

Air Quality Dispersion Modeling Summary for Permit No. 2116-M2

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Project: CEMEX Construction Materials South, LLC, CEMEX La Luz Aggregates
Township 15 S, Range 10 E, Section 34, Otero County
UTM Coordinates: 409,951.8 m East, 3,648,546.7 m North, zone 13
Elevation = 4588 feet

Brief: CEMEX desires that the New Mexico Air Quality Bureau (NMAQB) issue air quality permit 2116-M2 for a permit modification that includes a revision to address discrepancies between the current permit and the existing facility operations. More specifically, the co-located facilities (asphalt plant under permit #941 and concrete batch plant under General Permit GCP-5-3560) are included in this modeling analysis as the facility sources. The facility is an aggregate crushing facility located approximately 1.5 miles west of La Luz post office in Otero County, New Mexico. This facility is located in the Air Quality Control Region 153 where the PSD minor source baseline has been triggered for NO_x and PM₁₀; however, all the emission sources of the facility are PSD baseline sources. Therefore, PSD increment analysis is not applicable. The emission units are sources of Total Suspended Particulates (TSP), Particulates less than 10 micrometers in diameter (PM₁₀), and Particulates less than 2.5 micrometers in diameter (PM_{2.5}). Thus, impacts for TSP, PM₁₀, and PM_{2.5} are reviewed here. Relocation setback modeling isn't performed because it is a permanent facility. The emissions and stack parameters for the facility are shown in Table 1.

Modeling Assumptions:

Crusher operates during daylight hours only, with the weekly maximum operation of 60 hours. The hourly and daily maximum production rates for the crushing facility are limited to 400 tons and 5,733 tons, respectively. The Mesa Verde crushing facility under permit number 3295 maintains 350 meters setback distance from emission sources to fenceline. Background concentrations of 7.3 µg/m³, 20 µg/m³ and 26.6 µg/m³ are considered for PM_{2.5}, PM₁₀, and TSP, respectively.

Permit conditions:

Operating hours: The facility shall operate during daylight hours only from Monday to Saturday without exceeding the weekly maximum operation of 60 hours. The facility shall not operate on Sunday. The facility shall operate without exceeding the hourly and daily maximum production rates mentioned above.

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 PM_{2.5}; and NMAAQs for TSP.

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

The modeling report was submitted by Air, Soil and Water Environmental Consultants, Inc. (dated January 2009).

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The air quality analysis satisfactorily demonstrates compliance with applicable regulatory requirements.

**Table 1. Table of Emissions and Stack Parameters¹
Volume Source Modeling Parameters and Emission Rates**

Stack ID	Description	Release Height (m)	Horizontal Dimension (m)	Vertical Dimension (m)	TSP (lb/hr)	PM ₁₀ (lb/hr)	PM _{2.5} (lb/hr)
GRIZZ1	Grizzley	12	2.7907	5.5814	0.01	0.006	0.0060
JAWCR1	jaw crusher	5	1.1628	2.3256	0.48	0.216	0.1030
CONECR1	cone crusher 1	6	1.3953	2.7907	0.48	0.216	0.1030
VSICR1	VSI	6	1.3953	2.7907	0.48	0.216	0.1030
JAWSC1	Screen 1	6	1.3953	2.7907	0.88	0.296	0.1410
CONESC1	Screen 2	6	1.3953	2.7907	0.88	0.296	0.1410
VSISC1	Screen 3	6	1.3953	2.7907	1.44	0.88	0.4190
SANDSC1	Screen 4	2	0.4651	0.9302	0.88	0.296	0.1410
JAWC1 - 7	Conveyor	2	0.4651	0.9302	0.06	0.018	0.0050
CONEC1 - 7	Conveyor	2	0.4651	0.9302	0.06	0.018	0.0050
VSIC1 - 8	Conveyor	2	0.4651	0.9302	0.06	0.018	0.0050
ROCKC1 - 3	Conveyor	2	0.4651	0.9302	0.06	0.018	0.0050
SANDC1 - 5	Conveyor	2	0.4651	0.9302	0.06	0.018	0.0050
JAWST1 - 4	Stacker	5	1.1628	2.3256	0.06	0.018	0.0050
CONEST1 - 3	Stacker	5	1.1628	2.3256	0.06	0.018	0.0050
VSIST1 - 3	Stacker	5	1.1628	2.3256	0.06	0.018	0.0050
SANDST1	Stacker	5	1.1628	2.3256	0.06	0.018	0.0050
HRR_0001 - 48	Haul Road Segment - Crusher paved	4	6.51	3.72	0.0304	0.0078	0.0008
HRU_0001 - 41	Haul Road Segment - Crusher unpaved	4	6.51	3.72	0.0304	0.0078	0.0080
HRN_0002 - 12	Haul Road Segment - Pit North	4	6.51	3.72	0.0473	0.0121	0.0012
HRS_0001 - 20	Haul Road Segment - Pit South	4	6.51	3.72	0.0631	0.0161	0.0016

Open Pit Sources Modeling Parameters and Emission Rate

Stack ID	Description	Release Height (m)	Easterly Length (m)	Northerly Length (m)	Pit Volume (m)	Angle from North	TSP (lb/hr)	PM ₁₀ (lb/hr)	PM _{2.5} (lb/hr)
Open	Pit	0	350	400	300,000	0	9.40	4.44	0.67

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Area Circular Sources Modeling Parameters and Emission Rate

Stack ID	Description	Release Height (m)	Radius of Circle (m)	TSP (lb/hr)	PM ₁₀ (lb/hr)	PM _{2.5} (lb/hr)
CRUSHAGG	Crusher aggregate handling	3	200	9.40	4.44	0.67

¹ All values copied or converted from *CEMEX – CEMEX La Luz Aggregates Facility's* Permit Application.

Model(s) Used: AERMOD and Dry Plume Depletion Model were used to run the modeling analysis.

Note: complete modeling input and output files can be made available and are located on the server *magneto* in the directory *AQB/ModelingArchives/2116-M2_CEMEX_LaLuz*.

Number of Model Runs: AERMOD – 9 modeling runs were reviewed by NMED.

Modeling Parameters: The AERMOD regulatory default parameters were included in assumptions made by the model. Building downwash caused by buildings at the facility was considered.

Complex Terrain Data: Both simple and complex types of terrain were used to model the facility. Elevations of receptors, facility sources, and surrounding sources were obtained from digitized USGS 7.5-minute maps and one degree maps.

Receptor Grid: For each pollutant, the radius of significant impact around the facility was established using a Cartesian grid as shown in Table 2. Fenceline receptors were placed at 50-meter intervals around the facility fenceline. A 50-meter spacing for a very fine grid resolution was extended out to 0.5-km from the fenceline in each direction. Receptors for a fine grid resolution were defined with 100-meter spacing to a distance of 1.0-km from the facility. For intermediate and rough grid resolutions, 250-meter spacing and 500-meter spacing were extended out to 2.5-km and 5-km from the facility, respectively.

Table 2. Used Grid Resolutions in the Modeling Domain

Grid Type	Description	Shape	Spacing (m)	Length (km)
Cartesian	Very fine	Square	50	0.5
Cartesian	Fine	Square	100	1.0
Cartesian	Intermediate	Square	250	2.5
Cartesian	Rough	Square	500	5.0

Meteorological Data: AERMOD -- One (1) year of surface (SAMSON EL PASO 85.SFC) and upper air meteorological data (SAMSON EL PASO 85.PFL).

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Adjacent Sources: All adjacent particulate sources within 65 km were modeled. The entire lists of sources can be made available and can be found on the server *magneto* in the directory *AQB/ModelingArchives/2116-M2_CEMEX_LaLuz/SurroundingSources*.

Results Discussion: Results are detailed in Table 3.

TSP, PM₁₀, and PM_{2.5} Standards

Annual and 24-hr TSP NMAAQs

Compliance with the annual and 24-hour TSP NMAAQs has been demonstrated, as shown in Table 3.

24-hr PM₁₀ NAAQS

The 24-hour averaged maximum PM₁₀ concentrations demonstrated compliance with NAAQS in Table 3.

24-hr PM₁₀ PSD Class II Increment

PSD increment analysis is not applicable because all the sources of the facility are PSD baseline sources.

Annual and 24-hr PM₁₀ PSD Class I Increment

PSD increment analysis is not applicable because all the sources of the facility are PSD baseline sources.

Annual and 24-hr PM_{2.5} NAAQS

Compliance with the annual and 24-hour PM_{2.5} NAAQS has been demonstrated, as shown in Table 3.

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Table 3. Ambient Impact from Emissions

Pollutant	Contributing Sources	Averaging Period	Concentration with the background for PM ₁₀ and TSP		Standard		Percent of Standard or Significance Level
			µg/m ³	ppm	Applicable	Value	
PM _{2.5} *	All	24-hour	14.68	***	NAAQS	35 µg/m ³	41.94
PM _{2.5} *	All	annual	9.80	***	NAAQS	15 µg/m ³	65.33
PM _{2.5} *	Alone	24-hour	14.57	***	NAAQS	35 µg/m ³	41.63
PM _{2.5} *	Alone	annual	9.13	***	NAAQS	15 µg/m ³	60.87
PM ₁₀ *	All	24-hour	76.53	***	NAAQS	150 µg/m ³	51.02
PM ₁₀ *	Alone	24-hour	49.43	***	NAAQS	150 µg/m ³	32.95
TSP*	All	24-hour	147.37	***	NMAAQS	150 µg/m ³	98.25
TSP*	All	annual	48.06	***	NMAAQS	60 µg/m ³	80.10
TSP*	Alone	24-hour	112.08	***	NMAAQS	150 µg/m ³	74.72
TSP*	Alone	annual	46.42	***	NMAAQS	60 µg/m ³	77.37

*: Background concentrations of 7.3 µg/m³ (PM_{2.5}), 20 µg/m³ (PM₁₀) and 26.6 µg/m³ (TSP) were added to the modeled impact of the facility sources and surrounding sources for the NAAQS and the NMAAQS analysis.