



**STATE OF CONNECTICUT  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF AIR MANAGEMENT**

**NEW SOURCE REVIEW PERMIT  
TO CONSTRUCT AND OPERATE  
A STATIONARY SOURCE**

Issued pursuant to Title 22a of the Connecticut General Statutes and Section 22a-174-3a of the Regulations of Connecticut State Agencies.

|                        |   |
|------------------------|---|
| Owner/Operator:        | Capitol District Energy Cogeneration Associates |
| Address:               | 490 Capitol Avenue, Hartford, CT 06106          |
| Equipment Location:    | 490 Capitol Avenue, Hartford, CT 06106          |
| Equipment Description: | Zurn Package Boiler Serial Number 101087        |

|                          |  |
|--------------------------|--|
| Permit Number:           | 0065   |
| Town/Premises Numbers:   | 075/766  |
| Permit Issue Date:       | November 1, 2010   |
| Prior Permit Issue Date: | February, 1989 (Original Permit)<br>April 3, 2001 (Revision)<br>January 21, 2004 (Minor Permit Modification) |
| Expiration Date:         | None   |

/s/ Anne Gobin for  
Amey Marrella  
Commissioner

November 1, 2010  
Date

**PERMIT FOR FUEL BURNING EQUIPMENT**

**STATE OF CONNECTICUT, DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF AIR MANAGEMENT**

The conditions on all pages of this permit and attached appendices shall be verified at all times except those noted as design specifications. Design specifications need not be verified on a continuous basis; however, if requested by the Commissioner, demonstration of compliance shall be shown.

**PART I. OPERATIONAL CONDITIONS**

**A. Primary Fuel**

1. Fuel Type: Natural Gas
2. Maximum Hours of Operation: Daily 24 ; Over any Consecutive  
12 Month Period: 8760

*Design Specifications*

1. Maximum Fuel Firing Rate in cf/hr: 189,126
2. Maximum Gross Heat Input in MMBtu/hr: 194.8 (See Part V.A.6)

**B. Back-Up Fuel**

1. Fuel Type: No. 2 fuel oil
2. Fuel Sulfur Content (% by weight, dry basis): 0.30
3. Maximum Hours of Operation: Daily 24 ; Over any Consecutive  
12 Month Period: 8760

*Design Specifications*

1. Maximum Fuel Firing Rate in gal/hr: 1,329.1
2. Maximum Gross Heat Input in MMBtu/hr: 187.4 (See Part V.A.6)

**C. Stack Information**

1. Minimum Stack Height (ft): 234 (Diameter\* of 4 ft)
2. Minimum Exhaust Gas Flow Rate (acfm): 46,170
3. Stack Exit Temperature (°F): 200
4. Minimum Distance from Stack to Property Line (ft): 15

\* Package boiler has separate flue within 11.0 ft diameter stack.

**PART II. CONTROL EQUIPMENT** (Applicable if -X- Checked) (See Appendix E for Specifications)

**A. Type**

- |   |  |
|---|--|
| <input type="checkbox"/> None                       | <input type="checkbox"/> Selective Non-Catalytic Reduction               |
| <input type="checkbox"/> Scrubber                   | <input type="checkbox"/> Selective Catalytic Reduction                   |
| <input type="checkbox"/> Electrostatic Precipitator | <input checked="" type="checkbox"/> Low NO <sub>x</sub> Burner           |
| <input type="checkbox"/> Cyclone                    | <input type="checkbox"/> Fabric Filter                                   |
| <input type="checkbox"/> Multi-Cyclone              | <input type="checkbox"/> Particulate Trap                                |
| <input type="checkbox"/> Thermal DeNO <sub>x</sub>  | <input checked="" type="checkbox"/> Other: Efficient Combustion Controls |

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**PART III. CONTINUOUS EMISSION MONITORING (CEM) REQUIREMENTS AND  
ASSOCIATED EMISSION LIMITS (Applicable if -X- Checked)**

CEM shall be required for the following pollutant/operational parameters and enforced on the following basis:

| <u>Pollutant/Operational<br/>Parameter</u>             | <u>Averaging<br/>Times</u> | <u>Emission<br/>Limit</u> |
|--|----------------------------|---------------------------|
| <input type="checkbox"/> None                          |                            |                           |
| <input checked="" type="checkbox"/> Opacity            | six minute block           | 20%                       |
| <input type="checkbox"/> SO <sub>2</sub>               |                            |                           |
| <input checked="" type="checkbox"/> NO <sub>x</sub> *  | 1 hour block               | See Part VI               |
| <input type="checkbox"/> CO                            | 1 hour block               |                           |
| <input checked="" type="checkbox"/> CO <sub>2</sub> ** | 1 hour block               | See Part VI               |
| <input type="checkbox"/> O <sub>2</sub>                | 1 hour block               | See Part VI               |
| <input type="checkbox"/> Temperature                   | continuous                 |                           |

\* NO<sub>x</sub> shall be expressed as nitrogen dioxide (NO<sub>2</sub>) and will be corrected to a dry basis and 15% O<sub>2</sub>.

\*\* CO<sub>2</sub> shall be monitored as a CEM diluent gas and corrected to O<sub>2</sub> using a CTDEP approved correction factor based upon the measured relationship between CO<sub>2</sub> and O<sub>2</sub>.

CEM sampling probes shall be located in the stack breaching of the package boiler.

(See Appendix A for General Requirements)

**PART IV. OPERATING REQUIREMENTS**

- A.** The primary fuel used shall be natural gas and the back-up fuel shall be No. 2 fuel oil with a sulfur content of no more than 0.30% by weight, dry basis.
- B.** The package boiler shall be operated only when the in-line duct burner (permit 075-0064) is not operating. The gas turbine (permit 075-0064) and the package boiler may operate simultaneously, typically during startup or shutdown of the gas turbine, or while performing emissions testing, or during annual Relative Accuracy Test Audits (RATA) on the gas turbine (permit 075-0064) and/or the package boiler, as long as the in-line duct burner is not operating.
- C.** The emissions of NO<sub>x</sub>, expressed as NO<sub>2</sub>, from the package boiler shall not exceed 37 ppmvd @ 15% O<sub>2</sub> when firing natural gas or 37 ppmvd @ 15% O<sub>2</sub> when firing No. 2 fuel oil.

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**PART IV. OPERATING REQUIREMENTS, Continued**

- D. The package boiler shall not be operated when the Cleaver-Brooks package Boiler (EU 17) is operating except during transitional periods or testing purposes.
- E. During any air pollution emergency episode that occurs, the boiler shall be operated in accordance with the Updated Facility Emergency Episode Plans submitted to the Department, pursuant to RCSA Section 22a-174-6.
- F. The operation and maintenance plan for the opacity monitor(s) pursuant to RCSA Section 22a-174-4 shall be in accordance with 40 CFR 60, Appendices B and F.
- G. The facility shall submit, at least 60 days prior to the commencement of the CEM performance testing, the CEM Plan and the CEM summary plan.

**PART V. MONITORING, REPORTING AND RECORD KEEPING REQUIREMENTS**

**A. Monitoring Requirements**

1. The Permittee shall install, calibrate, maintain, and operate continuous emission monitoring systems (CEMS) and recording systems for measuring NO<sub>x</sub> and CO<sub>2</sub> discharged to the atmosphere and shall record the output of the systems. In lieu of a CEMS for SO<sub>2</sub>, the Permittee shall obtain fuel receipts as described in 40 CFR 60.49b(r) and certify that only very low sulfur oil, as defined in 40 CFR 60.41b, was combusted during each reporting period.
2. The Permittee shall install, calibrate, maintain, and operate CEMS for measuring the opacity of emissions discharged to the atmosphere and record the output of the system.
3. The CEMS and recorders shall be installed, calibrated, operated and tested in accordance with RCSA Section 22a-174-4(c) and with the requirements specified in 40 CFR 60 Subpart A, Appendix B and Appendix F, as may be amended from time to time.
4. CEMS data as shown in the table in Part III of this permit and as described in the CEMS plan submitted and approved shall be used to determine compliance with the emission limits defined in this permit. Good combustion practice will be established from the most recent stack test result.

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BUREAU OF AIR MANAGEMENT****PART V. MONITORING, REPORTING AND RECORD KEEPING REQUIREMENTS, Cont.**

5. The CEMS sampling probes shall be located in the stack breaching of the package boiler.
6. The firing rates of the package boiler are limited to 155.7 MMBtu/hr when firing gas, or 148.3 MMBtu/hr when firing No. 2 fuel oil until a re-test is performed at the maximum rated capacity listed in Part I of this permit and approved by the Department. Upon approval, the permitted (Part I) maximum firing rates shall be in effect. Re-testing of the package boiler is required within 180 days of exceeding either of the interim permitted limits.
7. All emissions testing at the premises must have the prior approval of the Connecticut Department of Environmental Protection and must follow all Connecticut DEP-approved methods and procedures.
8. The Permittee shall demonstrate that the No. 2 fuel oil used in the package boiler meets the definition of very low sulfur oil by maintaining certified fuel receipts from the fuel supplier as specified in 40 CFR 60.42b(j).
9. The Permittee shall comply with the sulfur dioxide emission limits at all times, including periods of startup, shutdown, and malfunction.
10. The particulate matter and opacity standards apply at all times, except during periods of startup, shutdown or malfunction.
11. The nitrogen oxide standards shall apply at all times, including periods of startup, shutdown, or malfunction.
12. The sulfur dioxide emissions standard shall apply at all times.
13. The performance or quality assurance testing of the CEMS shall be conducted in accordance with a testing protocol approved by the commissioner.
14. The Permittee shall use data recorded by the CEMS and any other records and reports to determine compliance with NO<sub>x</sub> emissions. The CEMS shall be capable of calculating emission concentrations corrected to 15% O<sub>2</sub> at ISO standard conditions.

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**PART V. MONITORING, REPORTING AND RECORD KEEPING REQUIREMENTS, Continued**

15. The averaging times for the emission limitations with the use of the CEMS shall be one hour block average. This shall include all periods of operation, including startup, shutdown, and malfunction. Startup, shutdown or malfunction periods shall not exceed 180 minutes.
16. Annual emissions shall be verified by the Permittee by, adding the current month's emissions to the previous 11 months emissions.
17. The Permittee shall comply with RCSA Section 22a-174-22 in accordance with the submitted and approved compliance plan to the Department.
18. If required by the commissioner, the Permittee shall measure NO<sub>x</sub> and SO<sub>x</sub> emissions using EPA Methods 7 and 6 stack test respectively.

**B. Record Keeping Requirements**

1. Annual fuel consumption shall be based on any consecutive 12 month time period and shall be determined by adding (for each fuel) the current month's fuel usage to that of the previous 11 months. These calculations shall be made on a monthly basis and made available for inspection by this Bureau upon request.
2. The Permittee shall obtain and maintain at the premises, fuel receipts from the fuel supplier which certify that the oil used meets the definition of very low sulfur oil as defined in 40 CFR 60.41b.
3. Each fuel oil shipment for this equipment shall include a shipping receipt from the fuel supplier and a certification from the fuel supplier certifying the type of fuel in the shipment and the weight percent of sulfur in the fuel.
4. The Permittee shall record and maintain records of the amounts of each fuel combusted during each day and calculate the annual capacity factor individually for No. 2 fuel oil and natural gas for the reporting period. The annual capacity factor is determined on a 12-month rolling average basis with a new annual capacity factor calculated at the end of each calendar month.
5. The Permittee shall maintain records of opacity.

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**PART V. MONITORING, REPORTING AND RECORD KEEPING REQUIREMENTS, Cont.**

6. The Permittee shall maintain a file of all measurements, including continuous monitoring system, monitoring device, and performance testing measurements; all continuous monitoring system performance evaluations; all continuous monitoring system or monitoring device calibration checks; adjustments and maintenance performed on these systems or devices; and all other information required by this permit recorded in a permanent form suitable for inspection. The file shall be retained for at least five years following the date of such measurements, maintenance, reports, and records, except as follows specified in 40 CFR 60.7(f).

**C. Reporting Requirements**

1. The Permittee shall submit to the commissioner and the Administrator a notification of any physical or operational change to the package boiler which may increase the emission rate of NO<sub>x</sub>, SO<sub>x</sub>, or Particulate, unless that change is specifically exempted under an applicable subpart or in Sec. 60.14(e).

This notice shall be postmarked 60 days or as soon as practicable before the change is commenced and shall include information describing the precise nature of the change, present and proposed emission control systems, productive capacity of the facility before and after the change, and the expected completion date of the change. The commissioner and the Administrator may request additional relevant information subsequent to this notice.

2. The Permittee shall maintain records of the occurrence and duration of any startup, shutdown, or malfunction; any malfunction of the air pollution control equipment; or any periods during which a continuous monitoring system or monitoring device is inoperative.
3. Reports shall be submitted to the commissioner and/or Administrator certifying that only very low sulfur oil meeting this definition was combusted in the affected facility during the reporting period.

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**PART VI. ALLOWABLE EMISSION LIMITS**

The Permittee shall not exceed the emission limits stated herein at any time.

**Natural Gas:**

| <u>Criteria Pollutants</u>     | <u>lb/hr</u> | <u>lb/MMBTU</u> | <u>ppmvd @15% O<sub>2</sub></u> | <u>Basis</u> |
|--------------------------------|--------------|-----------------|---------------------------------|--------------|
| TSP                            | 0.95         | 0.0049          |                                 | a            |
| PM-10                          | 0.95         | 0.0049          |                                 | a            |
| SO <sub>2</sub>                | 0.11         | 5.8E-04         |                                 | a            |
| NO <sub>x</sub>                | 26.49        | 0.136           | 37                              | a            |
| HC                             | 2.53         | 0.013           |                                 | a            |
| CO                             | 7.56         | 0.039           |                                 | a            |
| Pb                             | 0.0          | 0.0             |                                 | a            |
| H <sub>2</sub> SO <sub>4</sub> | 0.001        | 8.1E-06         |                                 | b            |

**No. 2 Fuel Oil:**

| <u>Criteria Pollutants</u>     | <u>lb/hr</u> | <u>lb/MMBTU</u> | <u>ppmvd @15% O<sub>2</sub></u> | <u>Basis</u> |
|--------------------------------|--------------|-----------------|---------------------------------|--------------|
| TSP                            | 2.66         | 0.014           |                                 | a            |
| PM-10                          | 2.66         | 0.014           |                                 | a            |
| SO <sub>2</sub>                | 57.4         | 0.306           | 60                              | a            |
| NO <sub>x</sub>                | 26.62        | 0.142           | 37                              | a            |
| VOC                            | 3.0          | 0.016           |                                 | a            |
| CO                             | 6.65         | 0.035           |                                 | a            |
| Pb                             | 0.0006       | 3.0E-06         |                                 | a            |
| H <sub>2</sub> SO <sub>4</sub> | 0.98         | 0.0052          | 1.0                             | b            |

**Total Allowable Emissions for the Gas Turbine with the Duct Burner (Permit 075-0064), and the Package Boiler (Permit 075-0065):**

| <u>Criteria Pollutants</u>      | <u>TPY</u> |
|---------------------------------|------------|
| TSP                             | 92.3       |
| PM-10                           | 92.3       |
| SO <sub>x</sub>                 | 1099.3     |
| NO <sub>x</sub>                 | 700.0      |
| NO <sub>x</sub> (target values) | 642.1      |
| VOC                             | 93.7       |
| CO                              | 313.7      |
| Pb                              | 0.0263     |
| H <sub>2</sub> SO <sub>4</sub>  | 47.70      |

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Town No: 075

Premise No: 766

Permit No: 0065

Stack No: 01

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**PART VI. ALLOWABLE EMISSION LIMITS, Continued**

These emission limits are based upon a reduced maximum firing rate. Additional testing is required for increase above these interim levels.

**Basis**

The above emission rates were calculated using emission factors from the following sources:

- a. Manufacturer's Guaranteed Emissions Factors.
- b. Mass Balance, AP-42, 1986

Demonstration of compliance with the above emission limits shall be met by calculating the emission rates using the given emission factors.

The above statement shall not preclude the commissioner from requiring other means (e.g. stack testing) to demonstrate compliance with the above emission limits, as allowed by state or federal statute, law or regulation.

**PART VII. STACK EMISSION TEST REQUIREMENTS** (Applicable if -X- Checked)

Stack emission testing shall be required for the following pollutant(s):

- None at this time
- TSP             SO<sub>x</sub>             NO<sub>x</sub>             CO
- VOC             PM-10             O<sub>2</sub>
- Other (HAPS): \_\_\_\_\_, \_\_\_\_\_ (See Appendix B for General Requirements)

**PART VIII. APPLICABLE REGULATORY REFERENCES** (The Regulations of Connecticut State Agencies, hereinafter referred to as the Regulations)

22a-174-2a; 22a-174-3a; 22a-174-4; 22a-174-6; 22a-174-7; 22a-174-8; 22a-174-9; 22a-174-12; 22a-174-14; 22a-174-18; 22a-174-19; 22a-174-22; 22a-174-29

These references are not intended to be all inclusive - other sections of the Regulations may apply.

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**PART IX. SPECIAL REQUIREMENTS**

- A.** Records indicating continual compliance with all above conditions must be kept on site at all times and made available upon Bureau request for the duration of this permit, or for the previous five years, whichever is less.
- B.** The Permittee shall operate and maintain this equipment in accordance with the manufacturer's specifications and written recommendations.

**C.** *Noise (for non-emergency use)*

The Permittee shall operate this facility at all times in a manner so as not to violate or contribute significantly to the violation of any applicable state noise control regulations, as set forth in Sections 22a-69-1 through 22a-69-7.4 of the Regulations.

- D.** The Permittee shall comply with all applicable sections of the following New Source Performance Standard(s) at all times. (Applicable if -X-checked)

40 CFR Part 60, Subpart   X   Db        Dc        GG   X   A

None (See Appendix C for Detailed Requirements)

**PART X. ADDITIONAL TERMS AND CONDITIONS**

- A.** This permit does not relieve the Permittee of the responsibility to conduct, maintain and operate the regulated activity in compliance with all applicable requirements of any federal, municipal or other state agency. Nothing in this permit shall relieve the Permittee of other obligations under applicable federal, state and local law.
- B.** Any representative of the DEP may enter the Permittee's site in accordance with constitutional limitations at all reasonable times without prior notice, for the purposes of inspecting, monitoring and enforcing the terms and conditions of this permit and applicable state law.
- C.** This permit may be revoked, suspended, modified or transferred in accordance with applicable law.
- D.** This permit is subject to and in no way derogates from any present or future property rights or other rights or powers of the State of Connecticut and conveys no property rights in real estate or material, nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state or local laws or regulations pertinent to the facility or regulated activity affected thereby. This permit shall neither create nor affect any rights of persons or municipalities who are not parties to this permit.

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**PART X. ADDITIONAL TERMS AND CONDITIONS, Continued**

- E.** Any document, including any notice, which is required to be submitted to the commissioner under this permit shall be signed by a duly authorized representative of the Permittee and by the person who is responsible for actually preparing such document, each of whom shall certify in writing as follows: "I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that any false statement made in the submitted information may be punishable as a criminal offense under section 22a-175 of the Connecticut General Statutes, under section 53a-157b of the Connecticut General Statutes, and in accordance with any applicable statute."

Any false statement in any information submitted pursuant to this permit may be punishable as a criminal offense in accordance with Connecticut General Statutes §22a-6, under §53a-157 of the Connecticut General Statutes.

- F.** Nothing in this permit shall affect the commissioner's authority to institute any proceeding or take any other action to prevent or abate violations of law, prevent or abate pollution, recover costs and natural resource damages, and to impose penalties for violations of law, including but not limited to violations of this or any other permit issued to the Permittee by the commissioner.
- G.** Within fifteen days of the date the Permittee becomes aware of a change in any information submitted to the commissioner under this permit, or that any such information was inaccurate or misleading or that any relevant information was omitted, the Permittee shall submit the correct or omitted information to the commissioner.
- H.** The date of submission to the commissioner of any document required by this permit shall be the date such document is received by the commissioner. The date of any notice by the commissioner under this permit, including but not limited to notice of approval or disapproval of any document or other action, shall be the date such notice is personally delivered or the date three days after it is mailed by the commissioner, whichever is earlier. Except as otherwise specified in this permit, the word "day" means calendar day. Any document or action which is required by this permit to be submitted or performed by a date which falls on a Saturday, Sunday or legal holiday shall be submitted or performed by the next business day thereafter.
- I.** Any document required to be submitted to the commissioner under this permit shall, unless otherwise specified in writing by the commissioner, be directed to: Office of Director; Compliance & Field Operations Division; Bureau of Air Management; Department of Environmental Protection; 79 Elm Street, 5th Floor; Hartford, Connecticut 06106-5127.

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Appendices attached (Applicable if -X- checked):

- A Continuous Emission Monitoring Requirements
- B Stack Emission Test Requirements
- C New Source Performance Standards
- E Control Equipment Specifications

APPENDIX E

Control Equipment Specifications

Air Pollution Control Equipment (applicable if -X- checked).

The Permittee shall comply with the procedures for malfunction of control equipment as specified in Section 7 of the Regulations.

The following specifications need not be verified on a continuous basis, however, if requested by the Bureau, demonstration shall be shown.

None

Scrubber

Make and Model: \_\_\_\_\_  
Reagent: \_\_\_\_\_  
Reagent Flow Rate: \_\_\_\_\_  
Pressure Drop (in H<sub>2</sub>O): \_\_\_\_\_  
Minimum Gas Flow Rate at Maximum Rated Capacity (acfm): \_\_\_\_\_  
PH: \_\_\_\_\_  
Design Outlet Grain Loading (gr/dscf): \_\_\_\_\_  
Design Removal Efficiency (%): \_\_\_\_\_

Electrostatic Precipitator (ESP)

Make and Model: \_\_\_\_\_  
Number of Fields: \_\_\_\_\_  
Minimum Gas Flow Rate at Maximum Rated Capacity (acfm): \_\_\_\_\_  
Design Outlet Grain Loading (gr/dscf): \_\_\_\_\_  
Design Removal Efficiency (%): \_\_\_\_\_

Cyclone  Multicyclone

Make and Model: \_\_\_\_\_  
Pressure Drop (in H<sub>2</sub>O): \_\_\_\_\_  
Minimum Gas Flow Rate at Maximum Rated Capacity (acfm): \_\_\_\_\_

Selective Non-catalytic Reduction (SNCR)

Urea  Ammonia

Make and Model: \_\_\_\_\_  
Injection Rate at Maximum Rated Capacity (lb/hr): \_\_\_\_\_  
Operating Temperature Range (EF): \_\_\_\_\_  
Minimum Gas Flow Rate at Maximum Rated Capacity (acfm): \_\_\_\_\_  
Design Removal Efficiency (%): \_\_\_\_\_

Selective Catalytic Reduction (SCR)

Make and Model: \_\_\_\_\_  
Catalyst Type: \_\_\_\_\_  
Minimum Gas Flow Rate at Maximum Rated Capacity (acfm): \_\_\_\_\_  
Pressure Drop (in H<sub>2</sub>O): \_\_\_\_\_  
Ammonia Injection Rate at Maximum Rated Capacity (lb/hr): \_\_\_\_\_  
Design Removal Efficiency (%): \_\_\_\_\_

**APPENDIX E**

**Control Equipment Specifications**

Low NO<sub>x</sub> Burner

Make and Model: \_\_\_\_\_  
Guaranteed NO<sub>x</sub> Emission Rate (lb/MM BTU): \_\_\_\_\_  
Design Removal Efficiency (%): \_\_\_\_\_

Particulate Trap

Make and Model: \_\_\_\_\_  
Design Removal Efficiency (%): \_\_\_\_\_

Fabric Filter

Make and Model: \_\_\_\_\_  
Number of Bags in Use: \_\_\_\_\_  
Air/Cloth Ratio: \_\_\_\_\_  
Bag Material: \_\_\_\_\_  
Cleaning Method: \_\_\_\_\_  
Pressure Drop (in H<sub>2</sub>O): \_\_\_\_\_  
Minimum Gas Flow Rate at Maximum Rated Capacity (acfm): \_\_\_\_\_  
Design Outlet Grain Loading (gr/dscf): \_\_\_\_\_  
Design Removal Efficiency (%): \_\_\_\_\_

Other: \_\_\_\_\_