

US EPA ARCHIVE DOCUMENT



United States  
Environmental Protection  
Agency New England

One Congress Street, Suite 1100  
Boston, MA 02114

## Prevention of Significant Deterioration Air Permit

issued to the

University of Massachusetts Building Authority  
225 Franklin Street, 12<sup>th</sup> Floor  
Boston, MA 02110

for the

University of Massachusetts-Amherst Campus  
Central Heating Plant

**Draft PSD Permit Number 050-026-MA11**

Pursuant to the provisions of the Clean Air Act (CAA) chapter I, Part C (42 U.S.C. Section 7470, *et. seq*) and the regulations found at the Code of Federal Regulations Title 40, Section 52.21, the United States Environmental Protection Agency Region 1 (EPA) is modifying a Prevention of Significant Deterioration (PSD) air quality permit issued to the University of Massachusetts Building Authority (the Authority). The modified PSD permit approves several changes the Authority made to the design of the University of Massachusetts central heating plant (CHP) located in Amherst, Massachusetts. The revised CHP includes a combustion turbine (CT) nominally rated at 10 megawatts, a heat recovery steam generator (HRSG) with a duct burner (DB), two low pressure boilers and a high pressure boiler.

The design, construction and operation of the revised CHP shall be subject to the attached permit conditions and permit limitations. This permit shall be effective 30 days from receipt of notice from EPA of permit issuance and shall remain in effect until rescinded by or surrendered to EPA. This permit does not relieve The Authority from the obligation to comply with applicable state and federal air pollution control rules and regulations. All terms and conditions of the permit are enforceable by EPA and citizens under the CAA.

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Stephen S. Perkins, Director  
Office of Ecosystems Protection

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Date of issuance

## **Environmental Protection Agency -Region 1**

### **Prevention of Significant Deterioration Air Permit**

#### **University of Massachusetts-Amherst Campus Central Heating Plant**

#### **Permit Terms and Conditions**

##### **I. Emission Limitations**

1. The owner/operator shall not discharge or cause to discharge into the atmosphere in excess of either of the following emission limits for Particulate Matter less than 10 micrometers (PM<sub>10</sub>) for the combustion turbine when the duct burner is not firing:

a. Natural gas: PM<sub>10</sub> (1- hour block average): 0.030 pounds per million British thermal units (0.030 lbs/MMBtu) and 4.14 lbs per hour (lbs/hr)

b. Distillate oil: PM<sub>10</sub> (1- hour block average): 0.036 lbs/MMbtu and 4.71 lbs/hr

2. The owner/operator shall not discharge or cause to discharge into the atmosphere in excess of either of the following emission limits for the combustion turbine while firing the duct burner:

a. Natural gas: PM<sub>10</sub> (1- hour block average): 0.030 lbs/MMbtu and 6.89 lbs/hr

b. Distillate oil: PM<sub>10</sub> (1- hour block average): 0.036 lbs/MMbtu and 7.96 lbs/hr

3. The owner/operator shall not discharge or cause to discharge into the atmosphere in excess of either of the following emission limits for each low pressure boiler:

a. Natural gas: PM<sub>10</sub> (1- hour block average): 0.020 lbs/MMbtu and 3.24 lbs/hr

b. Distillate oil: PM<sub>10</sub> (1- hour block average): 0.030 lbs/MMbtu and 4.68 lbs/hr

4. The owner/operator shall not discharge or cause to discharge into the atmosphere in excess of either of the following emission limits for the high pressure boiler:

a. Natural gas: PM<sub>10</sub> (1- hour block average): 0.020 lbs/MMbtu and 3.59 lbs/hr

b. Distillate oil: PM<sub>10</sub> (1- hour block average): 0.030 lbs/MMbtu and 5.21 lbs/hr

Note: Emission limits apply in paragraphs 1-4 above at all times including startup and shut down.

5. For each low pressure boiler and the high pressure boiler, the emission rate of ammonia discharged to the atmosphere shall not exceed 2.0 parts per million, on a dry volumetric basis, corrected to 3 percent oxygen (1-hour average).
6. For the CT/HRSG, the emission rate of ammonia discharged to the atmosphere shall not exceed 10.0 parts per million, on a dry volumetric basis, corrected to 15 percent oxygen (1-hour average).

## **II. Operating Requirements**

1. The owner/operator shall combust only natural gas or transportation grade distillate fuel oil in the CT and the boilers, and only natural gas in the DB.
2. The owner/operator shall operate the emergency engine only during emergency situations or for routine maintenance testing. The owner/operator shall only combust transportation grade distillate fuel oil in the emergency engine. Total hours of operation for the emergency engine shall not exceed 300 hours during any 12-month period.
3. Sulfur in natural gas shall not exceed 0.8 grains/100ft<sup>3</sup>.
4. Sulfur in distillate fuel oil shall not exceed 0.0015 percent by weight.

## **III. Testing Requirements**

1. The owner/operator shall ensure that all stacks and exhaust ducts are constructed so as to accommodate the emissions testing requirements stipulated in 40 CFR Part 60, Appendix A. The CT/HRSG and boiler ducts shall include two outlet sampling ports 90 degrees apart from each other. The sampling ports must be located at a minimum of one duct diameter upstream and two duct diameters downstream of any flow disturbance.
2. The owner/operator shall measure all PM<sub>10</sub> emission limits using 40 CFR 51, Appendix M, Test Method 201 or 201A and Test Method 202.
3. The owner/operator shall conduct initial PM<sub>10</sub> compliance emission tests for the CT/HRSG/DB and boilers at 100% of maximum load to determine compliance with the emission limits in lbs/hr and lbs/MMBtu established for PM<sub>10</sub> while burning distillate fuel oil.
4. The owner/operator shall conduct initial ammonia compliance emission tests for the

CT/HRSG/DB and boilers at 100% of maximum load using EPA Conditional Test Method 27 or an equivalent test method approved by EPA- Region 1.

5. The owner/operator shall complete the boiler emissions tests within 180 days after initial start-up of the boilers. The owner/operator shall conduct a second emissions test one year after initial stack testing is completed. If the second stack test shows that the emissions unit is in compliance, additional stack testing shall be required only when requested by EPA-Region 1.
6. The owner/operator shall complete CT/HRSG/DB emissions tests within 180 days after initial start-up of the CT/HRSG/DB. The owner/operator shall conduct a second emissions test one year after initial stack testing is completed. If the second stack test shows that the emissions unit is in compliance, additional stack testing shall be required only when requested by EPA-Region 1.
7. The owner/operator shall submit emissions test protocol(s) to EPA-Region 1 for review and written approval at least 30 days prior to the date of actual testing.
8. The owner/operator shall submit the final emissions test report(s) to the EPA-Region 1 within 60 days after the completion of each of the tests.

#### **IV. Monitoring Requirements**

1. The owner/operator shall monitor sulfur content of each new shipment of transportation grade fuel oil received. Compliance with the percent sulfur-in-fuel requirement can be demonstrated through testing (testing certification) or by maintaining a shipping receipt from the fuel supplier (shipping receipt certification) provided the testing certification or shipping receipt certification documenting the sulfur content is done in accordance with the applicable ASTM test methods (D4294-90) or any other method approved by the EPA-Region 1.
2. The owner/operator shall install, operate and maintain a Continuous Emission Monitoring System (CEMS) for ammonia or a nitrogen oxides CEMS with an ammonia injection rate monitor to calculate ammonia emissions. The CEMS shall satisfy the requirements of Performance Specification 2 (PS-2) of 40 CFR Part 60, Appendix B and Appendix F.

## **V. Recordkeeping Requirements**

1. The owner/operator shall maintain a log to record problems, upsets or failures associated with the ammonia handling system.
2. The owner/operator shall maintain records of all periods of excess ammonia emissions, even if attributable to an emergency/malfunction or startup/shutdown, and shall quantify these emissions.
3. The owner/operator shall maintain records of all measurements, performance evaluations, calibration checks, maintenance, and adjustments for the ammonia CEMS.
4. The owner/operator shall maintain on-site permanent records of output from ammonia CEMS and make these records available to the EPA-Region 1 on request.
5. The owner/operator shall maintain records of the testing certification or shipping receipt certification used to certify that each new shipment of transportation grade fuel oil complies with the percent sulfur-in-fuel requirement specified herein.
6. The owner/operator shall maintain and make available to the EPA-Region 1 upon inspection all operating and monitoring records and logs for the last five years.
7. The owner/operator shall establish a recordkeeping system with sufficient detail to document that the operation of each emergency generator does not exceed 300 hours for any rolling 12-month period.
8. The owner/operator shall maintain records of the results of the tune-ups required by Section VII below, and the date upon which each required tune-up was performed.
9. The owner/operator shall maintain records of each date and time that the DB begins or ceases firing.

## **VI. Reporting Requirements**

1. All notifications and reporting required by this permit shall be submitted to the address listed in Section XIII below.
2. The owner/operator shall submit to the EPA-Region 1 a semi-annual report postmarked by January 30<sup>th</sup> and July 30<sup>th</sup> of each year, which contains for the prior calendar 6-month period the following information, at a minimum:
  - a. Reports from the facility's ammonia CEMS summary data;

b. Reports of excess emissions or excursions from allowable operating conditions. The owner/operator shall list the duration, cause (including whether it is attributable to a malfunction or emergency), the response taken, and the amount of excess emissions. Periods of excess emissions shall include malfunctions, emergency, and upsets or failures associated with the emission control system and CEMS; and

c. A tabulation of oil use during the period.

## **VII. Special Terms and Conditions**

1. The owner/operator shall comply with any Massachusetts Department of Environmental Protection plan approval that applies to the CHP project.
2. The owner/operator shall tune each package boiler annually in accordance with procedures contained in EPA 340/1-83-023 Combustion Efficiency Optimization Manual for Operators of Oil and Gas Fired Boilers" (or equivalent) with the goal of reducing air pollutant emissions to optimum levels.
3. Upon startup and certification of the new CHP plant, the owner/operator shall decommission and disable the existing oil/coal-fired boilers.

## **VIII. Right of Entry**

The owner/operator shall allow all authorized representatives of EPA, upon presentation of credentials, to enter upon or through the facility where records required under this permit are kept. The owner/operator shall allow such authorized representatives, at reasonable times:

- a. To access and copy any records that must be kept under this permit;
- b. To inspect any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit; and
- c. To monitor substances or parameters for the purpose of assuring compliance with this permit.

## **IX. Transfer of Ownership**

In the event of any changes in control or ownership of the CHP, this permit shall be binding on all subsequent owners and operators. The owner/operator shall notify the succeeding owner and operator of the existence of this permit and its conditions. Notification shall be by



letter with a copy forwarded to the EPA.

**X. Severability**

The provisions of this permit are severable, and if any provision of the permit is held invalid, the remainder of this permit will not be affected thereby.

**XI. Other Applicable Regulations**

The owner/operator shall construct and operate the turbines in compliance with all other applicable provisions of federal and state regulations.

**XII. Agency Addresses**

All correspondence required by this permit shall be forwarded to:

Air Compliance Clerk  
U.S. EPA Region 1  
One Congress Street, Suite 1100-SEA  
Boston, MA 02114-2023