

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: **122017-006** Project Number: 2017-09-024

Installation Number: 186-0044

Parent Company: Holcim (US) Inc.

Parent Company Address: 8700 W Bryn Mawr Ave. Suite 300, Chicago, IL 60631

Installation Name: Holcim (US) Inc. - Ste. Genevieve Plant


Installation Address: 2942 US Hwy 61, Bloomsdale, MO 63627

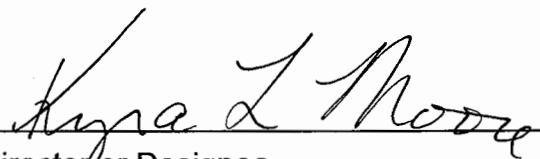
Location Information: Ste. Genevieve County, S9, T39N, R7E

Application for Authority to Construct was made for:
Installation of petcoke precrusher emission unit L62-RC1. 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.


Prepared by
David Little, PE
Environmental Engineer III
New Source Review Unit


Director or Designee
Department of Natural Resources
DEC 15 2017
Effective Date

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 Enforcement and Compliance Section of 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 Enforcement and Compliance Section of 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 within 30 days of actual startup. Also, you must notify the Department's 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 the permit application and this permit and permit review shall be kept at the installation address and shall be made available to Department's 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 using the contact information below.

Contact Information:
Missouri Department of Natural Resources
Air Pollution Control Program
P.O. Box 176
Jefferson City, MO 65102-0176
(573) 751-4817

The regional office information can be found at the following website:
<http://dnr.mo.gov/regions/>

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."

Holcim (US) Inc. - Ste. Genevieve Plant
Ste. Genevieve County, S9, T39N, R7E

1. Capture Device Requirement
 - A. Holcim (US) Inc. - Ste. Genevieve Plant shall capture emissions from the petcoke precrusher (L62-RC1) using an enclosure maintained at negative pressure during all precrusher operation. The enclosure flanges need not be sealed.
 - B. Holcim (US) Inc. - Ste. Genevieve Plant shall demonstrate negative pressure at the enclosure using a gauge or meter. The gauge or meter shall be operated and maintained in accordance with the manufacturer's specifications, which shall be kept on site. The gauge or meter shall be located such that department employees may easily observe it. Use of the existing pressure monitors located across the coal mill (L62-RM1) is sufficient. No additional or new monitor is required.
 - C. Holcim (US) Inc. - Ste. Genevieve Plant shall continuously monitor and record the operating pressure drop during precrusher operation. Periods of no precrusher operation shall be indicated.
2. Control Device Requirement
 - A. Holcim (US) Inc. - Ste. Genevieve Plant shall control emissions from the petcoke precrusher (L62-RC1) using existing baghouse (L62-BF1) as specified in the permit application.
 - B. The baghouse remains subject to requirements including but not limited to those in permit 062004-005C and 40 CFR 63 Subpart LLL.
3. Record Keeping and Reporting Requirements
 - A. Holcim (US) Inc. - Ste. Genevieve Plant 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. These records shall include SDS for all materials used.
 - B. Holcim (US) Inc. - Ste. Genevieve Plant shall report to the Air Pollution Control Program's Compliance/Enforcement Section, by mail at P.O. Box 176, Jefferson City, MO 65102 or by email at AirComplianceReporting@dnr.mo.gov, no later than 10 days after the end of the month during which any record required by this permit shows an exceedance of a requirement imposed by this permit.

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

Project Number: 2017-09-024

Installation ID Number: 186-0044

Permit Number: 122017-006

Installation Address:

Holcim (US) Inc. - Ste. Genevieve Plant
2942 US Hwy 61
Bloomsdale, MO 63627

Parent Company:

Holcim (US) Inc.
8700 W Bryn Mawr Ave. Suite 300
Chicago, IL 60631

Ste. Genevieve County, S9, T39N, R7E

REVIEW SUMMARY

- Holcim (US) Inc. - Ste. Genevieve Plant has applied for authority to install a crusher (L62-RC1) to precrush petcoke before entering the existing coal mill 2 (L62-RM1).
- The application was deemed complete on October 24, 2017.
- HAP emissions including metallic HAPs and POM/PAH are expected from the precrusher.
- NSPS 40 CFR 60 Subpart Y, *Standards of Performance for Coal Preparation Plants*, applies to the precrusher.
- None of the NESHAPs under 40 CFR 61 apply to the precrusher.
- None of the MACTs under 40 CFR 63 apply to the precrusher. However, the precrusher emissions are comingled with emissions from units that are subject to MACT LLL. The precrusher emissions are by default represented by MACT LLL, which are stricter than NSPS Y.
- The existing baghouse L62-BF1 is being used to control the filterable particulate emissions from the new precrusher.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Uncontrolled potential emissions exceed the values in 10 CSR 10-6.061(3)(A)3.A., thus requiring a permit. This permit makes enforceable the use of the existing baghouse for the new precrusher. Controlled potential emissions of all pollutants from the precrusher are below de minimis levels.
- This installation is located in Ste. Genevieve County, an attainment/unclassifiable 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 3. *Portland cement plants*. 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 project are below de minimis levels.
- Emission testing is not required as a part of this permit. Testing elsewhere at the installation is required as part of other state, federal or applicable rules.
- This project is an off-permit change for the operating permit. As to not further delay the draft operating permit (project 2010-07-011) issuance, this project can be added to the operating permit after its issuance.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Holcim (US) Inc. - Ste. Genevieve Plant (Holcim) is a Portland cement manufacturing installation located near Bloomsdale. Holcim is a major source of several pollutants. The following NSR permits have been issued to Holcim from the program.

Table 1: Permit History

Permit Number	Description
062004-005	PSD for new Portland cement manufacturing installation
022001-006T	Rock crushing
062004-005A	PSD amendment for as-built changes
032009-016	Temporary permit for crusher and screen
062004-005B	PSD amendment for haul roads
062004-005C	PSD amendment for haul roads
102011-012	Track mounted crusher
012013-005	Barge loading
082013-005	Dust collection upgrade
052014-002	Temporary lime injection test
062004-005D	PSD amendment for sorbent injection
092016-009	Reconstruct clinker cooler

PROJECT DESCRIPTION

Holcim proposes to install a petcoke precrusher. The precrusher will be a single roll crusher approximately 24" x 48" exterior dimensions. It will be located in the existing L62 grinding system, enclosed in the material chute, and will vent to the existing baghouse (L62-BF1). Petcoke will enter the existing grinding system, travel to the existing selector gate (L62-MW1), to the new precrusher (L62-RC1), and then to the existing coal mill 2 (L62-RM1). Previously, petcoke traveled from the selector gate to

the coal mill. The new precrusher is bottlenecked to 44 tph by the existing coal mill when the coal mill crushes petcoke. 104.72 tph is the design rate of the existing coal mill when crushing coal. Coal will also pass through the precrusher, and typically act as a transfer point rather than a crusher.

The petcoke precrusher is being installed to pre-grind petcoke before entering the existing coal mill. Beginning in 2013, Holcim started using large quantities of a petcoke that is harder than the existing petcoke. Starting in 2018, the existing, softer petcoke will not be used due to market conditions. According to Holcim, the purpose of the precrusher project is to protect the coal mill from vibration-related damage occurring while grinding larger pieces of the harder petcoke.

It appears as if usage of the harder petcoke may not exist but for the addition of the precrusher. The installation may not be capable of accommodating the harder petcoke without the precrusher. If this is true, then the project is not limited to the precrusher, but all aspects of the harder petcoke including delivery, storage, handling, combustion, etc. Statements from the petcoke industry say harder petcoke is from heavier crudes. Therefore, heavier crudes may result in different petcoke properties, and this could be a new fuel for NSR purposes.

- However, in this case the new, harder petcoke is practically equal to the existing, softer petcoke in the properties of moisture, ash, volatile matter, fixed carbon, sulfur, and Btu contents. Therefore potential emissions of PM filterable, PM₁₀ total, PM_{2.5} total, VOC, CO, CO₂, and SO₂ are expected to be equal between the petcoke.
- The practically equal Btu contents result in the same amount of usable energy and no potential clinker production increase.
- The petcoke has a different Hardgrove Grindability Index. The new petcoke is harder, thus the need for the precrusher.
- Petcoke has a high nitrogen content and may contribute to the production of high fuel-bound NO_x emissions. Heavy oils contain more organically bound nitrogen than lighter oils. As the new petcoke may originate from heavier crude, then it may have higher nitrogen content and therefore higher fuel-bound NO_x emissions. However, NO_x formation is complex. No information was available during the permit review that would conclusively say there will be a potential NO_x emission increase as a result of the new petcoke. However, Holcim should be aware that if there is a potential or actual NO_x increase then this issue may need to be reevaluated for NSR permit applicability.
- Differences in other properties such as metallic HAPs and POM/PAH HAPs content were not available.

Holcim states that the harder petcoke has had no effects on kiln combustion emissions or clinker quality. Considering all of the above, the harder petcoke is not a new fuel for NSR purposes at this time. The petcoke is practically equal and therefore delivery, storage, other handling, and kiln combustion are not modified. The project remains as just the precrusher.

EMISSIONS/CONTROLS EVALUATION

The precrusher will be routed to the existing baghouse (L62-BF1). Previously, emissions from the baghouse have been evaluated using grains per cubic feet of airflow. This project does not change the grain value, air flowrate, or hours of usage. However, the precrusher is a new emission unit and conservatively has its own potential emissions.

Potential PM filterable emissions from the precrusher were evaluated starting with SCC 3-03-003-10 for coal crushing with a cyclone, 0.11 lb/ton coal. The estimated PM filterable cyclone control efficiency of 75% obtained from AP-42 Table B.2-3 AIRS code 008 was removed to arrive at an uncontrolled emission factor of 0.44 lb/ton coal. Uncontrolled PM filterable emissions from petcoke were estimated by multiplying the uncontrolled coal emission factor by the ratio of petcoke silt to coal silt. The uncontrolled PM filterable emission factor is then 2.03 lb/ton petcoke.

Although the precrusher will be part of the in-line coal mill which has negative pressure upon it, the precrusher enclosure may not have 100% capture efficiency at all times. NSPS Subpart Y and MACT Subpart LLL do not explicitly require 100% capture efficiency. Also, this permit's special conditions do not require 100% capture efficiency. Precrusher capture efficiency was estimated at 99%.

At 44 tph of coke, a 2.03 lb/ton emission factor, 99% capture efficiency, a permits section default baghouse PM filterable control efficiency of 99.5%, and 8,760 hrs/yr; the resulting PM filterable potential emissions are 5.84 tpy. PM₁₀ filterable and PM_{2.5} filterable were not calculated, but won't exceed PM filterable.

Potential HAP emissions from the precrusher were calculated by multiplying petcoke HAP concentrations by the PM filterable potential emissions. Potential emissions of fluoranthene, phenanthrene, and anthracene exceed the SMAL, and would require modeling. However, the precrusher emits with the in-line coal mill which is subject to MACT LLL. EPA has completed this MACT's Risk and Technology Review (RTR), therefore it is program policy to not model these HAPs in this instance.

The following table provides an emissions summary for this project. Existing potential emissions were obtained from the draft operating permit of project 2010-07-011. Existing actual emissions were obtained from the 2016 EIQ, with GHG from EPA's flight website. Potential emissions of the project represent the potential of the new petcoke precrusher.

Table 2: Emissions Summary (tpy)

Pollutant	<i>De Minimis</i> Levels / SMALs	Existing Potential Emissions	Existing Actual Emissions	Potential Emissions of the Project	New Installation Conditioned Potential
PM	25.0	N/D	N/D	5.84	N/D
PM ₁₀	15.0	>100	333.90	N/D	>100
PM _{2.5}	10.0	>100	239.24	N/D	>100
SO ₂	40.0	>100	578.54	N/A	>100
NO _x	40.0	>100	2,661.02	N/A	>100
VOC	40.0	>100	261.61	N/A	>100
CO	100.0	>100	1,044.71	N/A	>100
GHG (CO ₂ e)	N/A	N/D	2,661,889	N/A	N/D
GHG (mass)	N/A	N/D	2,656,870	N/A	N/D
Combined HAPs	25.0	>25.0	34.14	0.08	>25.0
Combined POM	10.0	N/D	N/D	7.6E-02	N/D
Fluoranthene POM	0.01	N/D	N/D	1.2E-02	N/D
Phenanthrene POM	0.01	N/D	N/D	5.3E-02	N/D
Anthracene POM	0.01	N/D	N/D	1.2E-02	N/D
Antimony	5	N/D	N/D	2.8E-04	N/D
Arsenic	0.005	N/D	N/D	1.1E-04	N/D
Beryllium	0.008	N/D	N/D	5.6E-05	N/D
Cadmium	0.01	N/D	N/D	5.6E-05	N/D
Chromium	5	N/D	3.6E-03	5.6E-05	N/D
Cobalt	0.1	N/D	N/D	5.6E-05	N/D
Lead	0.01	N/D	2.2E-03	1.1E-04	N/D
Manganese	0.8	N/D	1.5E-02	1.1E-04	N/D
Nickel	1	N/D	N/D	2.1E-03	N/D
Selenium	0.1	N/D	N/D	1.1E-04	N/D

N/A = Not Applicable; N/D = Not Determined
The metallic HAPs are compounds.

APPLICABLE REQUIREMENTS

Holcim (US) Inc. - Ste. Genevieve 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

- *Operating Permits*, 10 CSR 10-6.065
- *Start-Up, Shutdown, and Malfunction Conditions*, 10 CSR 10-6.050
- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110
 - Per 10 CSR 10-6.110(4)(B)2.B(II) and (4)(B)2.C(II) a full EIQ is required for the first full calendar year the equipment (or modifications) approved by this permit are in operation.
- *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

SPECIFIC REQUIREMENTS

- *New Source Performance Regulations*, 10 CSR 10-6.070
 - –*Standards of Performance for Coal Preparation Plants*, 40 CFR Part 60, Subpart Y
- *MACT Regulations*, 10 CSR 10-6.075
 - *National Emission Standards for Hazardous Air Pollutants From the Portland Cement Manufacturing Industry*, 40 CFR Part 63, Subpart LLL

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*, it is recommended that this permit be granted with special conditions.

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated September 15, 2017, received September 18, 2017, designating Holcim (US) Inc. as the owner and operator of the installation.

The following documents are permit references:

- *AP-42 Compilation of Air Pollutant Emission Factors*, U.S. EPA, Fifth Edition.
- *Petroleum Coke in the Urban Environment: A Review of Potential Health Effects*, International Journal of Environmental Research and Public Health, 2015.
- *Petroleum Coke Category Analysis and Hazard Characterization*, American Petroleum Institute, December 28, 2007.
- *City of Chicago Fugitive Dust Study*, CDM Smith, March 2014.
- *An Alternative Use for Fuel Coke*, Gipson, ConocoPhillips, 2009.
- U.S. EPA flight website, <https://ghgdata.epa.gov/ghgp/main.do>
- *Control of Nitrogen Oxides Emissions*, APTI Course 418 Student Manual, ICES Ltd., September 2000.
- *The Coen and Hamworthy Combustion Handbook, Fundamentals for Power, Marine & Industrial Applications*, Londerville and Baukal, 2013.
- *2017-09-024 draft 1 comments.docx*, received November 27, 2017.
- *2017-09-024 draft 2 comments.docx*, received November 30, 2017.
- Emails between Marcus Genova of Holcim (US) Inc and David Little of the program.

APPENDIX A

Abbreviations and Acronyms

%percent	Mgal1,000 gallons
°Fdegrees Fahrenheit	MWmegawatt
acfmactual cubic feet per minute	MHDRmaximum hourly design rate
BACTBest Available Control Technology	MMBtuMillion British thermal units
BMPsBest Management Practices	MMCFmillion cubic feet
BtuBritish thermal unit	MSDSMaterial Safety Data Sheet
CAMCompliance Assurance Monitoring	NAAQSNational Ambient Air Quality Standards
CASChemical Abstracts Service	NESHAPs National Emissions Standards for Hazardous Air Pollutants
CEMSContinuous Emission Monitor System	NO_xnitrogen oxides
CFRCode of Federal Regulations	NSPSNew Source Performance Standards
COcarbon monoxide	NSRNew Source Review
CO₂carbon dioxide	PMparticulate matter
CO_{2e}carbon dioxide equivalent	PM_{2.5}particulate matter less than 2.5 microns in aerodynamic diameter
COMSContinuous Opacity Monitoring System	PM₁₀particulate matter less than 10 microns in aerodynamic diameter
CSRCode of State Regulations	ppmparts per million
dscfdry standard cubic feet	PSDPrevention of Significant Deterioration
EIQEmission Inventory Questionnaire	PTEpotential to emit
EPEmission Point	RACTReasonable Available Control Technology
EPAEnvironmental Protection Agency	RALRisk Assessment Level
EUEmission Unit	SCCSource Classification Code
fpsfeet per second	scfmstandard cubic feet per minute
ftfeet	SDSSafety Data Sheet
GACTGenerally Available Control Technology	SICStandard Industrial Classification
GHGGreenhouse Gas	SIPState Implementation Plan
gpmgallons per minute	SMALScreening Model Action Levels
grgrains	SO_xsulfur oxides
GWPGlobal Warming Potential	SO₂sulfur dioxide
HAPHazardous Air Pollutant	SSMStartup, Shutdown & Malfunction
hrhour	tphtons per hour
hphorsepower	tpytons per year
lbpound	VMTvehicle miles traveled
lbs/hrpounds per hour	VOCVolatile Organic Compound
MACTMaximum Achievable Control Technology	
µg/m³micrograms per cubic meter	
m/smeters per second	

Installation: Holcim Ste. Genevieve

ID: 186-0044

Calculation Date: 12/1/2017

Project Description: petcoke crusher (L62-RC1) for use in L62 grinding process, emit to existing bagfilter (L62-BF1). Crusher make: Williams St. Louis, Crusher model: 24x48 single roll crusher new EP (L62-08) for new petcoke crusher to existing coal feed mill (L62-RM1). Existing EP L62-04 will include emissions from selector gate (L62-MW1) to petcoke crusher (L62-RC1), rather than from gate to coal mill. intent to pregrind petcoke to enable them to use a harder petcoke and ensure uniform feed. Currently uses a petcoke but softer. expected annual usage is 160000 tons, which is apprx 2016 actuals 130531 plus 20%

Project Emissions:

Pollutant	Project PTE (tpy)	de minimis / SMAL (tpy)	PTE exceeds?
PM	5.84	25	no
PM10		15	no
PM2.5		10	no
combined HAPs	0.08	25	no
pom fluoranthene	0.012	0.01	yes, so limit or model
pom phenanthrene	0.053	0.01	yes, so limit or model
pom anthracene	0.012	0.01	yes, so limit or model
pom 2 methyl naphthalene	6.7E-05	0.01	no
pom benzo(a)pyrene	1.1E-05	0.01	no
pom naphthalene	2.1E-05	0.01	no
pom 1 methyl naphthalene	1.7E-05	0.01	no
pom dibenzo(g,h,i)perylene	7.0E-06	0.01	no
pom chrysene	5.8E-06	0.01	no
pom benzo(a)anthracene	3.4E-06	0.01	no
pom dibenzo(a,h)anthracene	2.9E-06	0.01	no
pom benzo(b)fluoranthene	3.3E-06	0.01	no
pom fluorene	2.0E-06	0.01	no
pom pyrene	7.6E-06	0.01	no
pom benzo(g,h,i)perylene	6.4E-06	0.01	no
pom indeno(1,2,3-cd)pyrene	2.0E-06	0.01	no
antimony	2.8E-04	5	no
arsenic	1.1E-04	0.005	no
beryllium	5.6E-05	0.008	no
cadmium	5.6E-05	0.01	no
chromium	5.6E-05	5	no
cobalt	5.6E-05	0.1	no
lead	1.1E-04	0.01	no
manganese	1.1E-04	0.8	no
nickel	2.1E-03	1	no
selenium	1.1E-04	0.1	no

modeling not required as emission unit is subject to a MACT that has completed RTR, limit not needed
 modeling not required as emission unit is subject to a MACT that has completed RTR, limit not needed
 modeling not required as emission unit is subject to a MACT that has completed RTR, limit not needed

metallic haps are compounds, not elemental
 POM SMAL is individual

so this is a new fuel that they weren't capable of using?
 conoco phillips presentation says heavier crudes = harder petcoke. Most existing customer grinding mills designed for soft coal.
 exactly what is the new petcoke type, feedstock? Sponge or shot?
 since crusher will be in-line will it crush all fuels or just the new petcoke?
 missing sds
 new hap emissions from fuel handling, metal haps and pah
 new combustion emissions
 new haul rd (if received by truck), receiving, several handling, storage emissions. List in PSD amendment C.
 is the higher coke higher BTU? Allows more clinker?

has EF 0.004 grs/dscf, but that appears to be the whole of the main baghouse at 607,142 scfm and 520 ft tall, not just the new crusher portion.
 they don't provide a lb/ton EF nor an SCC
 they don't provide project PTE
 can they confirm the 44 tph MHDR with mfg specs? Is this everything being crushed or just the 10% oversize?
 project 2016-03-073 chute from bin 2 to either coal mill was 104.72 tph. How does this project relate?
 eiq uses SCC 3-05-010-10, on page 29 of 32. uncontrolled 0.02 lb PM10/ton, uncontrolled 0.006 lb PM10/ton. Uncontrolled 0.0006 lb PM2.5/ton, but scc doesn't have this EF.
 but that scc is for coal crushing. Isn't petcoke higher silt content?

call 10/4/2017 with Marcus Genova
 have run trials on the new fuel, cheaper fuel, harder
 it has some large chunks >4 inches dia. Either slows down the existing mill or has other problems, he wasn't for sure. But the new petcoke precrusher was to fix those problems.
 can't perform long term on new petcoke w/o crusher
 want a better burn, etc

specs received 10/24/2017

new coke		Koch Carbon LLC, Exxonmobil Refinery Joliet, IL							
		Jan 30 2013							
		shot petcoke							
ING-2190 St. Genevieve		UBL-40 St. Genevieve				ING-2006 St. Genevieve		OR-5568 St. Genevieve	
	as received	dry	as received	dry	as received	dry	as received	dry	
moisture %	9.59%		6.10%		8.90%		6.87%		
ash %	0.30%	0.33%	0.38%	0.41%	0.34%	0.37%	0.39%	0.42%	
volatile matter %	10.30%	11.39%	10.54%	11.22%	10.50%	11.53%	10.46%	11.23%	
fixed carbon %	79.81%	88.28%	82.98%	88.37%	80.26%	88.10%	82.28%	88.35%	
sulfur %	5.49%	6.07%	5.69%	6.06%	5.75%	6.31%	6.01%	6.46%	
btu/lb gross	13789	15252	14313	15243	13886	15244	14176	15221	
hardgrove grindability moisture %	0.19%		0.09%		0.19%		0.09%		
hardgrove grindability index	44		43		45		42		

old coke	
TCP, Chicago Carbon, Lemont, IL	
22-Jan-09	
shot petcoke	
Barge ING 2160 Release No. 1972	
as received	dry
7.83%	
0.30%	0.33%
10.56%	11.46%
81.31%	88.21%
5.39%	5.85%
14187	15392
56	

the lower the HGI the harder

For only these criteria the "new" petcoke seems no different than the TCP, except the new is harder.
 10/24/2017 email, Been using in large amounts since 2013 without problems.
 Similar composition, and have been using without problems (number of years not relevant as would have been a new fuel in 2013 had the comp been different), so not a "new" fuel for NSR applicability.
 Project emissions are therefore just the new equipment, the crusher.

Marcus Genova
 Area Environmental Manager
 2942 US Highway 61, Bloomsdale, MO 63627
 (636) 524-8425
marcus.genova@lafargeholcim.com

coal crusher (lbPM/ton) controlled with cyclone, SCC 3-03-003-10	estimated cyclone PM control %	uncontrolled coal crusher (lbPM/ton)
0.11	75%	0.44

coal silt %	petcoke silt %	petcoke : coal silt ratio
4.6%	21.2%	4.609

75% cyclone PM control obtained from AP-42 Table B.2-3 AIRS code 008, medium efficiency centrifugal collector
petcoke silt content obtained from "City of Chicago Fugitive Dust Study" CDM Smith, March 2014.
coal silt content obtained from AP-42 Table 13.2.4-1

use this multiplier to determine coke crusher emission factor

emission unit	description	SCC	MHDR (tph)	Pollutant	uncontrolled emission factor (lb/ton)	emission factor reference	uncontrolled PTE (lb/hr)	uncontrolled PTE (tpy)	control device	capture efficiency	control efficiency	controlled PTE (tpy)
L62-RC1	coke precrusher	3-03-003-12	44	PM	2.03	see above	89.22	390.80	existing baghouse L62-BF1	99%	99.5%	5.84
				PM10	not determined							
				PM2.5	not determined							
				combined HAPs	0.02749	sum	1.21	5.30				7.9E-02
				fluoranthene	0.00406		0.18	0.78				1.2E-02
				phenanthrene	0.01825	1	0.80	3.52				5.3E-02
				anthracene	0.00406		0.18	0.78				1.2E-02
				2 methyl naphthalene	0.0000233		1.0E-03	4.5E-03				6.7E-05
				benzo(a)pyrene	0.0000037		1.6E-04	7.0E-04				1.1E-05
				naphthalene	0.0000073		3.2E-04	1.4E-03				2.1E-05
				1 methyl naphthalene	0.0000059		2.6E-04	1.1E-03				1.7E-05
				dibenzo(g,h,i)perylene	0.0000024	2	1.1E-04	4.7E-04				7.0E-06
				chrysene	0.0000020		8.8E-05	3.9E-04				5.8E-06
				benzo(a)anthracene	0.0000012		5.2E-05	2.3E-04				3.4E-06
				dibenzo(a,h)anthracene	0.0000010		4.5E-05	2.0E-04				2.9E-06
				benzo(b)fluoranthene	0.0000012		5.1E-05	2.2E-04				3.3E-06
				fluorene	0.0000007		3.0E-05	1.3E-04				2.0E-06
				pyrene	0.0000026		1.2E-04	5.1E-04				7.6E-06
				benzo(g,h,i)perylene	0.0000022		9.8E-05	4.3E-04				6.4E-06
				indeno(1,2,3-cd)pyrene	0.0000007		3.0E-05	1.3E-04				2.0E-06
				antimony	0.0000977		4.3E-03	1.9E-02				2.8E-04
				arsenic	0.0000391		1.7E-03	7.5E-03				1.1E-04
				beryllium	0.0000195		8.6E-04	3.8E-03				5.6E-05
				cadmium	0.0000195	3	8.6E-04	3.8E-03				5.6E-05
				chromium	0.0000195		8.6E-04	3.8E-03				5.6E-05
				cobalt	0.0000195		8.6E-04	3.8E-03				5.6E-05
				lead	0.0000391		1.7E-03	7.5E-03				1.1E-04
				manganese	0.0000391		1.7E-03	7.5E-03				1.1E-04
				nickel	0.0007444		0.03	0.14				2.1E-03
				selenium	0.0000391		1.7E-03	7.5E-03				1.1E-04

amount	units	wt%
0.2%	wt%	0.2%
0.9%	wt%	0.9%
0.2%	wt%	0.2%
11.5	ppm	0.001150%
1.8	ppm	0.000180%
3.6	ppm	0.000360%
2.9	ppm	0.000290%
1.2	ppm	0.000120%
0.99	ppm	0.000099%
0.58	ppm	0.000058%
0.5	ppm	0.000050%
0.57	ppm	0.000057%
0.34	ppm	0.000034%
1.3	ppm	0.000130%
1.1	ppm	0.000110%
0.34	ppm	0.000034%
48.2	ppm	0.004820%
19.3	ppm	0.001930%
9.6	ppm	0.000960%
9.6	ppm	0.000960%
9.6	ppm	0.000960%
9.6	ppm	0.000960%
19.3	ppm	0.001930%
19.3	ppm	0.001930%
367.1	ppm	0.036710%
19.3	ppm	0.001930%

This PTE method may be a gross overestimate. It is only used for permit applicability.

Regardless of the calculated emissions, a permit is needed to consider the the baghouse use on the new precrusher.

The stack portion PM emissions show zero increase as the existing baghouse calculation method is grain loading. This project will not change the grain loading, flowrate, or hrs/yr. Coke precrusher emissions commingled with everything else, indistinguishable.

But theoretically the crusher does have its own stack PTE, and also fugitives.

99% enclosure estimated. 99.5% control estimated baghouse permits section default.

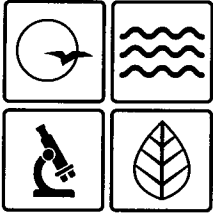
metallic haps are compounds. References don't mention concentrations as elemental or compounds, assume as elements. Compound mass is therefore slightly higher, but still much less than 10/25 tpy.

emission factor references

- 1 applicant supplied SDS
- 2 "Petroleum Coke in the Urban Environment: A Review of Potential Health Effects" International Journal of Environmental Research and Public Health, 2015.
- 3 "Petroleum Coke Category Analysis and Hazard Characterization" API, 12/28/2007.

2016 ghg actuals for permit table 2

pollutant	metric tons co2e, 2016 epa FLIGHT website	gwp	metric ton mass	short tons per 1 metric ton	short tons mass	short tons co2e
co2	2410222	1	2410222	1.1023	2656787.7	2656787.7
ch4	1618	25	64.72		71	1784
n2o	3010	298	10.100671		11	3318
					2656870	2661889



Missouri Department of dnr.mo.gov

NATURAL RESOURCES

Eric R. Greitens, Governor

Carol S. Comer, Director

DEC 15 2017

Mr. Marcus Genova
Area Environmental Manager
Holcim (US) Inc. - Ste. Genevieve Plant
2942 US Hwy 61
Bloomsdale, MO 63627

RE: New Source Review Permit - Project Number: 2017-09-024

Dear Mr. Genova:

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 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.

This permit may include requirements with which you may not be familiar. If you would like the department to meet with you to discuss how to understand and satisfy the requirements contained in this permit, an appointment referred to as a Compliance Assistance Visit (CAV) can be set up with you. To request a CAV, please contact your local regional office or fill out an online request. The regional office contact information can be found at the following website: <http://dnr.mo.gov/regions/>. The online CAV request can be found at <http://dnr.mo.gov/cav/compliance.htm>.

If you were adversely affected by this permit decision, you may be entitled to pursue an appeal before the administrative hearing commission pursuant to Sections 621.250 and 643.075.6 RSMo. To appeal, you must file a petition with the administrative hearing commission within thirty 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 administrative hearing commission, whose contact information is: Administrative Hearing Commission, United States Post Office Building, 131 West High Street, Third Floor, P.O. Box 1557, Jefferson City, Missouri 65102, phone: 573-751-2422, fax: 573-751-5018, website: www.oa.mo.gov/ahc.



Recycled paper

Mr. Marcus Genova
Page Two

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:dlj

Enclosures

c: Southeast Regional Office
PAMS File: 2017-09-024

Permit Number: 122017 - 006