



Statement of Basis

**General Air Quality Permit
for Concrete Plants**

Facility

City, South Dakota

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1.0 Background

On “Month, Day, Year,” “Facility name” submitted a notice of intent to operate a “stationary or portable” concrete plant “in City, or throughout” South Dakota. This “central or truck” mix concrete plant is seeking coverage under the general air for concrete plants (permit #SDG11XXXX). The units covered under the general permit are listed below:

1. Stationary or Portable Concrete Plants;
2. Cement and Flyash Silos;
3. Boilers with a maximum heat input of less than 10 Million Btus; and
4. New emergency generators (i.e. generators constructed after 2005).

Table 1.1 displays the Equipment listed in the application.

Table 1.1 – Description of Equipment listed in Application

Description	Maximum Operating Rate	Control Device
Description of Concrete Plant	XXX Cubic yards per hour	
Cement or Flyash Silo	XXX tons per hour	
Cement or Flyash Silo	XXX tons per hour	
Cement or Flyash Silo	XXX tons per hour	
Cement or Flyash Silo	XXX tons per hour	
Generator ¹	XXX horsepower	
Boiler	XXX million Btu per hour	

¹ - 40 CFR §1068.30 defines a non-road engine as an internal combustion engine that is by itself or in or on a piece of equipment that is portable or transportable. Portable or transportable means the engine is designed to be capable of being carried or moved from one location to another. Indications of transportability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer or platform. A portable engine is not considered a non-road engine if it will remain at a location for more than 12 consecutive months or a shorter period of time for an engine located at a seasonal source. A seasonal source becomes a stationary source if it remains in a single location on a permanent basis (i.e. at least two years) and operates at that single location approximately three months (or more) each year.

2.0 Typical Batch Plant Operation Information

Concrete batch plants eligible for coverage under the general air quality permit involve the same or substantially similar operations. Typical concrete batch plants store, convey, measure and discharge the product constituents into a central mixer or trucks for mixing and transport to a job site. Table 2.1 displays the typical material composition of one cubic yard of cement produced and was derived from AP-42, 11.12, Table 11.12-5, footnote ^a, page 11.12-10, January 2012.

Table 2.1 – Typical Composition of Cement

Component	Amount per cubic yard	Weight fraction
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Coarse Aggregate	1,865 pounds	0.46
Sand	1,428 pounds	0.36
Cement	491 pounds	0.12
Cement Supplement (fly ash)	73 pounds	0.02
Water	167 pounds	0.04
Total =	4,024 pounds	1.00

The department will assume this composition to estimate emissions from concrete batch plants in the state. The product density for this composition is 2.012 tons per cubic yard (4,024 pounds per cubic yard divided by 2,000 pounds per ton).

The cement and fly ash is transferred to elevated storage silos pneumatically or by bucket elevator. The sand and coarse aggregate are transferred to elevated bins by front end loader, clam shell crane, belt conveyor, or bucket elevator. From these elevated bins, the constituents are fed by gravity or screw conveyor to weigh hoppers, which combine the proper amounts of each material into the mixer or mixer truck.

3.0 New Source Performance Standards

DANR reviewed the New Source Performance Standards and determined that the following may be applicable:

3.1 Emergency Generators

Facility name does not operate an emergency generator or a non-emergency generator. Therefore, **Facility name** is not applicable to Subpart JJJJ or Subpart IIII of the General Air Quality Permit for concrete plants.

Facility name operates a generator that is considered a portable engine located at a seasonal source. Therefore, the generator is considered a non-road engine and is not applicable to this subpart

There are two New Source Performance Standards for stationary reciprocating internal combustion engines. The two standards are applicable to the following engines:

1. 40 CFR Part 60, Subpart IIII is applicable to compression ignition internal combustion engines that commence construction after July 11, 2005 where the stationary compression ignition internal combustion engine are manufactured after April 1, 2006 and are not fire pump engines, or manufactured as a certified National Fire Protection Association (NFPA) fire pump engine after July 1, 2006 or are modified or reconstructed after July 11, 2005; and
 - a. Manufacturers of stationary compression ignition internal combustion engines with a displacement of less than 30 liters per cylinder where the model year is

- 2007 or later for engines that are not fire pump engines or model year 2008 or later for engines that are fire pump engines;
 - b. Owners or operators of stationary compression ignition internal combustion engines that commence construction after July 11, 2005 where the compression ignition internal combustion engines is manufactured after April 1, 2006 and is not a fire pump engine or manufactured as a certified National Fire Protection Association fire pump engine after July 1, 2006; or
 - c. Owners or operators of stationary compression ignition internal combustion engines that modified or reconstructed their stationary compression ignition internal combustion engines after July 11, 2005.
2. 40 CFR Part 60, Subpart JJJJ is applicable to spark ignition engines that commence construction after June 12, 2006, where the stationary spark ignition internal combustion engines are manufactured:
- a. On or after July 1, 2007, for engines with a maximum engine power greater than or equal to 500 horsepower (except lean burn engines with a maximum engine power greater than or equal to 500 horsepower and less than 1,350 horsepower);
 - b. On or after January 1, 2008, for lean burn engines with a maximum engine power greater than or equal to 500 horsepower and less than 1,350 horsepower;
 - c. On or after July 1, 2008, for engines with a maximum engine power less than 500 horsepower;
 - d. On or after January 1, 2009, for emergency engines with a maximum engine power greater than 19 kilowatts (25 horsepower); or
 - e. Owners and operators of stationary spark ignition internal combustion engines that commence modification or reconstruction after June 12, 2006.

In accordance with 40 CFR §60.4219, a compression ignition means a type of stationary internal combustion engine that is not spark ignition engine. A spark ignition engine is an engine that uses gasoline, natural gas or liquefied petroleum. The Facility's generator is/is not considered a spark ignition engine, as the fuel source is/is not distillate oil. Facility's generator was constructed prior/after July 11, 2005, is a stationary combustion ignition internal combustion engine, and is not a fire pump engine. Therefore, Subpart III is/ is not applicable.

In accordance with 40 CFR §60.4231, a spark ignition means a type of stationary internal combustion engine that is not a combustion ignition engine. A combustion ignition engine is an engine that uses distillate oil. The Facility's generator is/is not considered a combustion ignition engine, as the fuel source is/is not gasoline, natural gas or liquefied petroleum. Facility's generator was constructed prior/after July 11, 2005, is a stationary spark ignition internal combustion engine. Therefore, Subpart JJJJ is/ is not applicable.

The general permit only covers emergency generators applicable to 40 CFR 60, Subpart III/JJJJ that are certified to meet the emission limits of Subpart III/JJJJ. Based upon the manufacturer specification data submitted in the application, Facility's generator has a maximum designed operating rate of XXX horsepower (XXX kW) and has a displacement of X.X liters per cylinder.

The manufacturer states in the Generator Set Performance Data sheet provided in the application

that Facility's emergency/non-emergency generator is capable of meeting the emission limits specified in (AP-42, Fifth Edition, Volume 1, Chapter 1, Section 3.4 (Large Distillate Oil Engines) April 2025, 3.3 (Gasoline and Diesel Engines) April 2025, and 3.2 (Natural Gas) October 2024.

The general permit only covers generators manufactured after June 12, 2006, used for emergency use only. Based upon the information submitted in the application, Facility's generator is a 20XX emergency/nonemergency generator with a maximum designed operating rate of XXX horsepower (XXX kW). Therefore, Facility will/will not be covered under the general permit.

3.2 Subpart Dc Applicable to Boilers

DANR determined that 40 CFR Part 60 Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units needs to be reviewed in more detail to determine if it is applicable to this facility. This New Source Performance Standard is applicable to a steam generator with a minimum design heat input capacity equal to or greater than 10 million Btus per hour but less than or equal to 100 million Btus per hour and commenced construction after June 9, 1989.

Facility name does not operate boilers and is not subject to 40 CFR 60, Subpart Dc of the General Air Quality Permit for concrete plants.

The boiler has a heat input capacity of XX million Btus per hour and was constructed in XXXX year. Therefore, the boiler is applicable to Subpart Dc / is not applicable to this subpart.

The General Permit for Concrete Plants does not cover boilers applicable to Subpart Dc. Therefore, Facility cannot be covered by the general permit. Facility must instead submit an application for an individual air quality operating permit.

4.0 Potential Emissions

To determine if a concrete plant may be covered by the general permit, annual potential emissions are calculated. A concrete plant must have potential uncontrolled emissions less than 100 tons per year of PM10, less than 10 tons per year of a single hazardous air pollutant, and less than 25 tons per year of hazardous air pollutant emissions in order to be eligible for coverage under the General Permit for Concrete Plants referenced as A and B general permits. If potential uncontrolled emissions exceed these thresholds, but the potential controlled emissions do not, a General Permit for Concrete Plants referenced as C and D general permits with federally enforceable operating restrictions is available.

4.1 Uncontrolled Emission Factors – Concrete Batch Plant

The potential uncontrolled emissions are calculated from the emission factor and the maximum operating rate for each process. The maximum operating rate assumes that each process operates at maximum design capacity every hour of every day of the year without any control equipment

that is not part of the process.

Particulate matter consisting primarily of cement and fly ash (some aggregate and sand dust) emissions is the primary pollutant of concern. In addition, there are emissions of metal associated with the particulate matter that are considered hazardous air pollutants (HAPs).

The uncontrolled emission factors derived from AP-42, 11.12, Tables 11.12-2, 11.12-5, January 2012 are summarized in Table 4.1.

Table 4.1 – Uncontrolled Emission Factors

Process	(pounds per cubic yard product)		
	TSP ^a	PM10 ^b	HAPs
Aggregate delivery to ground storage	0.0064	0.0031	-
Sand delivery to ground storage	0.0015	0.0007	-
Aggregate delivery to conveyor	0.0064	0.0031	-
Sand delivery to conveyor	0.0015	0.0007	-
Aggregate transfer to elevated storage	0.0064	0.0031	-
Sand transfer to elevated storage	0.0015	0.0007	-
Cement delivery to silos ^c	0.1767	0.1129	-
Fly ash delivery to silos ^c	0.1146	0.0402	-
Weigh hopper loading	0.0079	0.0038	-
Truck mixing loading ^c	0.2806	0.0784	-
Central mix loading ^c	0.1534	0.0378	-
Total – Truck mix plant	0.6035	0.2467	2.5E-05 ^d
Total – Central mix plant	0.4763	0.2061	3.7E-05 ^d

^a – “TSP” means total suspended particulates;

^b – “PM10” means particulate matter 10 microns in diameter or less.

^c – These emission factors are derived from AP-42, 11.12, Table 11.12-2, January 2012 and the units are in pounds per ton of the applicable material processed and converted to pounds per cubic yard of product; and;

^d – The metal emission factors are derived from AP-42, 11.12, Table 11.12-8, January 2012 and the units are in pounds per ton of concrete and flyash processed and converted to pounds per cubic yard of product.

The department used Equation 4-1 to convert the emission factor for loading cement from pounds of particulate matter per ton of cement processed to pounds of particulate matter per cubic yard of concrete produced. “PM” means total suspended particulate matter and “PM₁₀” means particulate matter 10 microns in diameter or less. The “PM” and “PM₁₀” were derived from AP-42, 11.12, Tables 11.12-2, January 2012, and are 0.72 and 0.46 pounds of particulate matter per ton of cement processed, respectively. The 491 pounds of cement per cubic yard is derived from Table 2.1. The results from Equation 4-1 are found in Table 4.1.

Equation 4-1 – Emission Factor for Cement Delivery (pounds per cubic yard)

$$\text{Cement Delivery} = \frac{PM, PM_{10} \left(\frac{\text{lbs}}{\text{ton}} \right) \times 491 \left(\frac{\text{lbs}}{\text{yd}^3} \right)}{2,000 \left(\frac{\text{lbs}}{\text{ton}} \right)}$$

The department used Equation 4-2 to convert the emission factor for loading flyash from pounds of particulate matter per ton of flyash processed to pounds of particulate matter per cubic yard of concrete produced. “PM” means total suspended particulate matter and “PM₁₀” means particulate matter 10 microns in diameter or less. The “PM” and “PM₁₀” were derived from AP-42, 11.12, Tables 11.12-2, January 2012, and are 3.14 and 1.10 pounds of particulate matter per ton of flyash processed, respectively. The 73 pounds of flyash per cubic yard is derived from Table 2.1. The results from Equation 4-2 are found in Table 4.1.

Equation 4-2 – Emission Factor for Flyash Delivery (pounds per cubic yard)

$$\text{Flyash Delivery} = \frac{PM, PM_{10} \left(\frac{\text{lbs}}{\text{ton}} \right) \times 73 \left(\frac{\text{lbs}}{\text{yd}^3} \right)}{2,000 \left(\frac{\text{lbs}}{\text{ton}} \right)}$$

The department used Equation 4-3 to convert the emission factor for central mix and truck loading from pounds of particulate matter per ton of cement and flyash processed to pounds of particulate matter per cubic yard of concrete produced. “PM” means total suspended particulate matter and “PM₁₀” means particulate matter 10 microns in diameter or less. The “PM” and “PM₁₀” were derived from AP-42, 11.12, Tables 11.12-2 and 11.12-5, January 2012. For central mix, the “PM” and “PM₁₀” are 0.544 and 0.134 pounds per ton, respectively. For truck mix, the “PM” and “PM₁₀” are 0.995 and 0.278 pounds of particulate matter per ton of cement and flyash processed, respectively. The 564 pounds of concrete and flyash per cubic yard is derived from Table 2.1. The results from Equation 4-3 are found in Table 4.1.

Equation 4-3 – Emission Factor for Central Mix and Truck Loading (pounds per cubic yard)

$$\text{Central Mix and Truck Loading} = \frac{PM, PM_{10} \left(\frac{\text{lbs}}{\text{ton}} \right) \times 564 \left(\frac{\text{lbs}}{\text{yd}^3} \right)}{2,000 \left(\frac{\text{lbs}}{\text{ton}} \right)}$$

The department used Equation 4-4 to convert the emission factor for central mix and truck loading from pounds of metal per ton of cement and flyash processed to pounds of metal per cubic yard of concrete produced. “Metal” is derived from AP-42, 11.12, Table 11.12-8, January 2012. For central mix and truck loading, “Metal” is 8.7E-05 and 1.3E-04 pounds of metal per ton cement and flyash processed, respectively. The 564 pounds of concrete and flyash per cubic yard is derived from Table 2.1. The results from Equation 4-4 are found in Table 4.1.

Equation 4-4 – Emission Factor for Metals (pounds per cubic yard)

$$\text{Central Mix and Truck Loading} = \frac{\text{Metal} \left(\frac{\text{lbs}}{\text{ton}} \right) \times 564 \left(\frac{\text{lbs}}{\text{yd}^3} \right)}{2,000 \left(\frac{\text{lbs}}{\text{ton}} \right)}$$

4.2 Potential Uncontrolled Emissions – Concrete Batch Plant

A comparison is conducted to determine if the capacity of the plant or the cement unloading process limits the amount of concrete produced in a year. Table 4.2 displays the comparison.

Table 4.2 – Concrete Production Comparison

Description	Maximum Design Capacity	Potential Operation (hours per year)	Potential Production (cubic yards per year)
Concrete Plant	XX cubic yards per hour	8,760	XXXXXX ^a
Cement/fly ash system	XX tons per hour	8,760	XXXXXX ^b
Diesel Generator	XXX horsepower	500	-
Boiler	XXX MMBtu per hour	8,760	-

^a – Potential production = maximum design capacity x potential operation; and

^b – Potential production = maximum design capacity x potential operations / 0.14 tons cement/fly ash/cubic yard or 2.012 tons concrete/cubic yard

The comparison shows that the production of this facility is limited by the design of the “concrete plant or cement/fly ash system”. The potential production (shown in bold in Table 4.2), the appropriate emission factor (EF) from Table “4.1, 4.3, and 4.4”, and Equation “4-5, 4-6, and 4-7” were used to estimate the potential annual emissions from the “central or truck” mix plant. Table 4.5 displays the potential uncontrolled emissions from the “central or truck” mix plant.

Equation 4-5 – Formula for Potential Concrete Batch Plant Emissions

$$\text{Potential} = \frac{\text{Potential production} \left(\frac{\text{cubic yards}}{\text{year}} \right) \times \text{EF} \left(\frac{\text{lbs}}{\text{cubic yard}} \right)}{2,000 \left(\frac{\text{lbs}}{\text{ton}} \right)}$$

4.3 Potential Emissions - Generators

This section can be deleted if the facility does not have any generators or if the generators are portable.

The uncontrolled emission factors for the diesel generator are derived from AP-42, 3.4, Table 3.4-1, April 2025 and can be seen in Table 4.3:

Table 4.3 – Uncontrolled Emission Factors

Pollutant	TSP	NO _x	SO ₂	VOC	CO	HAPs
Emission Factor (lbs / hp - hr)	0.310	4.410	0.290 ^a	0.350	0.950	0.00379 ^b

^a – assumes 0.5% sulfur content

^b – emission factor = lb/MMBtu (fuel input)

The uncontrolled emission factors for the natural gas generator are derived from AP-42, 3.3, Table 3.4-1, April 2025 and can be seen in Table 4.3:

Table 4.3 – Uncontrolled Emission Factors

Pollutant	TSP	NO _x	SO ₂	VOC	CO	HAPs
Emission Factor (lbs / hp - hr)	0.00008	4.080	0.00006 ^a	0.118	0.317	0.720 ^b

Equation 4-6 was used to calculate the potential emissions from the generator. Table 4.6 displays the results.

Equation 4-6 – Formula for Potential Generator Emissions

$$\text{Potential Emissions} = \frac{\text{horsepower} \times 500 \left(\frac{\text{hours}}{\text{year}} \right) \times EF \left(\frac{\text{lbs}}{\text{horsepower} - \text{hour}} \right)}{2,000 \left(\frac{\text{lbs}}{\text{ton}} \right)}$$

4.4 Potential Emissions - Boilers

This section can be deleted if the facility does not have any boilers or if the boilers are electric.

Table 4.5 displays the emission factors as derived from the Compilation of Air Pollutant Emission Factors (AP-42, Fifth Edition, Volume 1, Chapter 1, Section 1.3 (Distillate Oil) May 2010, 1.4 (Natural Gas) July 1998, and 1.5 (Propane) May 2025.

Table 4.4 – Fuel Emissions Factor for Boilers

Fuel Type	Pollutant					
	TSP/PM ₁₀	SO ₂ ¹	NO _x	CO	VOC	HAPs
Natural Gas (lbs/MMcf) ²	7.6	0.6	100	84	5.5	1.8
Propane (lb/1,000 gals) ³	0.7	0.1 x S	13	7.5	0.8	1.8 ⁴
Distillate Oil – Heat Input ⁵ <100 MMBtu/hr (lb/1,000 gals)	2	142 x S	20	5	0.34	0.05
Distillate Oil – Heat Input ⁵ >100 MMBtu/hr (lb/1,000 gals)	2	142 x S	24	5	0.2	0.04

¹ – For propane, “S” equals the sulfur content expressed in grains per 100 cubic feet gas vapor. The average sulfur content of propane is estimated to be similar to the sulfur content of natural gas and butane gas. Natural gas has an average sulfur content of 0.2 grains per 100 cubic feet and butane has an average sulfur content of 0.18 grains per 100 cubic feet. The higher value will be used in determination of the emission factors. For oil, “S” indicates the weight % of sulfur. For example, if the fuel contains 1% sulfur, then S = 1;

² – To convert to an energy basis (lb/MMBtu), divide by a heating value of 1,020 Btus/cf; and

³ – Propane has heat content of 91.5 MMBtus/10³ gallons; and

⁴ – There is not a hazardous air pollutant factor for propane listed in AP-42; therefore the HAP emission factor for natural gas is similar and will be use; and

⁵ – Distillate Oil has heat content of 137 MMBtus/10³ gallons.

Equation 4-7 was used to calculate the potential emissions from the Boiler. Table 4.6 displays the results.

Equation 4-7 – Formula for Potential Boiler Emissions

$$\text{Potential Emissions} = \frac{\text{heat input} \left(\frac{\text{MMBtu}}{\text{hour}} \right) \times 8,760 \left(\frac{\text{hours}}{\text{year}} \right) \times EF \left(\frac{\text{pounds}}{\text{MMBtu}} \right)}{2,000 \left(\frac{\text{lbs}}{\text{ton}} \right)}$$

4.5 Summary of Potential Uncontrolled Emissions

Table 4.5 provides a summary of potential emissions from “Facility name”’s “central or truck” mix plant.

Table 4.5 – Potential uncontrolled emissions

Process	(tons of pollutant per year)						
	TSP	PM10	SO ₂	NO _x	VOC	CO	HAPs
Central or Truck Mix Plant			0	0	0	0	0
Generator							
Boiler							
Facility Total							

This facility’s potential uncontrolled emissions are less/greater than 100 tons per year. Therefore, the controlled potential emissions will be calculated to determine if “Facility” is eligible for coverage under the minor General Permit for “Portable or Stationary” Concrete Plants with federally enforceable operating restrictions. Therefore, Facility is eligible for coverage under the minor General Permit for “Portable or Stationary” Concrete Plants.

4.6 Potential Controlled Emissions

A source operating in South Dakota that has uncontrolled potential emissions greater than 100 tons per year but potential controlled emissions less than 100 tons per year may accept federally enforceable permit conditions which maintain actual emissions below 100 tons per year. Therefore, the potential controlled emissions were calculated to determine if “Facility” is eligible for a general permit for concrete plants with federally enforceable operating restrictions.

Hazardous air pollutant emissions were not considered because the potential uncontrolled hazardous air pollutant emissions are below the major source threshold of 10 tons per year of a single hazardous air pollutant and 25 tons per year of a combination of hazardous air pollutants.

4.6.1 Controlled Emission Factors

Table 4.6 lists controlled emission factors for processes that are typically controlled at a concrete

batch plant and were derived from AP-42, 11.12, Tables 11.12-3, 11.12-4, and 11.12-6, January 2012.

Table 4.6 – Controlled Emission Factors

Process	(pounds per cubic yard product)	
	TSP ^a	PM10 ^b
Aggregate delivery to ground storage	0.0064	0.0031
Sand delivery to ground storage	0.0015	0.0007
Aggregate delivery to conveyor	0.0064	0.0031
Sand delivery to conveyor	0.0015	0.0007
Aggregate transfer to elevated storage	0.0064	0.0031
Sand transfer to elevated storage	0.0015	0.0007
Cement delivery to silos (fabric filter) ^c	0.0002	0.0001
Fly ash delivery to silos (fabric filter) ^c	0.0003	0.0002
Weigh hopper loading	0.0079	0.0038
Truck mixing loading ^c	0.0160	0.0045
Central mix loading ^c	0.0049	0.0014
Total – Truck mix plant	0.0481	0.0200
Total – Central mix plant	0.0370	0.0169

^a – “TSP” means total suspended particulates;

^b – “PM10” means particulate matter 10 microns in diameter or less; and

^c – These emission factors are derived from AP-42, 11.12, Table 11.12-2, January 2012 and the units are in pounds per ton of the applicable material processed and converted to pounds per cubic yard of product.

The department used Equation 4-8 to convert the emission factor for loading cement from pounds of particulate matter per ton of cement processed to pounds of particulate matter per cubic yard of concrete produced. “PM” means total suspended particulate matter and “PM10” means particulate matter 10 microns in diameter or less. The “PM” and “PM10” were derived from AP-42, 11.12, Tables 11.12-2, January 2012, and are 0.00099 and 0.00034 pounds of particulate matter per ton of cement processed, respectively. The 491 pounds of cement per cubic yard is derived from Table 2.1. The results from Equation 4-4 are found in Table 4.7.

Equation 4-8 – Emission Factor for Cement Delivery (pounds per cubic yard)

$$\text{Cement Delivery} = \frac{PM, PM_{10} \left(\frac{\text{lbs}}{\text{ton}} \right) \times 491 \left(\frac{\text{lbs}}{\text{yd}^3} \right)}{2,000 \left(\frac{\text{lbs}}{\text{ton}} \right)}$$

The department used Equation 4-9 to convert the emission factor for loading flyash from pounds of particulate matter per ton of flyash processed to pounds of particulate matter per cubic yard of concrete produced. “PM” means total suspended particulate matter and “PM10” means particulate matter 10 microns in diameter or less. The “PM” and “PM10” were derived from AP-42, 11.12, Tables 11.12-2, January 2012, and are 0.0089 and 0.0049 pounds of particulate matter per ton of flyash processed, respectively. The 73 pounds of flyash per cubic yard is derived from Table 2.1. The results from Equation 4-9 are found in Table 4.7.

Equation 4-9 – Emission Factor for Flyash Delivery (pounds per cubic yard)

$$\text{Flyash Delivery} = \frac{PM, PM_{10} \left(\frac{\text{lbs}}{\text{ton}} \right) \times 73 \left(\frac{\text{lbs}}{\text{yd}^3} \right)}{2,000 \left(\frac{\text{lbs}}{\text{ton}} \right)}$$

The department used Equation 4-10 to convert the emission factor for central mix and truck loading from pounds of particulate matter per ton of cement and flyash processed to pounds of particulate matter per cubic yard of concrete produced. “PM” means total suspended particulate matter and “PM10” means particulate matter 10 microns in diameter or less. The “PM” and “PM10” were derived from AP-42, 11.12, Tables 11.12-2, January 2012. For central mix, the “PM” and “PM10” are 0.0173 and 0.0048 pounds per ton, respectively. For truck mix, the “PM” and “PM10” are 0.0568 and 0.0160 pounds of particulate matter per ton of cement and flyash processed, respectively. The 564 pounds of concrete and flyash per cubic yard is derived from Table 2.1. The results from Equation 4-10 are found in Table 4.7.

Equation 4-10 – Emission Factor for Central Mix and Truck Loading (pounds per cubic yard)

$$\text{Central Mix and Truck Loading} = \frac{PM, PM_{10} \left(\frac{\text{lbs}}{\text{ton}} \right) \times 564 \left(\frac{\text{lbs}}{\text{yd}^3} \right)}{2,000 \left(\frac{\text{lbs}}{\text{ton}} \right)}$$

4.6.2 Potential Controlled Emissions

This facility has a fabric filter or bag house which collects particulate emissions from the cement and fly ash loading systems. Controlled emissions were calculated using equation 4-5, but instead of using the uncontrolled emissions factors the applicable controlled emission factors were used. [The potential controlled emissions for the generator and boiler are the same as the uncontrolled.](#) Table 4.7 displays the potential controlled emissions from the “truck or central mix” plant.

Table 4.7 – Potential Controlled Emissions

Process	(tons of pollutant per year)						
	TSP	PM10	SO ₂	NO _x	VOC	CO	HAPs
Central or Truck Mix Plant			0	0	0	0	0
Diesel Generator							
Boilers							
Facility Total							

This facility’s potential controlled emissions are less than 100 tons per year. Therefore, [Facility](#) is eligible for coverage under the minor General Permit for “[Portable or Stationary](#)” Concrete Plants with federally enforceable operating restrictions. The permit contains a permit condition, which states “No owner or operator may operate the concrete batch plant without the control equipment specified in the Notice of Intent”. The control equipment must be continually operated in accordance with the manufacturer’s specifications.

5.0 New Source Review

The Administrative Rules of South Dakota (ARSD) 74:36:10:01 notes that New Source Review (NSR) 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. South Dakota is currently in attainment for all the pollutants regulated under the Clean Air Act. Therefore, “this facility” is not subject to New Source Review.

6.0 National Emission Standards for Hazardous Air Pollutants

DANR reviewed the Maximum Achievable Control Technology standards and determined that the following may be applicable:

6.1 Subpart ZZZZ Applicable to Engines

This section can be deleted if the facility does not have any generators or if portable.

In accordance with ARSD 74:36:08:40, as referenced to 40 CFR § 63.6590 the provisions of this subpart are applicable to an existing or new stationary reciprocating internal combustion engines located at a major source or area source of hazardous air pollutants. A Stationary reciprocating internal combustion engine differ from mobile reciprocating internal combustion engine in that a stationary reciprocating internal combustion engine is not a non-road engine as defined at 40 CFR 1068.30, and is not used to propel a motor vehicle or a vehicle used solely for competition.

Subpart ZZZZ is applicable to any existing, new, or reconstructed stationary reciprocating internal combustion engines located at a major or area source of hazardous air pollutant emissions, excluding stationary reciprocating internal combustion engines being tested at a stationary reciprocating internal combustion engines test cell/stand. Stationary reciprocating internal combustion engines are any internal combustion engine which uses reciprocating motion to convert heat energy into mechanical work and which is not mobile.

As noted in 40 CFR § 63.6590(a)(1)(iii) an existing stationary reciprocating internal combustion engine is a stationary reciprocating internal combustion engine located at an area source of HAP emissions is existing if you commenced construction of the stationary reciprocating internal combustion engine before June 12, 2006.

If prior to June 12, 2006, use the following and adjust applicability's according to selected template:

The generator was constructed prior to 2006 and has the following applicability's:

1. Existing area source (manufactured prior to June 12, 2006);
2. Non-emergency, non-black start, compression ignition engine;

3. Not related to oil and gas production;
4. **Less/Greater** than 300 horsepower; and
5. Displacement of less than 30 liters per cylinder.

Or

1. Is an area source;
2. Is an existing emergency engine;
3. Is an compression ignition engine;
4. Is not contractually obligated;
5. Is not an emergency engine at an institution, commercial, or residential; and
6. Does not meet the emission standards for a non-emergency engine

The generator is applicable to Subpart ZZZZ.

If newer than June 12, 2006 use the following:

Facility's generator was manufactured on date; therefore Facility is applicable to this subpart. 40 CFR §63.6590(c) states an affected source that is a new stationary reciprocating internal combustion engine located at an area source must meet the requirements of this part by meeting the requirements of 40 CFR Part 60, Subpart IIII/Subpart JJJJ for engines. No further requirements apply for such engines under this subpart.

As stated above in section 4.2.2, Facility is applicable to 40 CFR Part 60 Subpart IIII/Subpart JJJJ.

The general permit only covers generators manufactured after June 12, 2006 used for emergency use only. Based upon the information submitted in the application, Facility's generator is a 20XX emergency/nonemergency generator with a maximum designed operating rate of XXX horsepower (XXX kW). Therefore, Facility will/will not be covered under the general permit.

6.2 Subpart JJJJJJ Applicable to Boilers

Subpart JJJJJJ is applicable to any new or existing industrial, commercial and institutional boiler located at an area source of hazardous air pollutants. A new boiler is defined as a boiler where construction was commenced after June 4, 2010 and the boiler meets the applicabililty criteria at the time construction was commenced. An existing boiler is defined as a boiler where construction or reconstruction occurred prior to June 4, 2010. The subpart excludes boilers that are gas-fired according to the definition.

Facility name does not operate fuel burning boilers and is not subject to Chapter 9.0 of the General Air Quality Permit for concrete plants.

Facility's boiler was constructed before/after June 4, 2010, is fueled with natural gas / propane and is located at an area source of hazardous air pollutants. Subpart JJJJJJ does not apply to

boilers fueled with natural gas and/or propane. Therefore the boiler is not applicable to Subpart JJJJJ.

Facility's boiler was constructed before/after June 4, 2010, is fueled with distillate oil and is located at an area source of hazardous air pollutants. Therefore the boiler is applicable to Subpart JJJJJ.

The General Permit for Concrete Plants does not cover boilers with a capacity greater than 10 million Btus. Therefore, Facility cannot be covered by the general permit. Facility must submit applications for an individual air quality operating permit.

6.3 Subpart CCCCCC Applicable to Gasoline Dispensing Facilities

Facility name does not operate a gasoline dispensing facility at their operations. Therefore, Facility name is not applicable to Subpart CCCCCC of the General Air Quality Permit for concrete plants.

Facility name operates a gasoline dispensing facility at their operations. Therefore, facility name is applicable to Subpart CCCCCC of the General Air Quality Permit so long as it does not have a monthly throughput of more than 10,000 gallons of gasoline per month.

7.0 Rapid City Natural Events Action Plan

7.1 Submittal of Approval

In accordance with ARSD 74:36:04:15(10), the owner or operator shall submit a proposal to the Secretary for approval prior to conducting any projects located in or affecting the Rapid City Natural Events Action Plan area for particulate matter less than or equal to 10 microns in diameter (PM10). The proposal shall consist of the following items and all supporting documentation:

1. The owner or operator shall determine the amount of PM10 emissions that will be generated during the project. The amount of PM10 emissions shall be determined and reported in tons per year for permitted units and fugitive emissions; and
2. The owner or operator shall describe what methods will be used to comply with Section VII - BACM for Particulate Emissions, in Rapid City's Natural Events Action Plan.

7.2 Notification of Operator

The Secretary will notify the owner or operator in writing within one week of receiving a proposal on whether the proposed project is approved or disapproved in the Rapid City Natural Events Action Plan Area. If the proposed project is denied, the Secretary will outline what needs to be completed for approval of the proposed project.



7.3 Compliance with Proposal

The owner or operator shall comply with the approved proposal at all times during the project. If the approved proposal is not complied with, it will constitute a violation of this permit.

7.4 Local Air Quality Ordinances

The owner or operator shall comply with all local (city and county) air quality ordinances that pertain to fugitive particulate emissions. The area regulated by these ordinances is different than the Rapid City Natural Events Action Plan area. The owner or operator should determine if these ordinances are applicable before locating in or near Rapid City.

8.0 State Restrictions on Visible Emissions

Visible emissions are applicable to units that discharge into the ambient air. In accordance with ARSD 74:36:12, a facility may not discharge into the ambient air more than 20 percent opacity for all units. The concrete batch plant must control the opacity at less than 20 percent for all units.

9.0 Prevention of Significant Deterioration (PSD)

In accordance with Administrative Rules of South Dakota 74:36:09, as referenced to 40 CFR § 52.21(b)(1), any stationary source which emits or has the potential to emit 250 tons per year or more of any air pollutant is subject to Prevention of Significant Deterioration requirements. In accordance with Administrative Rules of South Dakota 74:36:09, as referenced to 40 CFR § 52.21(b)(1), any stationary source which emits or has the potential to emit 100 tons per year or more of any air pollutant and is subject to one of the 28 named Prevention of Significant Deterioration source categories is subject to Prevention of Significant Deterioration requirements. The “potential to emit” as defined in the Prevention of Significant Deterioration rules is the maximum capacity of a stationary source under its physical and operational design. Any physical or operation limitation on the equipment, provided the limitation is enforceable, shall be treated as part of its design.

Concrete plants are not classified as one of the 28 named Prevention of Significant Deterioration source categories. Therefore, the major source threshold for them is 250 tons per year. As seen in Table 4-5, **Facility name**'s potential to emit is less than 250 tons per year. Therefore, the **concrete plant** is not applicable to the Prevention of Significant Deterioration program.

10.0 Eligible Coverage under General Permit

A source operating in South Dakota that meets the definition of a minor source is required to obtain a minor air quality operating permit under the ARSD 74:36:04. A minor source is defined as any source with potential emissions less than 100 tons per year of a criteria pollutant and hazardous air pollutant emissions are less than 10 tons per year for a single hazardous air

pollutant and less than 25 tons per year for a combination of hazardous air pollutant. Based on the above potential emission calculations, this facility is classified as a minor source under the air quality operating permit program and is eligible for the general permit.

Since the facility is a stationary source with the potential to emit less than 100 tons per year on an uncontrolled basis, the facility qualifies for the A general permit.

Or

Since the facility is a portable source with the potential to emit less than 100 tons per year on an uncontrolled basis, the facility qualifies for the B general permit.

Or

Since the facility is a stationary source with the potential to emit less than 100 tons per year on a controlled basis, the facility qualifies for the C general permit.

Or

Since the facility is a portable source with the potential to emit less than 100 tons per year on a controlled basis, the facility qualifies for the D general permit.

Any questions pertaining to this permit recommendation should be directed to [Chloe Ryan, Engineer I](#), Department of Agriculture and Natural Resources, Air Quality Program.