

**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: **11 2008 - 001**      Project Number: 2008-04-020

Parent Company:                      Office of Administration - Division of Facilities  
Management, Design and Construction

Parent Company Address: 301 West High St., Room 730, P.O. Box 809, Jefferson  
City, MO 65102

Installation Name:                      South Central Correctional Center

Installation Address:                      255 West Highway 32, Licking, MO 65542

Location Information:                      Texas County, S1, T32N, R9W

Application for Authority to Construct was made for:  
Installation of a 13.4 million British thermal units per hour (MMBtu/hr) wood-fired boiler with associated equipment. This review was conducted in accordance with Section (6), 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.

NOV 10 2008

EFFECTIVE DATE

A handwritten signature in black ink, appearing to read "James L. Kawonchuk".  
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 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.

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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."*

South Central Correctional Center  
Texas County, S1, T32N, R9W

1. **Operational Limitation – Wood-fired Boiler (EP08)**  
South Central Correctional Center shall use no other fuels other than untreated wood in the wood-fired boiler without receiving prior written authorization from the Air Pollution Control Program.
2. **Control Device – Cyclone System**
  - A. Two mechanical multiple cyclone fly ash arrestors with cyclone (cyclone system) must be in use at all times when the boiler (EP08) associated with this permit is in operation. The cyclone system shall be operated and maintained in accordance with the manufacturer's specifications. The cyclone system shall be equipped with a gauge or meter, which indicates the pressure drop across the control device.
  - B. South Central Correctional Center shall maintain an operating and maintenance log for the cyclone system which shall include the following:
    - 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions; and
    - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.
3. **Operational Limitation – Haul Roads**  
South Central Correctional Center shall allow haul road traffic for wood chip delivery, wood chip overs removal, and ash removal only between the hours of 7:00 a.m. and 3:00 p.m. daily.
4. **Specifications for Paved Haul Roads**
  - A. South Central Correctional Center shall maintain and / or repair the portions of the haul road described in the Application for Authority to Construct as paved. Maintenance of the surfaces will be conducted as necessary to ensure that the physical integrity of the pavement is adequate to achieve control of fugitive emissions from these areas while the plant is operating.
  - B. South Central Correctional Center shall periodically water, wash and/or otherwise clean all of the paved portions of the haul roads as necessary to achieve control of fugitive emissions from these roads.

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**SPECIAL CONDITIONS:**

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

5. South Central Correctional Center shall notify the Air Pollution Control Program before initial startup of any modifications to the facility design that could impact the release parameters or emission rates as specified in the Memorandum from the Modeling Unit titled "Ambient Air Quality Impact Analysis (AAQIA) for South Central Correctional Center-August 2008 Submittal". In the event the Program determines that the changes are significant, South Central Correctional Center shall submit an updated Ambient Air Quality Impact Analysis (AAQIA) to the Air Pollution Control Program that continues to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS) and Prevention of Significant Deterioration (PSD) increment standards.

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

Project Number: 2008-04-020  
Installation ID Number: 215-0074  
Permit Number:

South Central Correctional Center  
255 West Highway 32  
Licking, MO 65542

Complete: April 4, 2008

Parent Company:  
Office of Administration  
Division of Facilities Management, Design and Construction  
301 West High St., Room 730, P.O. Box 809  
Jefferson City, MO 65102

Texas County, S1, T32N, R9W

REVIEW SUMMARY

- South Central Correctional Center has applied for authority to install a 13.4 MMBtu/hr wood-fired boiler with associated equipment.
- Small amounts of Hazardous Air Pollutant (HAP) emissions are expected from the combustion of wood in the boiler.
- 40 CFR Part 60, Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*, of the New Source Performance Standards (NSPS) applies to the new wood-fired boiler.
- 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.
- Two mechanical multiple cyclone fly ash arrestors with cyclone are being used to control the particulate matter less than 10 microns in diameter (PM<sub>10</sub>) emissions from the wood-fired boiler in this permit.
- This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of PM<sub>10</sub> are above de minimis levels. Potential emissions of all other pollutants are below their respective de minimis levels.
- This installation is located in Texas County, an attainment area for all criteria air pollutants.
- This installation is not on the List of Named Installations [10 CSR 10-6.020(3)(B),

Table 2].

- Ambient air quality modeling was performed to determine the ambient impact of PM<sub>10</sub>.
- Emissions testing is not required for the new equipment.
- An amendment to your Basic Operating Permit is required for this installation within 30 days of equipment startup.
- Approval of this permit is recommended with special conditions.

### INSTALLATION DESCRIPTION

South Central Correctional Center (SCCC) is part of the Missouri Department of Corrections in Licking, Missouri. The site provides housing units for inmates and buildings for administrative offices, education, recreation and support. The SCCC site also has a furniture manufacturing facility. The existing heating and cooling plant consists of three boilers each having a maximum design capacity of 600 HP or 20 MMBTU/hr, and they are allowed to burn both liquefied petroleum gas (propane) or No. 2 diesel fuel oil. The entire site's heating and cooling needs are currently served by the existing plant (hot water and chilled water) located in the powerhouse. The chilled water plant consists of three electrical centrifugal chillers with a nominal rating of 400 tons each. One three-cell cooling tower provides condenser water for each chiller. The site also has an emergency diesel generator.

South Central Correctional Center received a Basic Operating Permit from the Air Pollution Control Program in August of 2004. The following Construction Permits have also been issued to South Central Correctional Center.

Table 1: Previously Issued Construction Permits

Permit Number	Description
082000-003	Installation of three (3) fire tube hot water boilers and one (1) emergency diesel engine generator.
062006-003	Installation of a furniture restoration facility.
062006-015	Addition of an alternative fuel, liquefied petroleum gas (LP gas) in the installation's existing three (3) fire tube hot water boilers.

### PROJECT DESCRIPTION

The SCCC is seeking authority to install a 13.4 MMBtu/hr biomass boiler system to be located near the existing powerhouse. The system will consist of a wood-fired boiler, a method for fuel delivery, fuel storage capacity and conveyors.

#### Wood-Fired Boiler (EP08):

The new boiler will have a heat input of 13.4 MMBtu/hr and will be used to heat water. It will be interconnected with the existing hot water boiler system and is designed to be the primary boiler with back-up from the existing systems. The new boiler system will

also have stoker and ash removal and be equipped with two mechanical multiple cyclone fly ash arrestors with cyclone to provide PM<sub>10</sub> control. The ash removal bin and the rejected wood chip (“overs”) bin will be covered.

The fuel specifications are for wood chips with a 50% or less moisture content and a Btu content of approximately 4,350 Btu per pound (minimum). Over 75% of the wood chips will be approximately ¼ of an inch to 2 inches in size with 100% less than 2 inches.

#### Method of Fuel Delivery:

Covered walking floor vans, also called live bottom trailers, will be used for fuel delivery. These trailers are usually rated to carry around 22 to 24 tons.

#### Fuel (Wood Chips) Storage (EP10):

Fuel (wood chips) will be stored under a roofed structure that is open on three sides. The total amount that can be stored under the structure is 16,170 cubic feet.

#### Conveyors:

There are two material handling system required for the proper operation of the hot water boiler system: the fuel handling and the ash handling. The fuel handling system from the inlet of the inclined conveyor through to the boiler stoker is enclosed. The only “open” conveyors are the walking floor and the vibrating cross conveyor. Since most of the wood chips are a quarter-inch to two-inches in size, the PM<sub>10</sub> emissions generated from wood chip handling is expected to be insignificant and were not further evaluated. The ash conveyor system is also totally enclosed from the boiler to the ash collection bin and therefore emissions are also not expected from its handling.

#### Haul Roads (EP09):

New haul road usage will be required for wood chip delivery, ash removal and wood chip overs removal. The roads used will be paved. The emissions are based on a maximum of 11 trucks total per day for delivery of wood chips and 1 truck each for ash removal and wood chip overs removal. The 11 trucks include the amount that it would take to fill storage to capacity and operate the boiler for a couple of days.

## EMISSIONS/CONTROLS EVALUATION

#### Wood-Fired Boiler

The emission factors used for the boiler were obtained from the Environmental Protection Agency (EPA) document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 1.6, *Wood Residue Combustion in Boilers* (September 2003). The EPA database, Factor Information Retrieval (FIRE) V6.25, *Source Classification Codes and Emission Factors Listing for Criteria Air Pollutants* (SCC # 1-02-009-05), was used to determine the boiler’s acrolein emissions. The cyclone system is designed to control the boiler’s PM<sub>10</sub> emissions at a control efficiency of 80%.

#### Haul Roads

The emission factor used for the paved haul road was taken from the EPA document AP-42, Fifth Edition, Section 13.2.2, *Unpaved Roads* (November 2006). The haul road will be paved and washed periodically to provide a 90% control of PM<sub>10</sub> emissions. The

emissions were based on a maximum of 13 trucks total per day for delivery of wood chips, ash removal and wood chip overs removal.

### Wood Chip Storage Pile

Emissions were calculated for load-in to the storage pile using EPA document AP-42, Fifth Edition, Section 13.2.4, *Aggregate Handling and Storage Piles* (November 2006) and a total daily amount stored of 220 tons which equals the approximate amount that can be stored in the storage area. Because of the relatively large size of the wood chips, we expect insignificant emissions due to wind erosion.

Existing potential emissions were taken from Permit Nos. 082000-003, 062006-015, 062006-003. The emissions for combustion of Fuel Oil No.2 were originally based on total particulate matter emissions. These emissions were adjusted to reflect PM<sub>10</sub> only emissions. Existing actual emissions were taken from the applicant's 2007 Emission Inventory Questionnaire (EIQ). Potential emissions of the application represent the potential emissions of the new equipment, assuming continuous operation (8760 hours per year). The following table provides an emissions summary for this project.

Table 2: Emissions Summary (tons per year)

Pollutant	Regulatory De Minimis Levels	Existing Potential Emissions <sup>1</sup>	Existing Actual Emissions (2007 EIQ)	Potential Emissions of the Application	New Installation Conditioned Potential
PM <sub>10</sub>	15.0	18.91	1.7	20.05	N/A
SOx	40.0	12.78	0.01	1.47	N/A
NOx	40.0	57.22	4.68	12.92	N/A
VOC	40.0	41.74	5.61	1.00	N/A
CO	100.0	31.39	0.79	35.22	N/A
HAPs	10.0/25.0	16.98	0.01	2.04	N/A

N/A = Not Applicable

<sup>1</sup>The existing potential emissions were updated to correct miscalculations in previous permits. In Permit No. 082000-003, three dual-fired hot water boilers and one emergency diesel engine generator were permitted. In Permit No. 062006-015, the capability of using liquefied petroleum gas (LPG) in these boilers was added. The potential emissions listed in Table 1 of Permit No. 082000-003 were based on combusting No. 2 fuel oil only in the three boilers and did not take into account the potential emissions associated with combustion of natural gas. (This error was replicated in Permit No. 062006-015.) The potential emissions for VOC and CO are greater when combusting natural gas as opposed to No. 2 fuel oil or LPG, therefore, the existing potential emissions for VOC and CO listed above were updated to reflect the higher emissions. Also, the original PM<sub>10</sub> calculations for the three boilers were based on the combustion of No. 2 fuel oil which is correct; however, they were based on total filterable particulate emissions and not just filterable PM<sub>10</sub> and did not include the condensable portion of PM<sub>10</sub>. The existing potential emissions for PM<sub>10</sub> were updated to account for the more accurate emission factor.

### 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 of PM<sub>10</sub> are above de minimis levels. All other pollutants are below their respective de minimis levels.

## APPLICABLE REQUIREMENTS

South Central Correctional Center 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
- *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 Emission of Sulfur Compounds*, 10 CSR 10-6.260

## AMBIENT AIR QUALITY IMPACT ANALYSIS

Ambient air quality modeling was performed to determine the ambient impact of PM<sub>10</sub>. For further details on the modeling, please refer to the memo titled "Ambient Air Quality Impact Analysis (AAQIA) for South Central Correctional Center-August 2008 Submittal".

## STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (6), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

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Susan Heckenkamp  
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 April 5, 2008, received April 4, 2008, designating Office of Administration - Division of Facilities Management, Design and Construction as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Southeast Regional Office Site Survey, dated April 21, 2008.

Mr. Steven Kroner  
State of Missouri Office of Administration  
2929 Plaza Drive  
Jefferson City, MO 65102

RE: New Source Review Permit - Project Number: 2008-04-020

Dear Mr. Kroner:

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 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 Susan Heckenkamp, 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:shl

Enclosures

c: Southeast Regional Office Name  
PAMS File: 2008-04-020

Permit Number: