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: 042018-008

Project Number: 2017-11-017
Installation Number: 099-0008

Parent Company: U.S. Silica

Parent Company Address: 1718 Hidden Creek Ct, Suite 150, Town & Country, MO 63131

Installation Name: U.S. Silica

Installation Address: 838 VFW Drive, Festus, MO 63028

Location Information: Jefferson County (S16, T40N, R6E)

Application for Authority to Construct was made for:
The installation of a new rotary sand dryer and associated handling equipment to allow for an increase in the production of fine sands. This review was conducted in accordance with Section (6), 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
Ryan Schott
New Source Review Unit

Director or Designee
Department of Natural Resources

APR 04 2018
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 startup 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 startup 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."

U.S. Silica
Jefferson County (S16, T40N, R6E)

1. Operational Limitation – Rotary Sand Dryer
   A. U.S. Silica shall output no more than 1,001,756 tons of sand from the new rotary sand dryer (Dryer 2) in any consecutive 12-month period.

   B. U.S. Silica shall develop and use forms to demonstrate compliance with Special Condition 1.A. The forms shall contain, at a minimum, the following information:
      1) Installation name & ID
      2) Permit number
      3) Current month & 12-month date range
      4) Monthly throughput of sand output from the dryer
      5) 12-month rolling total throughput of sand output from the dryer

2. Capture Device Requirement – Total Enclosure
   A. U.S. Silica shall capture emissions from the new conveyors (C-E01, C-E02, C-E03-O, C-E04, C-E05 & C-E06), the distribution chute (F-E01), and the new rotex screens (SCR-E01, SCR-E02 & SCR-E03) using total enclosure. The enclosed ducts shall be completely sealed except for material entry and exit points, which shall have minimal cross-sectional areas.

   B. U.S. Silica shall perform one of the following actions to ensure the capture of particulates:
      1) Construct the total enclosure where the maximum distance between the inlet duct and the emissions source does not exceed 1.5 times the diameter of the inlet duct; or
      2) Use visual indicators, such as negative pressure gauges, streamers, talc puff tests, etc. at the material entry and material exit to indicate that the flow of air is inwards toward the exhaust. U.S. Silica shall perform a visual indicator check at each emission point at least once every calendar month while the emission unit is in operation. The results of the visual indicator check shall be indicated in a log.

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

3. Control Device Requirement – Fabric Filters
   A. U.S. Silica shall control emissions from the new conveyors (C-E01, C-E02, C-E03-O, C-E04, C-E05 & C-E06), the distribution chute (F-E01), and the new rotex screens (SCR-E01, SCR-E02 & SCR-E03) using fabric filters, as specified in the permit application.

   B. The filters shall be equipped with gauges or meters, which indicate the pressure drop across the control devices. These gauges or meters shall be located such that Department of Natural Resources' employees may easily observe them.

   C. U.S. Silica shall monitor and record the operating pressure drop across the baghouses at least once per day while the plant is operating. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty.

   D. Replacement filters shall be kept on hand at all times. The filters shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance, and abrasion resistance).

   E. U.S. Silica shall maintain a copy of the filter manufacturer's performance warranty on site.

   F. U.S. Silica shall maintain an operating and maintenance log for the filters, which shall include the following:
      1) Incidents of malfunction, with impact on emissions (tons), 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 Scrubber & Mist Eliminator
   A. U.S. Silica shall control particulate matter emissions from the new rotary sand dryer (Dryer 2) using a wet scrubber and mist eliminator, as specified in the permit application.

   B. The wet scrubber and mist eliminator shall be operated and maintained in accordance with the manufacturer's specifications. The scrubber and mist eliminator shall be equipped with gauges or meters, which indicate the pressure drop across the control devices. These gauges or meters shall be located such that Department of Natural Resources' employees may easily observe them.

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

C. U.S. Silica shall monitor and record the operating pressure drop across the scrubber and mist eliminator at least once every 24 hours while the new rotary sand dryer (Dryer 2) is operating. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty.

D. U.S. Silica shall monitor the liquid flow rate into the wet scrubber and mist eliminator at least once per day while the new rotary sand dryer (Dryer 2) is operating and maintain the liquid flow rate within the manufacturer's specifications.

E. U.S. Silica shall maintain copies of the scrubber and mist eliminator manufacturer's performance warranty on site.

F. U.S. Silica shall maintain an operating and maintenance log for the scrubber and mist eliminator, which shall include the following:
1) Incidents of malfunction, with impact on emissions (tons), duration of event, probable cause, and corrective actions; and
2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.

5. Emission Rate Verification Requirement
U.S. Silica shall submit an amendment to this construction permit if the results of the initial performance test of the rotary sand dryer (Dryer 2), required by NSPS UUU, exceed a PM_{10} emission rate of 0.01 gr/dscf. The amendment shall require further PM_{10} and $PM_{2.5}$ emissions testing at Dryer 2 and update the emissions calculations accordingly.

6. Record Keeping & Reporting Requirements
A. U.S. Silica shall maintain all records required by this permit for not less than five years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request.

B. U.S. Silica 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 limitation imposed by this permit.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (6) REVIEW
Project Number: 2017-11-017
Installation ID Number: 099-0008
Permit Number: 042018-008

Installation Address:
U.S. Silica
838 VFW Drive
Festus, MO 63028
Jefferson County (S16, T40N, R6E)

Parent Company:
U.S. Silica
1718 Hidden Creek Ct, Suite 150
Town & Country, MO 63131

REVIEW SUMMARY

- U.S. Silica has applied for authority to install a new rotary sand dryer and associated handling equipment to allow for an increase in the production of fine sands.
- The application was deemed complete on November 14, 2017.
- The only HAPs expected from the proposed equipment include natural gas combustion emissions.
- 40 CFR 60 Subpart OOO – *Standards of Performance for Nonmetallic Mineral Processing Plants* applies to all proposed equipment except the rotary sand dryer (Dryer 2). 40 CFR 60 Subpart UUU – *Standards of Performance for Calciners and Dryers in Mineral Industries* applies to the rotary sand dryer (Dryer 2).
- None of the NESHAPs apply to this installation. None of the currently promulgated MACT regulations apply to the proposed equipment.
- Fabric filters and a wet scrubber with mist eliminator are being used to control particulate matter emissions from the equipment in this permit.
- This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of PM are above the de minimis level but below the major source level. Potential emissions of PM_{10} are indirectly conditioned below the de minimis level by a throughput limit. Potential emissions of all other pollutants are subsequently limited below their respective de minimis levels.
- This installation is located in Jefferson County, a nonattainment area for the 8-hour ozone standard and the $PM_{2.5}$ standard and an attainment/unclassifiable area for all other criteria pollutants. The installation is not located in the Jefferson County lead nonattainment area.

- 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 100 tons per year for $PM_{2.5}$, VOC & NO_x due to nonattainment status and 250 tons per year for all other pollutants. Fugitive emissions are not counted toward major source applicability.

- Although PM emissions exceed the de minimis level, ambient air quality modeling was not performed because no modeling standards currently exist for PM.

- Emissions testing is required for the rotary sand dryer (Dryer 2) according to 40 CFR 60 Subpart UUU. Additional testing may be required as part of other state, federal, or applicable rules.

- Submittal of an amendment to your 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

U.S. Silica (formerly Mississippi Sand, LLC) produces natural sand proppants out of a reserve located in Festus, Missouri. The facility produces multiple sand products that are distinguishable by their sizes. Current operations include a system of storage piles, hoppers, conveyors, crushers, screens, a fluid-bed dryer (controlled by a baghouse), storage silos, loadout activities, and haul roads. The processes collectively form two main areas of the plant, a wet side and a dry side. Wet side activities deal with sand containing relatively high moisture levels, which is handled by all processes leading up to the dryer. Dry side activities include the dryer and all post-dryer processes.

U.S. Silica was a de minimis source for all pollutants other than PM, which exceeds the de minimis level but is below the major source level. The installation currently has a Basic Operating Permit which expires July 19, 2018. The following New Source Review permits have been issued to U.S. Silica from the Air Pollution Control Program:

Table 1: Permit History

Permit Number	Description
0690-011	New portable asphaltic plant
0690-011A	Modification to portable asphaltic plant
0697-022	Permit existing conveyors
0697-022	Replace crusher
052005-008	Added conveyor and separator to rock-crushing plant
052005-008A	Allow concurrent operation for rock-crushing plant
062008-011	Installation of a new sand processing plant
052009-019	Addition of equipment to sand processing plant
052009-019A	Update workbook parameters and establish installation-wide de minimis limit
052009-019B	Update throughputs of emission units
052009-019C	Revise Attachment C of Permit 052009-019B
072014-007	Installation of additional screen, conveyor, and feeder to post-wash
072014-007A	Update silt loading value and reevaluate installation-wide emissions

PROJECT DESCRIPTION

U.S. Silica is proposing to increase the production of fine sands at their facility. To do this, a new 125 ton per hour rotary sand dryer (Dryer 2) will be installed, as well as six conveyors, a loader, a distribution chute, a hopper, and three rotex screens. The product will be stored in existing Silo 3. The dryer will be capable of drying product sizes ranging from 100 mesh to 40 mesh and its design allows for improved efficiency over fluid-bed dryers when operating at various throughputs and moisture contents. Particulate emissions generated by Dryer 2 will be controlled by a new wet scrubber, consisting of a high-efficiency scrubbing element and a two-stage mist eliminator. A list of new equipment being installed is included in Table 2.

Table 2: New Equipment Being Installed

Emission Unit Number	Description	MHDR (ton/hr)
Load-E01	Loader	150.0
H-E01	Hopper	132.0
C-E01	Conveyor	132.0
Dryer 2	27 MMBtu/hr Rotary Sand Dryer	125.0
C-E02	Dryer Discharge Conveyor	125.0
F-E01	Distribution Chute (Feeder)	125.0
SCR-E01, -E02 & -E03	Rotex Screens #1-3	125.0
C-E03-O	Oversize Conveyor	125.0
C-E04	Under-Screen Conveyor	75.0
C-E05	100 Product Conveyor	75.0
C-E06	Silo 3 Feed Conveyor	75.0

The new 41.7 ton per hour rotex screens (SCR-E01, SCR-E02 & SCR-E03) will only allow 100 mesh sand to pass through and continue on to Silo 3 via the new conveyors, while the larger material will be diverted to the oversize conveyor. The oversize material will be transported to the existing plant to be further processed in the dry side operations. Although the maximum design rate of the existing post-dryer equipment is limited by the existing dryer, the additional throughput from the new oversized materials being diverted to the dry side will increase the maximum design rate of some of the plant's existing dry side equipment. A list of existing dry side equipment being debottlenecked is included in Table 3.

Table 3: Existing Dry Side Equipment Being Debottlenecked

Emission Unit Number	Description	Existing MHDR (ton/hr)	Debottlenecked MHDR (ton/hr)
C-07	Dryer Discharge Conveyor	187.2	233.0
Bin 1, 2, 3, 4, 5 & 6	Storage Bins	187.2	233.0
F-05, -06, -07 & -08	Feeder Conveyors #5-8	28.1	39.5
SCR-02, -03, -04 & -05	Rotex Screens #4-7	28.1	39.5
C-10	40/70 Product Conveyor	62.4	85.3
C-14	30/50 Product Conveyor	62.4	85.3
C-15	Silo 4 Feed Conveyor	31.2	46.5
C-17	Silo 5 Feed Conveyor	31.2	46.5
C-18	Silo 6 Feed Conveyor	31.2	46.5
Haul Road 2	Paved Sales Haul Road	187.2	301.6
Haul Road 3	Unpaved Sales Haul Road	187.2	301.6
Pile 2	Loadout Storage Pile #2	10.0	16.7

The new system's oversized materials conveyor will also be capable of transferring materials prior to screening, which would divert all material from the new dryer to Conveyor C-07 for final screening and storage by the existing dry side plant. This bypass will only be utilized when the existing dryer is not in operation. Because the capacity of the existing system is larger than the capacity of the new system, utilizing this bypass will result in a net decrease in emissions when compared to operating just the existing system; therefore, no potential emission increase is associated with the bypass, and potential emissions for this scenario were only calculated for recordkeeping purposes. A flow diagram detailing all dry side processes is included in Attachment A.

The existing dryer also limits the maximum capacity of the existing wet side operations. Since the new dryer will increase material production, the installation will be able to process more material prior to drying; therefore, the maximum design rate of some of the plant's wet side equipment will increase, as well. A list of existing wet side equipment being debottlenecked is included in Table 4.

Table 4: Existing Wet Side Equipment Being Debottlenecked

Emission Unit Number	Description	Existing MHDR (ton/hr)	Debottlenecked MHDR (ton/hr)
F-101	Simplicity Feeder	245.4	366.2
CR-01	Jaw Crusher	245.4	366.2
C-01	Under Crusher Conveyor	245.4	366.2
F-02	Grizzly Feeder	245.4	366.2
CR-02	Impact Crusher	245.4	366.2
C-101	48"x40' Conveyor	245.4	366.2
C-02	Oversize Conveyor	15.0	22.4
STK-01	Oversize Materials Return to Crusher	15.0	22.4
Pile 3	Oversize/Fines Pile	15.0	22.4
Haul Road 1	Pit Haul Road	245.4	366.2

Potential emissions of the new equipment and the debottlenecked equipment are above the de minimis levels for PM, PM_{10} & $PM_{2.5}$. U.S. Silica is choosing to take a limit on the new dryer's annual throughput, such that PM_{10} emissions (and subsequently $PM_{2.5}$ emissions) will not exceed de minimis levels.

EMISSIONS/CONTROLS EVALUATION

Emissions for the project were calculated using emission factors obtained from the EPA document AP-42 *Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources*, Fifth Edition (AP-42).

Potential PM, PM_{10} & $PM_{2.5}$ emissions from all sand processing equipment were calculated using emission factors taken from AP-42 Section 11.19.1 *Sand and Gravel Processing* (November 1995) and Section 11.19.2 *Crushed Stone Processing and Pulverized Mineral Processing* (August 2004). The rotary dryer (Dryer 2) is controlled by a wet scrubber with an exhaust flow rate of 12,700 dcfm, which is guaranteed to control PM emissions (including condensable PM) to a maximum of 0.01 gr/dscf. The new conveyors (C-E01, C-E02, C-E03-O, C-E04, C-E05 & C-E06), the distribution chute

(F-E01), and the new rotex screens (SCR-E01, SCR-E02 & SCR-E03) are all controlled by fabric filters, which were given the manufacturer's rated control efficiency of 99% for PM, PM_{10} & $PM_{2.5}$. U.S. Silica also uses wet spray devices on the primary crusher and screen, as required in Construction Permit No. 062008-011; therefore, the material handled in all emission units after these points is considered to have a carryover moisture content greater than 1.5%.

Potential SO_x, NO_x, VOC, CO, and HAP emissions from the combustion of natural gas in the 27 MMBtu/hr rotary dryer were calculated using emission factors taken from AP-42 Section 1.4 *Natural Gas Combustion* (July 1998).

Potential PM, PM_{10} & $PM_{2.5}$ emissions from storage piles were calculated using the emission factors taken from AP-42 Section 13.2.4 *Aggregate Handling and Storage Piles* (November 2006).

Potential PM, PM_{10} & $PM_{2.5}$ emissions from haul roads were calculated using the methods found in AP-42 Section 13.2.1 *Paved Roads* (January 2011) and Section 13.2.2 *Unpaved Roads* (November 2006). The silt loading for paved roads was taken to be 0.75 g/m^2, which is the result of a previous silt load test with an added safety factor, as described in Construction Permit No. 072014-007A. The installation will perform Best Management Practices (BMPs), as required by Construction Permit No. 052009-019.

Particulate emissions from equipment in both the dry and wet sides of the plant (see Tables 3 & 4) are expected to increase as a result of the additional sand drying capabilities. Emissions from all affected processes were reevaluated at the new maximum design rates using emission factors taken from AP-42 Section 11.19.1 and 11.19.2. Consistent with the PSD guidance provided by the EPA, the updated potential to emit for each emission unit was compared to the baseline actual emissions (BAE) of the same unit for the maximum 24-month yearly emissions from the past ten years of data. The period chosen for this comparison was November 2015 – October 2017.

Table 5 provides an emissions summary for this project. Existing potential emissions were taken from the installation's previous construction permit (072014-007A). Existing actual emissions were taken from the installation's most recent EIQ. Potential emissions of the project represent the potential of the new equipment and affected existing equipment, assuming continuous operation (8,760 hours per year) with control devices and accounting for a dryer throughput limit, which indirectly limits PM_{10} below the de minimis level.

Table 5: Emissions Summary (tons per year)

Pollutant	Regulatory *De Minimis* Levels	Existing Potential Emissions	Existing Actual Emissions (2014 EIQ)	Potential Emissions of the Project	New Installation Conditioned Potential
PM	25.0	46.21	N/D	44.31	90.52
PM_{10}	15.0	<15.0	11.28	<15.0	30.00
$PM_{2.5}$	10.0	7.94	8.28	9.54	17.48
SO_x	40.0	0.09	N/D	0.06	0.15
NO_x	40.0	27.16	N/D	10.61	37.77
VOC	40.0	0.78	N/D	0.58	1.36
CO	100.0	11.90	N/D	8.91	20.81
Lead	0.6	N/D	N/D	$5.3x10^{-5}$	N/D
Total HAPs	25.0	0.27	N/D	0.20	0.47

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

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required.* This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required.* Potential emissions of PM are above the de minimis level but below the major source level. Potential emissions of PM_{10} are indirectly conditioned below the de minimis level by a throughput limit. Potential emissions of all other pollutants are subsequently limited below their respective de minimis levels.

APPLICABLE REQUIREMENTS

U.S. Silica 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

- *Start-Up, Shutdown, and Malfunction Conditions,* 10 CSR 10-6.050
- *Operating Permits*, 10 CSR 10-6.065
- *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 Emission of Odors*, 10 CSR 10-6.165

- *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

SPECIFIC REQUIREMENTS

- *New Source Performance Regulations*, 10 CSR 10-6.070
  - *Standards of Performance for Nonmetallic Mineral Processing Plants*, 40 CFR Part 60, Subpart OOO

- *New Source Performance Regulations*, 10 CSR 10-6.070
  - *Standards of Performance 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 (6), 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:

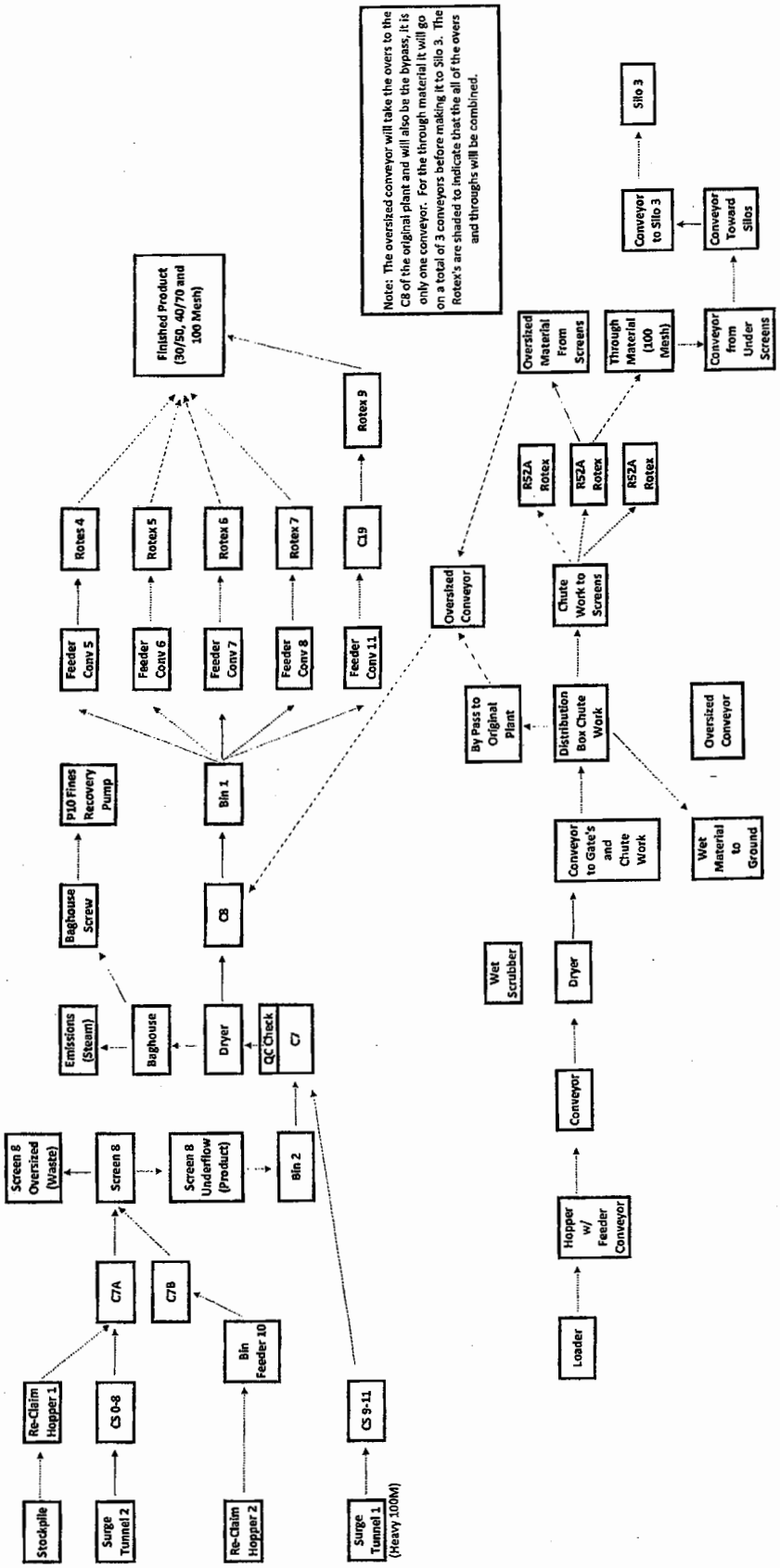
- The Application for Authority to Construct form, dated November 8, 2017, received November 13, 2017, designating U.S. Silica as the owner and operator of the installation.

APPENDIX A

Abbreviations and Acronyms

%.....percent
°F.....degrees Fahrenheit
acfm.....actual cubic feet per minute
BACT.....Best Available Control Technology
BMPs.....Best Management Practices
Btu.....British thermal unit
CAM.....Compliance Assurance Monitoring
CAS.....Chemical Abstracts Service
CEMS.....Continuous Emission Monitor System
CFR.....Code of Federal Regulations
CO.....carbon monoxide
CO_2.....carbon dioxide
CO_2e.....carbon dioxide equivalent
COMS.....Continuous Opacity Monitoring System
CSR.....Code of State Regulations
dscf.....dry standard cubic feet
EIQ.....Emission Inventory Questionnaire
EP.....Emission Point
EPA.....Environmental Protection Agency
EU.....Emission Unit
fps.....feet per second
ft.....feet
GACT.....Generally Available Control Technology
GHG.....Greenhouse Gas
gpm.....gallons per minute
gr.....grains
GWP.....Global Warming Potential
HAP.....Hazardous Air Pollutant
hr.....hour
hp.....horsepower
lb.....pound
lbs/hr.....pounds per hour
MACT.....Maximum Achievable Control Technology
µg/m^3.....micrograms per cubic meter
m/s.....meters per second
Mgal.....1,000 gallons
MW.....megawatt
MHDR.....maximum hourly design rate
MMBtu....Million British thermal units
MMCF.....million cubic feet
MSDS.....Material Safety Data Sheet
NAAQS....National Ambient Air Quality Standards
NESHAPs National Emissions Standards for Hazardous Air Pollutants
NO_x.....nitrogen oxides
NSPS.....New Source Performance Standards
NSR.....New Source Review
PM.....particulate matter
$PM_{2.5}$.....particulate matter less than 2.5 microns in aerodynamic diameter
PM_{10}.....particulate matter less than 10 microns in aerodynamic diameter
ppm.....parts per million
PSD.....Prevention of Significant Deterioration
PTE.....potential to emit
RACT.....Reasonable Available Control Technology
RAL.....Risk Assessment Level
SCC.....Source Classification Code
scfm.....standard cubic feet per minute
SDS.....Safety Data Sheet
SIC.....Standard Industrial Classification
SIP.....State Implementation Plan
SMAL.....Screening Model Action Levels
SO_x.....sulfur oxides
SO_2.....sulfur dioxide
tph.....tons per hour
tpy.....tons per year
VMT.....vehicle miles traveled
VOC.....Volatile Organic Compound

ATTACHMENT A: Dry Side Process Flow Diagram



Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Eric R. Greitens, Governor
Carol S. Comer, Director

APR 0 4 2018

Mr. Jason Bish
Vice President - Safety & Regulatory Management
U.S. Silica
1718 Hidden Creek Court, Suite 150
Town and Country, MO 63131

RE: New Source Review Permit - Project Number: 2017-11-017

Dear Mr. Bish:

Enclosed with this letter is your permit to construct. Please study it carefully and refer to Appendix A for a list of common abbreviations and acronyms used in the permit. Also, note the special conditions on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files. Operation in accordance with these conditions, your new source review permit application and with your amended operating permit is necessary for continued compliance. The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

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.

If you have any questions regarding this permit, please do not hesitate to contact Ryan Schott, 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

Kendall B. Hale for

Susan Heckenkamp
New Source Review Unit Chief

SH:rsj

Enclosures

c: St. Louis Regional Office
PAMS File: 2017-11-017

Permit Number: 042018-008