

Missouri Department of dnr.mo.gov

NATURAL RESOURCES

Eric R. Greitens, Governor

Carol S. Comer, Director

JUN 13 2017

Mr. Sean Mulherin
Operation Manager
Headwaters Resources-Macon Screening Operations
8501 N. State Route 94
West Alton, MO 63386, MO 63552

RE: New Source Review Temporary Permit Request - Project Number: 2017-05-002

Expiration Date: August 31, 2017

Temporary Permit Number: 062017-004

Dear Mr. Mulherin:

The Missouri Department of Natural Resources' Air Pollution Control Program has completed a review of your request to operate a coal slag screening operation at Headwaters Resources-Macon Screening Operations, located in West Alton, MO 63386, Missouri. The Air Pollution Control Program is hereby granting your request to conduct this temporary operation at this location in accordance with Missouri State Rule 10 CSR 10-6.060(3).

Headwaters Resources will be screening coal slag that was delivered by truck from Thomas Hill Energy Center to the Macon location. The coal slag is a byproduct of burning coal within boilers for electrical generation. The coal slag is removed from the boilers and stored in a pond. Coal slag particulate emissions were approximated using emission factors for crushed limestone with 1.5% moisture content. Coal slag screened by Headwaters Resources will have a high moisture content because of the pond storage and therefore testing for a 1.5% moisture content will not be required. The coal slag will be delivered by truck and dumped into storage piles. A front loader will move material from the coal slag storage pile to a feed hopper. The feed hopper will then drop slag onto a conveyor that will empty into a screening unit. The screen will separate fine coal slag particles and larger particles onto two separate conveyors which will then feed two separate storage piles. The separate fines and oversize storage piles will be moved via front loader to a haul truck. Fine slag will be delivered for a temporary highway project and the oversize slag will be sold without further treatment. All coal slag will be delivered on a haul road measuring approximately 425 feet and screened product will shipped via a 100 foot haul road.



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Emissions for the project were calculated using emission factors found in the United States Environmental Protection Agency (EPA) document AP-42 Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition (AP-42). Emissions from the rock-crushing equipment were calculated using emission factors from AP-42 Section 11.19.2 "Crushed Stone Processing and Pulverized Mineral Processing," August 2004. The plant will be powered by diesel engine, however it meets the definition of nonroad engine as defined in 40 CFR 89.2 (1)(i). Therefore, the emissions of the engine were not included in the project emissions.

There are trace element concentrations in coal slag, however, due to the lack of coal slag HAPs emission factors, coal bottom ash emission factors were used to approximate HAP emissions. Coal bottom emission factor values and considerations can be found in Table 6, "Reuse Options For Coal Fired Power Plant Bottom Ash and Fly Ash," Jayaranjan, Hullebusch, and Annachhatrewe, 01 April 2014, "Characterization of Coal Combustion Residues from Electric Utilities – Leaching and Characterization Data" EPA December 2009, "Chemical Constituents In Coal Combustion Product Leachate: Beryllium" EPRI November 2006, "Technical Memorandum, Technical Briefing Paper on Selenium" prepared by Exponent for TVA July 2010, and "Coal Ash: Characteristics, Management and Environmental Issues: EPRI September 2009. The highest concentration found in subbituminous coal ash for each of the concerned HAPs was used to calculate the HAPs emission from particulate matter. All individual HAPs were below the SMAL and de minimis level. Combined HAPs are below the 25.0 ton de minimis level.

Permission to operate the slag screening equipment at this site is granted for the time period between June 9, 2017 and August 31, 2017 resulting in a maximum potential operating time of 1,992 hours during the time period of 83 days. The temporary operation is expected to complete in early summer so setting the expiration date August 31, 2017 will allow for extra time in case of delays or unexpected coal slag demand. Additionally, this expiration sets the potential to emit below de minimis by a conservative margin. The calculations were performed using the basis that 175 tons of coal slag would be screened per hour. With 175 tons of coal slag being screened per hour over 1,992 (83 days x 24 hrs/day) hours, the total coal slag that may be processed before this temporary permit expires will be 10,000 tons (see Special Condition 1 below).

Table 1: Allowable Emissions for 4176 hours of Operation Summary (tons)

PM	PM ₁₀	PM _{2.5}	HAPs
34.25	10.45	1.12	0.0033

Headwaters Resources is authorized to construct and operate subject to the following special conditions:

1. Headwaters Resources shall screen a total of no more than 10,000 tons of coal slag over the 83 day duration of this temporary permit. All coal slag screening equipment must cease operation no later than August 31, 2017.

Mr. Sean Mulherin
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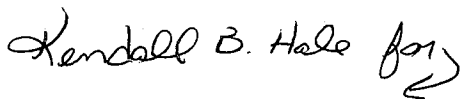
Headwaters Resources is still obligated to meet all applicable air pollution control rules, Department of Natural Resources' rules, or any other applicable federal, state, or local agency regulations. Specifically, you should avoid violating 10 CSR 10-6.045 *Open Burning Requirements*, 10 CSR 10-6.220 *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.165 *Restriction of Emission of Odors*, 10 CSR 10-6.170 *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, and 10 CSR 10-6.400 *Restriction of Emission of Particulate Matter From Industrial Processes*. No operating permit is required as part of this temporary permit. The unit is exempt from NSPS OOO because the slag will only undergo separation by screening.

You are still obligated to meet all applicable air pollution control rules, Department of Natural Resources' rules, or any other applicable federal, state, or local agency regulations. Specifically, you should avoid violating 10 CSR 10-6.045 *Open Burning Requirements*, 10 CSR 10-6.220, *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.165 *Restriction of Emission of Odors*, 10 CSR 10-6.170 *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, and 10 CSR 10-6.400 *Restriction of Emission of Particulate Matter From Industrial Processes*.

A copy of this letter should be kept with the unit and be made available to Department of Natural Resources' personnel upon verbal request. If you have any questions regarding this determination, please do not hesitate to contact Kathy Kolb at the departments' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or by telephone at (573) 75 1-4817. Thank you for your time and attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Handwritten signature of Kendall B. Hale in cursive, with a small arrow pointing to the right below the signature.

Kyra L. Moore
Director

KLM:kkj

c: PAMS File: 2017-05-002
Northeast Regional Office

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For Single Plant Operation

Hours per day	24.0
Days per year	119.1
Hours per year	8760.0

For Multiple Plant Operation

Hours per day	24.0
Days per year	119.1
Hours per year	1992.0

Pollutant Justification for Limit

PM10	De Minimis
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Pollutant	Potential Emissions from Process Equipment (tons/yr)	Potential Emissions including fugitives (tons/yr)	Allowable Emissions for 1992 hours per year (tons/yr)	De Minimis Threshold	Plant-wide Composite Emission Factor (lb/ton)
PM	0.92	150.61	34.25	25	0.1955
PM ₁₀	0.31	45.96	10.75	15	0.0600
PM _{2.5}	0.03	4.93	1.25	10	0.0064
SO ₂	-	-	-	40	0.0000
NO ₂	-	-	-	40	0.0000
VOC	-	-	-	40	0.0000
CO	-	-	-	100	0.0000
CH ₂ O	-	-	-	2.00	0.0000
Pb	-	-	-	0.01	0.0000
HAPs	-	-	-	10	0.0000
CO ₂	-	-	-	100	0.0000
N ₂ O	-	-	-	100	0.0000
CH ₄	-	-	-	100	0.0000
GHG _{mass}	-	-	-	100	0.0000
CO ₂ eq	-	-	-	100,000	0.0000

Limit Hours per Year
Limit Hours per Year w/ 24 hr day

Maximum hourly design rate (tons/hr)	175
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Tons of product per day	4,200.0
Tons of product per year	348,600.0

Trace Elements	Composition of ash (wt %)	Allowable PM (tpy)	Estimated HAP from Ash (tpy)	SMAL
antimony	0.00140%	0.92	0.0000	5
As/Arsenic	0.05100%	0.92	0.0005	0.005
beryllium	0.00250%	0.92	0.0000	0.008
Cd/Cadmium	0.00350%	0.92	0.0000	0.01
Cr/Chromium 3	0.11000%	0.92	0.0010	5
Co/Cobalt	0.00660%	0.92	0.0001	0.1
lead	0.02300%	0.92	0.0002	0.01
Mn/Manganese	0.08900%	0.92	0.0008	0.8
mercury	0.00015%	0.92	0.0000	0.01
nickel	0.04400%	0.92	0.0004	1
selenium	0.02100%	0.92	0.0002	0.1
TOTAL			0.013	25

HAP weight %

"Reuse Options for Coal Fired Power Plant Bottom Ash and Fly Ash" Jayaranjan, Hullebusch, and Annachatre. Rev Environ Sci Biotechnol. Published online April 1, 2014.

DOI 10.1007/s11157-014-9336-4 concentrations obtained from Table 3 and Table 6 in the above document. Concentrations used for subbit, if not available then bit.

"Characterization of Coal Combustion Residues from Electric Utilities – Leaching and Characterization Data" EPA December 2009. EPA-600/R-09/151. Table ES-2

"Chemical Constituents in Coal Combustion Product Leachate: Beryllium" EPRI November 2006.

"Technical Memorandum, Technical Briefing Paper on Selenium" prepared by Exponent for TVA, July 2010, document number 0900462.000 0201 0609 AF26, page 7 of 50 pdf

"Coal Ash: Characteristics, Management and Environmental Issues" EPRI. September 2009. Table 2.

HAP	Sub-bit (mg/kg fly ash)	Bit (mg/kg fly ash)	fly ash maximum concentration (wt %)	Source
antimony		14	0.00140%	EPA
arsenic		510	0.05100%	EPA
beryllium	25		0.00250%	EPRI 2006
cadmium		35	0.00350%	R.E.S.B.
chromium		300	0.03000%	EPRI 2009
cobalt		66	0.00660%	EPA
lead		230	0.02300%	EPRI 2009
manganese		700	0.07000%	EPRI 2009
mercury		1.5	0.00015%	EPA
nickel		230	0.02300%	EPRI 2009
selenium		210	0.02100%	EPA

124 0.339726027

365

124*8

992

HAP	Sub-bit (mg/kg bottom ash)	Bit (mg/kg bottom ash)	bottom ash maximum concentration (wt %)	Source
antimony		0.01	0.000001%	EPRI 2009
arsenic	30		0.00300%	R.E.S.B.
beryllium		14	0.00140%	EPRI 2009
cadmium	0.6		0.00006%	R.E.S.B.
chromium		1100	0.11000%	EPRI 2009
cobalt	13		0.00130%	R.E.S.B.
lead		53	0.00530%	EPRI 2009
manganese		890	0.08900%	EPRI 2009
mercury		0.07	0.00001%	EPRI 2009
nickel		440	0.04400%	EPRI 2009
selenium		14	0.00140%	Exponent

value was below detection level, so I assumed 0.01