

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: 012013-001 Project Number: 2012-06-001
Installation Number: 175-0001
Parent Company: Associated Electric Cooperative, Inc. (AECI)
Parent Company Address: P.O. Box 754, Springfield, MO 65801
Installation Name: AECI Associated Electric Cooperative, Inc.
Installation Address: 5693 Highway F, Clifton Hill, MO 65244
Location Information: Randolph County, S19, T55N, R15W

Application for Authority to Construct was made for:
New fly ash handling system. This 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.

January 4, 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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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."

AECI Thomas Hill Energy Center
Randolph County, S19, T55N, R15W

1. PM Emission Limitation
 - A. AECI Thomas Hill Energy Center shall emit less than 25.0 tons of PM in any consecutive 12-month period from the emission units in Table 2.
 - B. Attachment A and B or equivalent forms, such as electronic forms, approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Condition 1.A.
2. Haul Road Controls
 - A. AECI Thomas Hill Energy Center shall control the fly ash disposal haul roads (FE-02) whenever conditions exist which would cause visible fugitive emissions to enter the ambient air beyond the property boundary, using one or a combination of the following.
 - B. Application of Chemical Dust Suppressants
 - 1) The operator shall apply a chemical dust suppressant (such as magnesium chloride, calcium chloride, lignosulfonates, etc.) to unpaved areas.
 - 2) The quantities of the chemical dust suppressant shall be applied and maintained in accordance with the manufacturer's recommendation (if available) and in sufficient quantities to achieve control of fugitive emissions from these areas while the plant is operating.
 - 3) The operator shall record the time, date and the amount of material applied for each application of the chemical dust suppressant agent on the above areas.
 - C. Application of Water-Documented Daily
 - 1) The operator shall apply water to unpaved areas. Water shall be applied at a rate of 100 gallons per day per 1,000 square feet of unpaved or untreated surface area while the plant is operating.

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SPECIAL CONDITIONS:

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

- 2) Precipitation may be substituted for watering if the precipitation is greater than one quarter of one inch and is sufficient to control fugitive emissions.
 - 3) Watering may also be suspended when the ground is frozen, during periods of freezing conditions when watering would be inadvisable for traffic safety reasons, or when there will be no traffic on the roads.
 - 4) The operator shall record the date and volume of water application or the amount of precipitation that day. The operators shall also record the rationale for not watering (e.g. freezing conditions or not operating).
3. Fly Ash Watering
- A. AECI Thomas Hill Energy Center shall maintain at least 12.0 percent moisture content at each mixer loadout (EP-11C and EP-11D).
 - B. Samples shall be taken at each mixer loadout and tested using method ASTM D2216 or other method preapproved by the Air Pollution Control Program. All test records shall be kept on site.
 - C. Testing shall be conducted according to the following schedule,
 - 1) Weekly testing for a minimum of eight consecutive weeks after startup. Should the testing yield no excursion or excess emissions event during this period then,
 - 2) The permittee shall test monthly for a minimum of six consecutive months. Should the testing yield no excursion or excess emissions event during this period then,
 - 3) The permittee shall test once per every six consecutive months. Tests shall not be conducted within two months of each other.
 - 4) If at any time an excursion or excess emissions event is shown, testing shall revert to the initial weekly frequency and progress in a manner identical to the initial weekly frequency.
 - D. Excursion and excess emissions event
 - 1) Moisture content below the limit will be considered an excursion and a corrective action shall be implemented within 48 hours. A record of the corrective action shall be kept.
 - 2) Moisture content below the limit at any time after an excursion will be considered an excess emissions event and a corrective action shall be implemented within 48 hours. A record of the corrective action shall be kept.

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SPECIAL CONDITIONS:

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

- E. If there are two excess emission events within a six month period, respective to an emission unit, the permittee shall either
 - 1) Submit a complete Application for Authority to Construct to the Air Pollution Control Program within 90 days of the last excess emissions event, or
 - 2) Develop a new FE-08 emission factor for use in Attachment A, using the lowest moisture content from the excess emission events, silt content of 20 percent, and the AP-42 Table 11.9-1 October, 1998 equation for bulldozing overburden. The new emission factor shall be preapproved by the Air Pollution Control Program.

- 4. Operational Requirement
 - A. Fly ash mixers (EP-11C and EP-11D) and all disposal area ash placement heavy equipment (i.e. bulldozers) shall each be fitted with a non-resettable hour meter that indicates hours of operation.

 - B. AECI Thomas Hill Energy Center shall make daily records of the number of haul truck trips to the fly ash disposal area.

 - C. Haul truck miles shall be calculated monthly by multiplying the sum of the daily number of trips by the round trip distance to the disposal area, for use in Attachment A.

- 5. Record Keeping and Reporting Requirements
 - A. AECI Thomas Hill Energy Center shall maintain all records required by this permit for not less than five years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request.

 - B. AECI Thomas Hill Energy Center 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 show an exceedance of a limitation imposed by this permit.

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

Project Number: 2012-06-001
Installation ID Number: 175-0001
Permit Number:

AECI Thomas Hill Energy Center
5693 Highway F
Clifton Hill, MO 65244

Complete: June 11, 2012

Parent Company:
Associated Electric Cooperative, Inc.
P.O. Box 754
Springfield, MO 65801

Randolph County, S19, T55N, R15W

REVIEW SUMMARY

- AECI Thomas Hill Energy Center has applied for authority to construct a new fly ash handling system.
- HAP emissions are not expected from the proposed emission units.
- None of the New Source Performance Standards (NSPS) under 40 CFR 60 apply to the proposed emission units.
- None of the National Emissions Standards for Hazardous Air Pollutants (NESHAPs) under 40 CFR 61 apply to the proposed emission units.
- None of the Maximum Achievable Control Technology (MACT) regulations under 40 CFR 63 apply to the proposed emission units.
- Watering is being used to control the PM, PM₁₀, and PM_{2.5} emissions from the mixer loadout. Watering or chemical dust suppressants are being applied to the unpaved haul roads.
- 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 are conditioned below the de minimis level. Potential emissions of PM₁₀ and PM_{2.5} are indirectly conditioned below the respective de minimis level.
- This installation is located in Randolph 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 26. Fossil-fuel-

fired steam electric plants of 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 PM₁₀ and PM_{2.5} are below respective de minimis levels. There is no modeling standard for PM.
- Moisture testing is required for the proposed mixer loadouts.
- Submittal of an application to amend 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

AECI Thomas Hill Energy Center is an existing, primarily coal-fired, electric generating installation near Clifton Hill. The installation is a major source for New Source Review applicability and holds a Part 70 operating permit. The following New Source Review permits have been issued to AECI Thomas Hill Energy Center from the Air Pollution Control Program.

Table 2: Permit History

Permit Number	Description
0278-001	PSD for 610 MW Unit 3
0380-011	Increased coal production, coal preparation plant
0181-002	Increased coal production
0380-011B	Amendment to receive washed coal at existing truck dump
0380-011C	Amendment to 0380-011B
0380-011D	Amendment to include PM ₁₀
0380-011E	Amendment to correct emission factors and control efficiencies
0493-017	Switch to PRB coal
0493-017A	Remove radial stacker
0493-017A	Equipment change
0596-041	SO ₃ injection to Unit 3 precipitator
0596-041A	Remove SO ₂ limit
112002-006	Temporary permit for diesel fired generator
122009-002	Cycleclean fuel additive
122010-011	PSD to increase CO limit

PROJECT DESCRIPTION

AECI proposes to install a fly ash handling system consisting of two enclosed mixers, mixer loadout, disposal haul roads, dump-truck loadout, and disposal area activities. The system is being installed due to pending federal solid waste regulations which will render the existing fly ash handling system obsolete. The existing system consists of pneumatic fly ash loadout to enclosed semi-trailers, with the fly ash being mixed with water at the disposal area and then being pumped into place. The existing system will be kept as a back-up. There will be no change in bottom ash disposal under this

project. Some fly ash may be sold for off-site use, however the project MHDR is conservatively based upon all fly ash being disposed on-site. Project emission units are listed in the following table. The MHDR is based upon the boilers' capacity and fuel characteristics. They are not direct hourly limits. Some fly ash may be sold offsite, rather than landfilled.

Table 3: Project Emission Units

Emission Point	Description	Bottlenecked MHDR (tons per hour)
EP-11C	Unit 3 fly ash mixer loadout	14.32
EP-11D	Units 1 and 2 fly ash mixer loadout	6.20
FE-02	Disposal route unpaved haul road	¹ 3.83
FE-03A	Dump truck fly ash loadout	20.52
FE-08	Disposal area fly ash placement with bulldozer	²
FE-09	Disposal area bulldozer vehicular activity	¹ 0.005

¹ MHDR in units of vehicular miles traveled per hour (VMT/hr).

² There is no MHDR. Emissions based upon fly ash silt and moisture content.

EMISSIONS/CONTROLS EVALUATION

The emission factors for handling the fly ash (EP-11C, EP-11D, FE-03A) were obtained from the Environmental Protection Agency (EPA) document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 13.2.4, *Aggregate Handling and Storage Piles*, November 2006. The two mixers are enclosed. Emissions were considered negligible from the mixing process. Mixer loadout will occur with moisture content between 12 and 16%. Mixer loadout emissions conservatively cite the upper limit of the AP-42 range, 4.8%. Wind speed at the loadout point was cited at 9.8 miles per hour from the nearest meteorological reporting station's 32 year dataset. Potential emissions from fly ash loadout comprise a very small amount of the project emissions. According to AP-42 Table 13.2.4-1 fly ash silt content is 80%. A dry ash sample from Thomas Hill shows 89.6% silt content. The new loadout system will wet the fly ash before being loaded into trucks, and it will remain wet. A wetted, packed, dried, then broken Thomas Hill sample shows 17.4% silt content. A higher silt content of 20% was chosen as the wetted then dried silt test was only conducted once.

Potential emissions from the haul road (FE-02) and disposal area vehicular activity (dozer routes FE-09) were calculated using AP-42 Section 13.2.2 *Unpaved Roads*, November 2006. Haul road emissions have been previously considered at the installation, but do not account for the longest disposal route to Cell 7. Conservatively, the haul road emissions were calculated using the potential emissions, not potentials-minus-actuals. A 90% reduction in emissions from the unpaved haul road was applied for watering with documented application rates or applied chemical suppressant. Watering was not considered at the bulldozer routes and is not required.

Potential emissions from the ash placement with bulldozer (FE-08) have not been previously considered at the installation, and were calculated using AP-42 Section 11.9, *Western Surface Coal Mining*, Tables 11.9-1, October 1998, bulldozing overburden. Fly ash moisture content of 12% was selected. Wetted fly ash silt content of 20% was selected.

Potential emissions from earthwork wind erosion and earthwork itself were not considered. The disposal areas are existing strip mine pits. Most surfaces are rock, with established vegetation, or covered in water. New disposal areas are not being excavated for this project. Earthen daily cover is not being applied to the disposal areas, just a final cap when a disposal area has reached capacity. Wind erosion from the fly ash was not considered as it is wet and cementitious.

The following table provides an emissions summary for this project. Existing potential emissions were cited from operating permit OP2010-126, except for CO which was cited from the 13,873 tpy limit for Unit 1 and Unit 2 in permit 122010-011. The limit does not include Unit 3. Existing actual emissions were cited from the installation's 2011 EIQ. Potential emissions of the application represent the potential of the new emission units, assuming continuous operation (8,760 hours per year).

Table 4: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Potential Emissions	Existing Actual Emissions (2011 EIQ)	Conditioned Potential Emissions of the Application	New Installation Conditioned Potential
PM	25.0	major	N/D	< 25.0	major
PM ₁₀	15.0	588.18	544.00	6.53	major
PM _{2.5}	10.0	N/D	444.67	1.76	major
SO _x	40.0	25,188.65	19,246.07	N/A	major
NO _x	40.0	36,500.23	8,484.24	N/A	major
VOC	40.0	1,157.04	194.64	N/A	major
CO	100.0	>13,873	5,444.35	N/A	major
Lead	0.6	0.58	0.03	N/A	non-major
HAPs	10.0/25.0	178.99	151.53	N/A	major

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

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 are conditioned below the de minimis level. Potential emissions of PM₁₀ and PM_{2.5} are indirectly conditioned below the respective de minimis level.

APPLICABLE REQUIREMENTS

AECI Thomas Hill Energy 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
- *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
New Source Review Unit

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated May 31, 2012, received June 1, 2012, designating Associated Electric Cooperative, Inc. as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.

APPENDIX A

Abbreviations and Acronyms

%	percent	m/s	meters per second
°F	degrees Fahrenheit	Mgal	1,000 gallons
acfm	actual cubic feet per minute	MW	megawatt
BACT	Best Available Control Technology	MHDR	maximum hourly design rate
BMPs	Best Management Practices	MMBtu	Million British thermal units
Btu	British thermal unit	MMCF	million cubic feet
CAM	Compliance Assurance Monitoring	MSDS	Material Safety Data Sheet
CAS	Chemical Abstracts Service	NAAQS ...	National Ambient Air Quality Standards
CEMS	Continuous Emission Monitor System	NESHAPs	
CFR	Code of Federal Regulations	National Emissions Standards for Hazardous Air Pollutants
CO	carbon monoxide	NO_x	nitrogen oxides
CO₂	carbon dioxide	NSPS	New Source Performance Standards
CO_{2e}	carbon dioxide equivalent	NSR	New Source Review
COMS	Continuous Opacity Monitoring System	PM	particulate matter
CSR	Code of State Regulations	PM_{2.5}	particulate matter less than 2.5 microns in aerodynamic diameter
dscf	dry standard cubic feet	PM₁₀	particulate matter less than 10 microns in aerodynamic diameter
EQ	Emission Inventory Questionnaire	ppm	parts per million
EP	Emission Point	PSD	Prevention of Significant Deterioration
EPA	Environmental Protection Agency	PTE	potential to emit
EU	Emission Unit	RACT	Reasonable Available Control Technology
fps	feet per second	RAL	Risk Assessment Level
ft	feet	SCC	Source Classification Code
GACT	Generally Available Control Technology	scfm	standard cubic feet per minute
GHG	Greenhouse Gas	SIC	Standard Industrial Classification
gpm	gallons per minute	SIP	State Implementation Plan
gr	grains	SMAL	Screening Model Action Levels
GWP	Global Warming Potential	SO_x	sulfur oxides
HAP	Hazardous Air Pollutant	SO₂	sulfur dioxide
hr	hour	tph	tons per hour
hp	horsepower	tpy	tons per year
lb	pound	VMT	vehicle miles traveled
lbs/hr	pounds per hour	VOC	Volatile Organic Compound
MACT	Maximum Achievable Control Technology		
µg/m³	micrograms per cubic meter		

Mr. Todd Tolbert
Senior Environmental Analyst
AECI Thomas Hill Energy Center
P.O. Box 754
Springfield, MO 65801

RE: New Source Review Permit - Project Number: 2012-06-001

Dear Mr. Tolbert:

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 David Little, 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:dll

Enclosures

c: Northeast Regional Office
PAMS File: 2012-06-001

Permit Number: