

STATE OF MISSOURI



DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: 102010 - 010

Project Number: 2010-08-024

Parent Company: Missouri Joint Municipal Electric Utility Commission (MJMEUC)

Parent Company Address: 1808 I-70 Drive SW, Columbia, MO 65203

Installation Name: Fredericktown Energy Center

Installation Number: 123-0029

Installation Address: Fredericktown Business Park, Lot 17, Fredericktown, MO 63645

Location Information: Madison County, LG3087, T33N, R7E

Application for Authority to Construct was made for:

Two natural gas fired, electric generating, stationary combustion turbines, each rated at 157.97 million British thermal units per hour input. This review was conducted in accordance with Section (6), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

Standard Conditions (on reverse) are applicable to this permit.

Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

OCT 26 2010

EFFECTIVE DATE

DIRECTOR OR DESIGNEE
DEPARTMENT OF NATURAL RESOURCES

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Departments' Air Pollution Control Program of the anticipated date of start up of this (these) air contaminant source(s). The information must be made available within 30 days of actual startup. Also, you must notify the Department of Natural Resources Regional office responsible for the area within which you are located within 15 days after the actual start up of this (these) air contaminant source(s).

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant source(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention: Construction Permit Unit.

Page No.	3
Permit No.	
Project No.	2010-08-024

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."

Fredericktown Energy Center
Madison County, LG3087, T33N, R7E

1. Performance Testing
 - A. Fredericktown Energy Center shall complete oxides of nitrogen (NO_x) testing or install and operate continuous emission or parameter monitoring equipment as required by New Source Performance Standard (NSPS) 40 CFR 60 Subpart KKKK, *Standards of Performance for Stationary Combustion Turbines*.
 - B. Testing shall be performed within 60 days after achieving the maximum production rate of the installation, but not later than 180 days after initial start-up.
 - C. A completed Proposed Test Plan Form (enclosed) must be submitted to the Air Pollution Control Program 30 days prior to the proposed test date so that the Air Pollution Control Program may arrange a pretest meeting, if necessary, and assure that the test date is acceptable for an observer to be present. The Proposed Test Plan may serve the purpose of notification and must be approved by the Director prior to conducting the required emission testing.
 - D. Two (2) copies of a written report of the performance test results shall be submitted to the Director within 60 days of completion of any required testing. The report must include legible copies of the raw data sheets, analytical instrument laboratory data, and complete sample calculations from the required U.S. EPA Method for at least one (1) sample run.
 - E. The test report is to fully account for all operational and emission parameters addressed both in the permit conditions as well as in any other applicable state or federal rules or regulations.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (6) REVIEW

Project Number: 2010-08-024
Installation ID Number: 123-0029
Permit Number:

Fredericktown Energy Center
Fredericktown Business Park, Lot 17
Fredericktown, MO 63645

Complete: August 13, 2010

Parent Company:
Missouri Joint Municipal Electric Utility Commission (MJMEUC)
1808 I-70 Drive SW
Columbia, MO 65203

Madison County, LG3087, T33N, R7E

REVIEW SUMMARY

- Fredericktown Energy Center has applied for authority to install two natural gas fired, electric generating, stationary combustion turbines, each rated at 157.97 million British thermal units per hour input.
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment. HAPs of concern from this process are from the combustion of natural gas.
- New Source Performance Standard (NSPS) 40 CFR 60 Subpart KKKK, *Standards of Performance for Stationary Combustion Turbines* applies to the equipment. NSPS Subpart GG *Standards of Performance for Stationary Gas Turbines* does not apply to the equipment.
- None of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) apply to this installation. None of the currently promulgated Maximum Achievable Control Technology (MACT) regulations apply to the proposed equipment. MACT Subpart YYYY *National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines* does not apply as the installation is not a major source of HAPs.
- Low NO_x burners (SoLoNO_x) are being used in each turbine.
- This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, Construction Permits Required. Potential emissions of NO_x, PM₁₀, and PM_{2.5} are above de minimis levels. Potential emissions of HAPs are below respective Screening Model Action Levels.
- This installation is located in Madison County, an attainment area for all criteria pollutants.

- This installation is on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2 (Category 27) as a pre-1980 source category. The installation's major source level is 250 tons per year and fugitive emissions are counted toward major source applicability.
- Ambient air quality modeling was performed to determine the ambient impact of NO_x, PM₁₀, and PM_{2.5}.
- Per NSPS Subpart KKKK, NO_x emissions testing or continuous monitoring is required for the equipment.
- A Basic Operating Permit application is required for this installation within 30 days of equipment startup.
- Approval of this permit is recommended without special conditions.

INSTALLATION/PROJECT DESCRIPTION

Fredericktown Energy Center is a new source to be located at Lot 17 of the Fredericktown Business Park. The installation's parent company is Missouri Joint Municipal Electric Utility Commission. The applicant proposes to install two identical stationary combustion turbines for electricity production. The turbines are natural gas fired Solar Turbine Model Titan 130-20501S Axial, each rated at 16.23 megawatts output and 157.97 million British thermal units per hour (MMBtu/hr) input. Each turbine is equipped with low NO_x burners (SoLoNO_x). The turbines are not equipped with water or steam injection. No permits have been issued to Fredericktown Energy Center from the Air Pollution Control Program.

EMISSIONS/CONTROLS EVALUATION

Emission factors for PM₁₀, PM_{2.5}, NO_x, VOC, and CO were provided by the manufacturer based upon 100 percent load at 0° Fahrenheit. Emission factors were also provided for other loads and temperatures, but 100 percent load and 0° Fahrenheit results in the greatest potential to emit. According to the manufacturer almost all particulate matter emissions are less than one micron in diameter. The VOC emission factor was based upon the manufacturer's recommendation that up to 20 percent of unburned hydrocarbons are VOC. This assumption yields a more conservative emission factor than the VOC emission factor in the Environmental Protection Agency (EPA) document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 3.1 *Stationary Gas Turbines*, April 2000.

Emission factors for SO_x and HAPs were obtained from AP-42 Section 3.1 *Stationary Gas Turbines*, April 2000. Source classification code (SCC) 2-01-002-01 is for electric generation using natural gas turbines. Sulfur weight was assumed to be 2,000 grains per one million standard cubic feet of natural gas, per AP-42 Section 1.4 *Natural Gas*

Combustion, July 1998. To convert to weight percent, the natural gas density of 0.0438 pounds per standard cubic feet was selected.

The turbines are subject to NSPS Subpart KKKK, which requires NO_x testing or a continuous monitoring system for compliance.

Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8,760 hours per year). The following table provides an emissions summary for this project.

Table 1: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Potential Emissions	Existing Actual Emissions	Potential Emissions of the Application	New Installation Conditioned Potential
PM ₁₀	15.0	N/A	N/A	29.06	N/A
PM _{2.5}	10.0	N/A	N/A	29.06	N/A
SO _x	40.0	N/A	N/A	0.85	N/A
NO _x	40.0	N/A	N/A	83.22	N/A
VOC	40.0	N/A	N/A	9.67	N/A
CO	100.0	N/A	N/A	84.36	N/A
Combined HAPs	25.0	N/A	N/A	1.42	N/A
Formaldehyde	10.0	N/A	N/A	0.98	N/A

N/A = Not Applicable

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of NO_x and PM₁₀, and PM_{2.5} are above de minimis levels.

APPLICABLE REQUIREMENTS

Fredericktown Energy Center shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your operating permit.

GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110. The emission fee is the amount established by the Missouri Air Conservation Commission annually under Missouri Air Law 643.079(1). Submission of an Emissions Inventory Questionnaire (EIQ) is required June 1 for the previous year's emissions.

- *Operating Permits*, 10 CSR 10-6.065
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170
- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220
- *Restriction of Emission of Odors*, 10 CSR 10-3.090

SPECIFIC REQUIREMENTS

- *Restriction of Emission of Particulate Matter From Industrial Processes*, 10 CSR 10-6.400
- *New Source Performance Regulations*, 10 CSR 10-6.070 – *New Source Performance Standards (NSPS) for Stationary Combustion Turbines*, 40 CFR Part 60, Subpart KKKK.

AMBIENT AIR QUALITY IMPACT ANALYSIS

Ambient air quality modeling was performed to determine the ambient impact of NO_x, PM₁₀, and PM_{2.5}. Modeling was required because the potential emissions of NO_x, PM₁₀, and PM_{2.5} are above their respective de minimis levels. The turbine exhaust stacks are located approximately 13 feet from the property boundary. Each stack is 45 feet tall and 6 feet in diameter. If a building is added to house the turbine equipment, the expected building height is less than 25 feet, and the expected stack height is 50 feet. Screen View, which is an interface for EPA's SCREEN3 program was used to perform the analysis. The turbines' hourly emission rates and stack parameters are identical, therefore the hourly emission rates were summed to create one theoretical stack. Downwash was selected. Each maximum modeled impact is below the respective Significant Impact Level.

Table 2: Modeling Summary

Pollutant	Modeled Impact (µg/m ³)	Significant Impact Level (µg/m ³)	Time Period
NO _x	3.64	7.55	1 hour
NO _x	0.29	1	annual
PM ₁₀	0.509	5	24 hour
PM ₁₀	0.10	1	annual
PM _{2.5}	0.509	4	24 hour
PM _{2.5}	0.102	0.8	annual

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (6), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

David Little
Environmental Engineer

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated August 13, 2010, received August 13, 2010, designating Missouri Joint Municipal Electric Utility Commission (MJMEUC) as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Southeast Regional Office Site Survey, dated September 1, 2010.

Mr. John Grotzinger
Chief Operating Officer
Fredericktown Energy Center
1808 I-70 Drive SW
Columbia, MO 65203

RE: New Source Review Permit - Project Number: 2010-08-024

Dear Mr. Grotzinger:

Enclosed with this letter is your permit to construct. Please study it carefully. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files. Operation in accordance with these conditions, your new source review permit application and with your operating permit is necessary for continued compliance. The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

If you have any questions regarding this permit, please do not hesitate to contact David Little, at the Departments' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Kendall B. Hale
New Source Review Unit Chief

KBH:dll

Enclosures

c: Southeast Regional Office
PAMS File: 2010-08-024

Permit Number: