

STATE OF MISSOURI **PERMIT BOOK**



**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: **032008-002** Project Number: 2007-08-062

Parent Company: Curators of the University of Missouri

Parent Company Address: 8 Research Park Development Building, Columbia, MO  
65211-3050

Installation Name: University of Missouri Columbia Power Plant

Installation Address: Fifth and Stewart, Columbia, MO 65211-2030

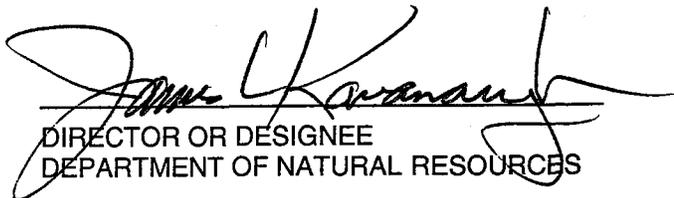
Location Information: Boone County, S13, T48N, R13W

Application for Authority to Construct was made for: The replacement of four (4) existing cooling towers with a new relocated cooling tower and a closed loop cooling system cooling tower. The review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

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

MAR 4 2008

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 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 with 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.

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## 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."*

University of Missouri - Columbia  
Boone County, S13, T48N, R13W

### 1. Cooling Tower Requirements

- A. The cooling tower(s) shall be operated and maintained in accordance with the manufacturer's specifications. Manufacturer's specifications shall be kept onsite and made readily available to Department of Natural Resources' personnel.
- B. The water circulation rate for the steam turbine condenser cooling tower (new relocated cooling tower) shall not exceed 55,000 gallons per minute. Verification of the circulation rate shall be by the manufacturer's maximum design rate and shall be kept onsite and be made readily available to Department of Natural Resources' personnel upon request.
- C. The water circulation rate for the auxiliary heat exchanger cooling tower (closed loop cooling system) shall not exceed 5,500 gallons per minute. Verification of the circulation rate shall be by the manufacturer's maximum design rate and shall be kept onsite and be made readily available to Department of Natural Resources' personnel upon request.
- D. The drift loss from the steam turbine condenser cooling tower shall not exceed 0.0025 percent of the water circulation rate. The drift loss from the auxiliary heat exchanger cooling tower shall not exceed 0.005 percent of the water circulation rate. Verification of drift loss shall be by manufacturer's guaranteed drift loss and shall be kept onsite and be made readily available to Department of Natural Resources' personnel upon request.
- E. The total dissolved solids (TDS) concentration in the circulated cooling water for both cooling towers shall not exceed a TDS concentration of 3,750 parts per million (ppm). A TDS sample shall be collected for each tower each month and the results recorded to verify the TDS concentration.
- F. The requirements for monthly TDS sample collection may be eliminated or

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**SPECIAL CONDITIONS:**

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

the frequency reduced upon written approval by the Air Pollution Control Program if TDS sampling results demonstrate compliance for twenty-four (24) consecutive months.

**2. Record Keeping Requirements**

All records required by this permit shall be kept onsite for no less than five (5) years and shall be made available to any Department of Natural Resources' personnel upon request.

**3. Reporting Requirements**

University of Missouri-Columbia Power Plant shall report to the Air Pollution Control Program's Enforcement Section (P. O. Box 176, Jefferson City, MO 65102) no later than ten (10) days after the end of the month during which the records required by Special Condition 1.E show that the limit has been exceeded.

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

Project Number: 2007-08-062  
Installation ID Number: 019-0004  
Permit Number:

University of Missouri Power Plant  
Fifth and Stewart  
Columbia, MO 65211-2030

Complete: 8/20/2007

Parent Company:  
Curators of the University of Missouri  
8 Research Park Development Building  
Columbia, MO 65211-2030

Boone County, S13, T48N, R13W

REVIEW SUMMARY

- University of Missouri - Columbia Power Plant has applied for authority to construct two (2) cooling towers.
- Hazardous Air Pollutant (HAP) emissions are not expected from the proposed equipment.
- None of the New Source Performance Standards (NSPS) apply to the proposed equipment.
- None of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) or currently promulgated Maximum Achievable Control Technology (MACT) regulations apply to the proposed equipment. 40 CFR Part 63, Subpart Q, *National Emissions Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers*, does not apply to the proposed equipment because the cooling towers are not operated with chromium-based water treatment chemicals.
- 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 Boone County, an attainment area for all criteria air pollutants.

- This installation is on the List of Named Installations [10 CSR 10-6.020(3)(B), Table 2] as a fossil-fuel-fired steam electric plant of more than 250 million British thermal units per hour heat.
- 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.
- A revision to your part 70 operating permit application is required for this installation within one (1) year of equipment startup.
- Approval of this permit is recommended with special conditions.

### INSTALLATION DESCRIPTION

The University of Missouri-Columbia operates a coal fired electrical power plant in Boone County. Electricity is generated for use in the University's buildings. Low-pressure steam from the plant is used to heat the buildings on campus.

This installation is an existing major source. A Part 70 operating permit (#OP1999-087) was issued to this installation in July, 1999 and a part 70 renewal application was received on January 13, 2004.

The following construction permits have been issued to University of Missouri - Columbia Power Plant from the Air Pollution Control Program.

Permit Number	Completion Date	Description
0886-004	8/18/2986	Installation of boiler.
0294-018	1/27/1994	Installation of emergency generator.
0494-020	4/28/1994	Installation of boiler.
0296-007	1/31/1996	Installation of emergency generator and storage tanks.
1096-021	10/31/1996	Replacement IC engine for east well.
0697-002	5/12/1997	Installation of solvent-based parts washer.
072000-005	7/6/2000	Installation of turbine and an emergency generator.
042007-019	4/27/2007	Temporary permit to burn biomass fuel in boiler.

### PROJECT DESCRIPTION

The installation has applied for authority to construct two (2) new cooling towers to replace the four (4) existing cooling towers. One cooling tower will be used to cool hot water from the steam turbine condenser and to send the cooled water back into the condenser to condense steam. The other cooling tower will be used to cool hot water from the plant's auxiliary heat exchangers and to send cooled water back into the heat exchangers. On colder days, the water will be cooled using air. On hotter days, water will be cooled by spraying water over the radiators.

The cooling tower for condenser water will have a water circulation rate of 55,000 gallons per minute (gpm) and the cooling tower for the heat exchanger water will have a water circulation rate of 5,500 gpm.

The drift loss from the steam turbine condenser cooling tower will be 0.0025 percent and the drift loss from the auxiliary heat exchanger cooling tower will be 0.005 percent. For both towers, the total dissolved solids (TDS) concentration will be 3,750 parts per million (ppm).

### EMISSIONS/CONTROLS EVALUATION

A mass balance approach was used to determine the potential emissions of PM<sub>10</sub>. 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 De Minimis Levels	Existing Potential Emissions	Existing Actual Emissions (2006 EIQ)	Potential Emissions of the Application	New Installation Conditioned Potential
PM <sub>10</sub>	15.0	Major	13.04	13.56	N/A
SO <sub>x</sub>	40.0		9,679.53	N/A	N/A
NO <sub>x</sub>	40.0		762.17	N/A	N/A
VOC	40.0		4.78	N/A	N/A
CO	100.0		696.79	N/A	N/A
HAPs	10.0/25.0		53.89	N/A	N/A

N/A = Not Applicable

### 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 PM<sub>10</sub> is below de minimis levels.

### APPLICABLE REQUIREMENTS

University of Missouri - Columbia Power Plant 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 April 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.

## AMBIENT AIR QUALITY IMPACT ANALYSIS

Ambient air quality modeling was not performed since potential emissions of the application are below de minimis levels.

## 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  
Environmental Engineer

\_\_\_\_\_  
Date

### PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated 8/1/2007, received 8/9/2007, designating University of Missouri as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Northeast Regional Office Site Survey, dated 8/30/2007.

Mr. Martin J. Kasper  
Senior Staff Engineer  
University of Missouri, Columbia  
Energy 417 South Fifth Street  
Columbia, MO 65211-2030

RE: New Source Review Permit - Project Number: 2007-08-062

Dear Mr. Kasper:

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 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 departments' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or (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:cwyl

Enclosures

c: Northeast Regional Office  
PAMS File 2007-08-062

Permit Number: