Statement of Basis

Minor Air Quality Permit
Permit Renewal

KNTC, LLC, DBA Sioux Marble
Brandon, South Dakota

South Dakota Department of Environment and Natural Resources

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1.0 Operational Description

KNTC, LLC, DBA Sioux Marble (Sioux Marble) in Brandon, South Dakota, manufactures cultured marble products using unsaturated polyester resin, unsaturated polyester gelcoat, calcium carbonate, and titanium dioxide dry pigment. Acetone and methyl ethyl ketone peroxide are used as solvents. The finished products are buffed using selected compounds as required for the specific product and desired finish. The primary Standard Industrial Code (SIC) for the facility is 3088 (plastics plumbing fixtures). The secondary SIC code is 3089 (plastics products, not elsewhere classified).

On December 12, 2017, Sioux Marble was issued a minor air quality operating permit by the Department of Agriculture and Natural Resources (DANR) for their facility located in Brandon, South Dakota.

DANR received a renewal application March 20, 2023. The application was deemed complete May 9, 2025.

1.1 Existing Equipment

Table 1-1 displays the description of the existing permitted units as listed in the minor operating permit issued on December 12, 2017.

Table 1-1 – Description of Permitted Units, Operations, and Processes

Unit	Description	Maximum Operating Rate	Control Device
#1	1985 Sioux Marble homemade spray booth, using air-atomized method of spraying.	Not applicable	Dry filter pads
#2	Open pot mixing.	Not applicable	Dry filter pads

Sioux Marble uses approximately 84,000 pounds of calcium carbonate (marble dust) per year. Sioux Marble also has sanding and polishing. Sioux Marble uses a vent in the side of the building with a dry filter matt as part of its ventilation system to control dust levels inside their facility. In accordance with the Administrative Rules of South Dakota (ARSD) 74:36:04:03(6) and 74:36:05:04.01(5), a ventilation system not designed specifically to remove dust from the equipment is exempt from permitting requirements.

2.0 New Source Performance Standards

DANR reviewed the New Source Performance Standards under 40 CFR Part 60 and determined there are no standards applicable to Sioux Marble.

3.0 New Source Review

Administrative Rules of South Dakota (ARSD) 74:36:10:01 states that New Source Review regulations apply to areas of the state which are designated as nonattainment pursuant to the Clean Air Act for any pollutant regulated under the Clean Air Act. Brandon, South Dakota, is in attainment or unclassifiable for all the pollutants regulated under the Clean Air Act. Therefore, Sioux Marble is not subject to New Source Review.

4.0 Prevention of Significant Deterioration

A Prevention of Significant Deterioration review applies to new major stationary sources and major modifications to existing major stationary sources in areas designated as attainment under Section 107 of the Clean Air Act for any regulated pollutant. The following is a list of regulated pollutants under the Prevention of Significant Deterioration program:

1. Total suspended particulate (PM);
2. Particulate with a diameter less than or equal to 10 microns (PM10);
3. Particulate with a diameter less than or equal to 2.5 microns (PM2.5);
4. Sulfur dioxide (SO_2);
5. Nitrogen oxides (NOx);
6. Carbon monoxide (CO);
7. Ozone – measured as volatile organic compounds (VOCs);
8. Lead;
9. Fluorides
10. Sulfuric acid mist;
11. Hydrogen sulfide;
12. Reduced sulfur compounds;
13. Total reduced sulfur; and
14. Greenhouse gases (carbon dioxide, methane, nitrous oxide, etc.).

If the source is considered one of the 28 named Prevention of Significant Deterioration source categories listed in Section 169 of the federal Clean Air Act, the major source threshold is 100 tons per year of any regulated air pollutant, except for greenhouse gases. The major source threshold for all other sources is 250 tons per year of any regulated air pollutant, except for greenhouse gases. Sioux Marble is not one of the 28 named Prevention of Significant Deterioration source categories; therefore, the major source threshold for pollutants is 250 tons per year. A facility must trigger one of the major source thresholds for another regulated pollutant before greenhouse gas emissions can be considered under the Prevention of Significant

Deterioration permitting program. This applies to both new Prevention of Significant Deterioration program sources as well as major source modifications.

4.1 Potential Emissions

DANR uses stack test results to determine air emissions whenever stack test data is available from the source or a similar source. When stack test results are not available, the DANR relies on manufacturing data, material balance, EPA's Compilation of Air Pollutant Emission Factors

(AP-42, Fifth Edition, Volume 1) document, the applicant's application, or other methods to determine potential air emissions.
Potential emissions for each applicable pollutant are calculated from the maximum design capacity listed in the application and assuming the unit operates every hour of every day of the year, while using the fuel that will emit the greatest emissions. Potential emissions are not realistic of the actual emissions and are used only to identify which air quality permit and requirements Sioux Marble is required to obtain.

4.1.1 Potential Emissions – Spray Booths

Based upon the information submitted in the application, Sioux Marble operates one spray booth. The potential air emissions from the spray booth are derived from the safety data sheets for the products in the spray booth, how much product was used, and a multiplying factor based on the number of hours the spray booth actual operation during the year. Sioux Marble stated in the application that the spray booth operates 8 hours per day, 250 days per year, or 2,000 hours per year. The potential emissions for the spray booth will be calculated using the multiplying factor derived in Equation 4.1.

Equation 4.1 – Spray Booth Multiplying Factor

$$Multiplying\ Factor = \frac{8{,}760\ potential\ operating\ hours\ per\ year}{2{,}000\ actual\ operating\ hours\ per\ year} = 4.38$$

Table 4-1 – Spray Booth Potential Emissions

Product	Actual Usage *(pounds per year)*	Potential Usage [1] *(pounds per year)*	VOC Content (percent by weight)
Clear Marble Gelcoat G-1272	4,700	20,586	48%
Gelcoat G-2500	0	0	39%

[1] – Potential Usage is the Actual usage multiplied by the multiplying ratio, 4.38.

Equation 4.2 is used to calculate the potential volatile organic compound emissions from the coating process. Equation 4.2 uses potential usage, in pounds per year, and the volatile organic compound content, in percent by weight, from Table 4-1. The results are shown in Table 4-2.

Equation 4.2 – Potential Volatile Organic Compound Emissions Calc

$$Potential\ Emissions\left(\frac{tons}{year}\right) = \frac{Potential\ Usage\left(\frac{pounds}{year}\right) \times VOC\ Content(\%)}{2{,}000\left(\frac{pounds}{ton}\right)}$$

Table 4-2 – Potential Emissions from Coating

Product	Tons per year
Clear Marble Gelcoat	4.94

4.1.2 Potential Emissions – Open Pot Mixing

Sioux Marble mixes dry materials, i.e. powders, in an open pot before mixing with resin, crushed marble filler, and an inhibiter. The mold is then filled with the mixture and allowed to cure and harden before the product is polished and sanded. Dry filter pads are used to control particulate emissions from mixing room.

Table 4-3 shows the actual usage of the materials listed in the application. The open pot mixing process operates similar hours as the coating process. Therefore, the potential usage is calculated by multiplying the actual usage by the multiplying factor and shown in Table 4-3.

The volatile organic compound and particulate emissions for the products used by Sioux Marble were found in the safety data sheets provided with the application DANR received. Table 4-3 also shows the volatile organic compound content and particulate matter content in percent by weight.

Table 4-3 – Usage and Volatile Organic Compound Content for Open Pot Mixing

Product	Actual Usage (pounds per year)	Potential Usage (pounds per year) [1]	Volatile Organic Compound Content (percent by weight)	Particulate Matter (percent by weight)
Unsaturated Polyester Resin	44,530	195,041	31.6%	-
MEKP-9 Norac	56	245	2.4%	-
Cadox L-50a	320	1402	37%	-
TR-210	29	127	95%	-
SIL Cell	1,372	6,009	-	100%
Titanium Dioxide	1,120	4,906	-	100%
Marble Dust	84,000	367,920	-	100%

[1] – Potential Usage is calculated by multiplying the Actual Usage by the multiplying ration, 4.38.

The potential volatile organic compound emissions are calculated using Equation 4.3 and the potential usage found in Table 4-3. The results are shown in Table 4-4.

The open pot mixing is controlled with dry filter pads. The dry filter pads have a control efficiency of 95%. The particulate matter emissions are calculated from the actual usage and particulate matter content from Table 4-3, using Equation 4.4. The results are shown in Table 4-4.

Equation 4.4 – Potential Particulate Matter Emissions Calculation

$$Potential\ Emissions\left(\frac{tons}{year}\right) = \frac{Potential\ Usage\left(\frac{pounds}{year}\right) \times PM\ Content(\%) * (1 - 0.95)}{2{,}000\left(\frac{pounds}{ton}\right)}$$

Table 4-4 – Potential Emissions from Open Pot Mixing (tons per year)

Product	Volatile Organic Compounds	Particulate Matter
Unsaturated Polyester Resin	30.82	-
MEKP-9 Norac	0.00	-
Cadox L-50a	0.26	-
TR-210	0.06	-
SIL Cell	-	0.15
Titanium Dioxide	-	0.12
Marble Dust	-	9.19
Total	**31.1**	**9.5**

4.1.3 Potential Emissions – Sanding and Polishing

Once the product is removed from the molds, it is sanded and polished. The sanding and polishing area are controlled by dry filter pads. AP-42 does not have emission factors for sanding and polishing marble. DANR estimated emission from sanding and polishing from crushed stone processing and pulverized mineral processing, AP-42, 11.19.2, Table 11.19.2-4, August 2004, for grinding with filter. The emission factors are shown in Table 4-5.

Table 4-5 – Emission Factors for Sanding and Polishing

	TSP	PM^{10}	$PM_{2.5}$
Pounds of emissions per pounds of material	0.0404	0.0339	0.0121

The amount of material sanded is estimated from the calculated potential usage of marble dust, found in Table 4-3. The sanding and polishing process is controlled with dry filter pads. The dry filter pads have a control efficiency of 95%. The potential emissions are calculated from Equation 4.5, the potential usage from Table 4-3, and the emission factors from Table 4-5. The results are shown in Table 4-6.

Equation 4.5 – Potential Emissions from Sanding Calculation

$$Potential\ Emissions\left(\frac{tons}{year}\right) = \frac{Potential\ Usage\left(\frac{pounds}{year}\right) \times Emission\ Factor\left(\frac{pounds}{ton}\right) * (1 - 0.95)}{2{,}000\left(\frac{pounds}{ton}\right)}$$

Table 4-6 – Potential Emissions from Sanding and Polishing (tons per year)

	TSP	PM^{10}	$PM_{2.5}$
Sanding and Polishing	0.17	0.14	0.05

4.1.4 Potential Emissions Summary

The potential emissions summary for Sioux Marble is displayed in Table 4-7.

Table 4-7 – Summary of Potential Emissions (tons per year)

	TSP	PM_{10}	$PM_{2.5}$	VOC
Coating	-	-	-	4.94
Open Pot Mixing	9.5	9.5	9.5	31.1
Sanding and Polishing	0.17	0.14	0.05	-
Total	**9.7**	**9.6**	**9.6**	**36.0**

4.2 Prevention of Significant Deterioration Summary

Sioux Marble is not one of the 28 named Prevention of Significant Deterioration source categories; therefore, the major source threshold is 250 tons per year. Sioux Marble's potential emissions of any regulated air pollutant are less than 250 tons per year. Sioux Marble is considered a minor source under the Prevention of Significant Deterioration program and is not subject to a Prevention of Significant Deterioration review.

5.0 National Emission Standards for Hazardous Air Pollutants

DANR reviewed the National Emission Standards for Hazardous Air Pollutants under 40 CFR Part 61 and determined there are no applicable requirements to Sioux Marble's operations.

6.0 Maximum Achievable Control Technology Standards

The federal Maximum Achievable Control Technology Standards are applicable to both major and area sources of hazardous air pollutants. A major source of hazardous air pollutants is defined as having the potential to emit 10 tons or more per year of a single hazardous air pollutant or 25 tons per year or more of a combination of hazardous air pollutants. An area source is a source that is not a major source of hazardous air pollutants. Sioux Marble has accepted operational limits to maintain plant-wide hazardous air pollutant emissions below the major source threshold. Therefore, Sioux Marble will be considered an area source of hazardous air pollutants.

DANR uses stack test results to determine air emissions whenever stack test data is available from the source or a similar source. When stack test results are not available, DANR relies on manufacturing data, material balance, EPA's Compilation of Air Pollutant Emission Factors (AP-42, Fifth Edition, Volume 1) document, information in the permit application, or other methods to determined potential air emissions.

6.1 Potential Hazardous Air Pollutant Emissions

The hazardous air pollutant emissions for the products used by Sioux Marble were found in the safety data sheets provided with the application DANR received. The hazardous air pollutant content, percent by weight, are shown in Table 6-1.

6.1.1 Potential Hazardous Air Pollutant Emissions – Coating

Potential uncontrolled emissions are those that would occur with no emission controls. Dry filter media are used to control particulate matter; however, the filters do not control hazardous air pollutant emissions. Table 6-1 provides the potential usage in tons per year, from Table 4-1, and the hazardous air pollutant content.

Table 6-1 – Potential Usage and Hazardous Air Pollutant Content: Coating

Product	Potential Usage (pounds per year)	Toluene (% by weight)	Cumene (% by weight)	Styrene (% by weight)
Clear Marble Gelcoat	20,586	-	-	48%

The potential hazardous air pollutant emissions are calculated using Equation 4.2, and the potential usage and hazardous air pollutant content from Table 6-2. The results are shown in Table 6-2.

Table 6-2 – Potential Hazardous Air Pollutant Emissions: Coating (tons per year)

Product	Toluene	Cumene	Styrene
Clear Marble Gelcoat	-	-	4.94

6.1.2 Potential Hazardous Air Pollutant Emissions – Open Pot Mixing

The hazardous air pollutant emissions for the products used by Sioux Marble were found in the safety data sheets provided with the application DANR received. Table 6-3 shows the hazardous air pollutant content and potential usage of hazardous air pollutant containing products used in the open pot mixing process.

Table 6-3 – Potential Usage and Hazardous Air Pollutant Content: Open Pot Mixing

Product	Potential Usage (pounds per year)	Toluene (% by weight)	Cumene (% by weight)	Styrene (% by weight)
Unsaturated Polyester Resin	195,041	-	-	32.6
TR-210	127	75	0.5	-

The potential hazardous air pollutant emissions are calculated using Equation 4.2, and the potential usage and hazardous air pollutant content from Table 6-3. The results are shown in Table 6-4.

Table 6-4 – Potential Hazardous Air Pollutant Emissions: Open Pot Mixing (tons per year)

Product	Toluene	Cumene	Styrene
Unsaturated Polyester Resin	-	-	33.93
TR-210	0.05	0.00	-

6.1.3 Potential Hazardous Air Pollutant Emissions – Sanding and Polishing

The sanding and polishing process does not emit hazardous air pollutants. Therefore, hazardous air pollutant emissions will not be evaluated.

6.1.4 Summary of Potential Hazardous Air Pollutant Emissions

Table 6-5 displays Sioux Marble's potential hazardous air pollutant emissions

Table 6-5 – Summary of Potential Hazardous Air Pollutants (tons per year)

Product	Toluene	Cumene	Styrene
Clear Marble Gelcoat	-	-	4.94
Unsaturated Polyester Resin	-	-	31.79
TR-210	0.05	0.00	-
Total	**0.1**	**0.0**	**36.7**
	37		

Based on the information in Table 6-5, the potential hazardous air pollutant emissions are greater than 10 tons per year for a single hazardous air pollutant, styrene, and greater than 25 tons per year for a combination of hazardous air pollutants. Sioux Marble's existing minor air quality operating permit contains operational limits to limit the actual emissions to less than 10 tons per year, per 12-month rolling period for any single hazardous air pollutant and less than 25 tons per year, per 12-month rolling period for any combination of hazardous air pollutants. Therefore, the hazardous air pollutant emissions are below the major source thresholds and Sioux Marble is considered an area source of hazardous air pollutants.

6.2 Maximum Achievable Control Technology Standards

DANR reviewed the Maximum Achievable Control Technology standards under 40 CFR Part 63 and determined the following standards may be applicable Sioux Marble.

6.2.1 Reinforced Plastics Composites Production – Subpart WWWW

The Maximum Achievable Control Technology standard for Reinforced Plastic Composites Production was finalized on April 21, 2003. The provisions of this subpart are applicable to reinforced plastic composites production facilities that are located at a major source of hazardous air pollutant emissions. Reinforced plastic compounds are manufactured using thermoset resins and/or gel coats that contain styrene to produce plastic composites. A major source is defined in ARSD 74:36:01:08 as any source with the potential to emit more than 10 tons per year of a single hazardous air pollutant and/or 25 tons per year of a combination of hazardous air pollutants.

Sioux Marble is not considered a major source of hazardous air pollutants. Therefore, Sioux Marble is not applicable to Subpart WWWW.

6.2.2 Other Maximum Achievable Control Technology Standards

DANR reviewed the other Maximum Achievable Control Technology standards and determined no other standards are applicable to Sioux Marble.

7.0 State Requirements

7.1 Permit Type

Any source operating in South Dakota that meets the requirements of the Administrative Rules of South Dakota (ARSD) 74:36:05:03 is required to obtain a Title V air quality operating permit. A major source is defined as having the potential to emit greater than 100 tons per year of a criteria air pollutant or greater than or equal to 10 tons per year of a single hazardous air pollutant, or greater than or equal to 25 tons per year of a combination of hazardous air pollutants. A source that is required to comply with federal New Source Performance Standards or Maximum Achievable Control Technology standards must obtain a Title V air quality operating permit.

Sioux Marble's potential emissions of volatile organic compounds are less than 100 tons per year and the potential emissions of a single hazardous air pollutant are greater than 10 tons per year and greater than 25 tons per year of a combination of hazardous air pollutants. Sioux Marble accepted operational limits to keep the facility out of the Title V air quality operating permit.

Sioux Marble's existing minor air quality operating permit contains operational limits to limit the actual volatile organic compound emissions to less than 95 tons per year. Based on current calculations, Sioux Marble no longer requires actual emission limits to be considered a minor source. To ensure these calculations are correct, Sioux Marble will still be required to record and calculate the 12-month rolling total for volatile organic compounds.

A minor source may require a Title V air quality operating permit if it is applicable to a New Source Performance Standard or a Maximum Achievable Control Technology standard. Sioux Marble is not applicable to a New Source Performance Standard or a Maximum Achievable Control Technology standard. Therefore, Sioux Marble is not required to obtain a Title V air quality operating permit.

7.2 Insignificant Activities

In accordance with Administrative Rules of South Dakota (ARSD) 74:36:04:03, the following emission units are exempt from inclusion in the air quality construction permit unless the source has requested federally enforceable permit conditions related to the emission unit to avoid needing a Part 70 operating permit, Prevention of Significant Deterioration preconstruction permit, or New Source Preview preconstruction permit:

1. One or more incinerators of less than 100 pounds per hour combined burning capacity that combust municipal or household waste;

2. A mobile internal combustion engine, including those in autos, trucks, tractors, airplanes, locomotives, and boats;
3. Laboratory equipment used exclusively for chemical or physical analysis;
4. A unit that has a heat input capability of not more than 3,500,000 Btus per hour, except for units fueled with wood or coal;
5. An air conditioning or ventilating system not designed to remove air pollutants from equipment;
6. Routine housekeeping or plant upkeep activities such as painting buildings, re-tarring roofs, or paving parking lots; and
7. A unit that has the potential to emit two tons or less per year of any criteria pollutant before the application of control equipment. However, the criteria pollutant emissions from the unit must be included in determining whether the source is a minor source.

The sanding and polishing operations have potential to emit less than 2 tons per year of any criteria air pollutant. Therefore, sanding and polishing operations are considered insignificant activities and are exempt from permitting.

7.3 State Emission Limits

South Dakota has air emission limits for particulate matter and sulfur dioxide. The emission limits apply to industry units and fuel burning units. Units classified as insignificant are not required to meet state emission limits. Therefore, the units listed in Table 7-1 are not applicable to the state emission limits. Also, the state emission limits are not applicable to paint booths. Therefore, there are no units applicable to the state emission limits.

Regardless of whether a unit is applicable to a state emission limit, visible emissions are applicable to any unit that discharges to the ambient air. In accordance with Administrative Rules of South Dakota (ARSD) 74:36:12, a facility may not discharge into the ambient more than 20 percent opacity for all units; therefore, Sioux marble must meet the 20 percent opacity requirement for all units.

7.4 Performance Testing

Sioux Marble is required to maintain records of the materials used at the facility and to determine hazardous air pollutant and volatile organic compound emissions based on the chemical composition of the material. This information will be required on a monthly basis and reported to DANR on periodic basis. Therefore, Sioux Marble is not required to conduct performance tests.

8.0 Recommendation

Any source operating in South Dakota that meets the requirements of Administrative Rules of South Dakota (ARSD) 74:36:04:02 is required to obtain a minor air quality permit. Based on the potential emissions summarized in Table 4-7, Sioux Marble is considered a minor source. Sioux Marble is required to operate within the requirements stipulated in the following regulations under the minor air quality operating permit program:

- ARSD 74:36:04 – Operating Permits for Minor Sources;
- ARSD 74:36:06 – Regulated Air Pollutant Emissions; and
- ARSD 74:36:12 – Control of Visible Emissions.

Based on the information submitted in the air quality permit application, DANR recommends conditional approval of a minor air permit for the operations in Brandan, South Dakota. Any questions pertaining to this review should be directed to Braydon Crawford, Engineer I, Department of Agriculture and Natural Resources – Air Quality Program.