

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: 042014-004

Project Number: 2014-01-014  
Installation Number: 147-0005

Parent Company: Northwest Missouri State University

Parent Company Address: 800 University Drive, Maryville, MO 64468

Installation Name: Northwest Missouri State University

Installation Address: 800 University Drive, Maryville, MO 64468

Location Information: Nodaway County, S18, T64N, R35W

Application for Authority to Construct was made for:

The replacement of two existing dual fuel (natural and fuel oil) fired burners on Boiler #2 (EP-02) that have a combined capacity of 26 MMBtu per hour with one new 30 MMBtu per hour natural gas fired burner with No. 2 fuel oil back-up. This review was conducted in accordance with Section (5), 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.

APR 17 2014

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 Department's Air Pollution Control Program of the anticipated date of startup of these air contaminant sources. 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 startup of these air contaminant sources.

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 sources(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. | 2014-01-014 |

**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."*

Northwest Missouri State University  
Nodaway County, S18, T64N, R35W

1. Fuel Restriction (Boiler #2 – EP-02)
  - A. Northwest Missouri State University shall combust exclusively either fuel oil No. 2 containing less than 15 parts per million by weight sulfur or natural gas in Boiler #2 (EP-02).
  - B. Fuel oil No. 2 shall only be combusted during periods of gas curtailment, gas supply emergencies, or periodic testing on liquid fuel. Periodic testing of liquid fuel shall not exceed a combined total of 48 hours per boiler during any calendar year.
  - C. Fuel supplier certifications per each shipment of fuel oil shall be used to demonstrate compliance with Special Condition 1.A.
  - D. Monthly records per boiler showing fuel oil amount (gallons), fuel oil operating hours, and reason for fuel oil usage shall be kept to demonstrate compliance with Special Condition 1.B.
2. Record Keeping and Reporting Requirements
  - A. Northwest Missouri State University shall maintain all records required by this permit for not less than five years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE  
SECTION (5) REVIEW

Project Number: 2014-01-014  
Installation ID Number: 147-0005  
Permit Number:

Northwest Missouri State University  
800 University Drive  
Maryville, MO 64468

Complete: January 13, 2014

Parent Company:  
Northwest Missouri State University  
800 University Drive  
Maryville, MO 64468

Nodaway County, S18, T64N, R35W

REVIEW SUMMARY

- Northwest Missouri State University has applied for authority to replace two existing dual fuel (natural and fuel oil) fired burners on Boiler #2 (EP-02) that have a combined capacity of 26 MMBtu per hour with one new 30 MMBtu per hour natural gas fired burner with fuel oil back-up.
- HAP emissions are expected from the combustion of natural gas and fuel oil. The PTE of the HAPs being emitted are expected to be below their respective SMAL.
- 40 CFR 60 Subpart Dc, "Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units" applies to the Boiler #2 as the replacement and increase in maximum fuel throughput of the new burner constitutes as a modification under this subpart.
- 40 CFR 63 Subpart JJJJJJ, "National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources" does not apply to Boiler #2 (EP-02) as it meets the definition of gas-fired boiler found within Subpart JJJJJJ.
- No air pollution control equipment is being used in association with the new equipment.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels.
- This installation is located in Nodaway County, an attainment area for all criteria pollutants.
- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation's major source level is 250 tons per year and fugitive emissions are not counted toward major source applicability.

- Ambient air quality modeling was not performed since potential emissions of the application are below de minimis levels.
- Emissions testing is not required for the equipment.
- An application to modify your Part 70 Operating Permit is required for this installation within one year of equipment startup.
- Approval of this permit is recommended with special conditions.

### INSTALLATION DESCRIPTION

Northwest Missouri State University (NMSU) is an educational institution for higher learning. The installation operates a power plant consisting of three natural gas boilers, a paper pellet/animal waste boiler, and a wood chip/animal waste boiler. Additional equipment includes wood chip, pellet, and ash storage piles, waste paper grinding, mixing and pelletizing animal waste with paper/wood chips, fuel storage tanks, a parts cleaners, small heaters and boilers, crucible furnaces, aluminum and bronze casting, two natural gas-fired kilns, a wood-fired kiln, and ceramic glazing. The installation is a major source under construction and operating permits. NMSU was issued a Part 70 operating permit (OP2013-051) in August of 2013.

The following New Source Review permits have been issued to Northwest Missouri State University from the Air Pollution Control Program.

Table 1: Permit History

| Project Number | Permit Number | Description   |
|----------------|---------------|---|
|                | 0679-001      | Installation of an incinerator  |
|                | 0881-001      | Addition of a new boiler to replace existing four (4) boilers   |
|                | 0792-038      | Retrofitting of existing gas/oil fired boiler No. 4 to burn pelletized recycle paper and wood chips                         |
| 2000-02-083    |               | Temporary Permit for test burning pig manure pellets in Boiler No. 4  |
| 2000-07-081    |               | Temporary Permit for test burning of animal waste pellets in Boiler No. 5   |
| 2000-08-002    | 102000-029    | Addition of a hammermill, a mixer, and a pelletizer to the existing equipment   |
| 2000-12-051    |               | Extension of Temporary Permit, which was issued for test burning of animal waste pellets in Boiler No. 5                    |
| 2000-12-050    | 022001-010    | Extension of Temporary Permit, which was issued for test burning of animal waste pellets in Boiler No. 4                    |
| 2001-06-020    | 082001-012    | Extension of Temporary Permits, which were issued for test burning of animal waste pellets in Boiler No. 4 and Boiler No. 5 |
| 2002-08-151    | 122002-008    | Combustion of animal waste pellets as alternate fuel in Boiler No 4 and Boiler No. 5  |
| 2003-05-050    | 092003-008    | Installation of an ash storage pile, pellet storage pile, and associated haul road.   |

## PROJECT DESCRIPTION

NMSU is replacing two existing dual fuel (natural and fuel oil) fired burners on Boiler #2 (EP-02) that have a combined capacity of 26 MMBtu per hour with a new 30 MMBtu per hour natural gas fired burner with fuel oil back-up. Natural gas will be the primary fuel for the burner with fuel oil only being used during periods of gas curtailment, gas supply emergencies, or periodic testing on liquid fuel. The increase in burner size does not debottleneck any processes at this installation therefore only emissions from the combustion of fuel were considered.

## EMISSIONS/CONTROLS EVALUATION

The emission factors used to calculate the potential emissions of the new burner were obtained from the Environmental Protection Agency (EPA) document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 1.4 *Natural Gas Combustion* (July 1998).

Emissions from the combustion of fuel oil were not included in the potential emissions of the new burner as the fuel oil combustion is restricted in the special conditions of this construction permit to periods of gas curtailment, gas supply emergencies, or periodic testing on liquid fuel and cannot be used otherwise.

The following table provides an emissions summary for this project. Existing potential emissions were taken from NMSU recently issued operating permit OP2013-051. Existing actual emissions were taken from the installation's 2013 EIQ. Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8760 hours per year).

Table 2: Emissions Summary (tons per year)

| Pollutant               | Regulatory<br><i>De Minimis</i><br>Levels | Existing<br>Potential<br>Emissions | Existing<br>Actual<br>Emissions<br>(2013 EIQ) | *Potential<br>Emissions of<br>the<br>Application | New<br>Installation<br>Conditioned<br>Potential |
|-------------------------|---|------------------------------------|---|--|---|
| PM                      | 25.0                                      | 71.93                              | N/D   | 0.24   | N/D   |
| PM <sub>10</sub>        | 15.0                                      | 58.32                              | 1.97  | 0.98   | N/D   |
| PM <sub>2.5</sub>       | 10.0                                      | 5.79                               | 1.71  | 0.98   | N/D   |
| SOx                     | 40.0                                      | 744.43                             | 0.43  | 0.08   | N/D   |
| NOx                     | 40.0                                      | 172.75                             | 19.05   | 12.88  | N/D   |
| VOC                     | 40.0                                      | 22.28                              | 1.32  | 0.71   | N/D   |
| CO                      | 100.0                                     | 114.34                             | 46.43   | 10.82  | N/D   |
| GHG (CO <sub>2</sub> e) | 75,000 / 100,000                          | 63,150.76                          | N/D   | 15,550   | N/D   |
| GHG (mass)              | 0.0 / 100.0 /<br>250.0                    | N/D                                | N/D   | 15,459   | N/D   |
| HAPs                    | 10.0/25.0                                 | 5.08                               | 1.53  | 0.24   | N/D   |

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

\*The Potential Emissions of the Application were greater than the Insignificant Emission Exemption Levels found in 10 CSR 6.061 Construction Permit Exemptions

## PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels.

## APPLICABLE REQUIREMENTS

Northwest Missouri State University 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 10-6.165

### SPECIFIC REQUIREMENTS

- *Restriction of Emission of Particulate Matter From Industrial Processes*, 10 CSR 10-6.400 does not apply to Boiler #2 as it burns fuel for indirect heating.
- *New Source Performance Regulations*, 10 CSR 10-6.070
  - *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*, 40 CFR Part 60, Subpart Dc applies to Boiler #2
- *MACT Regulations*, 10 CSR 10-6.075
  - *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources*, 40 CFR Part 63, Subpart JJJJJJ does not apply to Boiler #2 as it meets the definition of gas fired boiler according to this subpart.
- *Restriction of Emission of Sulfur Compounds*, 10 CSR 10-6.260 applies to Boiler #2 and is in compliance based on the restriction taken in this permit to burn low sulfur No. 2 fuel oil.

- *Restriction of Particulate Matter Emissions From Fuel Burning Equipment Used for Indirect Heating*, 10 CSR 10-6.405 applies to Boiler #2 and is in compliance as this emission unit only will burn natural gas or No. 2 fuel oil with a sulfur content of less than 1.2% by weight.

#### STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

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Gerad Fox  
New Source Review Unit

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Date

#### PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated December 19, 2013, received January 13, 2014, designating Northwest Missouri State University as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.

## APPENDIX A

### Abbreviations and Acronyms

|                               |  |                               |  |
|-------------------------------|--|-------------------------------|--|
| <b>%</b> .....                | percent                                | <b>m/s</b> .....              | meters per second  |
| <b>°F</b> .....               | degrees Fahrenheit                     | <b>Mgal</b> .....             | 1,000 gallons  |
| <b>acfm</b> .....             | actual cubic feet per minute           | <b>MW</b> .....               | megawatt   |
| <b>BACT</b> .....             | Best Available Control Technology      | <b>MHDR</b> .....             | maximum hourly design rate                                       |
| <b>BMPs</b> .....             | Best Management Practices              | <b>MMBtu</b> ....             | Million British thermal units                                    |
| <b>Btu</b> .....              | British thermal unit                   | <b>MMCF</b> .....             | million cubic feet   |
| <b>CAM</b> .....              | Compliance Assurance Monitoring        | <b>MSDS</b> .....             | Material Safety Data Sheet                                       |
| <b>CAS</b> .....              | Chemical Abstracts Service             | <b>NAAQS</b> ...              | National Ambient Air Quality Standards                           |
| <b>CEMS</b> .....             | Continuous Emission Monitor System     | <b>NESHAPs</b>                |  |
| <b>CFR</b> .....              | Code of Federal Regulations            | .....                         | National Emissions Standards for Hazardous Air Pollutants        |
| <b>CO</b> .....               | carbon monoxide                        | <b>NO<sub>x</sub></b> .....   | nitrogen oxides  |
| <b>CO<sub>2</sub></b> .....   | carbon dioxide                         | <b>NSPS</b> .....             | New Source Performance Standards                                 |
| <b>CO<sub>2e</sub></b> .....  | carbon dioxide equivalent              | <b>NSR</b> .....              | New Source Review  |
| <b>COMS</b> .....             | Continuous Opacity Monitoring System   | <b>PM</b> .....               | particulate matter   |
| <b>CSR</b> .....              | Code of State Regulations              | <b>PM<sub>2.5</sub></b> ..... | particulate matter less than 2.5 microns in aerodynamic diameter |
| <b>dscf</b> .....             | dry standard cubic feet                | <b>PM<sub>10</sub></b> .....  | particulate matter less than 10 microns in aerodynamic diameter  |
| <b>EQ</b> .....               | Emission Inventory Questionnaire       | <b>ppm</b> .....              | parts per million  |
| <b>EP</b> .....               | Emission Point                         | <b>PSD</b> .....              | Prevention of Significant Deterioration                          |
| <b>EPA</b> .....              | Environmental Protection Agency        | <b>PTE</b> .....              | potential to emit  |
| <b>EU</b> .....               | Emission Unit                          | <b>RACT</b> .....             | Reasonable Available Control Technology                          |
| <b>fps</b> .....              | feet per second                        | <b>RAL</b> .....              | Risk Assessment Level  |
| <b>ft</b> .....               | feet                                   | <b>SCC</b> .....              | Source Classification Code                                       |
| <b>GACT</b> .....             | Generally Available Control Technology | <b>scfm</b> .....             | standard cubic feet per minute                                   |
| <b>GHG</b> .....              | Greenhouse Gas                         | <b>SIC</b> .....              | Standard Industrial Classification                               |
| <b>gpm</b> .....              | gallons per minute                     | <b>SIP</b> .....              | State Implementation Plan  |
| <b>gr</b> .....               | grains                                 | <b>SMAL</b> .....             | Screening Model Action Levels                                    |
| <b>GWP</b> .....              | Global Warming Potential               | <b>SO<sub>x</sub></b> .....   | sulfur oxides  |
| <b>HAP</b> .....              | Hazardous Air Pollutant                | <b>SO<sub>2</sub></b> .....   | sulfur dioxide   |
| <b>hr</b> .....               | hour                                   | <b>tph</b> .....              | tons per hour  |
| <b>hp</b> .....               | horsepower                             | <b>tpy</b> .....              | tons per year  |
| <b>lb</b> .....               | pound                                  | <b>VMT</b> .....              | vehicle miles traveled   |
| <b>lbs/hr</b> .....           | pounds per hour                        | <b>VOC</b> .....              | Volatile Organic Compound  |
| <b>MACT</b> .....             | Maximum Achievable Control Technology  |                               |  |
| <b>µg/m<sup>3</sup></b> ..... | micrograms per cubic meter             |                               |  |

Mr. James Teaney  
Steam Plant/HVAC Supervisor  
Northwest Missouri State University  
800 University Drive  
Maryville, MO 64468

RE: New Source Review Permit - Project Number: 2014-01-014

Dear Mr. Teaney:

Enclosed with this letter is your permit to construct. Please study it carefully and refer to Appendix A for a list of common abbreviations and acronyms used in the permit. 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 modified 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 Gerad Fox, at the Department of Natural Resources' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102, or by telephone at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Susan Heckenkamp  
New Source Review Unit Chief

SH:gfk

Enclosures

c: Kansas City Regional Office  
PAMS File: 2014-01-014

Permit Number:

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