

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: **022012-010** Project Number: 2011-10-012

Installation Number: 097-0001

Parent Company: Empire District Electric Company

Parent Company Address: P.O. Box 127, Joplin, MO 64802

Installation Name: Asbury Power Plant

Installation Address: 21133 Uphill Lane, Asbury, MO 64832

Location Information: Jasper County, S17, T30N, R33W

Application for Authority to Construct was made for:

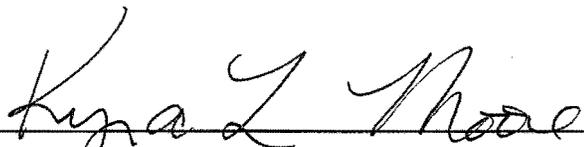
A flue gas desulfurization (FGD) and powdered activated carbon (PAC) system. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

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

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

FEB 21 2012

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.	2011-10-012

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."

Asbury Power Plant
Jasper County, S17, T30N, R33W

1. FGD/PAC Byproduct and Fly Ash Watering
 - A. Asbury Power Plant shall wet the FGD/PAC byproduct and fly ash at the pugmill (EP-18) sufficient to maintain no visible emissions from EP-18.
 - B. Observations will be made using a USEPA Method 22 trained observer and USEPA Method 22 procedures.
 - 1) Frequency:
 - a. The permittee shall conduct weekly observations for a minimum of eight consecutive weeks after permit issuance.
 - b. Should the permittee observe no violations of this regulation during this period then,
 - i. The permittee may observe once every two weeks for a period of eight weeks.
 - ii. If a violation is noted, monitoring reverts to weekly.
 - iii. Should no violation of this regulation be observed during this period then,
 - a) The permittee may observe once per month.
 - b) If a violation is noted, monitoring reverts to weekly.
 - c. If the source reverts to weekly monitoring at any time, monitoring frequency will progress in an identical manner from the initial monitoring frequency.
 - 2) Duration:

The duration of the observation shall not be less than six minutes.
 - 3) Threshold:
 - a. The observation of visible emissions from this emission unit will be considered an excursion and corrective actions shall be implemented within a reasonable period. An excursion does not necessarily indicate a violation of the applicable requirement.

Page No.	5
Permit No.	
Project No.	2011-10-012

SPECIAL CONDITIONS:

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

- B. Asbury Power Plant shall report to the Air Pollution Control Program's Compliance/Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after the end of the month during which any record required by this permit shows an exceedance of a limitation imposed by this permit.

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

Project Number: 2011-10-012
Installation ID Number: 097-0001
Permit Number:

Asbury Power Plant
21133 Uphill Lane
Asbury, MO 64832

Complete: October 18, 2011

Parent Company:
Empire District Electric Company
P.O. Box 127
Joplin, MO 64802

Jasper County, S17, T30N, R33W

REVIEW SUMMARY

- Asbury Power Plant has applied for authority to construct a flue gas desulfurization (FGD) and powdered activated carbon (PAC) system.
- Hazardous Air Pollutant (HAP) emissions are not expected from the project emission units.
- None of the New Source Performance Standards (NSPS) apply to the project emission units.
- None of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) apply to the project emission units.
- None of the Maximum Achievable Control Technology (MACT) regulations apply to the project emission units.
- Filters on the lime, PAC and byproduct/fly ash silo vents, watering of the byproduct/fly ash, and undocumented watering on unpaved haul roads are being used to control the particulate matter (PM), particulate matter less than 10 microns in diameter (PM₁₀), and particulate matter less than 2.5 microns in diameter (PM_{2.5}) emissions in this permit.
- 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 Jasper County, an attainment area for all criteria pollutants.

- This installation is on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation is classified as item number 21. Fossil-fuel boilers (or combination thereof) totaling more than 250 million British thermal units per hour heat input. The installation's major source level is 100 tons per year and fugitive emissions are 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 are not required for the project equipment.
- An amendment application to the Part 70 operating permit is required for this installation within 1 year of equipment startup.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Empire District Electric Company operates an existing, primarily coal-fired, electric generating cyclone boiler near Asbury, herein referred to as Asbury. Asbury was constructed in 1970 and has never required a construction permit. Asbury holds a Part 70 operating permit. The following permits have been issued to Asbury from the Air Pollution Control Program.

Table 1: Permit History

Permit Number	Description
OP	Phase II acid rain permit under project EX0970001021
OP1999-110	Part 70 operating permit
OP	Compliance plan phase II NO _x under project 1998-04-120
OP2010-082	Part 70 operating permit renewal
OP2007-071	Phase II acid rain permit renewal
OP2010-082	CAIR application
OP2010-082	Phase II acid rain permit renewal
OP2011-055	Phase II NO _x compliance

PROJECT DESCRIPTION

Asbury proposes to install FGD and mercury control equipment consisting of lime and PAC pneumatic receiving and handling, a circulating fluidized bed dry/semi dry scrubber, baghouse, and FGD byproduct and fly ash handling and shipping to existing disposal areas. Other emission units include haul roads and disposal activities. A new stack for the boiler is also proposed, but it does not affect the permit applicability of the project. The FGD system will pneumatically receive pebble lime into a storage silo equipped with vent filters. The pebble lime will be conveyed to a hydrator where it will be mixed with water and reduced in size. From the hydrator, the lime will be transferred to another storage silo before being injected into the flue gas stream. The hydrated lime will react with and reduce sulfur dioxide in the flue gas before being removed by the baghouse. PAC will be received into a storage silo and injected as needed in the flue gas before the baghouse. The baghouse will remove FGD/PAC byproduct and fly ash.

A portion of the FGD/PAC byproduct and fly ash will be circulated through the scrubber while the remainder is stored and watered before being loaded into trucks for disposal. Permit applicability is based upon potential emissions from handling the FGD ingredients and byproducts, and resulting haul road and disposal activities. Project emission units are listed in the following table. The maximum hourly design rates (MHDR) are based upon annual throughputs submitted in the permit application. They are not direct hourly limits.

Table 2: Project Emission Units

Emission Point	Description	Bottlenecked MHDR (tons per hour)
13	Pneumatic receiving of lime: storage silo filter vent	2.12
14	Lime hydrator: storage silo filter vent	2.12
15	Hydrated lime: storage silo filter vent	2.80
16	Byproduct/fly ash: storage silo filter vent	8.71
17	Pneumatic receiving of PAC: storage silo filter vent	0.08
18	Pugmill	10.90
19	Shipping of wetted byproduct/fly ash	10.90
20	Transfer of byproduct/fly ash from truck to existing disposal area	10.90
21	Disposal area earth moving	¹
22	Wind erosion of exposed disposal area	² 5
23	Lime/PAC receiving paved haul road	³ 0.069
24	Byproduct/fly ash shipping unpaved haul road	³ 0.480

¹ There is no MHDR. Emissions based upon silt and moisture content.

² MHDR in units of acres.

³ MHDR in units of vehicular miles traveled per hour (VMT/hr).

There will be a reduction in net power generation as a result of this pollution control device project. Asbury has indicated there is no hourly increase in fuel usage as a result of this project. Permit applicability of the project is based upon an increase in particulate matter emissions from storage silo vents, material handling, haul roads, and disposal activities. Asbury has indicated there will be no increase in any pollutant's emission factor (pounds per million British thermal units, lb/MMBtu) from the boiler's stack (EP-7) as a result of this project. The installation of the pollution control equipment is not required by any current emission standard, therefore there are no special conditions in this permit for its installation and performance testing.

EMISSIONS/CONTROLS EVALUATION

The emission factors and control efficiencies for handling the dry/semi dry lime, PAC, FGD byproduct and fly ash were obtained from the Environmental Protection Agency (EPA) document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 11.12 *Concrete Batching*, June 2006. The controlled emission factors for pneumatic cement unloading and pneumatic cement supplement unloading were selected for emission points 13 through 17. Potential emissions from emission points 18, 19, and 20 were calculated using AP-42 Section 13.2.4, *Aggregate Handling and Storage Piles*, November 2006. Potential emission from emission points 21 and 22 were calculated using AP-42 Section 11.9, *Western Surface Coal Mining*, Tables 11.9-1 and 11.9-4. Potential emissions from the haul roads were calculated using AP-42 Sections 13.2.1 *Paved Roads*, January 2011 and 13.2.2 *Unpaved Roads*, November

2006. A 50 percent reduction in emissions from the unpaved haul road was applied for undocumented watering.

The projected actual emissions (PAE) are approximations based upon projected fuel usage. The FGD reactant does not contain carbon and is not expected to affect greenhouse gas (GHG) emissions. The difference between PAE and baseline actual emissions (BAE) is provided for informational purposes and has not undergone a complete analysis. Potential emissions of the project represent the potential of the new equipment, assuming continuous operation (8,760 hours per year). The following tables provide an emissions summary for this project.

Table 3: Emission Factors for Boiler (EP-7)

Pollutant	^{1,2} Existing Emission Factor (lb/MMBtu)	^{1,3,4} Post-Project Emission Factor (lb/MMBtu)	⁴ PAE – BAE + Project Emissions (tpy)
PM	0.08970	0.05500	-289.51
PM ₁₀	0.05081	0.04630	-52.01
PM _{2.5}	0.04746	0.04555	-31.54
PM filterable	0.04470	0.01	-248.68
PM ₁₀ filterable	0.00581	0.00130	-30.08
PM _{2.5} filterable	0.00246	0.00055	-13.03
PM condensable	0.04500	0.04500	-16.53
SO _x	1.45574	0.06	-10,967.34
NO _x	0.13209	0.13209	-41.47
VOC	0.00347	0.00347	-2.48
CO	0.025	0.025	-17.88
Lead	0.0000210	0.0000210	-0.00060
HAPs	0.01608	0.01608	N/D
Sulfuric acid mist	0.01809	0.0004	-130.92
Hydrogen chloride	0.0103	0.0015	-71.79
Hydrogen fluoride	0.0035	0.0004	-31.43
Mercury compounds	0.0000020	0.0000008	-0.0142
GHG mass	209.78716	209.78716	-46,510.44
GHG CO ₂ e	211.20974	211.20974	-46,825.83

¹ Controlled emission factors where applicable.

² SO_x and NO_x are obtained from electronic data reports. All other emission factors cited from AP-42 Section 1.1 *Bituminous and Subbituminous Coal Combustion*, September 1998.

³ Emission factors for filterable PM, SO_x, sulfuric acid mist (SAM), hydrogen chloride (HCl), hydrogen fluoride (HF), and mercury are cited from bid requirements and have not been verified by the Air Pollution Control Program.

⁴ These values are estimates for informational purposes only and should not be used for emissions inventory, compliance, reporting, or other purposes.

Table 4: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Actual Emissions of Installation (2010 EIQ)	Potential Emissions of the Project	¹ Existing Potential Emissions of EP-7	¹ Post-Project Potential Emissions of EP-7
PM	25.0	N/D	24.30	1,072.60	657.66
PM ₁₀	15.0	381.59	5.41	607.57	553.63
PM _{2.5}	10.0	357.31	1.98	567.48	544.66
SO _x	40.0	9,403.50	N/A	17,406.85	717.44
	40.0	962.50	N/A	1,579.50	1,579.50
VOC	40.0	25.73	N/A	41.53	41.53
CO	100.0	185.34	N/A	298.94	298.94
Lead	0.6	0.13	N/A	0.25	0.25
HAPs	10.0/25.0	102.36	N/A	192.31	192.31
Sulfuric acid mist	7.0	N/D	N/A	216.37	4.78
Hydrogen chloride	10.0	76.34	N/A	123.25	17.94
Hydrogen fluoride	² 0.1	25.89	N/A	41.80	4.78
Mercury compounds	² 0.01	0.015	N/A	0.024	0.0096
GHG mass	100/250	N/D	N/A	2,508,509.01	2,508,509.01
GHG CO ₂ e	75,000/100,000	N/D	N/A	2,525,519.34	2,525,519.34

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

¹ These values are estimates for informational purposes only and should not be used for emissions inventory, compliance, reporting, or other purposes. Worst case ash and sulfur content were selected. Based upon heating value of 20 MMBtu per ton of subbituminous coal only. The boiler combusts a blend of subbituminous and bituminous coal, tire derived fuel, and fuel oil.

² Screening model action level (SMAL).

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

Asbury 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
- *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

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.

David Little
Environmental Engineer

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated September 28, 2011, received October 5, 2011, designating Empire District Electric Company as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Southwest Regional Office Site Survey, dated November 2, 2011.

Mr. Robert Bromley
Plant Manager
Asbury Power Plant
21133 Uphill Lane
Asbury, MO 64832

RE: New Source Review Permit - Project Number: 2011-10-012

Dear Mr. Bromley:

Enclosed with this letter is your permit to construct. Please study it carefully. 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 David Little, at the Department's 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:dpl

Enclosures

c: Southwest Regional Office
PAMS File: 2011-10-012

Permit Number: