

## 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: **092008-004** Project Number: 2007-11-020

Parent Company: Missouri Public Utility Alliance

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

Installation Name: MJMEUC Generating Station # 2

Installation Address: State Highway T, Deerfield, MO 64741

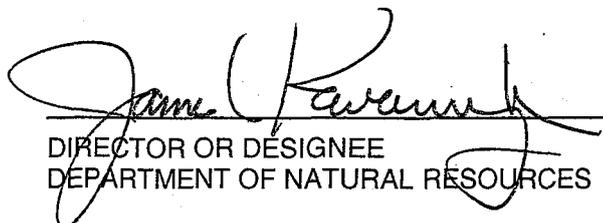
Location Information: Vernon County, S9, T35N, R33W

Application for Authority to Construct was made for:  
Installation of a Solar Titan 130 natural gas fired turbine. 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.

SEP 15 2008

EFFECTIVE DATE

  
DIRECTOR OR DESIGNEE  
DEPARTMENT OF NATURAL RESOURCES

2001 11/11/11

## 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 not more than 60 days but at least 30 days in advance of this date. 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.

STATE OF MISSOURI



DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

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Permit Number: Project Number: 2007-11-020

Parent Company: Missouri Public Utility Alliance

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

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Installation Address: State Highway T, Deerfield, MO 64741

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DIRECTOR OR DESIGNEE  
DEPARTMENT OF NATURAL RESOURCES

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Permit No.	
Project No.	2007-11-020

## 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."*

MJMEUC Generating Station # 2  
Vernon County, S9, T35N, R33W

1. NO<sub>x</sub> Emission Limitation
  - A. MJMEUC shall emit less than 40 tons of nitrogen oxides (NO<sub>x</sub>) from the natural gas fired turbine in any consecutive 12-month period. This includes emissions routed to the heat recovery steam generator (HRSG) stack as well as emissions diverted to the HRSG by-pass stack.
  - B. MJMEUC shall demonstrate compliance with the NO<sub>x</sub> emission limitation through utilization of a continuous emission monitoring system or a parametric monitoring system that meets the requirements of 40 CFR Part 60, Subpart KKKK. MJMEUC shall maintain all records required by this permit for not less than five (5) years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request.
  - C. MJMEUC shall report to the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, Missouri 65102, no later than ten (10) days after the end of the month during which the source exceeds the limitation of Special Condition Number 1.A.
2. Performance Testing
  - A. MJMEUC shall conduct initial performance testing to determine the emission rate of NO<sub>x</sub> from the gas turbine. Subsequent NO<sub>x</sub> performance tests shall be conducted at least once every three years.
  - B. MJMEUC shall conduct performance testing sufficient to demonstrate compliance with applicable new source performance standards.
  - C. The initial performance tests shall be conducted within 60 days of achieving the maximum production rate, but no later than 180 days after initial startup.

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Permit No.	
Project No.	2007-11-020

**SPECIAL CONDITIONS:**

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

- D. The initial performance test date(s) shall be pre-arranged with the Air Pollution Control Program a minimum of 30 days prior to the proposed test date so that a pre-test meeting may be arranged if necessary, and to assure that the test date is acceptable for an observer from the Air Pollution Control Program to be present. A proposed test plan shall be submitted to the Air Pollution Control Program a minimum of 30 days prior to the proposed test date. The test plan must be approved by the Air Pollution control Program prior to the test date.
3. Fuel Specification
- MJMEUC shall utilize pipeline-grade natural gas only as the fuel for this turbine. Use of any other fuel will require amendment or modification of this permit.

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

Project Number: 2007-11-020  
Installation ID Number: 217-048  
Permit Number:

MJMEUC Generating Station # 2  
State Highway T  
Deerfield, MO 64741

Complete: May 6, 2008

Reviewed: June 2008

Parent Company:  
Missouri Public Utility Alliance  
1808 I-70 Drive Southwest  
Columbia, MO 65203

Vernon County, S9, T35N, R33W

REVIEW SUMMARY

- The Missouri Joint Municipal Electric Utility Commission (MJMEUC) has applied for authority to install a Solar Titan 130 natural gas fired turbine.
- The MJMEUC turbine will be located at the Prairie Pride, Inc. soybean processing/biodeisel installation. A heat recovery stream generator (HRSG), owned by Prairie Pride, Inc., will be located downstream of the MJMEUC turbine.
- For purposes of prevention of significant deterioration (PSD) applicability, the MJMEUC turbine and Prairie Pride's operations are considered as the same installation. See the Prairie Pride's construction permit (Permit No. 062008-006) review summary for further explanation and implications.
- Hazardous Air Pollutant (HAP) emissions are expected from gas turbine operations. HAPs of concern for natural gas combustion include formaldehyde, toluene, acetaldehyde and benzene.
- 40 CFR Part 60, Subpart KKKK, *Standards of Performance for Stationary Combustion Turbines* applies to the turbine. Missouri has yet to adopt the new Subpart KKKK standards, but the standards are enforceable at the federal level.
- 40 CFR Part 63, Subpart YYYY, *National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines* applies to the turbine since the installation is a major source of HAPs. The MJMEUC turbine is not a major source of HAPs, but the Prairie Pride, Inc. soybean processing operations will emit the HAP n-hexane in excess of the 10 (ten) ton per year major source level. Since the turbine utilizes lean premix technology and is fired by natural gas the only applicable requirement from Subpart YYYY is a notification requirement (see 40 CFR 63.6095(d) and § 63.6145).

- Lean premix technology is used to minimize NO<sub>x</sub> emissions from the turbine.
- This review was conducted in accordance with Section 6 of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions are above de minimis levels when considered in conjunction with the Prairie Pride emissions (Permit No. 062008-006).
- This installation is located in Vernon County, an attainment area for all criteria air pollutants.
- The biodiesel production portion of this installation is in the named source category of “Chemical Processing Plant” however, the installation as a whole is not considered a named installation. See the Prairie Pride construction permit (Permit No. 062008-006) review summary for further explanation.
- Ambient air quality modeling was performed to determine the ambient impact of NO<sub>x</sub>. For details regarding NO<sub>x</sub> NAAQS and increment consumption modeling please refer to the June 2008 modeling memorandum for Permit No. 062008-006 that is incorporated by reference at the end of this review summary.
- Emission testing is required for the turbine.
- A Part 70 operating permit application is required for this equipment within one year of equipment startup due to being considered the same installation as Prairie Pride.
- Approval of this permit is recommended with special conditions.

## INSTALLATION DESCRIPTION

The Prairie Pride, Inc/MJMEUC Generating Station # 2 installation consists of a soybean processing plant, a biodiesel manufacturing plant, a combined heat/power plant (combustion turbine with a HRSG), a natural gas fired boiler and ancillary equipment. The soybean processing plant includes material handling operations (such as unloading, crushing, conveying, pelletization and storage), soy meal conditioning (thermal/mechanical), solvent extraction (with hexane), distillation for solvent recovery and refining and bleaching processes (for oil that is to be used for biodiesel production). The proposed front-end capacity of the soybean processing plant is 2,000 tons of soybeans per day. Products from the soybean processing plant include crude soy oil, refined and bleached soy oil, soy meal and soy hulls.

The biodiesel plant includes chemical reaction vessels, soy oil storage tanks, methanol storage tanks, glycerine storage tanks, biodiesel storage tanks and other process equipment. The primary feedstock for the biodiesel plant is refined and bleached soy oil from the soybean processing plant, but purchased soy oil may also be used as well as other feedstock, such as animal fat and waste cooking oil. Biodiesel is produced from the base-catalyzed transesterification of soy oil with methanol. The by-product of

this reaction is glycerine. The proposed capacity for biodiesel production is 90,411 gallons per day.

The combustion turbine portion of the combined heat/power plant will be a 141.4 MMBTU per hour (lower heating value) Solar Titan 130-20501S natural gas fired turbine operated by MJMEUC. Prairie Pride, Inc. originally envisioned that the HRSG portion of the combined heat/power plant would be equipped with duct burners capable of burning natural gas or fuel oil, however the HRSG duct burners were dropped in favor of a natural gas fired boiler per the amendment application submitted in 2008. The natural gas fired boiler is a Nebraska Boiler Model NS-F-85 watertube boiler. The maximum hourly design rate for natural gas fuel input is 149 MMBTU/hr (higher heating value). The boiler is capable of providing up to 115,000 pounds per hour of process steam.

Ancillary equipment includes cooling towers, storage tanks and fire pump engines.

Air Pollution Control equipment includes cyclones for wet particulate-generating processes, fabric filters for dry particulate-generating processes, a water absorber for control of emissions from the biodiesel reactor, a mineral oil absorber for hexane absorption and condensers that are used to recover hexane and methanol.

A construction permit (Permit Number 022007-004) was issued to Prairie Pride, Inc. by the Air Pollution Control Program for this installation on February 6, 2007. An amended permit (Permit Number 062008-006) was issued to Prairie Pride, Inc. on June 12, 2008.

This is the first construction permit issued for the MJMEUC Generating Station # 2 turbine. MJMEUC will be required to apply for and obtain a Part 70 operating permit.

## PROJECT DESCRIPTION

The MJMEUC Generating Station # 2 will be located on the Prairie Pride, Inc. property in Vernon County. MJMEUC will lease building space from Prairie Pride, Inc. and will enter in to a contract with Prairie Pride, Inc. relating to operation of the combustion turbine. From MJMEUC's perspective, the primary purpose of the combustion turbine and associated generator is to generate electricity. The electrical power output from the generator will be connected to the Barton County Electric Cooperative power grid and wheeled to Missouri Public Utility Alliance power pool cities.

The exhaust stream/waste heat from the combustion turbine will be used to generate process steam in the Prairie Pride, Inc. HRSG. This is the benefit that Prairie Pride, Inc. realizes by having the MJMEUC turbine located at their installation. However, there will be a diverter valve between the turbine and the HRSG that will allow for operation in electricity production mode only.

A process flow diagram submitted with the MJMEUC Generating Station # 2 construction permit application indicates a Solar Titan 130-20501S Axial Turbine with evaporative cooler. At 60 F and 60 percent humidity the heat input at full load is 141.4 MMBtu/hr (LHV, natural gas) and the gross output of the generator is predicted to be 14,261 kWe. The application does not contain plans for combustion of fuel oil. The

turbine will utilize lean premix technology to minimize NO<sub>x</sub> emissions.

### EMISSIONS/CONTROLS EVALUATION

The emission factors used in this analysis were obtained from the Environmental Protection Agency (EPA) document AP-42, Compilation of Air Pollutant Emission Factors, Fifth Edition, Section 3.1, Stationary Gas Turbines (4/00). One exception to use of the AP-42 emission factors was the NO<sub>x</sub> emission factor for the combustion turbine. In this case, the emission factor was based on 25 parts per million NO<sub>x</sub>, corrected to 15 percent oxygen. This is consistent with the recently promulgated new source performance standards for combustion turbines (see 40 CFR Part 60, Subpart KKKK). Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8760 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	Combustion Turbine Potential Emissions (un-conditioned)	Combustion Turbine Potential Emissions (conditioned)	Installation-Wide Potential Emissions (conditioned)
PM <sub>10</sub>	15.0	0.4	0.4	40.1
SO <sub>x</sub>	40.0	2.3	2.3	2.3
NO <sub>x</sub>	40.0	60.6	< 40.0	149
VOC	40.0	0.005	0.005	249.5
CO	100.0	37.0	37.0	89.6
HAPs	10.0/25.0	N/D	N/D	159.4

N/A = Not Applicable; N/D = Not Determined

### 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 are above de minimis levels when considered in conjunction with the Prairie Pride emissions (Permit No. 062008-006).

### APPLICABLE REQUIREMENTS

MJMEUC 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

- *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
- *Restriction of Emission of Sulfur Compounds*, 10 CSR 10-6.260

#### STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section 5 of 10 CSR 10-6.060, *Construction Permits Required*, I recommend permit issuance with special conditions.

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Stephen R. Jaques, P.E.  
Environmental Engineer

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Date

#### PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, with attachments, received November 5, 2007, designating Missouri Joint Municipal Electric Utility Commission (MJMEUC) as the owner and operator of the combustion turbine.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Air Pollution Control Program Internal Memorandum, Dated June 6, 2008, from Josh Vander Veen to Steve Jaques regarding Ambient Air Quality Impact Analysis (AAQIA) for Prairie Pride, Inc. – May 6, 2008.





Mr. John Grotzinger  
Executive Director of Engineering and Operations  
Missouri Joint Municipal Electrical Utility Commission  
1808 I-70 Drive Southwest  
Columbia, MO 65203

RE: New Source Review Permit - Project Number: 2007-11-020

Dear Mr. Grotzinger:

Enclosed with this letter is your permit to construct. Please study it carefully. Also, note the special conditions, if any, on the accompanying pages. 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 Steve Jaques 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:sjk

Enclosures

c: Southwest Regional Office  
PAMS File: 2007-11-020