

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: 012013-011

Project Number: 2012-05-034  
Installation Number: 077-0047

Parent Company: Missouri State University

Parent Company Address: 901 S. National Ave., Springfield, MO 65897

Installation Name: Missouri State University

Installation Address: 940 S. Carrington Avenue, Springfield, MO 65897

Location Information: Greene County, S24, T29N, R22W

Application for Authority to Construct was made for:

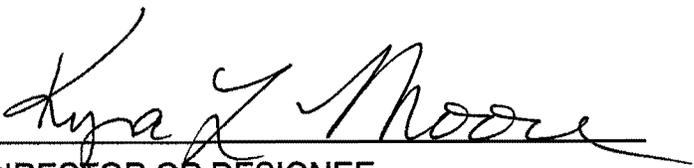
The installation of two (2) 14.7 MMBtu/hr natural gas-fired boilers with number 2 fuel oil as backup. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

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

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

JAN 31 2013

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 start up 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 start up 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.

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Permit No.	
Project No.	2012-05-034

#### 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."*

#### 1. Fuel Requirements

- A. Missouri State University shall burn exclusively natural gas or number two fuel oil in the new boilers (EU210 and EU220) and the existing boilers #2 (EU0180) and #3 (EU0190). All other boilers and hot water heaters at the university shall only burn natural gas. A listing of all boilers, hot water heaters and their allowable fuels are given in Appendix A.
- B. The number 2 fuel oil used in all boilers at the installation shall contain no more than 15.0 ppm sulfur by weight.
- C. Missouri State University shall maintain compliance with Special Condition 1.B. by either obtaining records from the vendor of the sulfur content for each shipment of fuel received or by testing each shipment of fuel for the sulfur content in accordance with the methods described in 10 CSR 10-6.040, *Reference Methods*.
- D. Missouri State University shall keep the records required by Special Condition 1.C. with the units and make them available for Department of Natural Resources' personnel upon request.

#### 2. Record Keeping Requirement

Missouri State University shall maintain all records required by this permit for not less than five years and make them available to any Missouri Department of Natural Resources personnel upon request.

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

Project Number: 2012-05-034  
Installation ID Number: 077-0047  
Permit Number:

Missouri State University  
940 S. Carrington Ave.  
Springfield, MO 65897

Complete: May 7, 2012

Parent Company:  
Missouri State University  
901 S. National Ave.  
Springfield, MO 65897

Greene County, S24, T29N, R22W

REVIEW SUMMARY

- Missouri State University has applied for authority to construct two (2) 14.7 MMBtu/hr natural-gas fired boilers with number 2 fuel oil as backup.
- HAP emissions are expected from the proposed equipment but only in amounts less than their respective *de minimis* levels and SMAL.
- 40 CFR 60 Subpart Db, "Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units" of the NSPS does not apply to the boilers because they have heat input capacity less than 100 MMBtu/hr.
- 40 CFR 60 Subpart Dc, "Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units," of the NSPS applies to the boilers.
- None of the currently promulgated MACT regulations apply to the proposed equipment. 40 CFR 63 Subpart JJJJJJ, "National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boiler Area Sources," does not apply to the boilers because the boilers fit the definition of a gas-fired boiler. According to this subpart, a gas-fired boiler is "any boiler that burns gaseous fuels not combined with any solid fuels, burns liquid fuel only 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 during any calendar year." If the facility ever operates the boilers where this definition does not apply (i.e. use number 2 fuel oil in a non-emergency situation, etc.), it will then be subject to this Subpart.
- 40 CFR 63 Subpart DDDDD, "National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters," of the MACT does not apply to the boilers because the installation is not a major source of HAP.

- None of the NESHAPs apply to this installation.
- 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 Greene 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 as a requirement of this permit.
- The facility qualifies for a downgrade from an Intermediate Operating Permit to a Basic Operating Permit.
- Approval of this permit is recommended with special conditions.

#### INSTALLATION DESCRIPTION

Missouri State University is an educational institution that uses boilers to generate steam for heating in various campus buildings and dormitories. No construction permits have been issued to Missouri State University from the Air Pollution Control Program. An intermediate operating permit (OP2010-056) was issued to the university in June, 2010.

In OP2010-056, SO<sub>x</sub> emissions were calculated assuming a 0.5% sulfur content and the entire facility was limited to 100 tons per year of SO<sub>x</sub> emissions. However, the facility currently uses number 2 fuel oil with sulfur content less than 15 ppm (0.0015%) and calculations using the new data show SO<sub>x</sub> potential emissions less than 100 tons per year. Furthermore, the installation-wide potential emissions of all other pollutants were calculated to be less than the major source level for operating permits, so the facility qualifies for a downgrade to a basic operating permit.

## PROJECT DESCRIPTION

Missouri State University proposes to add two (2) boilers with maximum heat input of 14.7 MMBtu/hr each to replace Boiler #4 (EU0200) in the powerhouse (54 MMBtu/hr). Natural gas will be used as the primary fuel but number 2 fuel oil will be used as backup. The new boilers are equipped with low-NO<sub>x</sub> burners.

