

ADDITIONAL SPECIAL TERMS and CONDITIONS
PTI NO. 02-12745

INTRODUCTION:

The primary emissions unit listed in this synthetic minor permit to install is a new, 10 mmBtu/hr, bubbling, atmospheric fluidized bed (AFB), coal-fired combustor/boiler (B009) which will physically replace an existing 2.2 mmBtu/hr AFB currently in use at Cedar Lane Farms. The installation and test operation of this new AFB combustor (AFBC10) is being co-sponsored by the U.S. Department of Energy Morgantown Energy Technology Center (METC), the Ohio Coal Development Office (OCDO), the Will-Burt Company, and Cedar Lane Farms, Inc. as a special, demonstration, reduced sulfur dioxide emissions unit. Included in this synthetic minor permit are new emissions restrictions on the other two existing coal-fired emissions units at this facility (B002 & B005) for the purpose of limiting the total facility emissions of sulfur dioxide to less than the major source threshold limit of 100 tons/year to avoid Title V permitting requirements.

APPLICABLE EMISSIONS LIMITATIONS:

1. Per OAC Rule 3745-17-10(C)(2), Figure I, curve P-2, the particulate emissions from these emissions units shall not exceed 0.60 pound per million Btu (mmBtu) of heat input. Hourly and annual mass particulate emissions from each emissions unit shall not exceed the following values:
 - a. for B009, 6.00 pounds per hour and 15.34 tons per year (TPY);
 - b. for B002, 3.34 pounds per hour and 8.54 TPY; and
 - c. for B005, 3.36 pounds per hour and 0.60 TPY.

2. Sulfur dioxide (SO₂) emissions from this facility shall not exceed 99.86 tons per year. SO₂ emissions from all coal-fired emissions units (B002, B005, & B008) collectively shall not exceed 99.84 TPY; SO₂ emission rates from individual emissions units shall not exceed the following values:
 - a. for B009, 1.3 pounds per million Btu of heat input or 13.0 pounds per hour and 30.89 TPY.
 - b. for B002, 4.53 lbs/mmBtu of heat input or 25.19 lbs./hr. and 64.38 TPY.
 - c. for B005, 4.53 lbs/mmBtu of heat input or 25.37 lbs./hr. and 4.57 TPY.

ADDITIONAL TERMS AND CONDITIONS:

Particulate/Visible Emission Restrictions:

1. These emissions units shall comply with OAC Rule 3745-17-07(A), which limits visible particulate emissions as follows:
 - a. Except as provided below, visible particulate emissions from any stack shall not exceed an opacity of twenty (20) percent as a six-minute average.
 - b. Visible particulate emissions from any stack may exceed twenty (20) percent as a six-minute average for not more than six (6) consecutive minutes in any sixty-minute period, but shall not exceed sixty (60) percent opacity at any time.
2. The visible particulate emission limitations specified above shall not apply to the following operations for emissions units B002 and B005, provided the operations are documented daily in a boiler operations log kept at the facility:
 - a. The start-up of the source for a period of time required to achieve stable combustion conditions, but no more than three (3) hours from the moment of start-up. "Start-up" means the commencement of firing of fuel from a cold non-fired condition.
 - b. The shutdown of the source for a period of not more than three (3) hours.
 - c. The malfunction of the source or associated equipment, if the owner of the source or operator of the equipment complies with the requirements of OAC Rule 3745-15-06.
 - d. Intermittent soot-blowing operations (the cleaning of heat transfer surfaces with pressurized air or steam).
 - e. Intermittent ash removal operations (the dumping or pulling of ash).
 - f. The commencement of increased coal firing from a banked condition for a period not to exceed thirty (30) minutes. "Banked condition" means the condition where the fuel is burned on the grates at rates which are sufficient to maintain ignition only.

This boiler operations log shall clearly document the date, beginning time, and ending time of the exempted operations listed above.

Federally Enforceable Emissions Requirements for Sulfur Dioxide:

The total annual emissions of SO₂ from all emissions units at this facility shall be limited

to 99.86 tons. Since two minor sources at this facility (two gas fired boilers, sources B001 and B007 with maximum heat input rates of 5.3 and 5.0 mmBtu per hour, respectively) have combined maximum annual potential SO₂ emissions of 0.02 ton per year, the annual allowable emissions from these three coal-fired sources (B002, B005, and B009) shall not exceed 99.84 tons. This annual facility SO₂ emission limitation shall be achieved by restricting both the sulfur content in the coal supply burned in these emissions units and the maximum annual hours of operation for these emissions units in the following manner:

1. The quality of coal burned in these emissions units shall meet the following specifications on a dry basis:
 - a. a sulfur content no greater than 3.1 percent by weight;
 - b. a sulfur content which is sufficient to comply with a maximum allowable SO₂ emission limitation of 4.53 pounds of SO₂ per mmBtu actual heat input for B002 and B005;
 - c. less than 8.0 percent ash; and
 - d. heat content greater than 13,000 Btu per pound of coal.

Compliance with the above-mentioned specifications for sulfur, ash, and heat content shall be determined by using the analytical results provided by the coal supplier for each shipment of coal. The analytical methods for sulfur content, ash content, and heat content in coal shall be: ASTM Method D3177, Total Sulfur in the Analysis Sample of Coal and Coke or ASTM Method D4239, Sulfur in the Analysis Sample of Coal and Coke Using High Temperature Tube Furnace Combustion Methods; ASTM Method D3174, Ash in the Analysis Sample of Coal and Coke; ASTM Method D2015, Gross Calorific Value of Solid Fuel by the Adiabatic Bomb Calorimeter, ASTM Method D3286, Gross Calorific Value of Coal and Coke by the Isothermal Bomb Calorimeter, or ASTM Method D1989, Standard Test Method for Gross Calorific Value of Coal and Coke by Microprocessor Controlled Isothermal Bomb Calorimeter, respectively.

2. The maximum annual hours of operation of the two coal-fired emissions units, B009 and B002, shall not exceed 5112 on a rolling 12 month basis.
3. The maximum annual hours of operation of emissions unit B005 shall not exceed 360 on a rolling 12 month basis. Further, emissions unit B005 shall only be utilized as a back-up emissions unit to B009 (i.e., shall only be operated when B009 is not operating/out of service).
4. The allowable annual operating hours of emissions unit B009 shall be diminished by the number of hours (up to 360) that B005 is operated.

OPERATIONAL RESTRICTIONS:

1. New Emissions Unit (B009):

- a. The maximum heat input for this emissions unit shall not exceed 10.0 mmBtu/hr., the maximum heat rate capacity for this fluidized bed combustor.
- b. The restrictions regarding the use of flyash reinjection and an overfire air system found in OAC Rule 3745-17-10(C)(7)(a) are not applicable to this bubbling fluidized bed coal combustion process. In lieu of these generic requirements, the following design specific emissions control systems shall be used at all times during the operation (coal firing) of this emissions unit:
 - i. This emissions unit shall maintain a minimum calcium (from injection of limestone or equivalent) to sulfur (contained in coal fuel) weight ratio of 2.5 in the fluid bed of the reactor at all times; and
 - ii. The baghouse and filter shall be operated and maintained as recommended by the manufacturer to ensure the anticipated collection efficiency of the control device.

A daily log shall be maintained recording the operational status of this boiler, the baghouse, and the ratio of the weight of calcium to sulfur in the combustor.

2. Existing Emissions Units (B002 & B005):

- a. The maximum heat input to emissions unit B002 shall not exceed 5.56 mmBtu per hour, the maximum rated capacity of this boiler. The maximum heat input to emissions unit B005 shall not exceed 5.60 mmBtu/hr., the maximum rated capacity of this boiler.
- b. The steam injection system shall be used at all times during operation of these emissions units.
- c. The use of flyash reinjection in these emissions units is prohibited.
- d. These emissions units shall employ an overfire air system which is designed, maintained, and operated in accordance with good engineering practices and which minimizes visible emissions.

3. During the first twelve (12) months of operation under this permit, these emissions units shall not exceed the cumulative total hours of operation as specified for each month in the following table:

<u>CALENDAR MONTH(S)</u> <u>(AFTER PERMIT ISSUANCE)</u>	<u>CUMULATIVE ALLOWABLE</u> <u>TOTAL HOURS OF OPERATION</u>	
	<u>B009 & B002</u>	<u>B005</u>
1	744	360
2	1464	360
3	2208	360
4	2952	360
5	3624	360
6	4368	360
7	5088	360
8	5112	360
9	5112	360
10	5112	360
11	5112	360
12	5112	360

MONITORING AND/OR RECORDKEEPING REQUIREMENTS:

1. The permittee shall maintain the following records for these emissions units, in addition to those operations logs referred to above:
 - a. Daily records of the total hours of normal or full firing as well as hours during which either of these emissions units is in a banked condition plus a daily estimate of the tons of coal burned. These records shall be signed daily by the permittee attesting to the accuracy of the data.
 - b. Daily record of the weight of limestone injected into emissions unit B009 and a calculation of the average Ca/S ratio for the days operation.
 - c. Monthly records of the total hours of both full and banked firing, the total monthly coal burned (estimated), and the total monthly tonnage of coal received.

2. For each shipment of coal, the quantity of coal received and the results of the coal supplier's analyses on both an as-received and dry basis. Data recorded shall include:
 - a. the total quantity of coal received (tons),
 - b. the sulfur content (percent) of the coal,
 - c. the ash content (percent) of the coal,
 - d. the heat content (Btu per pound) of the coal, and

- e. the SO₂ emission rate (pounds SO₂ per mmBtu actual heat input) for the coal.

Compliance with the applicable SO₂ emission limit, as well as the sulfur, ash and Btu limitations, shall be determined based on the weighted arithmetic average of all fuel analyses for each calendar month.

[NOTE: A weighted average fuel quality value is determined by multiplying each fuel analysis value (Btu/pound, percent ash, or SO₂ emission rate) by the weight of the shipment of fuel for which the quality value is representative, adding up all the value-weighted products, and dividing the sum of the value-weighted products by the sum of all the shipment weights.]

3. Monthly calculations of the weighted average SO₂ emission rate, ash content, and heat content for the coal received each calendar month and the tons of coal burned in these emissions units.

These records, as well as any other supporting analyses, computations, operations logs, and fuel receipts, shall be retained on site in facility files for a period of not less than five (5) years and shall be made available to the Director or any authorized representative of the Director for review during normal business hours.

REPORTING REQUIREMENTS:

1. The permittee shall submit deviation (excursion) reports that identify all periods during which the terms and conditions listed above were exceeded or the required records were not maintained. These reports shall include the following information:
 - a. the date of each exceedance;
 - b. the nature or type of each deviation (i.e., coal quality, cumulative hours of operation, boiler operating log not completed, etc.); and
 - c. the corrective action taken to rectify the condition which caused the excursion.
2. The permittee shall submit required reports in the following manner:
 - a. Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quarterly written reports of (a) any deviations (excursions) from emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by

the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the appropriate Ohio EPA District Office or local air agency. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, i.e., by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

TESTING REQUIREMENTS:

1. **Emissions Limitation:** Sulfur dioxide emissions from each emissions unit shall not exceed:
 - a. (B009) 1.3 lbs/mmBtu of actual heat input or 13.0 lbs/hr and 33.23 TPY
 - b. (B002) 4.53 lbs/mmBtu of actual heat input or 25.19 lbs/hr and 64.38 TPY.
 - c. (B005) 4.53 lbs/mmBtu of actual heat input or 25.37 lbs/hr and 4.57 TPY.

Applicable Compliance Method: Compliance shall be based upon data from the required fuel quality and operation hours records and the formula referenced in OAC 3745-18-04(F)(1). If required pursuant to OAC 3745-15-04, the permittee shall demonstrate compliance with the sulfur dioxide emissions limits of this permit by means of physical testing of the effluent from this emissions unit in accordance with testing procedures listed in 40 CFR Part 60, "Standards of Performance for New Stationary Sources", Appendix A, Method 6 or 6C.

2. **Emission Limitation:** The total annual allowable SO₂ emissions from the three coal-fired emissions units (B002, B005, and B009) at this facility shall not exceed 99.84 tons.

Applicable Compliance Method: Compliance shall be based on engineering calculations and a compilation of emissions units operations and fuel quality data recorded and reported pursuant to the above terms and conditions.

3. **Emissions Limitation:** 0.60 pound particulate matter per million Btu of actual heat input.

Applicable Compliance Method: Compliance shall be based upon the use of an

emission factor as specified in AP-42, 5th Edition, Compilation of Air Pollution Emission Factors, section 1.1, table 1.1-3, and a compilation of fuel usage and operations data required to be recorded in the above terms and conditions. If required pursuant to OAC 3745-15-04, the permittee shall demonstrate compliance with the particulate emissions limits of this permit by means of physical testing of the effluent from these emissions units in accordance with testing procedures listed in 40 CFR Part 60, "Standards of Performance for New Stationary Sources", Appendix A, Method 5, and in OAC 3745-17-03(B)(7).

4. Emissions Limitation: Visible particulate emissions from the exhaust stack serving each emissions unit shall not exceed twenty (20) percent opacity, as a six-minute average, except as provided by rule.

Applicable Compliance Method: Compliance shall be determined through visible emission observations in accordance with 40 CFR Part 60, Appendix A, Method 9 and the procedures specified in OAC rule 3745-17-03(B)(1).

5. Emissions Limitation: Nitrogen oxides emissions from each emissions unit shall not exceed:
 - a. (B009) 5.84 lbs/hr and 14.93 TPY
 - b. (B002) 2.03 lbs/hr and 5.19 TPY.
 - c. (B005) 2.05 lbs/hr and 0.37 TPY.

Applicable Compliance Method: Compliance shall be based upon the use of an emission factor as specified in AP-42, 5th Edition, Compilation of Air Pollution Emission Factors, section 1.1, table 1.1-1, and a compilation of fuel usage and operations data required to be recorded in the above terms and conditions. If required pursuant to OAC 3745-15-04, the permittee shall demonstrate compliance with the NO_x emissions limits of this permit by means of physical testing of the effluent from these emissions units in accordance with testing procedures listed in 40 CFR Part 60, "Standards of Performance for New Stationary Sources", Appendix A, Method 7 or 7E.

6. Emissions Limitations: Carbon monoxide emissions from each emissions unit shall not exceed:
 - a. (B009) 6.90 lbs/hr and 17.64 TPY
 - b. (B002) 2.35 lbs/hr and 6.01 TPY.
 - c. (B005) 2.37 lbs/hr and 0.43 TPY.

Applicable Compliance Method: Compliance shall be based upon the use of an emission factor as specified in AP-42, 5th Edition, Compilation of Air Pollution Emission Factors, section 1.1, table 1.1-1, and a compilation of fuel usage and operations data required to be recorded and reported in the above terms and conditions. If required pursuant to OAC 3745-15-04, the permittee shall demonstrate compliance with the CO emissions limits of this permit by means of physical testing of the effluent from this emissions unit in accordance with testing procedures listed in 40 CFR Part 60, "Standards of Performance for New Stationary Sources", Appendix A, Method 10.

MISCELLANEOUS REQUIREMENTS:

1. Emissions Testing Requirement (B009):

Prior to the issuance of a Permit to Operate for emissions unit B009, and within ninety days of the initial startup of this fluidized bed combustion unit, the permittee shall conduct, or have conducted, performance/emissions testing of this source in accordance with procedures approved by the Ohio EPA. Two copies of the written test report shall be submitted to the Agency within thirty days of the completion of these tests. This test report shall be signed by the person responsible for the test and shall describe the test procedures followed and the results of such tests. The Director, or an Ohio EPA representative, shall be allowed to witness the tests, examine the testing equipment, and require the acquisition or submission of data and information necessary to assure that source operation and testing procedures provide a valid characterization of the emissions from the source and/or the performance of the control equipment.

1. A completed Intent to Test form shall be submitted to the Ohio EPA, Northeast District Office, where the original PTI application was filed at least thirty (30) days in advance of the scheduled test and shall specify the operation parameters, the proposed test procedures, the pollutants to be tested for, and the time, date, place, and person(s) conducting such tests.
2. Two copies of the test results shall be submitted to the Ohio EPA, Northeast District Office, within thirty (30) days after completion of the performance test.
3. The performance/emissions tests conducted on this source shall specifically be performed for both particulate and sulfur dioxide emissions rates.