

Air Dispersion Modeling Summary for Permit No. 9883M1

Report Date: 8/17/2023

NMED/AQB Modeler: Eric Peters

Facility Identification:

Project: Bennett Sand Mine
Permit number: 9883M1

Company: Intrepid Potash-New Mexico, LLC
TEMPO ID: 40957

Location Information:

The facility is located 3.7 miles south-southwest of Jal, in Lea County. The facility is located 25.9 miles south of Eunice.

UTM Coordinates: 668,000 m East, 3,549,500 m North, zone 13, Datum: WGS84

Elevation = 2971 feet

Air Quality Control Region (AQCR): 155

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Project Description:

Brief: Intrepid Potash-New Mexico, LLC has applied to the New Mexico Air Quality Bureau for a New Source Review air quality permit for the modification of the Bennett Sand Mine (the facility). The facility is a sand mine. The facility was permitted under the GCP-2. An application for an individual permit is being submitted to include nighttime operation in permit conditions.

The following types of emission sources are included in the project: feed hopper, haul road, material handling, product loading, and raw material storage pile. The emission units used in the modeling are described in the tables below.

For this permit, modeling was required for the following pollutants: Particulate Matter 10 micrometers or less in aerodynamic diameter (PM10), and Particulate Matter (2.5 microns or less) (PM2.5).

Table 1: Table of Total Facility Emissions

PM10 Rate (lbs/hr)	PM2.5 Rate (lbs/hr)
12.820	1.448

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Table 2: Table of Volume Sources¹

Source ID	Description	Release Height (ft)	Horizontal Dimension (ft)	Vertical Dimension (ft)	PM10 Rate (lbs/hr)	PM2.5 Rate (lbs/hr)
F5	Feed Hopper 1	16.0	3.3	6.7	0.690	0.100
F6	Feed Hopper 2	16.0	3.3	6.7	0.690	0.100
L0008591	haul road	9.6	29.1	8.9	2.990	0.280
L0008534	haul road	9.6	29.4	8.9	2.220	0.220
L0008713	haul road	11.5	29.1	10.7	2.340	0.230
L0008665	haul road	11.5	40.1	10.7	1.050	0.110
L0000001	material handling	15.0	7.2	5.2	1.080	0.150
F7_B	Product Loading F-7 (Area 2)	13.1	26.7	5.3	0.190	0.029
F7_A	Product Loading F-7 (Area1)	13.1	26.7	5.3	0.190	0.029
F3	Raw Material Storage Pile 1	15.0	13.7	9.9	0.690	0.100
F4	Raw Material Storage Pile 2	15.0	13.7	9.9	0.690	0.100

¹ Includes sources from multiple scenarios.

Modeling Assumptions: The facility operates continuously.

Permit Conditions:

The wash plant and associated piles shall be located at least 190 meters west of the eastern boundary and at least 130 meters north of any boundary to the south.

Conclusion:

This modeling analysis demonstrates that operation of the facility described in this report neither causes nor contributes to any exceedances of applicable air quality standards. The standards relevant at this facility are NAAQS for PM10 and PM2.5; and Class I and Class II PSD increments for PM10 and PM2.5.

Action: The permit can be issued based on this modeling analysis.

Modeling report submitted by FC&E Engineering, LLC (dated 5/3/2023)

The air quality analysis demonstrates compliance with applicable regulatory requirements.

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Model(s) Used: AERMOD version 22112 was used to run the modeling analysis.

Note: Complete modeling input and output files can be made available and are located in the Modeling Archives in the folder, "9883M1_Intrepid Potash-New Mexico, LLC_Bennett Sand Mine".

Modeling Parameters:

The AERMOD regulatory default parameters were included in assumptions made by the model.

Building downwash was not modeled because the facility consists of volume sources that are not affected by building downwash.

Complex Terrain Data:

Elevations of receptors, facility sources, and surrounding sources were obtained from USGS GeoTIFF files using AERMAP.

Receptor Grid: The following grids were used to determine the maximum concentration for each pollutant.

Table 3: Table of Receptors

Grid Type	Description	Shape	Spacing	Radius
Cartesian	Intermediate	Square	200 meters	3 kilometers
Cartesian	Fine	Square	100 meters	2 kilometers
Cartesian	Very fine	Square	50 meters	1.5 kilometers
Fence line	Very fine	Fence line	25 meters	Fence line

Receptors outside of the radii of impact were discarded for the surrounding source runs.

Meteorological Data: AERMOD – Carlsbad 2014-2018.

Adjacent Sources:

The Department's Modeling Guidance was used to select 559 sources within 50 km of the facility. Sources provided by Texas TCEQ are included in this inventory.

The facility is 1.4 km from Bennetville Compressor Station. The facility is 5.6 km from Gila Compressor Station. The facility is 32.7 km from Red Hills Gas Processing Plant. The facility is 40.1 km from Eunice Gas Processing Plant. The facility is 60.0 km from 3 Bear Libby Gas Plant.

Modeling Procedures: Wind speed emission factors were used to relate material handling emission rates to wind speed.

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PSD Increment Information:

The facility is a minor source (for PSD purposes) located in AQCR 155. The minor source baseline dates here are 3/16/1988 for NO₂, 7/28/1978 for SO₂, 2/20/1979 for PM₁₀, and 11/13/2013 for PM_{2.5}.

The facility is 109.1 km from the Class I area Carlsbad Caverns National Park. Class I area impacts are negligible for minor sources over 50 km from a Class I area. Modeling is not required.

Results Discussion:

PM₁₀ Analysis:

The maximum total 24-hour PM₁₀ concentration was 69.087 µg/m³, which occurred 137 m east-southeast from the center of the facility. This was 46.1% of the NAAQS. A background concentration of 37.300 µg/m³ was added from the monitor 5ZS, at Hobbs - 2320 N. Jefferson St. The maximum source alone 24-hour PM₁₀ concentration was 31.787 µg/m³, which occurred 137 m east-southeast from the center of the facility. This was 46.1% of the NAAQS.

The maximum total 24-hour PM₁₀ concentration was 29.212 µg/m³, which occurred 137 m east-southeast from the center of the facility. This was 97.4% of the PSD Class II increment.

The maximum total annual PM₁₀ concentration was 10.059 µg/m³, which occurred 1306 m north-northwest from the center of the facility. This was 59.2% of the PSD Class II increment. The maximum source alone annual PM₁₀ concentration was 9.902 µg/m³, which occurred 1306 m north-northwest from the center of the facility. This was 58.2% of the PSD Class II increment.

PM_{2.5} Analysis:

The maximum total 24-hour PM_{2.5} concentration was 19.367 µg/m³, which occurred 565 m east-northeast from the center of the facility. This was 55.3% of the NAAQS. A background concentration of 16.500 µg/m³ was added from the monitor 5ZS, at Hobbs - 2320 N. Jefferson St. The maximum source alone 24-hour PM_{2.5} concentration was 3.981 µg/m³, which occurred 565 m east-northeast from the center of the facility. This was 11.4% of the NAAQS.

The maximum total annual PM_{2.5} concentration was 8.341 µg/m³, which occurred 1306 m north-northwest from the center of the facility. This was 69.5% of the NAAQS. A background concentration of 7.100 µg/m³ was added from the monitor 5ZS, at Hobbs - 2320 N. Jefferson St. The maximum source alone annual PM_{2.5} concentration was 1.170 µg/m³, which occurred 1306 m north-northwest from the center of the facility. This was 9.8% of the NAAQS.

The maximum total 24-hour PM_{2.5} concentration was 3.527 µg/m³, which occurred 565 m east-northeast from the center of the facility. This was 39.2% of the PSD Class II increment.

The maximum total annual PM_{2.5} concentration was 1.240 µg/m³, which occurred 1306 m north-northwest from the center of the facility. This was 31.0% of the PSD Class II increment.

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Table 4: Table of Ambient Impact from Emissions

Pollutant	Period	Modeled Facility Concentration (µg/m ³)	Modeled Concentration with Surrounding Sources (µg/m ³)	Background Concentration (µg/m ³)	Cumulative Concentration (µg/m ³)	Standard	Value of Standard (µg/m ³)	Percent of Standard	UTM East (m)	UTM North (m)	Elevation (ft)
PM10	24-hour	31.787	31.787	37.300	69.087	NAAQS	150	46.1	668,121.0	3,549,435.0	2964
PM10	24-hour		29.212		29.212	PSD Class II	30	97.4	668,121.0	3,549,435.0	2964
PM10	annual	9.902	10.059		10.059	PSD Class II	17	59.2	667,346.0	3,550,631.0	2980
PM2.5	24-hour	3.981	2.867	16.500	19.367	NAAQS	35	55.3	668,518.0	3,549,726.0	2965
PM2.5	annual	1.170	1.241	7.100	8.341	NAAQS	12	69.5	667,346.0	3,550,631.0	2980
PM2.5	24-hour		3.527		3.527	PSD Class II	9	39.2	668,518.0	3,549,726.0	2965
PM2.5	annual		1.240		1.240	PSD Class II	4	31.0	667,346.0	3,550,631.0	2980