## EMISSIONS/CONTROLS EVALUATION

Emissions were calculated for both natural gas and number 2 fuel oil usage. For each pollutant, the higher emissions of the two were used as the potential emissions for this project. The emission factors and control efficiencies used in this analysis were obtained from the EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 1.3, *Fuel Oil Combustion*, (9/99) or Section 1.4, *Natural Gas Combustion*, (7/98)

The following table provides an emissions summary for this project. Existing potential emissions were recalculated during the review for this project using equipment list given in OP2010-056 and include the existing Boiler #4, which is being replaced by the new boilers. Existing actual emissions were taken from the installation's 2011 EIQ. Potential emissions of the application represent the potential of the new equipment, assuming continuous operations (8,760 hours per year). The new installation potential emissions are the potential emissions of the installation after this project, which include the emissions from the two new boilers but do not include emission from Boiler #4.

**Table 1: Emissions Summary (tons per year)**

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Potential Emissions	Existing Actual Emissions (2011 EIQ)	Potential Emissions of the Application	New Installation Potential Emissions
PM	25.0	14.30	0.56	3.02	11.74
PM <sub>10</sub>	15.0	14.30	0.56	3.02	11.74
PM <sub>2.5</sub>	10.0	14.30	N/D	3.02	11.74
SO <sub>x</sub>	40.0	0.93	0.04	0.20	0.77
NO <sub>x</sub>	40.0	86.67	7.37	18.32	71.21
VOC	40.0	1.50	0.41	0.70	1.63
CO	100.0	22.14	6.19	10.6	24.29
HAPs	10.0/25.0	0.08	N/D	0.24	0.29
GHG-Mass	<sup>1</sup> 250.0	97,069.13	N/D	20,435.23	79,829.3
CO <sub>2e</sub>	<sup>1</sup> 100,000	97,434.94	N/D	20,512.81	80,129.66

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

Note 1: PSD permitting for GHG only required if both of the regulatory levels for GHG-Mass and CO<sub>2e</sub> are exceeded.

## 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

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

- *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
- *Restriction of Particulate Matter Emissions From Fuel Burning Equipment Used for Indirect Heating*, 10 CSR 10-6.405

## 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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Chia-Wei Young  
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, dated March 12, 2012, received May 7, 2012, designating 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

### List of Boilers and Heaters

EU (EP)	Description	MHDR (MMBtu/hr)	Allowed Fuels
EU0180 (EP-18)	Power House (POWR) BLR-2	30	Natural Gas/Number 2 Fuel Oil Backup
EU0190 (EP-19)	POWR BLR-3	54	Natural Gas/Number 2 Fuel Oil Backup
EU0210	POWR BLR-4	14.7	Natural Gas/Number 2 Fuel Oil Backup
EU0200	POWR BLR-5	14.7	Natural Gas/Number 2 Fuel Oil Backup
(EP-01)	Morris Center (MCCE) Boiler #1	2.232	Natural Gas Only
(EP-02)	MCCE Boiler #2	2.232	Natural Gas Only
(EP-03)	Glass Hall (GLAS) Boilding Boiler	4.3	Natural Gas Only
(EP-04)	GLAS Domestic Hot Water Heater	0.665	Natural Gas Only
(EP-05)	King Stree Annex (KGSX) 1 <sup>st</sup> Floor Hot Water Boiler	1.05	Natural Gas Only
(EP-06)	KGSC 3 <sup>rd</sup> Floor Boiler	1.8	Natural Gas Only
(EP-07)	KGSC Hot Water Boiler	0.12	Natural Gas Only
(EP-08)	Professional Building (PROF) East Boiler	1.749	Natural Gas Only
(EP-09)	PROF West Boiler	2.1	Natural Gas Only
(EP-10)	PROF AJAX Boiler	6	Natural Gas Only
(EP-11)	JQ Hammons Arena (JQHA) Boiler #3	4	Natural Gas Only
(EP-12)	JQHA Boiler #4	4	Natural Gas Only
(EP-13)	Condensing Boilers	2	Natural Gas Only
(EP-14)	Condensing Builders	2	Natural Gas Only
(EP-15)	HHPA Water Heater	0.25	Natural Gas Only
(EP-16)	Hammonds Student Center (HAMC) East Boiler	8.368	Natural Gas Only
(EP-17)	HAMC West Boiler	8.369	Natural Gas Only
(EP-21)	University Hall (UNVH) Hot Water Boiler	0.55	Natural Gas Only
(EP-22)	Kentwood Hall (KENT) Hot Water Boiler #1	1.63	Natural Gas Only
(EP-23)	KENT Hot Water Boiler #2	1.63	Natural Gas Only
(EP-24)	Kentwood South (KENT South) Boiler #1	0.4	Natural Gas Only
(EP-25)	KENT South Boiler #2	0.4	Natural Gas Only

(EP-26)	Sunvilla Tower (SUNV) Boiler #1	0.7	Natural Gas Only
(EP-27)	Sunvilla Tower (SUNV) Boiler #2	0.7	Natural Gas Only
(EP-28)	SUNV Domestic W/H Boiler #1	2.4	Natural Gas Only
(EP-29)	SUNV Domestic W/H Boiler #2	2.4	Natural Gas Only
(EP-30)	Hammons House (HAMH) Water Heater #1	0.6	Natural Gas Only
(EP-31)	HAMH Water Heater #2	0.6	Natural Gas Only
(EP-32)	HAMH Water Heater #3	0.6	Natural Gas Only
(EP-33)	HAMH Boiler #1	2	Natural Gas Only
(EP-34)	HAMH Boiler #2	2	Natural Gas Only
(EP-35)	Hutchens House (HURC) Boiler #1	2.1	Natural Gas Only
(EP-36)	HURC Boiler #2	2.1	Natural Gas Only
(EP-37)	HUTC Water Heater #1	1.5	Natural Gas Only
(EP-38)	HUTC Water Heater #2	1.5	Natural Gas Only
(EP-39)	Garst Dining (GRST) Boiler #1	0.81	Natural Gas Only
(EP-40)	GRST Boiler #2	0.81	Natural Gas Only
(EP-41)	GRST Water Heater #1	1	Natural Gas Only

## APPENDIX B

### 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 Sheets
<b>CAS</b> .....	Chemical Abstracts Service	<b>NAAQS</b> ...	National Ambient Air Quality Standards
<b>CEMS</b> .....	Continuous Emission Monitor System	<b>NESHAPs</b>	..... National Emissions Standards for Hazardous Air Pollutants
<b>CFR</b> .....	Code of Federal Regulations	<b>NO<sub>x</sub></b> .....	nitrogen oxides
<b>CO</b> .....	carbon monoxide	<b>NSPS</b> .....	New Source Performance Standards
<b>CO<sub>2</sub></b> .....	carbon dioxide	<b>NSR</b> .....	New Source Review
<b>CO<sub>2e</sub></b> .....	carbon dioxide equivalent	<b>PM</b> .....	particulate matter
<b>COMS</b> .....	Continuous Opacity Monitoring System	<b>PM<sub>2.5</sub></b> .....	particulate matter less than 2.5 microns in aerodynamic diameter
<b>CSR</b> .....	Code of State Regulations	<b>PM<sub>10</sub></b> .....	particulate matter less than 10 microns in aerodynamic diameter
<b>dscf</b> .....	dry standard cubic feet	<b>ppm</b> .....	parts per million
<b>EQ</b> .....	Emission Inventory Questionnaire	<b>PSD</b> .....	Prevention of Significant Deterioration
<b>EP</b> .....	Emission Point	<b>PTE</b> .....	potential to emit
<b>EPA</b> .....	Environmental Protection Agency	<b>RACT</b> .....	Reasonable Available Control Technology
<b>EU</b> .....	Emission Unit	<b>RAL</b> .....	Risk Assessment Level
<b>fps</b> .....	feet per second	<b>SCC</b> .....	Source Classification Code
<b>ft</b> .....	feet	<b>scfm</b> .....	standard cubic feet per minute
<b>GACT</b> .....	Generally Available Control Technology	<b>SIC</b> .....	Standard Industrial Classification
<b>GHG</b> .....	Greenhouse Gas	<b>SIP</b> .....	State Implementation Plan
<b>gpm</b> .....	gallons per minute	<b>SMAL</b> .....	Screening Model Action Levels
<b>gr</b> .....	grains	<b>SO<sub>x</sub></b> .....	sulfur oxides
<b>GWP</b> .....	Global Warming Potential	<b>SO<sub>2</sub></b> .....	sulfur dioxide
<b>HAP</b> .....	Hazardous Air Pollutant	<b>tpy</b> .....	tons per hour
<b>hr</b> .....	hour	<b>tpy</b> .....	tons per year
<b>hp</b> .....	horsepower	<b>VMT</b> .....	vehicle miles traveled
<b>lb</b> .....	pound	<b>VOC</b> .....	Volatile Organic Compound
<b>lbs/hr</b> .....	pounds per hour		
<b>MACT</b> .....	Maximum Achievable Control Technology		
<b>µg/m<sup>3</sup></b> .....	micrograms per cubic meter		

Mr. Mark Frietchen  
Project Manager  
Missouri State University  
901 S. National Ave.  
Springfield, MO 65897

RE: New Source Review Permit - Project Number: 2012-05-034

Dear Mr. Frietchen:

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 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 amended 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 Chia-Wei Young, at the Department of Natural Resources' 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

Susan Heckenkamp  
New Source Review Unit Chief

SH:cyl

Enclosures

c: Southwest Regional Office  
PAMS File: 2012-05-034

Permit Number: