

STATE OF MISSOURI



DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: 082011-004 Project Number: 2011-03-036
Installation Number: 093-0007

Parent Company: ISP Minerals, Incorporated

Parent Company Address: 1101 Opal Court, Hagerstown, MD 21740

Installation Name: ISP Minerals, Incorporated

Installation Address: 1 Hillcrest Drive, Annapolis, MO 63620

Location Information: Iron County, S22, T31N, R3E

Application for Authority to Construct was made for:
Installation of a rock dryer, crusher, screen, and the associated material handling equipment. 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.

AUG 10 2011

EFFECTIVE DATE

Kyra L Moore

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 Departments' 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."

ISP Minerals, Incorporated
Iron County, S22, T31N, R3E

1. Emission Limitation
 - A. ISP Minerals, Incorporated shall emit less than 100,000 tons of carbon dioxide equivalents (CO₂e) in any consecutive 12-month period from the entire installation.

Table 1: CO₂e Generating Emission Units

Emission Unit	MHDR (mmBtu/hr)
Natural Gas Combustion Unit #1	
Natural Gas Combustion Unit #2	
Natural Gas Combustion Unit #3	
Natural Gas Combustion Unit #4	
Natural Gas Combustion Unit #5	
Natural Gas Combustion Unit #6	
Natural Gas Combustion Unit #7	
Natural Gas Combustion Unit #8	
Natural Gas Combustion Unit #9	
Natural Gas Combustion Unit #10	
Natural Gas Combustion Unit #11	
Natural Gas Combustion Unit #12	
Natural Gas Combustion Unit #13	
Incinerator	

- B. Attachment A 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.
 - C. ISP Minerals, Incorporated 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 Special Condition 1.B. shows an exceedance of the limitation imposed by Special Condition 1.A.

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SPECIAL CONDITIONS:

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

2. Capture Device Requirements

- A. ISP Minerals, Incorporated shall use total enclosures to capture emissions from the emission units indicated in Appendix A. A total enclosure is an enclosure, including a curtain or shroud that completely surrounds emissions from an emission unit.
- B. ISP Minerals, Incorporated shall use hoods to capture emissions from the emission units indicated in Appendix A. A hood is a shaped inlet to a pollution control system that does not totally surround emissions from an emission unit.
- C. ISP Minerals, Incorporated shall minimize cross drafts by locating the emissions source and the hood inside a building with 4 sides and a roof.
- D. ISP Minerals, Incorporated shall design and construct each hood according to the most current version of the industrial ventilation manual entitled, "Industrial Ventilation - A Manual of Recommended Practice, American Conference of Governmental Industrial Hygienists".
- E. ISP Minerals, Incorporated shall demonstrate that each hood was constructed according to Special Condition 2.D. by keeping a record of the following design parameters for each hood:
 - 1) the cross-sectional area of the hood inlet
 - 2) the distance from the hood inlet to the emissions source
 - 3) the minimum recommended volumetric airflow
 - 4) the minimum recommended hood face velocity
- F. At least one time per calendar year (no less than nine calendar months and no more than 15 calendar months following the previous measurement), ISP Minerals, Incorporated shall verify the proper operation of each hood by:
 - 1) recording the actual face velocity or the actual volumetric airflow of each capture hood
 - 2) performing a visual smoke puff test at each emission source

3. Control Device Requirement-Baghouse

- A. ISP Minerals, Incorporated shall control emissions from the equipment indicated in Appendix A using baghouses as specified in the permit application.

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SPECIAL CONDITIONS:

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

- 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 the 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, acidic and alkali resistance, and abrasion resistance).
 - D. ISP Minerals, Incorporated shall monitor and record the operating pressure drop across the baghouses at least once every 24 hours. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty.
 - E. ISP Minerals, Incorporated 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.
4. Control Device Requirement- Wet Spray Devices
- A. ISP Minerals, Incorporated shall control emissions from the crusher feeder conveyors (EP-05 Segment 4) using wet spray devices as specified in the permit application.
 - B. The wet spray devices shall be installed on the conveyor that feeds the outdoor storage pile following the primary crusher and shall be operated whenever the conveyor is in operation.
 - C. Watering may be suspended during periods of freezing conditions, when use of the wet spray devices may damage the equipment.
5. Record Keeping and Reporting Requirements
- ISP Minerals, Incorporated 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.

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

Project Number: 2011-03-036
Installation ID Number: 093-0007
Permit Number:

ISP Minerals, Incorporated
1 Hillcrest Drive
Annapolis, MO 63620

Complete: March 14, 2011

Parent Company:
ISP Minerals, Incorporated
1101 Opal Court
Hagerstown, MD 21740

Iron County, S22, T31N, R3E

REVIEW SUMMARY

- ISP Minerals, Incorporated has applied for authority to install a rotary kiln rock dryer, a crusher, a screen, and the associated material handling equipment.
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment. HAPs of concern from this process are due to the combustion of natural gas.
- 40 CFR 60 Subpart OOO, "Standards of Performance for Nonmetallic Mineral Processing Plants" applies to the crusher, screen, and conveyors.
- 40 CFR 60 Subpart UUU, "Standards of Performance for Calciners and Dryers in Mineral Industries" applies to the rotary kiln rock dryer.
- None of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) apply to this installation. None of the currently promulgated Maximum Achievable Control Technology (MACT) regulations apply to the proposed equipment.
- Baghouses are being used to control the emissions of particulate matter less than 10 microns (PM_{10}) and 2.5 microns ($PM_{2.5}$) in diameter 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 below de minimis levels. ISP Minerals has requested a voluntary limit on emissions of CO_2e such that greenhouse gases (GHGs) are not subject to regulation.
- This installation is located in Iron 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.

- Ambient air quality modeling was not performed since potential emissions of the application are below de minimis levels.
- Emissions testing are required by NSPS 40 CFR 60 Subpart OOO and 40 CFR 60 Subpart UUU.
- An application for an amendment to the Basic Operating Permit is required for this installation within 30 days of equipment startup.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

ISP Minerals is an existing manufacturer of roofing shingle granules located in Iron County, Missouri. ISP Minerals quarries rhyolite on-site and processes the rock through crushing and screening operations to form raw roofing granules of a precise size. The raw roofing granules are then processed in a coloring plant to create a coated roofing granule.

This installation was originally classified as a major source of PM₁₀. However, the facility has since installed a number of fabric filter control devices which has reduced the potential emissions of PM₁₀ to minor source levels. The facility is an existing minor source of PM₁₀ and Nitrogen Oxides (NO_x). ISP Minerals currently holds a Basic State Operating Permit. The following construction permits have been issued to ISP Minerals from the Air Pollution Control Program.

Table 2: Construction Permit History

Permit Number	Description
0680-006	Rotary rock dryer for the secondary crusher, 20 MMBtu/hr burner, two conveyors
0680-007	4 Underground storage tanks
0680-008	Rock storage and conveyors
0680-009	Rock storage and conveyors
0680-010	Conveyor
0680-011	Hopper and conveyor
0680-012	2-500 ton storage bins and conveyors
0680-013	1-1000 ton storage bun and conveyor
1187-005	Incinerator
1290-002	Modifications to process
0792-034	Tertiary crusher, screens, elevators, conveyors, and storage bins
0393-006	Conveyor and screens
0394-015	Conveyor and slurry tank
0395-016	Outside storage stockpile
0395-017	2 screens
0298-002A	4 conveyors, 2 elevators, 2 screens for the Recovery System
122009-007	Replacement of preheater kilns in the coloring plant.
122009-007A	Correction to the potential emissions calculations.
012011-014	4 screens, 4 conveyors for the Mill building

PROJECT DESCRIPTION

The throughputs, emission factors and maximum design rates have not been included in this permit because ISP Minerals has requested that they be considered confidential due to the proprietary nature of the information. This information is contained in the confidential permit and project folder (2011-03-037) and is available to employees of the Missouri Department of Natural Resources and the U.S. Environmental Protection Agency for review.

ISP Minerals proposes to install a rotary kiln rock dryer, a crusher, a screen, and the associated material handling equipment. This project will de-bottleneck some of their processes both upstream and downstream of the new equipment. All emission units considered for this review are listed in Appendix A.

The new kiln will have a higher capacity natural gas-fired burner. As a result of this project, the facility-wide potential emissions of CO₂e will exceed 100,000 tons per year, and ISP Minerals will be a major source of GHGs. In order to remain a basic source for operating permit purposes and a minor source for construction permitting purposes., ISP Minerals has requested a voluntary limit on emissions of CO₂e such that GHGs are not subject to regulation.

EMISSIONS/CONTROLS EVALUATION

The filterable emission factors used in the analysis of the rotary kiln rock dryer were obtained from the Environmental Protection Agency (EPA) document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 11.19.1 "Sand & Gravel Processing" (November 1995) and assuming a particle size distribution of 51% PM₁₀ and 15% PM_{2.5}. The particle size distribution was obtained from AP-42, Appendix B.2 "Generalized Particle Size Distributions" (September 1996) for Mechanically Generated, Unprocessed Ores. The condensable particulate emissions and other emissions from the combustion of natural gas were calculated with the emission factors obtained from AP-42, Section 1.4 "Natural Gas Combustion" (July 1998). The emission factors used in the analysis of the crushers, screens, conveyors, and storage bins were obtained from AP-42, Section 11.19.2 "Crushed Stone Processing and Pulverized Mineral Processing" (August 2004) and assuming 29% of PM₁₀ is PM_{2.5} according to Appendix B.2 "Generalized Particle Size Distributions" (September 1996).

Emissions from the equipment that are vented to baghouse dust collectors are captured by either total enclosures or hoods. Total enclosures completely surround the emissions from an emission unit and are assumed to capture 100% of the emissions. Hoods are shaped inlets to a pollution control system that do not completely surround the emissions but are designed to capture and discharge the emissions to control equipment. The emission units with hoods are located inside a building and will be designed and installed according to the industrial ventilation manual entitled, "Industrial Ventilation - A Manual of Recommended Practice, American Conference of Governmental Industrial Hygienists". The hoods are expected to capture at least 90% of the particulate emissions. The baghouses are expected to control at least 99.5% of PM₁₀ and 99.0% of PM_{2.5}.

In regards to the water spray application at the outdoor stockpile, no control efficiency was applied to the feeder conveyors from this stockpile because the controlled emission factors account for the higher moisture content of this material.

Potential emissions of the de-bottlenecked equipment were calculated at the potential-to-emit for the de-bottlenecked design rate. Although the project emissions for the de-bottlenecked units could have been calculated using a potential minus actual approach, the difference would not affect the outcome of the permit. Potential emissions of the application represent the potential of the new equipment and the de-bottlenecked equipment, assuming continuous operation (8760 hours per year). The following table provides an emissions summary for this project.

Table 3: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Potential Emissions ^[1]	Existing Actual Emissions (2010 EIQ)	Potential Emissions of the Application	New Installation Conditioned Potential ^[2]
PM _{2.5}	10	N/D	0.48	8.14	N/D
Non-Fugitive PM _{2.5}	N/A	N/D	N/D	8.14	N/D
PM ₁₀	15	122.10	36.83	11.84	133.94
Non-Fugitive PM ₁₀	N/A	44.34	N/D	11.84	56.18
SO _x	40.0	2.45	0.17	0.19	2.46
NO _x	40.0	82.69	16.47	32.21	83.91
VOC	40.0	6.78	0.88	1.77	6.85
CO	100.0	75.36	3.29	27.05	76.38
HAPs	10.0/25.0	N/D	0.50	0.61	N/D
CO _{2e}	100,000	97,964	N/D	38,885	<100,000

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

¹Obtained from project 2010-09-006 (permit number 012011-014)

²Conditioned potential emissions are based on a direct limit on emissions of CO_{2e} and an indirect limit on natural gas usage. The potential emissions of other pollutants emitted from the combustion of natural gas are proportionately reduced.

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels.

APPLICABLE REQUIREMENTS

ISP Minerals, Incorporated 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
The emission fee is the amount established by the Missouri Air Conservation Commission annually under Missouri Air Law 643.079(1). Submission of a hardcopy Emissions Inventory Questionnaire (EIQ) is required by April 1 (May 1 for an electronic EIQ) for the previous year's emissions. Otherwise, submission of an electronic EIQ via MOEIS is required by May 1.
- *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 Odors*, 10 CSR 10-6.165

SPECIFIC REQUIREMENTS

- *New Source Performance Regulations*, 10 CSR 10-6.070 – *New Source Performance Standards (NSPS) for Nonmetallic Mineral Processing Plants*, 40 CFR Part 60, Subpart OOO
- *New Source Performance Regulations*, 10 CSR 10-6.070 – *New Source Performance Standards (NSPS) for Calciners and Dryers in Mineral Industries*, 40 CFR Part 60, Subpart UUU

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.

Kathi Jantz
Environmental Engineer

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated March 11, 2011, received March 14, 2011, designating ISP Minerals, Incorporated as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Southeast Regional Office Site Survey, dated April 6, 2011.

