

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: **012015-006**

Project Number: 2014-03-038
Installation Number: 007-0001

Parent Company: Shamrock Group

Parent Company Address: 600 Green Boulevard, Mexico, MO 65265

Installation Name: Shamrock Group

Installation Address: 600 Green Boulevard, Mexico, MO 65265

Location Information: Audrain County, S25, T51N, R9E

Application for Authority to Construct was made for:
The construction of a new ceramic proppant facility. 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.

JAN 29 2015

JAN 29 2015

EFFECTIVE DATE

Handwritten signature of Kya L. Moore in cursive script.

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.

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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."

Shamrock Group
Audrain County, S25, T51N, R9E

1. Best Management Practices (BMPs) Requirement
 - A. Shamrock Group shall control fugitive emissions from all of the haul roads and vehicular activity areas at this site by performing Best Management Practices as defined in Attachment A.

2. Control Device Requirement-Baghouses
 - A. Shamrock Group shall control particulate emissions from the equipment listed in Table 1 using baghouses, as specified in the permit application.

Table 1. Baghouse Controlled Emission Points

Emission Point	Description	Emission Point	Description
EP-03	Primary Crusher	EP-15	Storage Receiver
EP-04	Finish Grinder #1	EP-16	Segregation
EP-05	Finish Grinder #2	EP-17	Storage Bins Area #1
EP-06	Bin Vent #1	EP-18	Storage Bins Area #2
EP-07	Bin Vent #2	EP-19	Product Bin Vent #1
EP-08	Bin Vent #3	EP-20	Product Bin Vent #2
EP-09	Mixer	EP-21	Product Bin Vent #3
EP-10	Dryer	EP-22	Product Bin Vent #4
EP-13	Dust Bin	EP-23	Loadout
EP-14	Storage Bin		

- B. The baghouses shall be operated and maintained in accordance with the manufacturer's specifications. The baghouse shall be equipped with a gauge or meter, which indicates the pressure drop across the control device. These gauges or meters shall be located such that Department of Natural Resources' employees may easily observe them.

- C. Replacement filters for the baghouses shall be kept on hand at all times. The bags shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, abrasion resistance, etc.).

- D. Shamrock Group shall monitor and record the operating pressure drop across the baghouses at least once every 24 hours while the plant is operating. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty.

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SPECIAL CONDITIONS:

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

- E. Shamrock Group shall maintain a copy of the baghouse manufacturer's performance warranty on site.
- F. Shamrock Group shall maintain an operating and maintenance log for the baghouses which shall include the following:
 - 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions; and
 - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.
- 3. Control Device Requirement-Venturi Scrubber
 - A. Shamrock Group shall control SO_x, HAP, and particulate emissions from the kiln (EP-11) using a Venturi Scrubber, as specified in the permit application.
 - B. The scrubber shall be operated and maintained in accordance with the manufacturer's specifications. The scrubber shall be equipped with gauges or meters, which indicate the pressure drop and liquid flow rate across the control device. The gauges or meters shall be located such that Department of Natural Resources' employees may easily observe them.
 - C. Shamrock Group shall monitor and record the pressure drop and liquid flow rate across the scrubber at least once every 24 hours while the plant is operating. The pressure drop and liquid flow rate shall both be maintained within the design conditions specified by the manufacturer's performance specifications.
 - D. The scrubber shall be maintained at a liquid/ gas ratio that is consistent with manufacturer specifications to maintain listed control efficiencies.
 - E. The scrubber shall be operated at a temperature that is consistent with manufacturer specifications.
 - F. Shamrock Group shall maintain a copy of the scrubber manufacturer's performance warranty on site.
 - G. Shamrock Group shall maintain an operating maintenance log for the scrubber which shall include the following:
 - 1) Incidents of malfunction, with impacted emissions, duration of event, probable cause, and corrective actions; and
 - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.

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SPECIAL CONDITIONS:

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

4. Operational Limitation and Specifications-Emergency Generator
 - A. The generator shall be fired only with low sulfur diesel fuel.
 - B. The generator shall be limited to 500 hours of operation per year.
 - C. Shamrock Group shall maintain inspection, maintenance, and repair logs for the generator.
 - D. Shamrock Group shall install a non-resettable meter or maintain a log for the generator, such as Attachment B, which records a running total of the hours per year that the generator is in operation.

5. Stack Testing Requirements
 - A. Shamrock Group shall verify that the emissions from the kiln (EP-11) do not exceed the emission rates listed in Table 2.

Table 2. Kiln Emission Rates

Pollutant	MHDR (tons/hr)	Controlled Emission Rate (lbs/hr)
PM	15	0.780
PM ₁₀	15	0.667
PM _{2.5}	15	0.578
NO _x	15	3.922
SO _x	15	0.950
HF	15	0.0222
HCl	15	0.102

- B. Shamrock Group shall verify that the emissions from each process handling group does not exceed the emission rates listed in Table 3.

Table 3. Process Handling Emission Rates

Baghouse Group Number	Baghouse Group Equipment Description	Affected Emission Points (EP-XX)	Controlled PM ₁₀ Emission Rate (lbs/hr) ¹
1	Primary Crusher ²	03	0.0240
2	Finish Grinders ²	04, 05	0.0248
3	Bin Vents #1-3 ²	06, 07, 08	0.00720
4	Mixer	09	0.00720
5	Dryer	10	0.00890
6	Storage and Dust Bin	13, 14	0.00900
7	Storage Receiver	15	0.0240
8	Segregation	16	0.0400
9	Area 1 and Product Bin Vents	17, 18 19, 20, 21, 22	0.0120
10	Loadout	23	0.0210

¹Controlled Emission rate for each unit in Baghouse Group

²To be tested while handling [REDACTED]

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SPECIAL CONDITIONS:

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

- C. This testing may be limited to conducting tests on a representative piece of each type of equipment upon written request from Shamrock Group and approval of the director. These test results shall be done in accordance with the procedures outlined below.
 - D. A completed Proposed Test Plan (form enclosed) must be submitted to the Air Pollution Control Program at least 30 days prior to the proposed test date of any performance tests so that a pretest meeting may be arranged, if necessary, and to assure that the test date is acceptable for an observer to be present. The Proposed Test Plan must include specification of test methods to be used and must be approved by the director prior to conducting the required emissions testing.
 - E. The stack testing shall be performed within 60 days after reaching the maximum production rate of the kiln (EP-11), but no later than 180 days after initial start of operation. These tests shall be conducted at the MHDR in Table 3 or within 10% of the MHDR. If the tests are conducted below 90% of the MHDR, then the tested production rate is the new MHDR.
 - F. Two copies of a written report of the performance test results must be submitted to the director within 90 days of completion of the performance testing. The report must include legible copies of the raw data sheets, analytical instrument laboratory data, and complete sample calculations from the required EPA method for at least one sample run for each air pollutant tested.
 - G. No later than 30 days after the performance test results are submitted, Shamrock Group shall provide the director with a report that establishes the potential emissions of all pollutants for the emission units tested according to Special Condition 5.A and 5.B. The emission rates shall be reported in pounds per hour and tons per year. If the potential emissions are greater than what was indicated in this permit, then Shamrock Group shall submit an application for an amendment to this permit to correct the potential emissions calculations.
6. Record Keeping and Reporting Requirements
- A. Shamrock Group 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.

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SPECIAL CONDITIONS:

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

- B. Shamrock Group shall report to the Air Pollution Control Program's Compliance/Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than 10 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: 2014-03-038
Installation ID Number: 007-0001
Permit Number:

Shamrock Group
600 Green Boulevard
Mexico, MO 65265

Complete: March 21, 2014

Parent Company:
Shamrock Group
600 Green Boulevard
Mexico, MO 65265
Audrain County, S25, T51N, R9E

REVIEW SUMMARY

- Shamrock Group has applied for authority to construct a new ceramic proppant facility.
- HAP emissions are expected from the proposed equipment. HAPs of concern from this process are hydrofluoric acid and hydrochloric acid. All HAPs are conditioned below their respective Screen Modeling Action Levels (SMALs).
- 40 CFR 60 Subpart OOO, *Standards of Performance for Nonmetallic Mineral Processing Plants*, applies to the equipment.
- 40 CFR 60 Subpart IIII, *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*, applies to the emergency diesel generator (EP-24).
- None of the NESHAPs apply to this installation. None of the currently promulgated MACT regulations apply to the proposed equipment.
- Baghouses, a Venturi Scrubber, and BMPs are being used to control particulate matter, SO_x, and HAP emissions from the equipment 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 conditioned below de minimis levels.
- This installation is located in Audrain County, an attainment area for all criteria pollutants.
- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation's major source level is 250 tons per year and fugitive emissions are not counted toward major source applicability.

- Emissions testing is required for the equipment.
- A Basic Operating Permit application is required for this installation within 30 days of equipment startup.
- Approval of this permit is recommended with special conditions.

PROJECT/INSTALLATION DESCRIPTION

Shamrock Group is seeking authority to construct a new plant that manufactures ceramic proppant in Audrain County. Proppants are used in a process called hydraulic fracturing, also known as fracking, where pressurized fluid is used to create or extend hydraulic fractures in a rock layer for the purpose of releasing petroleum, natural gas, coal seam gas, or other substances for extraction. Proppant consists of materials such as sand, ceramic, or other particulates that prevent hydraulic fractures from closing when the fluid injection is stopped.

Appendix A contains a complete list of the equipment to be installed, the maximum hourly design rates (MHDRs) of each process, the bottlenecked MHDRs, and the control devices used for each emission point.

The manufacturing of ceramic proppant at this Shamrock Group facility begins with the delivery of [REDACTED] by trucks. [REDACTED] is unloaded into two storage piles, and from there it is transferred to the primary crusher, followed by one of two secondary grinders. After being properly sized, [REDACTED] is sent to a set of three storage bins where it awaits being transferred into a [REDACTED] natural gas-fired dryer. The dryer is a totally enclosed, fluid bed dryer that uses waste heat from the kiln to operate.

[REDACTED]. From the dryer, [REDACTED] is sent to a 40 MMBTU/hr natural gas-fired rotary kiln which is equipped with a Venturi Scrubber to control SO_x, HAP, and particulate emissions. It is assumed that 8% of [REDACTED] is lost during kiln processing, which reduces the maximum production rate from 15 to 13.8 tons of product per hour. [REDACTED] is then sent to a cooler and routed through a dust bin to a storage bin and storage receiver. All cooler exhaust is used as preheated air for the kiln, and this collective exhaust is then routed to a baghouse, where the dust is collected and reused.

After the excess dust is removed, [REDACTED] is sent through segregation, where it is screened and sent to two storage bin areas. Next, the finished proppant is transferred to the final product bins where it awaits loadout by truck or rail. The loadout area is covered from the storage bin discharge spout to the truck or rail hatch, and a slight negative pressure is created to allow for a better seal. This take off air, as well as every other source of particulate matter emission from the previously mentioned equipment, is routed to a baghouse.

The following New Source Review permits have been issued to Shamrock Group from the Air Pollution Control Program:

Table 4. Permit History

Permit Number	Description
062010-008	Brick Kiln (Mid America Brick)
062010-008A	Stack Testing Amendment (Mid America Brick)

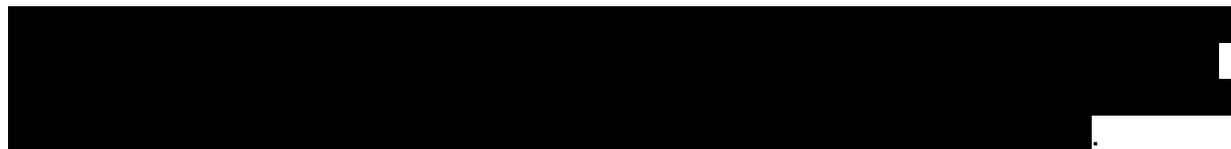
Shamrock Group has requested confidentiality with regard to emission factors, process rates, and source classification codes. This is the public version of the permit. A confidential version is available under project 2014-03-039.

EMISSIONS/CONTROLS EVALUATION

The emission factors used in this analysis were obtained from the EPA document AP-42, *Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources*, Fifth Edition (AP-42).



Emissions from haul roads and vehicular activity areas were calculated using the predictive equation from AP-42 Section 13.2.1 *Paved Roads*, January 2011 and AP-42 Section 13.2.2 *Unpaved Roads*, November 2006. A silt loading of 12 grams per meter squared (g/m^2) was used. A 90% control efficiency for PM and PM_{10} and a 40% control efficiency for $\text{PM}_{2.5}$ were applied to the emission calculations for the use of BMPs. Emissions from load-in and load-out of storage piles were calculated using the predictive equation from AP-42 Section 13.2.4. Emissions from wind erosion of storage piles were calculated using the equation found in the Air Pollution Control Program's EIQ Form 2.8 *Storage Pile Worksheet*.



Potential emissions associated with the combustion of natural gas in the enclosed, fluid bed dryer and the kiln were developed using manufacturer's data and AP-42. Emission factors for HF and HCl resulting from the [redacted] in the kiln were obtained from AP-42 Section 11.3 *Brick and Structural Clay Manufacturing*, August 1997. To calculate the potential PM, PM_{10} , and $\text{PM}_{2.5}$ emissions from the dryer, AP-42 Table 11.25-5 and AP-42 Table B.2.2 Category 5 were consulted. The dryer vents its exhaust to a baghouse with 99% control efficiency for PM, PM_{10} , and $\text{PM}_{2.5}$. The kiln is equipped

with a Venturi Scrubber that has a control efficiency of 95% for PM and PM₁₀, 80% for PM_{2.5}, 80% for SO_x, 98% for HF, and 80% for HCl.

Potential emissions associated with the combustion of diesel fuel in the emergency generator were derived from AP-42 Section 3.3 *Gasoline and Diesel Industrial Engines*, October 1996. The genset is classified as a Tier 4 engine. A limit on generator usage to 500 hours per year limits the potential to emit combustion products.

Table 5 provides an emissions summary for this project. This is a new facility, so there are no existing potential emissions or existing actual emissions. Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8,760 hours per year) and not considering control mechanisms. The conditioned potential emissions were calculated using control devices and applicable special conditions.

Table 5: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels / SMAL	Existing Potential Emissions	Existing Actual Emissions	Potential Emissions of the Application	New Installation Conditioned Potential Emissions
PM	25.0	N/A	N/A	1004.64	24.92
PM ₁₀	15.0	N/A	N/A	163.77	13.84
PM _{2.5}	10.0	N/A	N/A	99.70	9.32
SO _x	40.0	N/A	N/A	4.25	4.16
NO _x	40.0	N/A	N/A	28.63	N/A
VOC	40.0	N/A	N/A	13.10	N/A
GHG (CO ₂ e)	75,000	N/A	N/A	24,933	N/A
HF	10.0 / 0.1	N/A	N/A	4.86	0.097
HCl	10.0 / 10	N/A	N/A	2.23	0.45
Combined HAPs	25.0	N/A	N/A	7.10	0.54

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 all pollutants are conditioned below de minimis levels.

APPLICABLE REQUIREMENTS

Shamrock Group 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

SPECIFIC REQUIREMENTS

- *Restriction of Emission of Particulate Matter From Industrial Processes*, 10 CSR 10-6.400
- *New Source Performance Regulations*, 10 CSR 10-6.070
 - *Standards of Performance for Nonmetallic Mineral Processing Plants*, 40 CFR Part 60, Subpart OOO.

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.

Ryan Schott
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 March 7, 2014, received March 20, 2014, designating Shamrock Group as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.

Attachment A: Best Management Practices

Haul roads and vehicular activity areas shall be maintained in accordance with at least one of the following options when the plant is operating.

1. Pavement

- A. The operator shall pave the area with materials such as asphalt, concrete or other materials approved by the Air Pollution Control Program. The pavement will be applied in accordance with industry standards to achieve control of fugitive emissions¹ while the plant is operating.
- B. Maintenance and repair of the road surface will be conducted as necessary to ensure that the physical integrity of the pavement is adequate to achieve control of fugitive emissions from these areas while the plant is operating.
- C. The operator shall periodically wash or otherwise clean all of the paved portions of the haul roads as necessary to achieve control of fugitive emissions from these areas while the plant is operating.

2. Application of Chemical Dust Suppressants

- A. The operator shall apply a chemical dust suppressant (such as magnesium chloride, calcium chloride, lignosulfonates, etc.) to unpaved areas.
- B. 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.
- C. 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. The operator shall keep these records with the plant for not less than five (5) years and make these records available to Department of Natural Resources personnel upon request.

3. Application of Water-Documented Daily

- A. 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.
- B. Precipitation may be substituted for watering if the precipitation is greater than one quarter of one inch and is sufficient to control fugitive emissions.
- C. 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.
- D. 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).
- E. The operator shall keep these records with the plant for not less than five (5) years, and the operator shall make these records available to Department of Natural Resources personnel upon request.

¹ For purposes of this document, Control of Fugitive Emissions means to control particulate matter that is not collected by a capture system and visible emissions to the extent necessary to prevent violations of the air pollution law or regulation. (Note: control of visible emission is not the only factor to consider in protection of ambient air quality.)

APPENDIX A

Emission Unit Summary
 Shamrock Group
 Audrain County, S25, T51N, R9E
 Project Number: 2014-03-038
 Installation ID Number: 007-0001

Emission Point	Description	MHDR (tons/hr)	Bottlenecked MHDR (tons/hr)	Control Device No.	Control Device Description
EP-01	Stockpiles	7.5	7.5	N/A	Enclosed Shed
EP-02	Stockpiles	7.5	7.5	N/A	Covered Building
EP-03	Primary Crusher	60	15	CD-01	Baghouse
EP-04	Finish Grinder #1	10	7.5	CD-02	Baghouse
EP-05	Finish Grinder #2	10	7.5	CD-03	Baghouse
EP-06	Bin Vent #1	15	15	CD-04	Baghouse
EP-07	Bin Vent #2	15	15	CD-05	Baghouse
EP-08	Bin Vent #3	15	15	CD-06	Baghouse
EP-09	Mixer	15	15	CD-07	Baghouse
EP-10	Dryer	██████████	15	CD-08	Baghouse
EP-11	Kiln	15 tons/hr 40 MMBTU/hr	15	CD-09	Venturi Scrubber
EP-12	Cooler	15	13.8*	CD-10	Baghouse
EP-13	Dust Bin	15	13.8	CD-11	Baghouse
EP-14	Storage Bin	15	6.9	CD-12	Baghouse
EP-15	Storage Receiver	15	6.9	CD-13	Baghouse
EP-16	Segregation	25	13.8	CD-14	Baghouse
EP-17	Storage Bins Area #1	20	6.9	CD-15	Baghouse
EP-18	Storage Bins Area #2	20	6.9	CD-16	Baghouse
EP-19	Product Bin Vent #1	20	3.45	CD-17	Baghouse
EP-20	Product Bin Vent #2	20	3.45	CD-18	Baghouse
EP-21	Product Bin Vent #3	20	3.45	CD-19	Baghouse
EP-22	Product Bin Vent #4	20	3.45	CD-20	Baghouse
EP-23	Loadout	35	13.8	CD-21	Baghouse
EP-24	Diesel Generator	125 HP	N/A	N/A	Emergency Only
EP-25	Paved / Unpaved Haul Roads	1.091 VMT/hr / 0.546 VMT/hr	N/A	N/A	BMPs

*Assumed 8% loss of ██████████ after kiln processing

APPENDIX B

Abbreviations and Acronyms

%percent	m/s meters per second
°Fdegrees Fahrenheit	Mgal 1,000 gallons
acfmactual 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 National Emissions Standards for Hazardous Air Pollutants
CFR Code of Federal Regulations	NO_x nitrogen oxides
COcarbon monoxide	NSPS New Source Performance Standards
CO₂carbon dioxide	NSR New Source Review
CO₂ecarbon dioxide equivalent	PM particulate matter
COMS Continuous Opacity Monitoring System	PM_{2.5} particulate matter less than 2.5 microns in aerodynamic diameter
CSR Code of State Regulations	PM₁₀ particulate matter less than 10 microns in aerodynamic diameter
dscfdry standard cubic feet	ppm parts per million
EQ Emission Inventory Questionnaire	PSD Prevention of Significant Deterioration
EP Emission Point	PTE potential to emit
EPA Environmental Protection Agency	RACT Reasonable Available Control Technology
EU Emission Unit	RAL Risk Assessment Level
fpsfeet per second	SCC Source Classification Code
ft feet	scfm standard cubic feet per minute
GACT Generally Available Control Technology	SDS Safety Data Sheet
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/m³micrograms per cubic meter	

Mr. Chris Heller
Vice President - Chief Operating Officer
Shamrock Group
600 Green Boulevard
Mexico, MO 65265

RE: New Source Review Permit - Project Number: 2014-03-038

Dear Mr. Heller:

Enclosed with this letter is your permit to construct. Please study it carefully and refer to Appendix B 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.

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 of 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 petition is sent by 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 the date it is received by Administrative Hearing Commission, Truman State Office Building, P.O. Box 1557, Jefferson City, MO 65102, www.oa.mo.gov/ahc.

If you have any questions regarding this permit, please do not hesitate to contact Ryan Schott, Department of Natural Resources' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Susan Heckenkamp
New Source Review Unit Chief

SH:rsf

Enclosures

c: Northeast Regional Office
PAMS File: 2014-03-038
Permit Number: