

217/785-1705

CONSTRUCTION PERMIT - NSPS and NESHAP SOURCE

PERMITTEE

Aventine Renewable Energy, Inc  
Attn: Steve Antonacci  
1300 South Second Street  
Pekin, Illinois 61554

Application No.: 13090044

I.D. No.: 179060ACR

Applicant's Designation:

Date Received: September 26, 2013

Construction of: Two New Natural Gas Fired Boilers

Date Issued: DRAFT

Source Location: 1300 South Second Street, Pekin, Tazewell County

This Permit is hereby granted to the above-designated Permittee to CONSTRUCT emissions source(s) and/or air pollution control equipment consisting of two natural gas-fired boilers, as described in the above referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

1. Introduction

The project involves installation of two natural gas-fired boilers, Boilers E and F (the affected boilers). The new boilers will provide steam to process operations at the existing plant. In conjunction with this project, the three existing coal-fired boilers at the plant must be permanently shutdown (See Condition 10).

2-1. Applicable Federal Emission Standards

- a. i. The affected boilers are subject to the federal New Source Performance Standards (NSPS) for Industrial-Commercial-Institutional Steam Generating Units, 40 CFR 60 Subpart Db (Boiler NSPS), and related requirements of the General Provisions of the NSPS, 40 CFR 60 Subpart A.
- ii. Pursuant to the NSPS, 40 CFR 60.44b(i) and (1)(1), as high heat release rate boilers, the NO<sub>x</sub> emissions of each affected boiler shall not exceed 86 ng/J (0.20 lb/million Btu) heat input on a 30-day rolling average, beginning on and after the date on which the initial performance test is completed or is required to be completed under 40 CFR 60.8, whichever date comes first.

Note: NO<sub>x</sub> emissions of the boilers are subject to a more stringent limit, 0.04 lb/mmBtu, pursuant to Condition 5(b).

- b. The affected boilers are affected sources under the federal National Emission Standards for Hazardous Air Pollutants (NESHAP) for Major

Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters, 40 CFR 63, Subpart DDDDD (the boiler NESHAP). As affected sources, for each boiler, the Permittee must comply with applicable requirements of the NESHAP, 40 CFR 63 Subpart DDDDD, including:

- i. Pursuant to 40 CFR 63.7540(a)(10) or (12), the Permittee shall conduct periodic tune-ups of each affected boiler as specified by the NESHAP.
- ii. Pursuant to 40 CFR 60.11(d) and 63.7500(a)(3), the Permittee must operate and maintain each affected boiler, including associated air pollution control and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunction.
- iii. Pursuant to 40 CFR 63.7565, the Permittee must comply with related requirements of the General Provisions of the NESHAP, 40 CFR 63 Subpart A, as specified in Table 10 of 40 CFR 63 Subpart DDDDD.

2-2. Applicable State Emission Standards

- a. Pursuant to 35 IAC 212.122(a), the emissions of smoke or other particulate matter from each affected boiler shall not have an opacity greater than 20 percent, except as provided in 35 IAC 212.122(b).
- b. Pursuant to 35 IAC 216.121, the emission of CO from each affected boiler shall not exceed 200 ppm, corrected to 50 percent excess air.

3. Non-Applicability Provisions

- a.
  - i. This permit is issued based on this project not constituting a major modification under the federal rules for Prevention of Significant Deterioration (PSD), 40 CFR 52.21. For emissions of nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), particulate matter<sub>10</sub> (PM<sub>10</sub>), particulate matter<sub>2.5</sub> (PM<sub>2.5</sub>) and greenhouse gases (GHG), this is because the net increase in emissions, considering the decreases in emissions from the permanent shutdown of the coal-fired boilers, will not be significant (See Table 2). For other pollutants regulated under PSD, including particulate matter (PM) and volatile organic material (VOM), this is because emissions are not significant. (See Condition 5(a) and Table 1.)
  - ii. This permit is issued based on this project not constituting a major modification for emissions of SO<sub>2</sub> under the state rules for Major Stationary Sources Construction and Modification (MSSCAM), 35 IAC Part 203. This is because the SO<sub>2</sub> emissions of each new boiler will be minimal and thus their combined SO<sub>2</sub> emissions are not significant. (See Condition 5(d).)
- b. This permit is issued based on the affected boilers not being subject to the SO<sub>2</sub> emission standards of the NSPS, 40 CFR 60.42b. This is

because only gaseous fuel is being fired in the boilers so this standard does not apply pursuant to 40 CFR 42b(k)(2).

4. Operational Limits

- a. Natural gas shall be the only fuel fired in each affected boiler.
- b. The design heat input of each affected boiler shall not exceed 370 million Btu per hour (mmBtu/hr).

5. Emissions

- a. The emissions of the affected boilers shall not exceed the limits in Table 1. Compliance with the annual limits in Table 1 shall be determined from a running total of 12 months of data, i.e., from the sum of the data for the current month plus the preceding 11 months (running 12 month total).
- b. Emissions of NO<sub>x</sub> from each affected boiler shall not exceed 0.04 lb/mmBtu heat input on an average of 30 boiler operating days.
- c. If continuous emissions monitoring is conducted for CO, CO emissions from each affected boiler shall not exceed 0.09 lb/mmBtu on an average of 30 boiler operating days.
- d. This permit is issued based on minimal emissions of SO<sub>2</sub> from each affected boiler. For this purpose, emissions of SO<sub>2</sub> shall not exceed 1.1 tons/year from each affected boiler.

6. Performance Testing Requirements

- a. Pursuant to 40 CFR 60.46b(e), emission limits for NO<sub>x</sub> required under 40 CFR 60.44b, the Permittee shall comply with the applicable performance testing requirements of NSPS for each affected boiler, including 40 CFR 60.8 using the continuous system for monitoring NO<sub>x</sub> under 40 CFR 60.48b(b).
- b. i. A. Within one year after beginning routine operation of the affected boilers, the Permittee shall have tests conducted for one of the boilers for emissions of CO, VOM, and PM<sub>10</sub>/PM<sub>2.5</sub>, as specified below, at its expense by a qualified testing service while the affected boiler is operating in the maximum load range and other representative operating conditions.
  - B. In addition to the emission testing required above, the Permittee shall have testing performed as specified by the Illinois EPA within 45 days of a written request by the Illinois EPA or such later date agreed to by the Illinois EPA.

- ii. A. Applicable USEPA test methods and procedures shall be used for testing emissions of the affected boilers, including the following methods unless another method is approved by the Illinois EPA.

Carbon Monoxide <sup>1</sup>	Method 10
Volatile Organic Material	Method 18, 25 and/or 25A
PM <sub>10</sub> /PM <sub>2.5</sub> (Filterable) <sup>2</sup>	Method 201A
Condensable particulate	Method 202

Notes:

<sup>1</sup> Testing for CO is not required if the affected boilers are equipped with instrumentation for CO that can be used to provide emission data for the boilers in pounds/hour and ppm at 50 percent excess air.

<sup>2</sup> The Permittee may report all PM emissions measured by USEPA Method 5 as filterable PM<sub>10</sub> and PM<sub>2.5</sub>, in which case testing for PM<sub>10</sub>/PM<sub>2.5</sub> using USEPA Method 201A need not be performed.

- B. If visible emissions are normally present during the operation of the affected boilers, the Permittee shall have observations of opacity in accordance with USEPA Method 9 conducted during this testing.

- c. i. The Permittee shall have the opacity of the emissions from the affected boiler(s) during representative operating conditions determined in accordance with USEPA Method 9 within 30 days of a written request from the Illinois EPA. The duration of opacity observations shall be at least 30 minutes (five 6-minute averages) unless the average opacities for the first 12 minutes of observations (two 6-minute averages) are both less than 10.0 percent.

- ii. The Permittee shall submit a written report for these observations which report shall be submitted within 30 days of the date of observations. This report shall include:

- i. Date and time of observations.
- ii. Name and employer of qualified observer.
- iii. Copy of current Method 9 certification.
- iv. Description of weather observation conditions during observations.
- v. Description of the operating conditions of the boiler.
- vi. Raw data.

- vii. Opacity determinations.
  - viii. Conclusions.
  - d. The Permittee shall submit a test plan to the Illinois EPA at least 60 days prior to this testing.
  - e. The Illinois EPA shall be notified prior to these tests to enable the Illinois EPA to observe these tests. Notification and test protocol for the expected date of testing shall be submitted a minimum of 30 days prior to the expected date. Notification of the actual date and expected time of testing shall be submitted a minimum of 5 working days prior to the actual date of the test. The Illinois EPA may at its discretion accept notifications with shorter advance notice provided that the Illinois EPA will not accept such notifications if it interferes with the Illinois EPA's ability to observe testing.
  - f. Three copies of the Final Report for these tests shall be promptly submitted to the Illinois EPA and in no case later than 60 days after the completion of the testing, and shall include as a minimum:
    - i. A summary of results that includes measured emission rates, emission rates in the terms of the applicable limits (e.g., lbs/hour and lbs/mmBtu), and whether compliance was demonstrated with applicable limits.
    - ii. Description of test methods and procedures used, including description of sampling train, analysis equipment, and test schedule.
    - iii. Detailed description of operating conditions during the period of testing, including operating parameters of the boiler (e.g., heat input, and oxygen content in the flue gas leaving the boiler).
    - iv. Data and calculations, including copies of all raw data sheets and records of laboratory analyses, sample calculations, and data on equipment calibration.
    - v. Monitored emissions of NO<sub>x</sub> during the period of testing.
    - vi. Opacity data if opacity observations were conducted during the period of testing (see Condition 6(c)(ii).)
  - g. Copies of emission test reports shall be retained for at least five years after the date that an emission test is superseded by a more recent test.
- 7-1. Emissions Monitoring Requirements
- a. For each affected boiler the Permittee shall conduct continuous monitoring for emissions of NO<sub>x</sub> in accordance with the requirements of

the NSPS, including 40 CFR 60.48b(b), e.g., the Permittee shall install, calibrate, maintain, and operate Continuous Emission Monitoring System (CEMS) for measuring NO<sub>x</sub> and O<sub>2</sub> (or CO<sub>2</sub>) emissions discharged to the atmosphere, and shall record the output of the system, as required in 40 CFR 60.48b(c), (d), (e) and (f).

- b. Pursuant to 35 IAC 217.454(b), as the affected boilers are "budget units" for purposes of 35 IAC Part 217 Subpart U, the Permittee must also comply with the requirements of 35 IAC 217.456(c) for this monitoring.

7-2. Operational Monitoring Requirements

- a. For each affected boiler, the Permittee shall install, operate, and maintain monitors to measure and record fuel consumption.

8. Recordkeeping Requirements

- a. For each affected boiler, the Permittee shall comply with the applicable recordkeeping requirements of the Boiler NSPS, including 40 CFR 60.7(b) and (f) and 60.49b(d) and (g).

- b. For each affected boiler, the Permittee shall comply with the applicable recordkeeping requirements of the Boiler NESHAP, including 40 CFR 63.10(a) and (b)(1) and 63.7555(a), (b), and (j).

- c. The Permittee shall maintain a file or other records containing the following information for the affected boilers:

- i. The manufacturer's specifications for the boilers including emissions guarantees and rated heat input capacity (mmBtu/hour).
- ii. The operating and maintenance procedures for the boilers recommended by the manufacturer.

- d. The Permittee shall keep the following operating records for each affected boiler:

- i. Daily records of fuel usage and monthly records of annual capacity factor, as required by 40 CFR 60.49b(d).
- ii. An operating log.
- iii. An inspection, maintenance and repair log, including date and nature of activity.

- e. Pursuant to 35 IAC 217.454(b), as the affected boilers are "budget units" for purposes of 35 IAC Part 217 Subpart U, the Permittee must comply with the recordkeeping requirements of 35 IAC 217.456(e)(1)(B) through (D).

- f. The Permittee shall maintain the following records related to the emissions of the affected boilers:
    - i. Records of the emissions of NO<sub>x</sub> from each boiler and other related information as required for each boiler operating day by the NSPS, 40 CFR 60.49b(g).
    - ii. A file containing a demonstration that the emission of the affected boilers when operating normally will comply with the applicable hourly emission limits in Table 1, with supporting documentation, which information shall be kept current.
    - iii. Records for each boiler for its emissions of NO<sub>x</sub>, CO, PM, PM<sub>10</sub>, PM<sub>2.5</sub>, VOM and GHG, as CO<sub>2</sub>e (tons/month and tons/year), with supporting calculations.
    - iv. Records for the total emissions of NO<sub>x</sub>, CO, PM, PM<sub>10</sub>, PM<sub>2.5</sub>, VOM and GHG, as CO<sub>2</sub>e from the affected boilers (tons/month and tons/year).
  - g. The Permittee shall keep records for all opacity measurements made in accordance with USEPA Method 9 for the affected boilers that it conducts or that are conducted at its behest. For each occasion on which such measurements are made, these records shall include the formal report for the measurements if conducted pursuant to Condition 6(c) or otherwise the identity of the observer, a description of the measurements that were made, the operating condition of the boiler, the observed opacity, and copies of the raw data sheets for the measurements.
  - h. All records and logs required by this permit shall be retained at a readily accessible location at the source for at least five years from the date of entry and shall be made available for inspection and copying by the Illinois EPA or USEPA upon request. Any records retained in an electronic format (e.g., computer) shall be capable of being retrieved and printed on paper during normal source office hours so as to be able to respond to an Illinois EPA or USEPA request for records during the course of a source inspection.
9. Reporting Requirements
- a. For each affected boiler, the Permittee shall comply with the applicable notification and reporting requirements of the NSPS, including 40 CFR 60.7(a), (c), (d) and (e) and 60.49b(b).
  - b. For each affected boiler, the Permittee shall comply with the notification and reporting requirements of the NESHAP, including 40 CFR 63.9(a), (b), 63.10(a), (b), 63.7545(a), (c), 63.7550(a), (b), (c), and (h), with such submittals made to the Illinois EPA.
  - c. For each affected boiler, pursuant to 35 IAC 217.454(b), the Permittee shall comply with the reporting requirements of 35 IAC 217.456(e)(2).

- d. If there is a deviation of the requirements of this permit, not otherwise addressed pursuant to the above reporting requirements, the Permittee shall submit a report to the Illinois EPA within 30 days after deviation. The report shall include a description of the deviation, the probable cause of the deviations, the corrective actions that were taken and any actions taken to reduce future occurrences.
  - e. Two copies of all reports and notifications required by this permit shall be sent to the Illinois EPA, Division of Air Pollution Control, Compliance Section, and one copy shall be sent to the Illinois EPA, Air Regional Office in Peoria.
10. Requirements for Existing Coal-Fired Boilers
- a. Following the initial startup of both affected boilers to produce steam, the Permittee shall permanently shutdown existing Boilers A, B, and C. For this purpose, the existing boilers shall be permanently shutdown either no later than 30 days after the shakedown of both affected boilers is complete and reliable operation has been demonstrated or 180 days after the initial startup of the first affected boiler, whichever occurs first. Notwithstanding the above, the Illinois EPA may extend this 180 day period upon written request by the Permittee that shows that shakedown is ongoing and/or the ability of the affected boilers to reliably operate has not yet been demonstrated so that more time is reasonably needed to complete the commissioning of the affected boilers.
  - b.
    - i. During the transition period, i.e., the period when both the affected boiler(s) and existing Boilers A, B and C may be in service, there shall not be any net increases in emissions of NO<sub>x</sub>, CO, PM<sub>10</sub>/PM<sub>2.5</sub> or GHG, i.e., the combined actual emissions of each of these pollutants from the affected boilers and the existing boilers, in total, shall not exceed the values in Table 2 for the decreases in emissions. Emissions shall be determined on a monthly basis, summing the emission data for the month and the previous 11 months (12 months total).
    - ii. During each month of the transition period, for NO<sub>x</sub>, CO, PM<sub>10</sub>/PM<sub>2.5</sub> and GHG, the Permittee shall keep records of the combined emissions of the affected boilers and existing Boiler A, B and C to demonstrate compliance with the above requirement.
  - c. The Permittee shall notify the Illinois EPA in writing when each existing boiler is permanently shutdown. This notification shall be submitted within 30 days and include the date that the boiler was permanently shutdown and a description of the actions that have or will be taken to render the boiler incapable of operation.
11. Authorization for Operation
- a. Under this permit, each affected boiler may be operated for a period of one year from initial startup to allow for equipment shakedown and

emissions testing as required. This period may be extended by the Illinois EPA upon request of the Permittee if additional time is needed to complete shakedown or perform emission testing.

- b. Upon completion of the initial performance testing for NOx required by Condition 6(a), the Permittee may continue to operate an affected boiler until a new or revised CAAPP permit is issued that addresses the boiler, provided that a timely and complete application for such CAAPP permit is submitted in accordance with Section 39.5(5) of the Environmental Protection Act.
- c. This condition supersedes Standard Condition 6.

If you have any questions on this permit, please call Manish Patel at 217/785-1705.

Robert W. Bernoteit  
Acting Manager, Permit Section  
Division of Air Pollution Control

Date Signed: \_\_\_\_\_

RWB:MNP:

Attachments

cc: FOS - Region 2, Illinois EPA  
CAAPP Application File - 96030001, Illinois EPA  
Lotus Notes

Table 1: Emission Limits for the Affected Boilers

Pollutant	Lb/Hr (for each boiler)	Tons/Year (combined total)
NO <sub>x</sub>	--- <sup>3</sup>	129.7
CO	30.5 <sup>4</sup>	267.2
PM <sup>1</sup>	1.0	8.5
PM <sub>10</sub> /PM <sub>2.5</sub> <sup>2</sup>	2.8	24.5
VOM	2.0	17.5
GHG, as CO <sub>2</sub> e	---	379,232

<sup>1</sup> PM emissions only include filterable particulate as measured by USEPA Method 5 or other appropriate USEPA Test Method.

<sup>2</sup> PM<sub>10</sub> and PM<sub>2.5</sub> emissions include both filterable and condensable particulate.

<sup>3</sup> NO<sub>x</sub> emissions are limited to 0.04 lb/mmBtu, an average of 30 boiler operating days. (See Condition 5(b).)

<sup>4</sup> As an alternative to this limit, if continuous emissions monitoring is conducted for CO, CO emissions are limited to 0.09 lb/mmBtu, an average of 30 boiler operating days. (See Condition 5(c).)

Table 2: Net Changes in Emissions with the Project (tons/year)<sup>5</sup>

Pollutant	Potential Emissions of New Boilers	Contemporaneous Changes in Emissions		Net Change	Significant Emission Rate
		Decreases <sup>6</sup>	Increases <sup>7</sup>		
Pollutants with Netting					
NO <sub>x</sub>	129.7	891.2	12.1	- 749.4	40
CO	267.2	328.5	16.7	- 44.6	100
PM <sub>10</sub>	24.5	235.8	24.0	- 187.3	15
PM <sub>2.5</sub>	24.5	108.8	16.0	- 68.3	10
GHG, as CO <sub>2</sub> e	379,232	595,594	17,340	- 199,022	75,000

Notes:

<sup>5</sup> This table only addresses the changes in emissions of pollutants for which the permitting of the new gas-fired boilers would rely on netting. This project would be accompanied by decreases in emissions of other pollutants from the coal-fired boilers. In particular, there would be a reduction of over 13,000 tons/year in the plant's SO<sub>2</sub> emissions, comparing the baseline SO<sub>2</sub> emissions of existing coal-fired boilers that would be permanently shutdown, 13,154 tons/year, and the potential SO<sub>2</sub> emissions of the new boilers, 2.2 tons/year.

<sup>6</sup> The emissions decreases are the "baseline" actual emissions of the existing coal-fired boilers as determined in accordance with 40 CFR 52.21(b)(48).

<sup>7</sup> The emissions increases account for the increases in emissions from the two contemporaneous projects. They reflect evaluations of the greatest emissions for which these projects, for which Aventine only recently submitted an application, would be permitted. In this regard, the permitted increases in emissions from the proposed enhancements to the grain handling operations at the plant should be at most 80 percent of the significant emission rates for PM<sub>10</sub> and PM<sub>2.5</sub>. For the proposed enhancements to the yeast process, the permitted increases in emissions of PM<sub>10</sub> and PM<sub>2.5</sub> should also be at most 80 percent of the significant emission rates. The increases in emissions of NO<sub>x</sub> and CO would be no more than the current permitted NO<sub>x</sub> and CO emissions of the yeast process since Aventine is not requesting any increase in their permitted emissions. The increase in GHG emissions would not exceed the potential GHG emissions of the yeast process since Aventine is not requesting an increase in the capacity of the burner in the natural gas-fired spray dryer in this process.

Project	Project Emissions(tons/year)				
	NO <sub>x</sub>	CO	PM <sub>10</sub>	PM <sub>2.5</sub>	GHG, as CO <sub>2</sub> e
Proposed Enhancements to Grain Handling	-	-	12.0	8.0	-
Proposed Enhancements to the Yeast Process	12.1	16.7	12.0	8.0	17,340
Total	12.1	16.7	24.0	16.0	17,340