Appendix A – Debottlenecked Emission Unit List

ISP Minerals, Incorporated
 Iron County, S22, R31N, R3E
 Project Number: 2011-03-036
 Installation ID Number: 093-0007
 Permit Number:

Project ^[1]	Emission Point	Segment	Unit Description	Existing MHDR (tons/hr)	Project MHDR (tons/hr)	Capture Device	Control Device
New			Crusher			Total Enclosure	Baghouse
New			Screen			Total Enclosure	Baghouse
New			Dryer			Total Enclosure	Baghouse
New			Conveyor			Hood	Baghouse
New			Conveyor			Hood	Baghouse
New			Conveyor			Hood	Baghouse
New			Conveyor			Hood	Baghouse
New			Conveyor			Hood	Baghouse
Modified			Conveyor			Hood	Baghouse
Modified			Conveyor			Hood	Baghouse
Modified			Conveyor			Hood	Baghouse
Modified			Conveyor			N/A	watersprays
Modified			Conveyor			N/A	watersprays
Modified			Conveyor			N/A	watersprays
Modified			Conveyor			N/A	watersprays
Modified			Crusher			Total Enclosure	Baghouse
Modified			Screen			Total Enclosure	Baghouse
Modified			Conveyor			Hood	Baghouse
Modified			Conveyor			Total Enclosure	Baghouse
Modified			Rock Bin			Total Enclosure	Baghouse

¹Modified means that the equipment is not new, but was de-bottlenecked by this project. The change in the maximum hourly design rates (MHDR) are shown in the existing and project MHDR columns.

Attachment A – CO₂e Compliance Worksheet

ISP Minerals, Incorporated
 Iron County, S22, T31N, R3E
 Project Number: 2011-03-036
 Installation ID Number: 093-0007
 Permit Number: _____

This sheet covers the period from _____ to _____.
 (month, year) (month, year)

Month/Year	Facility-Wide Natural Gas Usage			Incinerator	Total
	Column 1	Column 2	Column 3	Column 4	Column 5
	Monthly Amount of Natural Gas Combusted (MMCF)	Emission Factor ^[1] (tons CO ₂ e per MMCF)	Monthly CO ₂ e Emissions from Natural Gas ^[3] (tons)	Monthly CO ₂ e Potential Emissions from the Incinerator ^[2] (Tons)	12-Month CO ₂ e Emissions ^[4] (Tons/Year)
		60.37		129	
		60.37		129	
		60.37		129	
		60.37		129	
		60.37		129	
		60.37		129	
		60.37		129	
		60.37		129	

MMCF = million cubic feet

¹Emission factors obtained from *AP-42, Compilation of Air Pollutant Emission Factors, Fifth Edition* Section 1.4 “Natural Gas Combustion” (July 1998), Global Warming Potentials obtained from 40 CFR Part 98 (FR 56260) CO₂e emission factor (tons/mmcf) = [120,000 lb CO₂/mmcf + 2.2 lb N₂O/mmcf * (310 lb CO₂e/ lb N₂O) + 2.3 lb CH₄/mmcf * (21 lb CO₂e/ lb CH₄)]/2000 = 60.365 tons CO₂e/mmcf

²Emission factor obtained from *AP-42, Compilation of Air Pollutant Emission Factors, Fifth Edition* Section 2.1 Refuse Combustion. Of the Greenhouse Gases (GHGs), only carbon dioxide (CO₂) emissions are expected. Value represents the maximum monthly CO₂e emissions from the incinerator based on a maximum design rate of 0.18 tons per hour.

³Column 3 = Column 1 * Column 2

⁴Column 5 = Column 3 + Column 4 + previous 11-months. **A 12-Month CO₂e emissions total of less than 100,000.0 tons indicates compliance.**

Mr. Garry Pogue
EH&S Coordinator
ISP Minerals, Incorporated
1 Hillcrest Drive
Annapolis, MO 63620

RE: New Source Review Permit - Project Number: 2011-03-036

Dear Mr. Pogue:

Enclosed with this letter is the public version of your construction permit. It will be available for the public to review in our fileroom and on the internet. The confidential version of your permit will only be available to employees of the Missouri Department of Natural Resources and the Environmental Protection Agency.

If you have any questions regarding this permit, please do not hesitate to contact Kathi Jantz, at the Department's Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Kendall B. Hale
New Source Review Unit Chief

KBH:kjl

Enclosures

c: Southeast Regional Office
PAMS File: 2011-03-036

Permit Number: