 illustrates the sampling system. The sample is withdrawn from the source through a heated probe, filter, and sample line to a sample conditioner, which removes moisture from the gas stream. The sample is then being transported through a Teflon® sample line to a California Analytical Instruments, Inc. Model 400CLD NO_X Analyzer and a California Analytical Instruments, Inc. Model 300 paramagnetic oxygen analyzer.

After system calibration and bias determination and prior to initiation of the NO_X emission test, a preliminary O_2 traverse is conducted to determine the appropriate NO_X sample points. Up to 48 traverse points are selected according to the procedures of EPA Reference Method 1 for the O_2 traverse. The sampling system response time is determined by injecting NO_X and/or O_2 calibration gases to the probe and measuring the time required for the analytical measurement system to measure 95% of the expected step change from source gas concentration to calibration gas or zero gas concentration. The O_2 concentration is determined at each of the traverse points for a minimum of one (1) minute, plus the sample system response time.

To conduct the NO_X sample run, a minimum of eight sample points of the lowest O_2 concentration, as determined during the O_2 traverse, are selected for determination of NOx concentration. The sample run consists of a minimum of one (1) minute of data, plus the sample system response time, collected at each of the eight sample points.

Analytical Principal

The NO_X analyzer uses an oxidizing converter to produce nitric oxide (NO) molecules. A chemiluminescent reaction of NO and ozone is then used to produce nitrogen dioxide (NO_2), oxygen (O_2), and ultraviolet light. This ultraviolet light is measured using a highly sensitive optical filter/photomultiplier whose output is linearly proportional to the NO concentration.

The O_2 analyzer uses a paramagnetic sensor to determine O_2 molecular concentration and produces an output that is linearly proportional to the O_2 concentration.

Data Acquisition and Reduction

Data are acquired electronically using an IBM compatible computer and software designed by WESTON for EPA Reference Method 20 analysis. This system generates a calibration curve, converts electronic signals into concentrations, and provides bias-corrected hourly averages.

Quality Control

Prior to sampling, NO in nitrogen and O_2 in nitrogen calibration gases, certified according to EPA Protocol-1, are used to calibrate the analyzers and to determine a bias correction factor for the entire system. Calibration and system response is performed in accordance with EPA Reference Method 20.

The zero and mid-range NO_X calibration gases are introduced directly to the NO_X analyzer to generate the calibration curve. The low- and high-range NO_X calibration gases are then introduced to determine calibration error, which should be <2%. The zero and one calibration gas are introduced at the probe and recovered through the sampling and analytical system. A bias correction factor is calculated using the ratio of the measured concentration of the bias gas and concentration certified by the vendor. An interference response study was performed by the manufacturer of the analyzer. The data from this study are on file at WESTON.

An NO_2 to NO conversion efficiency test is performed on site in accordance with the procedure described in EPA Reference Method 20. The results from this study should indicate that the NO_2 to NO conversion efficiency is greater than 98%.

B.4 VISIBLE EMISSION (STACK OPACITY)

The opacity of emissions from stationary sources is determined visually by a qualified observer using EPA Reference Method 9.

Sampling and Analytical Objectives

- The observer will stand at a distance to provide a clear view of the emissions with the sun oriented in the 140° sector to his/her back.
- Observers' line of vision should be perpendicular to the plume direction.
- Line of sight should not include more than one plume.
- Observer to record all pertinent atmospheric conditions and pertinent client information.
- Opacity observations are made at the point of greatest opacity of the plume and at a point without condensed water vapor.
- For attached steam plumes the observations are made at a point where condensed water vapor can no longer be seen.
- For detached steam plumes, when the water vapor condenses and becomes visible at a distinct distance from the emission outlet, the plume is evaluated at the emission outlet.
- Each run is calculated as the average of 60 minutes of observations recorded at 15 second intervals.

Potential Problems and Limitations

- Luminescence and color contrast between the plume and the background against which the plume is viewed may exert an influence upon the appearance of a plume.
- For a strong contrast there may be a positive influence upon the observer.

B.5 CARBON MONOXIDE

Carbon monoxide testing is conducted in accordance with EPA Reference Method 10.

Sampling Equipment and Procedures

Figure B-1 illustrates the sampling system. Sampling is performed by continuous sample extraction and analysis withdrawn from the stack through a conditioning system for moisture removal, using a leak-tight sample pump. The dry gas sample is then transported through sample lines to a Thermo Environmental Corporation (TECO) Model 48 Non-Dispersive Infrared (NDIR) CO analyzer for continuous on-line monitoring.

Sample Analysis

The analyzer uses gas filter correlation spectroscopy to measure the amount of CO present in the sample. Infrared radiation is chopped and passed through an alternating CO and N_2 correlation filter wheel and the sample stream. Carbon monoxide in the sample absorbs the infrared radiation, leaving the remaining radiation to be measured by a detector producing a linear output signal.

Data Acquisition and Reduction

Data are acquired electronically using an IBM compatible computer and software designed by WESTON for EPA Reference Method 10 analysis or alternatively the analyzer analog signal is recorded using a strip-chart recorder.

For data collection using a computer and acquisition interface, the software generates a calibration curve and continuous calculation of sample concentration. All subsequent calculation procedures required for compliance with EPA Reference Method 10 are performed electronically.

For data collection using a strip chart recorder, the calibration curve and subsequent calibration procedures are performed manually or by using pre-programmed calculators.

Quality Control

At the time of analysis, CO in nitrogen calibration gases, of at certified ($\pm$5%) or EPA Protocol-1 quality, are used to calibrate the analysis system. Calibration is performed in accordance with EPA Reference Method 10. Following each sample run, calibration gases are introduced to the sampling system to determine calibration drift.

A CO_2 interference response study was performed by the manufacturer of the analyzer. The data from this study are on file at WESTON.

B.6 VOLATILE ORGANIC COMPOUND CONCENTRATION

Volatile organic compound (VOC) concentrations are sampled according to EPA Reference Method 25A as total hydrocarbons (THC) and analyzed by WESTON on site with a flame ionization detector (FID) analyzer. It should be noted that Method 25A determines total organics, including methane, which is not a regulated volatile organic compound (VOC). In cases where significant levels of THC (at or near the permit limit) are determined, integrated bag samples of source gas may be collected for analysis for methane, which will be subtracted from the THC concentration.

Sampling Equipment and Procedures

Figure B-2 is a schematic of the EPA Reference Method 25A sampling system. Sample gas is withdrawn continuously from a single point and transported to the FID through a heated probe and heated Teflon® sample line to a J.U.M. Model VE-7 total hydrocarbon analyzer. All hydrocarbon measurements are made on a "hot, wet" basis and concentration results are determined as parts per million of carbon by volume, on a wet basis (ppmvw) .

Sample Analysis

The analyzer utilizes a FID as described by EPA Reference Method 25A. The technique is not selective between species, and the results are reported as carbon volume equivalents of the calibration gas.

Prior to each test, the sampling and analytical system are calibrated using two calibration gases (zero and 80 to 90 percent of span). This step is followed by a calibration error check utilizing two additional calibration gases at approximately 25 and 45 percent of the span value. The acceptance criterion for the calibration error check is less than 5% the certified gas value.

Data Acquisition and Reduction

Data is acquired electronically using an IBM compatible computer and software designed by WESTON for EPA Reference Method 25A analysis.

Quality Control

The calibration gases are either methane or propane, in either air or nitrogen, certified according to EPA Protocol-1. Following each sample run, the sampling system calibration drift is determined by introducing the zero gas and one upscale gas to the sampling system. The response is recorded and the difference in concentration must be within three percent of the full scale span value.

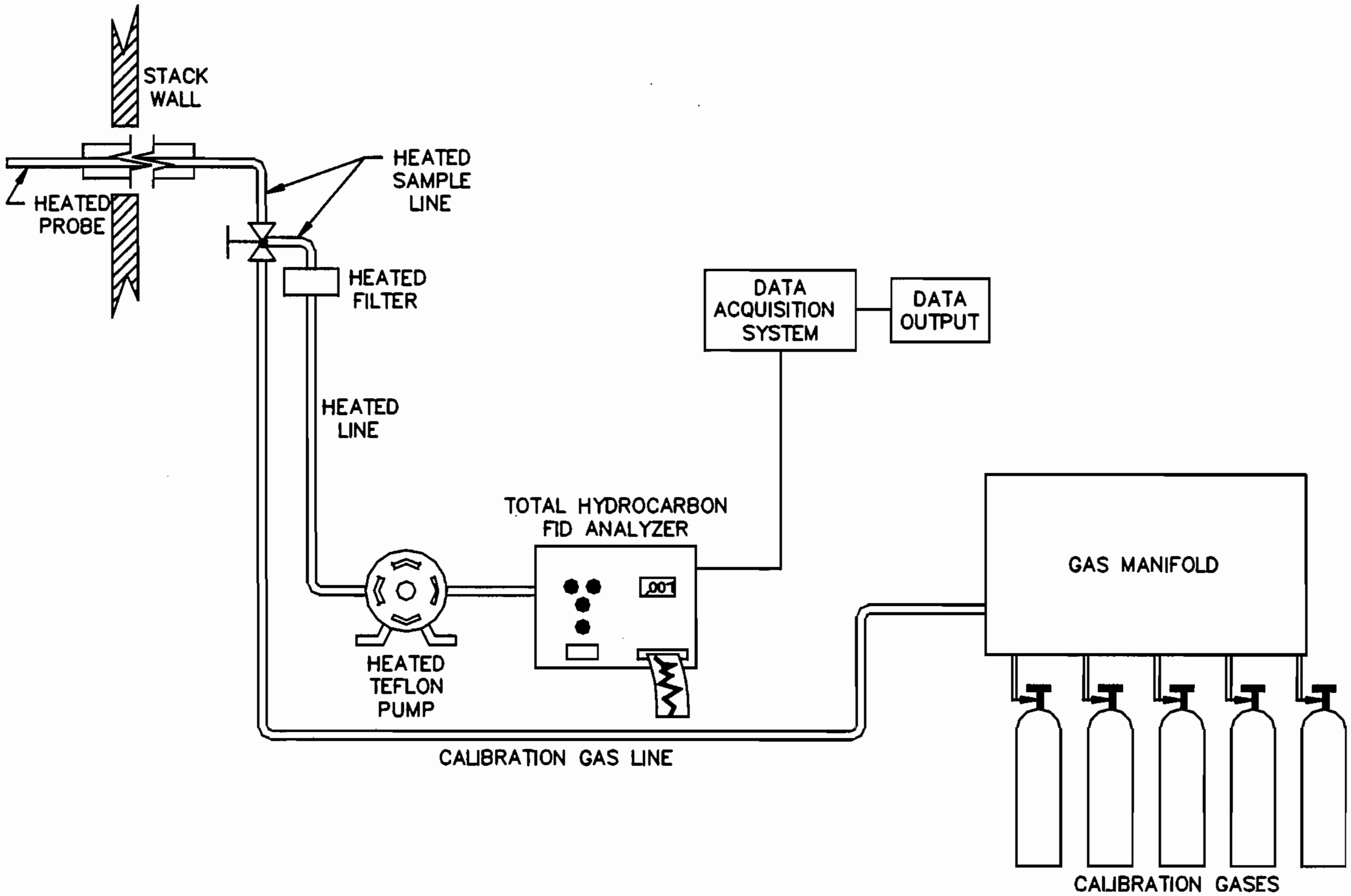


Figure B-2 EPA Reference Method 25A Sampling Train

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):
Unregulated Emissions Activities- 2 Tanks 1.8 Million gallons each

4. Emissions Unit Identification Number: [ ] No ID
ID: **006, 007** [ ] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
A		**49**	[ ]

9. Emissions Unit Comment: (Limit to 500 Characters)

This emission unit information section addresses two 1.8-million gallon tanks. NSPS Subpart Kb recordkeeping requirements are applicable; there is no emission limiting or work practice standards.

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:	°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:				mmBtu/hr
2. Maximum Incineration Rate:		lb/hr		tons/day
3. Maximum Process or Throughput Rate:			707,879	gallons/year
4. Maximum Production Rate:				
5. Requested Maximum Operating Schedule:	24	hours/day	7	days/week
	52	weeks/year	8,760	hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters): Throughput of Methanol.				

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

40 CFR 60, Subpart Kb

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: **58,240**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **132**
10. Segment Comment (limit to 200 characters): **Annual rate combined for both the fuel oil 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

CONNECTION LEGEND

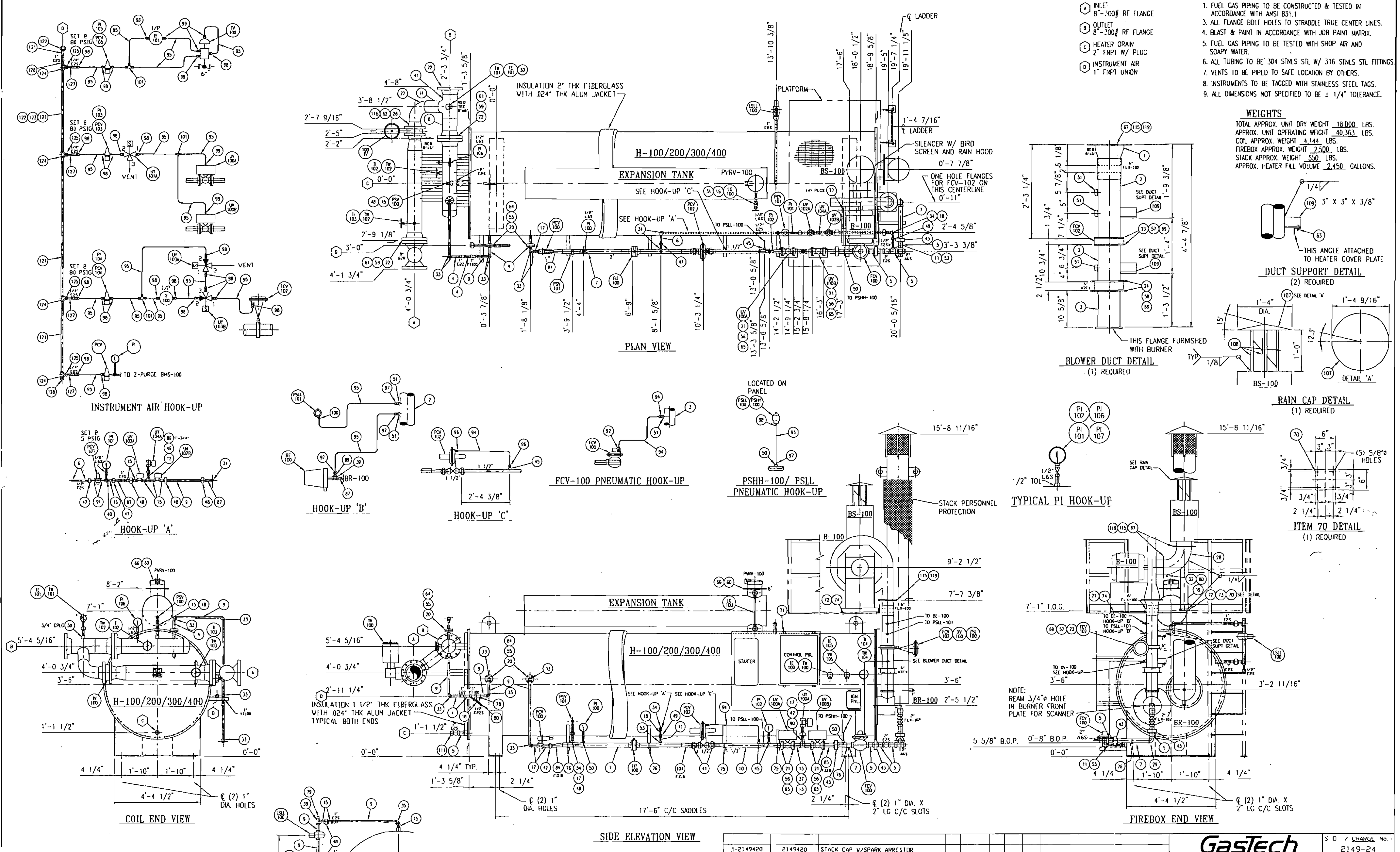
- (A) INLET 8"-300# RF FLANGE
- (B) OUTLET 8"-300# RF FLANGE
- (C) HEATER DRAIN 2" FNPT W/ PLUG
- (D) INSTRUMENT AIR 1" FNPT UNION

GENERAL NOTES

1. FUEL GAS PIPING TO BE CONSTRUCTED & TESTED IN ACCORDANCE WITH ANSI B31.1
3. ALL FLANGE BOLT HOLES TO STRADDLE TRUE CENTER LINES.
4. BLAST & PAINT IN ACCORDANCE WITH JOB PAINT MATRIX.
5. FUEL GAS PIPING TO BE TESTED WITH SHOP AIR AND SOAPY WATER.
6. ALL TUBING TO BE 304 STNLS STL W/ 316 STNLS STL FITTINGS.
7. VENTS TO BE PIPED TO SAFE LOCATION BY OTHERS.
8. INSTRUMENTS TO BE TAGGED WITH STAINLESS STEEL TAGS.
9. ALL DIMENSIONS NOT SPECIFIED TO BE ± 1/4" TOLERANCE.

WEIGHTS

TOTAL APPROX. UNIT DRY WEIGHT 18,000 LBS.
APPROX. UNIT OPERATING WEIGHT 40,363 LBS.
COIL APPROX. WEIGHT 4,144 LBS.
FIREBOX APPROX. WEIGHT 2,500 LBS.
STACK APPROX. WEIGHT 550 LBS.
APPROX. HEATER FILL VOLUME 2,450 GALLONS.



DRAWING NO.	FILE NO.	DESCRIPTION
D-2149420	2149420	STACK CAP W/SPARK ARRESTOR
D-2149710	2149710	PLATFORM AND LADDER
D-2149410	2149410	FIREBOX AND STACK
D-2149400	2149400	HEATER SHELL
D-2149300	2149300	COIL
D-2149100	2149100	P & ID

REFERENCE DRAWINGS

No.	DATE	BY	CHKD	APPD	DESCRIPTION
0	12/6/01	CM			ISSUE FOR FABRICATION

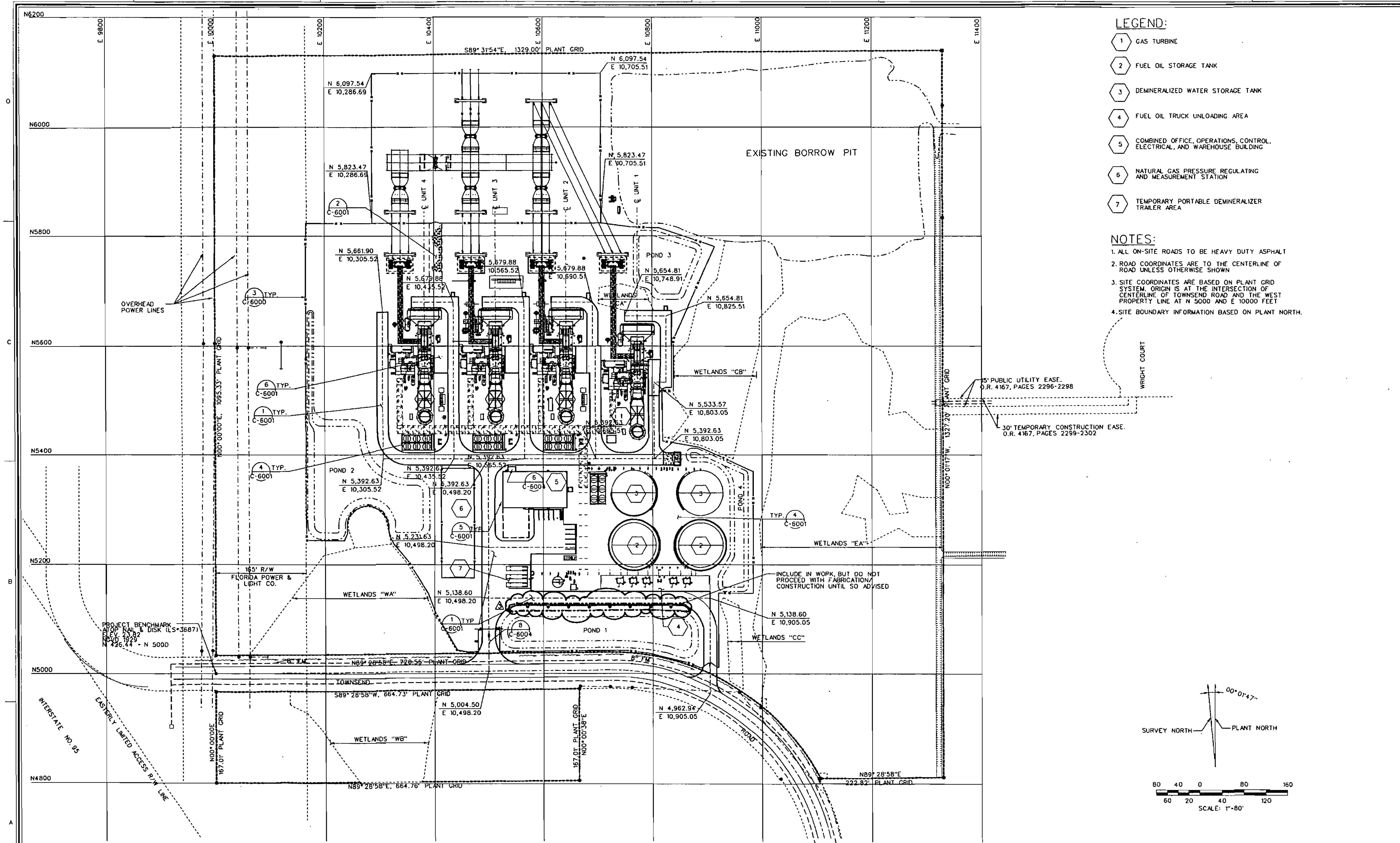
REVISIONS

GasTech Engineering Corp.
1007 E. Admiral Blvd. • Tulsa, OK 74120

S.O. / CHARGE No.: 2149-24
DATE ACCESSED 12/6/01 4:30pm — REV No 0

ASSEMBLY OF INDIRECT FIRED HEATER
2.6 MM BTU/HR GROSS W/ FORCED DRAFT BURNER
P.O. #20622-1043, OLEANDER POWER PROJECT SITE
J.A. JONES E&C LLC, LOCKWOOD GREENE, COCOA, FL.

FILE No.: 2149500 | SCALE: 1/2"=1'-0" | APP'D: | DRAWING NUMBER: D-2149500
DRAWN BY: CM | DATE: 10/16/01 | CH'K'D: | SHT. 1 OF 1



NO	DATE	REVISION	BY	CK.	APPR.
3	30MAY2001	ADDED GUARDRAIL			
2	17MAY2001	ADD COORD TO FENCE, REV. DETAIL BUBBLE	DJD	WRC	JBS
1	01MAY2001	ADD LEGEND, REMOVE 5TH TURBINE, CHGD. PARKING	DJD	WRC	JBS
0	09MAR2001	INITIAL ISSUE	DJD	WRC	JBS

DESIGNED BY D.J. DROUGHT
CHECKED BY W.R. COOK
APPR. BY J.B. SAYLOR

LOCKWOOD GREENE
A J.A. JONES COMPANY
ENGINEERING & CONSTRUCTION
Certificate: EB-0000384
250 Williams Street
Atlanta, GA 30303-1036

SHEET TITLE: OVERALL SITE PLAN

JOB NAME: Oleander Power Project

JOB NO. 012022.01	DATE 30-MAY-2001
FILENAME C0002000.DGN	REV. NO. 3
SCALE 1" = 80'	DWG. NO. C-2000