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

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.


- 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$_x$ emissions were calculated assuming a 0.5% sulfur content and the entire facility was limited to 100 tons per year of SO$_x$ 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$_x$ 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_x 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)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>25.0</td>
<td>14.30</td>
<td>0.56</td>
<td>3.02</td>
<td>11.74</td>
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<tr>
<td>PM_{10}</td>
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<td>14.30</td>
<td>0.56</td>
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<td>11.74</td>
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<td>PM_{2.5}</td>
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<td>N/D</td>
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<td>SOx</td>
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<td>NOx</td>
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<td>86.67</td>
<td>7.37</td>
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<td>71.21</td>
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<td>VOC</td>
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<td>1.50</td>
<td>0.41</td>
<td>0.70</td>
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<tr>
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<td>22.14</td>
<td>6.19</td>
<td>10.6</td>
<td>24.29</td>
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<tr>
<td>HAPs</td>
<td>10.0/25.0</td>
<td>0.08</td>
<td>N/D</td>
<td>0.24</td>
<td>0.29</td>
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<td>GHG-Mass</td>
<td>250.0</td>
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<td>N/D</td>
<td>20,435.23</td>
<td>79,829.3</td>
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<tr>
<td>CO_{2e}</td>
<td>100,000</td>
<td>97,434.94</td>
<td>N/D</td>
<td>20,512.81</td>
<td>80,129.66</td>
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</tbody>
</table>

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 CO2e 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.

________________________________   _________________________________
Chia-Wei Young          Date
Environmental Engineer

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.

### APPENDIX A

List of Boilers and Heaters

<table>
<thead>
<tr>
<th>EU (EP)</th>
<th>Description</th>
<th>MHD (MMBtu/hr)</th>
<th>Allowed Fuels</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU0180 (EP-18)</td>
<td>Power House (POWR) BLR-2</td>
<td>30</td>
<td>Natural Gas/Number 2 Fuel Oil Backup</td>
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<td>EU0190 (EP-19)</td>
<td>POWR BLR-3</td>
<td>54</td>
<td>Natural Gas/Number 2 Fuel Oil Backup</td>
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<td>EU0210</td>
<td>POWR BLR-4</td>
<td>14.7</td>
<td>Natural Gas/Number 2 Fuel Oil Backup</td>
</tr>
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<td>EU0200</td>
<td>POWR BLR-5</td>
<td>14.7</td>
<td>Natural Gas/Number 2 Fuel Oil Backup</td>
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<tr>
<td>(EP-01)</td>
<td>Morris Center (MCCE) Boiler #1</td>
<td>2.232</td>
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<td>(EP-02)</td>
<td>MCCE Boiler #2</td>
<td>2.232</td>
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<td>(EP-03)</td>
<td>Glass Hall (GLAS) Building Boiler</td>
<td>4.3</td>
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<td>(EP-04)</td>
<td>GLAS Domestic Hot Water Heater</td>
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<td>(EP-05)</td>
<td>King Stree Annex (KGSX) 1&lt;sup&gt;st&lt;/sup&gt; Floor Hot Water Boiler</td>
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<td>(EP-06)</td>
<td>KGSC 3&lt;sup&gt;rd&lt;/sup&gt; Floor Boiler</td>
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<td>(EP-07)</td>
<td>KGSC Hot Water Boiler</td>
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<td>(EP-08)</td>
<td>Professional Building (PROF) East Boiler</td>
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<td>(EP-09)</td>
<td>PROF West Boiler</td>
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<td>(EP-10)</td>
<td>PROF AJAX Boiler</td>
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<td>(EP-11)</td>
<td>JQ Hammons Arena (JQHA) Boiler #3</td>
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<td>(EP-12)</td>
<td>JQHA Boiler #4</td>
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<td>Condensing Boilers</td>
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<td>Condensing Builders</td>
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<td>(EP-15)</td>
<td>HHPA Water Heater</td>
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<td>(EP-16)</td>
<td>Hammonds Student Center (HAMC) East Boiler</td>
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<td>(EP-17)</td>
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<td>(EP-21)</td>
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<td>(EP-22)</td>
<td>Kentwood Hall (KENT) Hot Water Boiler #1</td>
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<td>(EP-23)</td>
<td>KENT Hot Water Boiler #2</td>
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<td>(EP-24)</td>
<td>Kentwood South (KENT South) Boiler #1</td>
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<td>(EP-25)</td>
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<td>EP-26</td>
<td>Sunvilla Tower (SUNV) Boiler #1</td>
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<td>EP-28</td>
<td>SUNV Domestic W/H Boiler #1</td>
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<td>Hammons House (HAMH) Water Heater #1</td>
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<td>EP-32</td>
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<td>EP-34</td>
<td>HAMH Boiler #2</td>
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<td>EP-36</td>
<td>HURC Boiler #2</td>
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<td>EP-37</td>
<td>HUTC Water Heater #1</td>
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<td>EP-38</td>
<td>HUTC Water Heater #2</td>
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<tr>
<td>EP-39</td>
<td>Garst Dining (GRST) Boiler #1</td>
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<td>EP-40</td>
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<td>EP-41</td>
<td>GRST Water Heater #1</td>
<td>1</td>
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</table>
APPENDIX B
Abbreviations and Acronyms

% .......... percent  m/s .......... meters per second
°F .......... degrees Fahrenheit  Mgal ...... 1,000 gallons
acfm....... actual cubic feet per minute  MW.......... megawatt
ºF .......... degrees Fahrenheit  MHDRI max hourly design rate
BACT ...... Best Available Control Technology  MMBtu..... Million British thermal units
BMPs ...... Best Management Practices  MMCF ...... million cubic feet
Btu.......... British thermal unit  MSDS .... Material Safety Data Sheets
CAM ...... Compliance Assurance Monitoring  NAAQS ... National Ambient Air Quality
CAS ......... Chemical Abstracts Service  Standards
CEMS ......... Continuous Emission Monitor  NESHAPs........ National Emissions Standards for
System  Hazardous Air Pollutants
CFR ........ Code of Federal Regulations  NOx......... nitrogen oxides
CO .......... carbon monoxide  NSPS ...... New Source Performance
CO2 .......... carbon dioxide  Standards
CO2e......... carbon dioxide equivalent  NSR ...... New Source Review
COMS ......... Continuous Opacity Monitoring  PM .......... particulate matter
System  PM2.5 ........ particulate matter less than 2.5
CSR ........ Code of State Regulations  microns in aerodynamic diameter
Dscf ...... dry standard cubic feet  PM10........ particulate matter less than 10
EIQ ........ Emission Inventory Questionnaire  microns in aerodynamic diameter
EP .......... Emission Point  ppm......... parts per million
EPA ........ Environmental Protection Agency  PSD ....... Prevention of Significant
EU .......... Emission Unit  Deterioration
fps .......... feet per second  PTE ........ potential to emit
ft .......... feet  RACT ...... Reasonable Available Control
GACT ...... Generally Available Control  Technology
Technology  GHG ........ Greenhouse Gas
GWP ...... Global Warming Potential  SCC ......... Source Classification Code
HAP ........ Hazardous Air Pollutant  scfm ...... standard cubic feet per minute
hr .......... hour  SIC ......... Standard Industrial Classification
hp .......... horsepower  SIP ......... State Implementation Plan
Lb .......... pound  SMAL .... Screening Model Action Levels
Lbs/hr ...... pounds per hour  SOx.......... sulfur oxides
MACT ...... Maximum Achievable Control  SO2 ....... sulfur dioxide
Technology  Tpy.......... tons per hour
µg/m³ ...... micrograms per cubic meter  Tpy .......... tons per year
VMT ...... vehicle miles traveled  VOC ......... Volatile Organic Compound
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: