CITY OF ALBUQUERQUE
ENVIRONMENTAL HEALTH DEPARTMENT
AIR QUALITY PROGRAM

MODIFICATION APPLICATION #0752-M4

American Gypsum Company, LLC
Albuquerque Plant

American Gypsum Company, LLC
Albuquerque Plant

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1. GENERAL INFORMATION

1.0 Executive Summary

American Gypsum Company LLC (AMG) currently operates its Gypsum Wallboard Manufacturing Plant in Albuquerque, New Mexico under Construction Permit (CP) #0752-M4 issued November 17, 2023. The Albuquerque Plant (herein referred to as the facility) receives raw material via ore truck which it processes to form wallboard.

AMG is proposing a modification to this permit to authorize a true-up increase in emission rates for unit DC-11. The permitted hourly emissions of 2.12 lb/hr for carbon monoxide (CO) will increase to 16.2 lb/hr. This will also increase the yearly emission rate for CO from 9.28 tpy to 70.95 tpy. All other emission rates associated with this unit will remain unchanged, as well as all other regulated emission-sourced units at this facility. The calculations and application forms include all units, and are divided into the proposed equipment unit revisions and existing equipment units unchanged.

The application includes a modeling waiver request and subsequent approval justifying that modeling is not required. The Air Quality Program (AQP) has finished reviewing the modeling waiver request submitted on July 16, 2024 on behalf of American Gypsum for the proposed modification to permit #0752-M4. The modeling waiver request was approved on August 8, 2024 for both 1-hour and 8-hour CO for Unit DC-11. A modeling waiver is not required for other pollutants, averaging periods or emission units because none of those emissions are changing.

As part of this permit modification, AMG would also like to respectfully request a draft permit be issued prior to final permit issuance.

2. DESCRIPTION OF FACILITY AND EMISSIONS INFORMATION

The following section summarizes the emission factors and methodology used to estimate air pollutant emissions from the Albuquerque Plant.

2.1 Description of The Facility

2.1.1 Proposed to Change in Facility

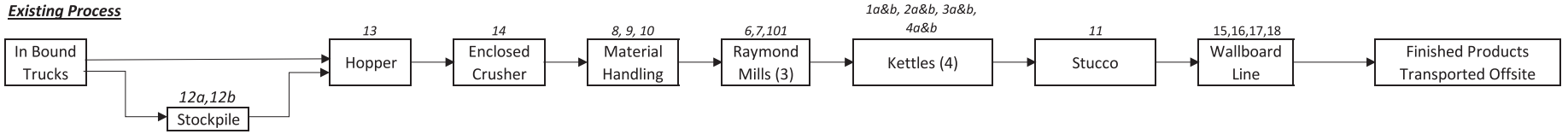
- The proposed change to this facility is to authorize a true-up increase in emission rates for unit DC-11. The permitted hourly emissions of 2.12 lb/hr for carbon monoxide (CO) will increase to 16.2 lb/hr. This will also increase the yearly emission rate for CO from 9.28 tpy to 70.95 tpy. All other emission rates associated with this unit will remain unchanged, as well as all other regulated emission-sourced units at this facility. For reference, the current, existing processing description which will remain unchanged is below in section 2.1.2

2.1.2 Existing (Unchanged) Gypsum Processing Description

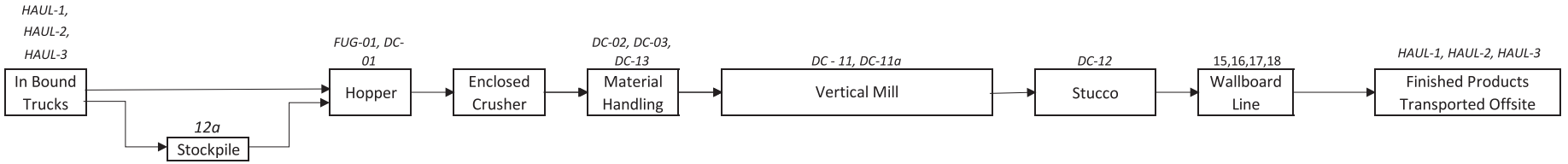
- Haul trucks deliver gypsum from mine;
- Belly dump into receiving hopper or on stockpile;
- Material from receiving hopper is fed to crusher to reduce size of gypsum;
- Gypsum is conveyed via belt, elevators & screws to storage silos;
- Gypsum is conveyed via elevators & screws to the grinding mills;
- Three grinding mills pulverize the gypsum into powder and drive off moisture;
- The ground gypsum is conveyed to one of four kettles where the material is cooked;
- Gypsum powder is fed into the top of the kettle;
- Each kettle has an agitator keeping the material mixing;
- There is a firebox under each kettle and flues that allow heat to run through the kettle to cook the gypsum;
- As the gypsum is cooked, it rises in the kettle and the raw gypsum powder flows toward the bottom;
- The fully cooked gypsum; plaster-of-Paris or stucco, overflows the top of the kettle;
- The stucco is conveyed to the production line to be converted to wallboard;
- Finished products are transported off site via rail and truck.

2.2 Process Flow Sheets

Existing Process



New Process



2.3 Air Pollutant Emissions and Calculations Methodology

2.3.1 Proposed Emission Calculations

a) Summary of Proposed Changes

Emissions from the hot gas generator except for carbon monoxide (CO) will remain unchanged. Calculations and methodology remain unchanged in the estimation of CO emission rates and are described in 2.3.1.b below.

Vertical Mill Hot Gas Generator Unit DC-11

b) Combustion Emissions

Emissions from the hot gas generator are split into combustion emissions (associated with combustion of natural gas) and particulate matter emissions released from the baghouse associated with material processing. CO, SO_2, VOC, and PM combustion emissions are based on AP-42 Table 1.4-1 & 1.4-2 for external combustion sources. For PM, only the condensable portion was estimated since the filterable portion is included in the manufacturer's guaranteed outlet grain loading as described in 2.3.1.c below. The revised CO emission rates are based on a manufacturer guarantee. Current NOx emission rates are unchanged, also based on a manufacturer guarantee.

c) Particulate Matter Emissions

Particulate matter emissions related to the processing of material through the new equipment are based on a manufacturer's guaranteed outlet grain loading value of 0.005 gr/acf and the assumption that PM10 and $PM_{2.5}$ emissions are based on the Aerodynamic Particle Size Multiplier (k factor) from AP-42 Section 13.2.4-4 ($PM_{2.5}$ = PM10 * 0.053/0.35). This outlet grain loading value corresponds to an assumed 99% control efficiency for the baghouse.

2.3.2 Existing (Unchanged) Emission Calculations

2.3.2.1 Kettles (Units 1a, 1b, 2a, 2b, 3a, 3b, 4a and 4b)

a. Combustion Stacks (Units 1a, 2a, 3a, 4a):

Emissions from the existing kettles are split into combustion emissions (associated with combustion of natural gas) and particulate matter emissions released from the baghouse associated with material processing. SO_2, VOC, and PM combustion emissions are based on AP-42 Table 1.4-1 & 1.4-2 for external combustion sources – with an assumed value of 0.2 gr S/100 scf adjusted to 0.5 gr S/100 scf per footnote (d) of AP-42 Table 1.4-2. NO_X and CO emission rates are based on stack test values plus a 25% safety factor. These calculations remain unchanged as part of this permit modification.

b. Baghouse Stacks (Units 1b, 2b, 3b, 4b)

Particulate matter emissions related to the processing of material through the kettles are based on the unit's process rate, as well as emission factors from AP-42 Table 11.16-2. $PM_{2.5}$ emissions are interpolated based on the particle size distribution data from AP-42 Table 11.16-3. The baghouses associated with the kettles have an assumed control efficiency of 99.7% per manufacturer specifications. These calculations remain unchanged as part of this permit modification.

2.3.2.2 Raymond Mills (Units 6, 7, 101)

a. Combustion Emissions:

Emissions from the existing Raymond Mills are split into combustion emissions (associated with combustion of natural gas) and particulate matter emissions released from the baghouse associated with material processing. NO_X, SO_2, VOC, and PM combustion emissions are based on AP-42 Table 1.4-1 & 1.4-2 for external combustion sources – with an assumed value of 0.2 gr S/100 scf adjusted to 0.5 gr S/100 scf per footnote (d) of AP-42 Table 1.4-2. CO emission rates are based on stack test values plus a 25% safety factor. These calculations remain unchanged as part of this permit modification.

b. Particulate Matter Emissions:

Particulate matter emissions related to the processing of material through the mills are based on the unit's process rate, as well as emission factors from AP-42 Table 11.16-2. PM_{10} emissions are based on the assumption that 90% of TSP is PM_{10} per previous applications and $PM_{2.5}$ emissions are conservatively assumed to be 30% of TSP per AP-42 Appendix 2, Table B.2.2. Previously, the baghouses associated with the kettles had an assumed control efficiency of 98%; however, recent data provided by the manufacturer shows control efficiencies of 99.99%+. The calculation methodology remains unchanged as part of this permit modification, but the control efficiency associated with these mills has been conservatively updated to 99% to better reflect emissions from these existing units.

2.3.2.3 Miscellaneous Mill Equipment (Unit 8)

Particulate matter emissions associated with mill equipment are based on equations and values from the NMED's "Crusher Facility Emissions and Overview of Modeling Methodology" as utilized in previous applications. Additionally, emission rates are based on AP-42 Table 11.16-2 and assume $PM_{2.5}$ is 30% of TSP per Appendix 2 of Table B.2.2. A control efficiency of 98% is assumed for the baghouse controlling this unit. These calculations remain unchanged as part of this permit modification.

2.3.2.4 Rock Feeder and Hammermill Crusher (Unit 9)

Particulate matter emissions associated with the rock feeder and hammermill crusher are based on AP-42 Table 11.19.2-2 and assume $PM_{2.5}$ is 30% of TSP per Appendix 2 of Table B.2.2. A control efficiency of 99.5% is assumed for the baghouse controlling this unit. These calculations remain unchanged as part of this permit modification.

2.3.2.5 Bucket Elevator and Rock Tank (Unit 10)

Particulate matter emissions associated with the bucket elevator and rock tank are based on AP-42 Table 11.19.2-2 and assume $PM_{2.5}$ is 30% of TSP per Appendix 2 of Table B.2.2. A control efficiency of 98% is assumed for the baghouse controlling this unit. These calculations remain unchanged as part of this permit modification.

2.3.2.6 Stucco Silos and Equipment Emissions (Unit 11)

Particulate matter emissions associated with the stucco silos and associated equipment are based on equations and values from the NMED's "Crusher Facility Emissions and Overview of Modeling Methodology" as utilized in previous applications. Additionally, emission rates are based on AP-42 Table 11.16-2 and assume $PM_{2.5}$ is 30% of TSP per Appendix 2 of Table B.2.2. A control efficiency of 98% is assumed for the baghouse controlling this unit. These calculations remain unchanged as part of this permit modification.

2.3.2.7 Stockpile Loader (Unit 12b)

Emissions associated with the stockpile loader are based on AP-42 Table 11.19.2-2 for truck loading/unloading of fragmented stone. PM_{10} and $PM_{2.5}$ emissions are based on the Aerodynamic Particle Size Multiplier (k factor) from AP-42 Section 13.2.4-4 ($PM_{2.5}$ = PM_{10} * 0.053/0.35. A photograph of this process is shown in Figure 1 to provide additional clarity on the types of trucks and location and release height of this source.

Figure 1. A photograph of the stockpile truck loader associated with Unit 12b.

2.3.2.8 Material Drop (Unit 13)

Particulate matter emissions associated with the material drop into hopper are based on AP-42 Section 13.2.4 and assume $PM_{2.5}$ is 30% of TSP per Appendix 2 of Table B.2.2. A control efficiency of 50% for TSP and PM_{10} and 75% for $PM_{2.5}$ are taken into account considering the hopper is underground and enclosed. These calculations remain unchanged as part of this permit modification. Pictures are provided in Figures 2 to 4 to provide additional clarity on the types of trucks and location and release height of this source.

Figure 2. A wide-view photograph of the material drop location associated with Unit 13.

Figure 3. A close-up view photograph of the material drop location associated with Unit 13.

Figure 4. A photograph of the material drop location associated with Unit 13 from the side.

2.3.2.9 Ball Mill Crushers (Unit 14)

Particulate matter emissions associated with the ball mill crushers are based on AP-42 Table 11.19.2-2 and assume $PM_{2.5}$ is 30% of TSP per Appendix 2 of Table B.2.2. A control efficiency of 98% is assumed for the baghouse controlling this unit. These calculations remain unchanged as part of this permit modification.

2.3.2.10 Dryer (Unit 15) and Dryer Wet End Seal (Unit 16)

a. Combustion Emissions from Dryer (Unit 15):

NO_X, CO, SO_2, VOC, and PM combustion emissions are based on AP-42 Table 1.4-1 & 1.4-2 for external combustion sources – with an assumed value of 0.2 gr S/100 scf adjusted to 0.5 gr S/100 scf per footnote (d) of AP-42 Table 1.4-2. These calculations remain unchanged as part of this permit modification.

b. Wet End Seal Emissions (Unit 16):

Dryer wet end seal emissions are based on manufacturer recommendations to apply a 1% ratio to Unit 15 combustion emissions. These calculations remain unchanged as part of this permit modification.

2.3.2.11 Final Trim (Unit 17)

Particulate matter emissions related to the processing of material through the final trim process are based on the unit's process rate, as well as specifications regarding the wallboard. These include wallboard weight, gypsum content, board size, cut width and cuts per board. PM_{10} emissions are based on the assumption that 90% of TSP is PM_{10} per previous applications and $PM_{2.5}$ emissions are conservatively assumed to be 30% of TSP per AP-42 Appendix 2, Table B.2.2. Manufacturer guarantees for the baghouse assume an outlet grain loading of 0.02 gr/acf. These calculations remain unchanged as part of this permit modification.

2.3.2.12 Reclaimed Wallboard Recycling System (Unit 18)

Particulate matter emissions related to the wallboard recycling system are based on an outlet grain loading value of 0.009 gr/scf. The flowrate for this unit is being updated from 12,800 acfm to 14,000 acfm based on a proposed increase in flowrate associated with the system. Uncontrolled emissions are estimated assuming a baghouse control efficiency of 99% and are provided for informational purposes only.

2.3.2.13 Dust Collectors (Units DC-01, DC-02, DC-03, DC-11a, DC-12, DC-13)

Particulate matter emissions related to the processing of material through the new equipment will be controlled by multiple dust collectors. Emissions from these units are based on a manufacturer's guaranteed outlet grain loading value of 0.005 gr/acf and the assumption that PM_{10} and $PM_{2.5}$ emissions are based on the Aerodynamic Particle Size Multiplier (k factor) from AP-42 Section 13.2.4-4 ($PM_{2.5} = PM_{10} * 0.053/0.35$). This outlet grain loading value corresponds to an assumed 99% control efficiency for the units. Details regarding the controlled processes are listed below:

DC-01: Material Unloading
DC-02: Mill Feed
DC-03: Rock Storage
DC-11a: Stucco Silos and Equipment
DC-12: Conditioning
DC-13: Start-up

2.3.2.14 Dump to Hopper (Unit FUG-01)

Particulate matter emissions associated with dropping material into the new hopper are based on the process rate, and AP-42 Table 11.19.2-2 for truck unloading. PM_{10} and $PM_{2.5}$ emissions are based on the Aerodynamic Particle Size Multiplier (k factor) from AP-42 Section 13.2.4-4 ($PM_{2.5} = PM_{10} * 0.053/0.35$).

2.3.2.15 Stockpile (Unit 12a)

Emissions associated with the stockpile are based on material handling (truck drops to stockpile and front-end loader drops) as well as loader and truck traffic traveling over the stockpile. Unit 12a encompasses emissions from both sources. Material handling emissions are based on AP-42 Table 11.19.2-2 for truck loading/unloading of fragmented stone. PM_{10} and $PM_{2.5}$ emissions are based on the Aerodynamic Particle Size Multiplier (k factor) from AP-42 Section 13.2.4-4 ($PM_{2.5} = PM_{10} * 0.053/0.35$). Water sprays are utilized so the controlled factor for wet material was utilized for material removed from the stockpile.

In addition to material handling, loaders and trucks travel on the stockpile, generating dust associated with haul traffic. These emissions were calculated based on AP-42 Section 13.2.2 for unpaved roads with an assumed silt content of 9.7% for Gypsum. Vehicles per hour, vehicles per year, segment length and mean vehicle weight were all provided by American Gypsum based on the facility processes and throughput. These emissions were added to the material handling and will be modeled as an area source representing the stockpile. Additional facility haul traffic is discussed below.

Pictures are provided in Figures 5 to 7 to provide additional clarity on the types of trucks and location and release height of this source.

Figure 5. A photograph of a bottom-dumping ore truck used to deposit material at Unit 12a.

Figure 6. A photograph showing the stockpile associate with Unit 12a.

Figure 7. A photograph showing a Stockpile 12a and the MSHA required berms.

2.3.2.16 Haul Roads (Units HAUL-1 to HAUL-3)

Haul trucks travel throughout the facility in conjunction with multiple facility processes. Ore trucks deliver raw material from the mine to be processed at the facility; finished product trucks are loaded and tarped before traveling off site; and trucks also transport wet waste off the property. Trucks travel on both unpaved and paved roads throughout the facility. Units HAUL-1 and HAUL-2 represent emissions from paved and unpaved roads respectively; however, American Gypsum would like to represent a maximum number of total trucks per hour and year that can travel on these roads. Instead of specifying mean vehicle weights for each different type of truck and differentiating multiple haul paths, calculations are based on a maximum (conservative) mean vehicle weight, a conservative number of trips per hour that can travel on the paved and unpaved roads and a total number of vehicles per year that are expected at this facility.

Authorization for a second unpaved haul truck route (Unit HAUL-3) is also being requested with this permit revision. This haul route is located in the northwest segment of the facility and will be used to stage trucks prior to entering the facility. Consistent with Units HAUL-1 and HAUL-2, American Gypsum would like to represent a maximum number of total trucks per hour and year that can travel on these roads. Calculations are based on a maximum (conservative) mean vehicle weight.

A map of HAUL-1, HAUL-2 and HAUL-3 is reported in Figure 8.

Figure 8. An aerial map showing the routes associated with Units HAUL-1 to HAUL-3.

The emission calculations are not based on a specific type of truck, but rather a generic (conservative) truck with the maximum mean vehicle weight and trips per hour that would be expected. Paved roads emissions will be based on AP-42 Section 13.2.1 and will use a silt content of 0.2 g/m^2 and the unpaved roads will be based on AP-42 Section 13.2.2 and will use a value of 4.8%, which is conservative considering the unpaved portions are asphalt millings and not completely unpaved roads. A control efficiency of 60% is applied based on the NMED's department accepted values for haul road emissions and control using water or base course. Vehicles per hour, vehicles per year, segment length and maximum mean vehicle weight were all provided by American Gypsum based on the facility processes, throughput and haul road paths.

Loader and haul truck traffic associated with the stockpile (Unit 12a) are quantified separately and are added to the emissions that are represented as part of the area source modeled for the stockpile. These calculations use a silt content of 9.7% for Gypsum.

2.4 Emission Calculations

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Table 2.4.2.1: Facility Proposed Emissions

Unit Number	Nitrogen Oxides (NO_X)		Carbon Monoxide (CO)		Nonmethane Hydrocarbons/Volatile Organic Compounds (NMHC/VOCs)		Sulfur Dioxide (SO_2)		Particulate Matter ≤ 10 Microns (PM_{10})		Particulate Matter ≤ 2.5 Microns ($PM_{2.5}$)	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
1. Kettle #1	**2.85**	**9.98**	**0.28**	**0.98**	**0.1**	**0.36**	**0.028**	**0.098**	**0.14**	**0.5**	**0.14**	**0.5**
1b. Kettle #2	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.4**	**6.15**	**0.44**	**1.94**
2a. Kettle #2	**1.9**	**6.65**	**0.2**	**0.7**	**0.07**	**0.25**	**0.019**	**0.067**	**0.097**	**0.34**	**0.097**	**0.34**
2b. Kettle #2	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.86**	**3.76**	**0.27**	**1.19**
3a. Kettle #3	**1.9**	**6.65**	**0.2**	**0.7**	**0.07**	**0.25**	**0.019**	**0.067**	**0.097**	**0.34**	**0.097**	**0.34**
3b. Kettle #3	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.4**	**6.15**	**0.44**	**1.94**
4a. Kettle #4	**2.85**	**9.98**	**0.28**	**0.98**	**0.1**	**0.36**	**0.028**	**0.098**	**0.14**	**0.5**	**0.14**	**0.5**
4b. Kettle #4	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.4**	**6.15**	**0.44**	**1.94**
6. Raymond Mill #1	**0.49**	**1.72**	**0.43**	**1.51**	**0.027**	**0.094**	**0.0074**	**0.026**	**0.63**	**2.74**	**0.24**	**1**
7. Raymond Mill #2	**0.49**	**1.72**	**0.43**	**1.51**	**0.027**	**0.094**	**0.0074**	**0.026**	**0.63**	**2.74**	**0.24**	**1**
101. Raymond Mill #3	**0.59**	**2.06**	**0.43**	**1.51**	**0.032**	**0.11**	**0.0088**	**0.031**	**0.75**	**3.23**	**0.28**	**1.18**
8. EU 8 (Misc. Mill Equip)	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.11**	**0.5**	**0.04**	**0.17**
9. Rock Feeder and Hammermill Crusher	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.0053**	**0.023**	**0.0035**	**0.015**
10. Bucket Elevator and Rock Tank	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.0024**	**0.011**	**0.002**	**0.0087**
11. Stucco Silos and Equipment	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.09**	**0.38**	**0.03**	**0.13**

12a. Stockpile	-	-	-	-	-	-	-	-	0.48	1.67	0.051	0.18
12b. Stockpile Loader	-	-	-	-	-	-	-	-	0.02	0.048	0.003	7.30E-03
13. Material Drop	-	-	-	-	-	-	-	-	0.11	0.49	0.04	0.16
14. Ball Mill Crushers	-	-	-	-	-	-	-	-	0.00024	0.0012	0.000097	0.00043
15. Dryer	9.8	43.1	8.3	36.2	0.54	2.4	0.15	0.65	0.75	3.27	0.75	3.27
16. Dryer Wet End Seal	0.1	0.43	0.08	0.36	0.01	0.02	0.0023	0.01	0.0075	0.033	0.0075	0.033
17. Final Trim	-	-	-	-	-	-	-	-	0.86	3.75	0.86	3.75
18. Reclaimed Wallboard Recycling System[1]	-	-	-	-	-	-	-	-	1.08	4.73	0.16	0.72
DC-01 – Unloading Baghouse	-	-	-	-	-	-	-	-	0.28	1.22	0.042	0.18
DC-02 – Mill Feed Baghouse	-	-	-	-	-	-	-	-	0.26	1.13	0.039	0.17
DC-03 – Rock Storage Baghouse	-	-	-	-	-	-	-	-	0.17	0.75	0.026	0.11
DC-11a – Stucco Silos and Equipment	-	-	-	-	-	-	-	-	0.22	0.98	0.034	0.15
DC-11 – Mill Baghouse	2.46	10.76	16.2	70.95	0.29	1.28	0.032	0.14	2.44	10.71	0.63	2.74
DC-12 – Conditioning Baghouse System	-	-	-	-	-	-	-	-	0.27	1.16	0.04	0.18
DC-13 – Start-up Baghouse	-	-	-	-	-	-	-	-	0.086	0.38	0.013	0.057
FUG-01 – Dump to Hopper	-	-	-	-	-	-	-	-	0.0018	0.0077	0.00027	0.0012
HAUL-1 – Unpaved Haul Roads	-	-	-	-	-	-	-	-	2	5.08	0.2	0.51

HAUL-2 – Paved Haul Roads	-	-	-	-	-	-	-	-	**0.12**	**0.36**	**0.03**	**0.089**
HAUL-3 – Truck Staging Area	-	-	-	-	-	-	-	-	**1.46**	**2.58**	**0.15**	**0.26**
Totals of Controlled Emissions	**23.43**	**93.03**	**26.83**	**115.4**	**1.27**	**5.21**	**0.3**	**1.21**	**18.38**	**71.86**	**5.97**	**24.75**

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Table 2.4.3.1. Current Permitted Emissions

Unit	Description	Current Permitted Emissions											
		NO_x		CO		SO_2		VOC		PM_{10}		$PM_{2.5}$	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
DC-11	Vertical Mill Roller Hot Gas Generator	2.46	10.76	2.12	9.28	0.032	0.14	0.29	1.28	2.44	10.71	0.063	2.74
Total		2.46	10.76	2.12	9.28	0.032	0.14	0.29	1.28	2.44	10.71	0.063	2.74

Table 2.4.3.2 Proposed Emissions

Unit	Description	Proposed Emissions											
		NO_x		CO		SO_2		VOC		PM_{10}		$PM_{2.5}$	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
DC-11	Vertical Mill Roller Hot Gas Generator	2.46	10.76	16.2	70.95	0.032	0.14	0.29	1.28	2.44	10.71	0.063	2.74
Total		2.46	10.76	16.2	70.95	0.032	0.14	0.29	1.28	2.44	10.71	0.063	2.74

Table 2.4.3.3. Proposed Change in Emissions

Description	Proposed Change in Emissions											
	NO_x		CO		SO_2		VOC		PM_{10}		$PM_{2.5}$	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Proposed Emissions	2.46	10.76	16.2	70.95	0.032	0.14	0.29	1.28	2.44	10.71	0.063	2.74
Current Permitted Levels	2.46	10.76	2.12	9.28	0.032	0.14	0.29	1.28	2.44	10.71	0.063	2.74
Increase in Emissions from Current Permit	0	0	14.08	61.67	0	0	0	0	0	0	0	0

2.5 Supporting Information

2.5.1 Proposed Unit Changes Supporting Documentation

The below supporting documentation is used for changes in units at this facility. The proposed unit change is solely for unit DC-11, which is a true-up in emissions for carbon monoxide (CO).

- AP-42 Tables 1.4-1 and 1.4-2: Emission Factors for Natural Gas Combustion
- Vertical Mill Hot Gas Generator Burner Manufacturer Guarantee (Honeywell)

2.5.2 Existing Unit (Unchanged) Supporting Documentation

The below supporting documentation is for all existing units that are unchanged in this application. They are included as a reference only.

- AP-42 Tables 1.4-1 and 1.4-2: Emission Factors for Natural Gas Combustion
- AP-42 Table B.2.2: Particulate Size Distribution of Processed Ores and Nonmetallic Minerals
- AP-42 Table 11.16-2: Emission Factors for Gypsum Processing
- AP-42 Table 11.19.2-2: Emission Factors for Crushed Stone Operation
- AP-42 Section 13.2.2: Unpaved Haul Roads
- NMED Guidance: Aggregate Handling, Storage Pile, and Haul Road Emissions
- AP-42 Section 13.2.4: Aggregate Handling and Storage Piles
- AP-42 Section 8.19.1 Sand and Gravel Processing
- Correspondence with PNM regarding sufficient power supply
- Kettle baghouse stack testing emissions substantiating emission control greater than permitted emissions
- Raymond Mill baghouse control efficiency manufacturer guarantee of > 99.99% (Parker)
- Letter from GE with filter control efficiency for Unit 17
- Units 18 and DC-01 to DC-13 guarantee of 0.005 gr/scf (IAC)

Table 1.4-1. EMISSION FACTORS FOR NITROGEN OXIDES (NO_x) AND CARBON MONOXIDE (CO) FROM NATURAL GAS COMBUSTION[a]

Combustor Type (MMBtu/hr Heat Input) [SCC]	NO_x[b]		CO	
	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
Large Wall-Fired Boilers (>100) [1-01-006-01, 1-02-006-01, 1-03-006-01]				
Uncontrolled (Pre-NSPS)[c]	280	A	84	B
Uncontrolled (Post-NSPS)[c]	190	A	84	B
Controlled - Low NO_x burners	140	A	84	B
Controlled - Flue gas recirculation	100	D	84	B
Small Boilers (<100) [1-01-006-02, 1-02-006-02, 1-03-006-02, 1-03-006-03]				
Uncontrolled	100	B	84	B
Controlled - Low NO_x burners	50	D	84	B
Controlled - Low NO_x burners/Flue gas recirculation	32	C	84	B
Tangential-Fired Boilers (All Sizes) [1-01-006-04]				
Uncontrolled	170	A	24	C
Controlled - Flue gas recirculation	76	D	98	D
Residential Furnaces (<0.3) [No SCC]				
Uncontrolled	94	B	40	B

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. Emission factors are based on an average natural gas higher heating value of 1,020 Btu/scf. To convert from $1b/10^6$ scf to lb/MMBtu, divide by 1,020. The emission factors in this table may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to this average heating value. SCC = Source Classification Code. ND = no data. NA = not applicable.

[b] Expressed as NO_2. For large and small wall fired boilers with SNCR control, apply a 24 percent reduction to the appropriate NO_X emission factor. For tangential-fired boilers with SNCR control, apply a 13 percent reduction to the appropriate NO_X emission factor.

[c] NSPS=New Source Performance Standard as defined in 40 CFR 60 Subparts D and Db. Post-NSPS units are boilers with greater than 250 MMBtu/hr of heat input that commenced construction modification, or reconstruction after August 17, 1971, and units with heat input capacities between 100 and 250 MMBtu/hr that commenced construction modification, or reconstruction after June 19, 1984.

TABLE 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION[a]

Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
CO_2[b]	120,000	A
Lead	0.0005	D
N_2O (Uncontrolled)	2.2	E
N_2O (Controlled-low-NO_X burner)	0.64	E
PM (Total)[c]	7.6	D
PM (Condensable)[c]	5.7	D
PM (Filterable)[c]	1.9	B
SO_2[d]	0.6	A
TOC	11	B
Methane	2.3	B
VOC	5.5	C

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. Data are for all natural gas combustion sources. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. To convert from $lb/10^6$ scf to 1b/MMBtu, divide by 1,020. The emission factors in this table may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to this average heating value. TOC = Total Organic Compounds. VOC = Volatile Organic Compounds.

[b] Based on approximately 100% conversion of fuel carbon to CO_2. $CO_2[lb/10^6 \text{ scf}] = (3.67)(CON)(C)(D)$, where CON = fractional conversion of fuel carbon to CO_2, C = carbon content of fuel by weight (0.76), and D = density of fuel, 4.2×10^4 $lb/10^6$ scf.

[c] All PM (total, condensible, and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM_{10}, $PM_{2.5}$ or PM_1 emissions. Total PM is the sum of the filterable PM and condensible PM. Condensible PM is the particulate matter collected using EPA Method 202 (or equivalent). Filterable PM is the particulate matter collected on, or prior to, the filter of an EPA Method 5 (or equivalent) sampling train.

[d] Based on 100% conversion of fuel sulfur to SO_2. Assumes sulfur content is natural gas of 2,000 grains/10^6 scf. The SO_2 emission factor in this table can be converted to other natural gas sulfur contents by multiplying the SO_2 emission factor by the ratio of the site-specific sulfur content (grains/10^6 scf) to 2,000 grains/10^6 scf.

July 10, 2024

Industrial Automation (IA)
Smart Energy and Thermal Solutions (SETS)
2101 CityWest Blvd
Houston, TX 77042

Julio Astudillo
Gebr. Pfeiffer, Inc.
18501 Pines Blvd. - Suite 208
Pembroke Pines - FL 33029
USA

Dear Julio,

Please see the attached for the emissions statement for the burner and combustion chamber to be installed at the American Gypsum facility in Albuquerque, NM. This is our normal emissions guarantee, that summarizes the operational and site conditions.

In summary, the burner system supplied by Honeywell Thermal Solutions (HTS), operating within the Gebr. Pfeiffer system, will be able to meet the following emissions levels at a system firing rate of 51.2MM Btu/hr.

NOx emissions: less than 2.46 lb/hr.
CO emissions: less than 16.2 lb/hr.

Please let us know if you have any questions or concerns with the attached.

Sincere regards,

Brian K Kelly
Applications Engineering Manager
Honeywell Thermal Solutions

Table 1.4-1. EMISSION FACTORS FOR NITROGEN OXIDES (NO_x) AND CARBON MONOXIDE (CO) FROM NATURAL GAS COMBUSTION[a]

Combustor Type (MMBtu/hr Heat Input) [SCC]	NO_x[b]		CO	
	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
Large Wall-Fired Boilers (>100) [1-01-006-01, 1-02-006-01, 1-03-006-01]				
Uncontrolled (Pre-NSPS)[c]	280	A	84	B
Uncontrolled (Post-NSPS)[c]	190	A	84	B
Controlled - Low NO_x burners	140	A	84	B
Controlled - Flue gas recirculation	100	D	84	B
Small Boilers (<100) [1-01-006-02, 1-02-006-02, 1-03-006-02, 1-03-006-03]				
Uncontrolled	100	B	84	B
Controlled - Low NO_x burners	50	D	84	B
Controlled - Low NO_x burners/Flue gas recirculation	32	C	84	B
Tangential-Fired Boilers (All Sizes) [1-01-006-04]				
Uncontrolled	170	A	24	C
Controlled - Flue gas recirculation	76	D	98	D
Residential Furnaces (<0.3) [No SCC]				
Uncontrolled	94	B	40	B

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. Emission factors are based on an average natural gas higher heating value of 1,020 Btu/scf. To convert from $1b/10^6$ scf to lb/MMBtu, divide by 1,020. The emission factors in this table may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to this average heating value. SCC = Source Classification Code. ND = no data. NA = not applicable.

[b] Expressed as NO_2. For large and small wall fired boilers with SNCR control, apply a 24 percent reduction to the appropriate NO_X emission factor. For tangential-fired boilers with SNCR control, apply a 13 percent reduction to the appropriate NO_X emission factor.

[c] NSPS=New Source Performance Standard as defined in 40 CFR 60 Subparts D and Db. Post-NSPS units are boilers with greater than 250 MMBtu/hr of heat input that commenced construction modification, or reconstruction after August 17, 1971, and units with heat input capacities between 100 and 250 MMBtu/hr that commenced construction modification, or reconstruction after June 19, 1984.

TABLE 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION[a]

Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
CO_2[b]	120,000	A
Lead	0.0005	D
N_2O (Uncontrolled)	2.2	E
N_2O (Controlled-low-NO_X burner)	0.64	E
PM (Total)[c]	7.6	D
PM (Condensable)[c]	5.7	D
PM (Filterable)[c]	1.9	B
SO_2[d]	0.6	A
TOC	11	B
Methane	2.3	B
VOC	5.5	C

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. Data are for all natural gas combustion sources. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. To convert from $lb/10^6$ scf to 1b/MMBtu, divide by 1,020. The emission factors in this table may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to this average heating value. TOC = Total Organic Compounds. VOC = Volatile Organic Compounds.

[b] Based on approximately 100% conversion of fuel carbon to CO_2. $CO_2[lb/10^6 \text{ scf}] = (3.67)(CON)(C)(D)$, where CON = fractional conversion of fuel carbon to CO_2, C = carbon content of fuel by weight (0.76), and D = density of fuel, 4.2×10^4 $lb/10^6$ scf.

[c] All PM (total, condensible, and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM_{10}, $PM_{2.5}$ or PM_1 emissions. Total PM is the sum of the filterable PM and condensible PM. Condensible PM is the particulate matter collected using EPA Method 202 (or equivalent). Filterable PM is the particulate matter collected on, or prior to, the filter of an EPA Method 5 (or equivalent) sampling train.

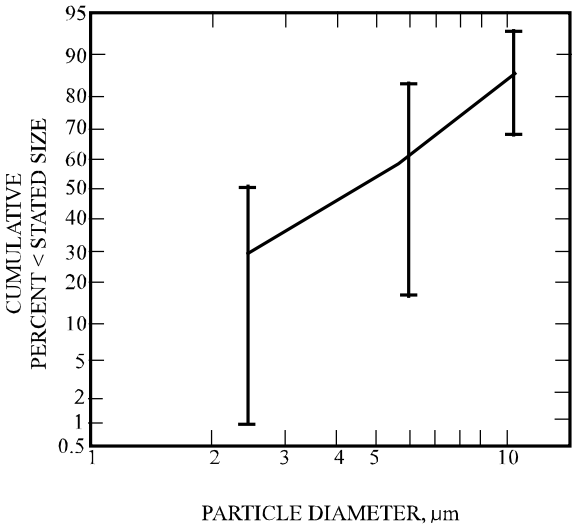
[d] Based on 100% conversion of fuel sulfur to SO_2. Assumes sulfur content is natural gas of 2,000 grains/10^6 scf. The SO_2 emission factor in this table can be converted to other natural gas sulfur contents by multiplying the SO_2 emission factor by the ratio of the site-specific sulfur content (grains/10^6 scf) to 2,000 grains/10^6 scf.

Table B.2.2 (cont.).

Category: 4
Process: Mechanically Generated
Material: Processed Ores and Nonmetallic Minerals

Category 4 covers material handling and processing of processed ores and minerals. While similar to Category 3, processed ores can be expected to have a greater size consistency than unprocessed ores. Particulate emissions are a result of agitating the materials by screening or transfer during size reduction and beneficiation of the materials by grinding and fine milling and by drying.

REFERENCE: 1



Particle Size, µm	Cumulative % ≤ Stated Size (Uncontrolled)	Minimum Value	Maximum Value	Standard Deviation
1.0[a]	6			
2.0[a]	21			
2.5	30	1	51	19
3.0[a]	36			
4.0[a]	48			
5.0[a]	58			
6.0	62	17	83	17
10.0	85	70	93	7

[a] Value calculated from data reported at 2.5, 6.0, and 10.0 µm. No statistical parameters are given for the calculated value.

Table 11.16-2 (English Units). EMISSION FACTORS FOR GYPSUM PROCESSING[a]

EMISSION FACTOR RATING: D

Process	Filterable PM[b]	PM-10	CO_2[c]
Crushers, screens, stockpiles, and roads (SCC 3-05-015-05,-06,-07,-08)	—[d]	—[d]	NA
Rotary ore dryers (SCC 3-05-015-01)	0.16(FFF)$^{1.77}$[e]	0.013(FFF)$^{1.7}$	23[f]
Rotary ore dryers w/fabric filters (SCC 3-05-015-01)	0.040[g]	0.010	NA
Roller mills w/cyclones (SCC 3-05-015-02)	2.6[h]	ND	NA
Roller mills w/fabric filters (SCC 3-05-015-02)	0.12[h]	ND	NA
Roller mill and kettle calciner w/electrostatic precipitators (SCC 3-05-015-02,-11)	0.090[h,j]	ND	ND
Continuous kettle calciners and hot pit (SCC 3-05-015-11)	41[k]	26	ND
Continuous kettle calciners and hot pit w/fabric filters (SCC 3-05-015-11)	0.0060[k]	ND	NA
Continuous kettle calciners w/cyclones and electrostatic precipitators (SCC 3-05-015-11)	0.090[k]	ND	NA
Flash calciners (SCC 3-05-015-12)	37[m]	14[m]	110[n]
Flash calciners w/fabric filters (SCC 3-05-015-12)	0.040[m]	0.034[m]	ND
Impact mills w/cyclones (SCC 3-05-015-13)	100[p]	ND	NA
Impact mills w/fabric filters (SCC 3-05-015-13)	0.020[p]	ND	NA
Board end sawing--8-ft boards (SCC 3-05-015-21)	0.80[q]	ND	NA
Board end sawing--12-ft boards (SCC 3-05-015-22)	0.50[q]	ND	NA
Board end sawing w/fabric filters--8- and 12-ft boards (SCC 3-05-015-21,-22)	7.5[r]	5.7[r]	NA

[a] Factors represent uncontrolled emissions unless otherwise specified. All emission factors are lb/ton of output rate. SCC = Source Classification Codes. NA = not applicable. ND = no data.

Table 11.16-2 (cont.).

[b] Filterable PM is that particulate collected on or prior to an EPA Method 5 (or equivalent) sampling train.
[c] Typical pollution control devices generally have a negligible effect on CO_2 emissions.
[d] Factors for these operations are in Sections 8.19 and 13.2.
[e] References 3-4,8,11-12. Equation is for the emission rate upstream of any process cyclones and applies only to concurrent rotary ore dryers with flow rates of 16,000 actual cubic feet per minute (acfm) or less. FFF in the uncontrolled emission factor equation is "flow feed factor," the ratio of gas mass rate per unit dryer cross section area to the dry mass feed rate, in the following units: (lb/hr-ft^2 of gas flow)/(ton/hr dry feed). Measured uncontrolled emission factors for 9,000 and 12,000 acfm range from 10 to 120 lb/ton.
[f] References 3-4.
[g] References 3-4,8,11-12. Applies to rotary dryers with and without cyclones upstream of fabric filter.
[h] References 11-14. Applies to both heated and unheated roller mills.
[j] References 11-14. Factor is for combined emissions from roller mills and kettle calciners, based on the sum of the roller mill and kettle calciner output rates.
[k] References 4-5,11,13-14. Emission factors based on the kettle and the hot pit do not apply to batch kettle calciners.
[m] References 3,6,10.
[n] References 3,6,9.
[p] References 9,15. As used here, an impact mill is a process unit used to dry, grind, and calcine gypsum simultaneously.
[q] References 4-5,16. Emission factor units = lb/100 ft^2. Based on 1/2-in. board thickness and 4-ft board width. For other thicknesses, multiply the appropriate emission factor by 2 times board thickness in inches.
[r] References 4-5,16. Emission factor units = lb/10^6 ft^2.

Table 11.16-3. SUMMARY OF PARTICLE SIZE DISTRIBUTION DATA FOR UNCONTROLLED PM EMISSIONS FROM GYPSUM PROCESSING[a]

EMISSION FACTOR RATING: D

Diameter (μm)	Cumulative % Less Than Diameter			
	Rotary Ore Dryer[b]	Rotary Ore Dryer With Cyclone[c]	Continuous Kettle Calciner[d]	Flash Calciner[e]
2.0	1	12	17	10
10.0	8	45	63	38

[a] Weight % given as filterable PM. Diameter is given as aerodynamic diameter, except for continuous kettle calciner, which is given as equivalent diameter, as determined by Bahco and Sedigraph analyses.
[b] Reference 3.
[c] Reference 4.
[d] References 4-5.
[e] References 3,6.

Table 11.19.2-2 (English Units). EMISSION FACTORS FOR CRUSHED STONE PROCESSING OPERATIONS (lb/Ton)[a]

Source [b]	Total Particulate Matter [r,s]	EMISSION FACTOR RATING	Total PM-10	EMISSION FACTOR RATING	Total PM-2.5	EMISSION FACTOR RATING
Primary Crushing (SCC 3-05-020-01)	ND		ND[n]		ND[n]	
Primary Crushing (controlled) (SCC 3-05-020-01)	ND		ND[n]		ND[n]	
Secondary Crushing (SCC 3-05-020-02)	ND		ND[n]		ND[n]	
Secondary Crushing (controlled) (SCC 3-05-020-02)	ND		ND[n]		ND[n]	
Tertiary Crushing (SCC 3-050030-03)	0.0054[d]	E	0.0024[o]	C	ND[n]	
Tertiary Crushing (controlled) (SCC 3-05-020-03)	0.0012[d]	E	0.00054[p]	C	0.00010[q]	E
Fines Crushing (SCC 3-05-020-05)	0.0390[e]	E	0.0150[e]	E	ND	
Fines Crushing (controlled) (SCC 3-05-020-05)	0.0030[f]	E	0.0012[f]	E	0.000070[q]	E
Screening (SCC 3-05-020-02, 03)	0.025[c]	E	0.0087[l]	C	ND	
Screening (controlled) (SCC 3-05-020-02, 03)	0.0022[d]	E	0.00074[m]	C	0.000050[q]	E
Fines Screening (SCC 3-05-020-21)	0.30[g]	E	0.072[g]	E	ND	
Fines Screening (controlled) (SCC 3-05-020-21)	0.0036[g]	E	0.0022[g]	E	ND	
Conveyor Transfer Point (SCC 3-05-020-06)	0.0030[h]	E	0.00110[h]	D	ND	
Conveyor Transfer Point (controlled) (SCC 3-05-020-06)	0.00014[i]	E	4.6×10^{-5}[i]	D	1.3×10^{-5}[q]	E
Wet Drilling - Unfragmented Stone (SCC 3-05-020-10)	ND		8.0×10^{-5}[j]	E	ND	
Truck Unloading -Fragmented Stone (SCC 3-05-020-31)	ND		1.6×10^{-5}[j]	E	ND	
Truck Loading - Conveyor, crushed stone (SCC 3-05-020-32)	ND		0.00010[k]	E	ND	

a. Emission factors represent uncontrolled emissions unless noted. Emission factors in lb/Ton of material of throughput. SCC = Source Classification Code. ND = No data.

b. Controlled sources (with wet suppression) are those that are part of the processing plant that employs current wet suppression technology similar to the study group. The moisture content of the study group without wet suppression systems operating (uncontrolled) ranged from 0.21 to 1.3 percent, and the same facilities operating wet suppression systems (controlled) ranged from 0.55 to 2.88 percent. Due to carry over of the small amount of moisture required, it has been shown that each source, with the exception of crushers, does not need to employ direct water sprays. Although the moisture content was the only variable measured, other process features may have as much influence on emissions from a given source. Visual observations from each source under normal operating conditions are probably the best indicator of which emission factor is most appropriate. Plants that employ substandard control measures as indicated by visual observations should use the uncontrolled factor with an appropriate control efficiency that best reflects the effectiveness of the controls employed.

c. References 1, 3, 7, and 8

d. References 3, 7, and 8

13.2.2 Unpaved Roads

13.2.2.1 General

When a vehicle travels an unpaved road, the force of the wheels on the road surface causes pulverization of surface material. Particles are lifted and dropped from the rolling wheels, and the road surface is exposed to strong air currents in turbulent shear with the surface. The turbulent wake behind the vehicle continues to act on the road surface after the vehicle has passed.

The particulate emission factors presented in the previous draft version of this section of AP-42, dated October 2001, implicitly included the emissions from vehicles in the form of exhaust, brake wear, and tire wear as well as resuspended road surface material[25]. EPA included these sources in the emission factor equation for unpaved public roads (equation 1b in this section) since the field testing data used to develop the equation included both the direct emissions from vehicles and emissions from resuspension of road dust.

This version of the unpaved public road emission factor equation only estimates particulate emissions from resuspended road surface material [23, 26]. The particulate emissions from vehicle exhaust, brake wear, and tire wear are now estimated separately using EPA's MOBILE6.2 [24]. This approach eliminates the possibility of double counting emissions. Double counting results when employing the previous version of the emission factor equation in this section and MOBILE6.2 to estimate particulate emissions from vehicle traffic on unpaved public roads. It also incorporates the decrease in exhaust emissions that has occurred since the unpaved public road emission factor equation was developed. The previous version of the unpaved public road emission factor equation includes estimates of emissions from exhaust, brake wear, and tire wear based on emission rates for vehicles in the 1980 calendar year fleet. The amount of PM released from vehicle exhaust has decreased since 1980 due to lower new vehicle emission standards and changes in fuel characteristics.

13.2.2.2 Emissions Calculation And Correction Parameters[1-6]

The quantity of dust emissions from a given segment of unpaved road varies linearly with the volume of traffic. Field investigations also have shown that emissions depend on source parameters that characterize the condition of a particular road and the associated vehicle traffic. Characterization of these source parameters allow for "correction" of emission estimates to specific road and traffic conditions present on public and industrial roadways.

Dust emissions from unpaved roads have been found to vary directly with the fraction of silt (particles smaller than 75 micrometers [μm] in diameter) in the road surface materials.[1] The silt fraction is determined by measuring the proportion of loose dry surface dust that passes a 200-mesh screen, using the ASTM-C-136 method. A summary of this method is contained in Appendix C of AP-42. Table 13.2.2-1 summarizes measured silt values for industrial unpaved roads. Table 13.2.2-2 summarizes measured silt values for public unpaved roads. It should be noted that the ranges of silt content vary over two orders of magnitude. Therefore, the use of data from this table can potentially introduce considerable error. Use of this data is strongly discouraged when it is feasible to obtain locally gathered data.

Since the silt content of a rural dirt road will vary with geographic location, it should be measured for use in projecting emissions. As a conservative approximation, the silt content of the parent soil in the area can be used. Tests, however, show that road silt content is normally lower than in the surrounding parent soil, because the fines are continually removed by the vehicle traffic, leaving a higher percentage of coarse particles.

Other variables are important in addition to the silt content of the road surface material. For example, at industrial sites, where haul trucks and other heavy equipment are common, emissions are highly correlated with vehicle weight. On the other hand, there is far less variability in the weights of cars and pickup trucks that commonly travel publicly accessible unpaved roads throughout the United States. For those roads, the moisture content of the road surface material may be more dominant in determining differences in emission levels between, for example a hot, desert environment and a cool, moist location.

The PM-10 and TSP emission factors presented below are the outcomes from stepwise linear regressions of field emission test results of vehicles traveling over unpaved surfaces. Due to a limited amount of information available for PM-2.5, the expression for that particle size range has been scaled against the result for PM-10. Consequently, the quality rating for the PM-2.5 factor is lower than that for the PM-10 expression.

Table 13.2.2-1. TYPICAL SILT CONTENT VALUES OF SURFACE MATERIAL ON INDUSTRIAL UNPAVED ROADS[a]

Industry	Road Use Or Surface Material	Plant Sites	No. Of Samples	Silt Content (%)	
				Range	Mean
Copper smelting	Plant road	1	3	16 - 19	17
Iron and steel production	Plant road	19	135	0.2 - 19	6.0
Sand and gravel processing	Plant road	1	3	4.1 - 6.0	4.8
	Material storage area	1	1	-	7.1
Stone quarrying and processing	Plant road	2	10	2.4 - 16	10
	Haul road to/from pit	4	20	5.0-15	8.3
Taconite mining and processing	Service road	1	8	2.4 - 7.1	4.3
	Haul road to/from pit	1	12	3.9 - 9.7	5.8
Western surface coal mining	Haul road to/from pit	3	21	2.8 - 18	8.4
	Plant road	2	2	4.9 - 5.3	5.1
	Scraper route	3	10	7.2 - 25	17
	Haul road (freshly graded)	2	5	18 - 29	24
Construction sites	Scraper routes	7	20	0.56-23	8.5
Lumber sawmills	Log yards	2	2	4.8-12	8.4
Municipal solid waste landfills	Disposal routes	4	20	2.2 - 21	6.4

[a]References 1,5-15.

The following empirical expressions may be used to estimate the quantity in pounds (lb) of size-specific particulate emissions from an unpaved road, per vehicle mile traveled (VMT):

For vehicles traveling on unpaved surfaces at industrial sites, emissions are estimated from the following equation:

$$E = k\,(s/12)^a (W/3)^b \quad (1a)$$

and, for vehicles traveling on publicly accessible roads, dominated by light duty vehicles, emissions may be estimated from the following:

$$E = \frac{k\,(s/12)^a (S/30)^d}{(M/0.5)^c} - C \quad (1b)$$

where k, a, b, c and d are empirical constants (Reference 6) given below and

E = size-specific emission factor (lb/VMT)
s = surface material silt content (%)
W = mean vehicle weight (tons)
M = surface material moisture content (%)
S = mean vehicle speed (mph)
C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear.

The source characteristics s, W and M are referred to as correction parameters for adjusting the emission estimates to local conditions. The metric conversion from lb/VMT to grams (g) per vehicle kilometer traveled (VKT) is as follows:

1 lb/VMT = 281.9 g/VKT

The constants for Equations 1a and 1b based on the stated aerodynamic particle sizes are shown in Tables 13.2.2-2 and 13.2.2-4. The PM-2.5 particle size multipliers (k-factors) are taken from Reference 27.

Table 13.2.2-2. CONSTANTS FOR EQUATIONS 1a AND 1b

Constant	Industrial Roads (Equation 1a)			Public Roads (Equation 1b)		
	PM-2.5	PM-10	PM-30*	PM-2.5	PM-10	PM-30*
k (lb/VMT)	0.15	1.5	4.9	0.18	1.8	6.0
a	0.9	0.9	0.7	1	1	1
b	0.45	0.45	0.45	-	-	-
c	-	-	-	0.2	0.2	0.3
d	-	-	-	0.5	0.5	0.3
Quality Rating	B	B	B	B	B	B

*Assumed equivalent to total suspended particulate matter (TSP)
"-" = not used in the emission factor equation

Table 13.2.2-2 also contains the quality ratings for the various size-specific versions of Equation 1a and 1b. The equation retains the assigned quality rating, if applied within the ranges of source conditions, shown in Table 13.2.2-3, that were tested in developing the equation:

Table 13.2.2-3. RANGE OF SOURCE CONDITIONS USED IN DEVELOPING EQUATION 1a AND 1b

Emission Factor	Surface Silt Content, %	Mean Vehicle Weight		Mean Vehicle Speed		Mean No. of Wheels	Surface Moisture Content, %
		Mg	ton	km/hr	mph		
Industrial Roads (Equation 1a)	1.8-25.2	1.8-260	2-290	8-69	5-43	4-17[a]	0.03-13
Public Roads (Equation 1b)	1.8-35	1.4-2.7	1.5-3	16-88	10-55	4-4.8	0.03-13

[a] See discussion in text.

As noted earlier, the models presented as Equations 1a and 1b were developed from tests of traffic on unpaved surfaces. Unpaved roads have a hard, generally nonporous surface that usually dries quickly after a rainfall or watering, because of traffic-enhanced natural evaporation. (Factors influencing how fast a road dries are discussed in Section 13.2.2.3, below.) The quality ratings given above pertain to the mid-range of the measured source conditions for the equation. A higher mean vehicle weight and a higher than normal traffic rate may be justified when performing a worst-case analysis of emissions from unpaved roads.

The emission factors for the exhaust, brake wear and tire wear of a 1980's vehicle fleet (*C*) was obtained from EPA's MOBILE6.2 model [23]. The emission factor also varies with aerodynamic size range

as shown in Table 13.2.2-4

Table 13.2.2-4. EMISSION FACTOR FOR 1980'S VEHICLE FLEET EXHAUST, BRAKE WEAR AND TIRE WEAR

Particle Size Range[a]	*C*, Emission Factor for Exhaust, Brake Wear and Tire Wear[b] lb/VMT
$PM_{2.5}$	0.00036
PM_{10}	0.00047
PM_{30}[c]	0.00047

[a] Refers to airborne particulate matter (PM-x) with an aerodynamic diameter equal to or less than x micrometers.
[b] Units shown are pounds per vehicle mile traveled (lb/VMT).
[c] PM-30 is sometimes termed "suspendable particulate" (SP) and is often used as a surrogate for TSP.

It is important to note that the vehicle-related source conditions refer to the average weight, speed, and number of wheels for all vehicles traveling the road. For example, if 98 percent of traffic on the road are 2-ton cars and trucks while the remaining 2 percent consists of 20-ton trucks, then the mean weight is 2.4 tons. More specifically, Equations 1a and 1b are *not* intended to be used to calculate a separate emission factor for each vehicle class within a mix of traffic on a given unpaved road. That is, in the example, one should *not* determine one factor for the 2-ton vehicles and a second factor for the 20-ton trucks. Instead, only one emission factor should be calculated that represents the "fleet" average of 2.4 tons for all vehicles traveling the road.

Moreover, to retain the quality ratings when addressing a group of unpaved roads, it is necessary that reliable correction parameter values be determined for the road in question. The field and laboratory procedures for determining road surface silt and moisture contents are given in AP-42 Appendices C.1 and C.2. Vehicle-related parameters should be developed by recording visual observations of traffic. In some cases, vehicle parameters for industrial unpaved roads can be determined by reviewing maintenance records or other information sources at the facility.

In the event that site-specific values for correction parameters cannot be obtained, then default values may be used.In the absence of site-specific silt content information, an appropriate mean value from Table 13.2.2-1 may be used as a default value, but the quality rating of the equation is reduced by two letters. Because of significant differences found between different types of road surfaces and between different areas of the country, use of the default moisture content value of 0.5 percent in Equation 1b is discouraged. The quality rating should be downgraded two letters when the default moisture content value is used. (It is assumed that readers addressing industrial roads have access to the information needed to develop average vehicle information in Equation 1a for their facility.)

The effect of routine watering to control emissions from unpaved roads is discussed below in Section 13.2.2.3, “Controls”. However, all roads are subject to some natural mitigation because of rainfall and other precipitation. The Equation 1a and 1b emission factors can be extrapolated to annual

average uncontrolled conditions (but including natural mitigation) under the simplifying assumption that annual average emissions are inversely proportional to the number of days with measurable (more than 0.254 mm [0.01 inch]) precipitation:

$$E_{ext} = E\ [(365 - P)/365] \quad (2)$$

where:

E_{ext} = annual size-specific emission factor extrapolated for natural mitigation, lb/VMT

E = emission factor from Equation 1a or 1b

P = number of days in a year with at least 0.254 mm (0.01 in) of precipitation (see below)

Figure 13.2.2-1 gives the geographical distribution for the mean annual number of "wet" days for the United States.

Equation 2 provides an estimate that accounts for precipitation on an annual average basis for the purpose of inventorying emissions. It should be noted that Equation 2 does not account for differences in the temporal distributions of the rain events, the quantity of rain during any event, or the potential for the rain to evaporate from the road surface. In the event that a finer temporal and spatial resolution is desired for inventories of public unpaved roads, estimates can be based on a more complex set of assumptions. These assumptions include:

1. The moisture content of the road surface material is increased in proportion to the quantity of water added;
2. The moisture content of the road surface material is reduced in proportion to the Class A pan evaporation rate;
3. The moisture content of the road surface material is reduced in proportion to the traffic volume; and
4. The moisture content of the road surface material varies between the extremes observed in the area. The CHIEF Web site (http://www.epa.gov/ttn/chief/ap42/ch13/related/c13s02-2.html) has a file which contains a spreadsheet program for calculating emission factors which are temporally and spatially resolved. Information required for use of the spreadsheet program includes monthly Class A pan evaporation values, hourly meteorological data for precipitation, humidity and snow cover, vehicle traffic information, and road surface material information.

It is emphasized that the simple assumption underlying Equation 2 and the more complex set of assumptions underlying the use of the procedure which produces a finer temporal and spatial resolution have not been verified in any rigorous manner. For this reason, the quality ratings for either approach should be downgraded one letter from the rating that would be applied to Equation 1.

13.2.2.3 Controls[18-22]

A wide variety of options exist to control emissions from unpaved roads. Options fall into the following three groupings:

1. Vehicle restrictions that limit the speed, weight or number of vehicles on the road;

2. Surface improvement, by measures such as (a) paving or (b) adding gravel or slag to a dirt road; and
3. Surface treatment, such as watering or treatment with chemical dust suppressants.

Available control options span broad ranges in terms of cost, efficiency, and applicability. For example, traffic controls provide moderate emission reductions (often at little cost) but are difficult to enforce. Although paving is highly effective, its high initial cost is often prohibitive. Furthermore, paving is not feasible for industrial roads subject to very heavy vehicles and/or spillage of material in transport. Watering and chemical suppressants, on the other hand, are potentially applicable to most industrial roads at moderate to low costs. However, these require frequent reapplication to maintain an acceptable level of control. Chemical suppressants are generally more cost-effective than water but not in cases of temporary roads (which are common at mines, landfills, and construction sites). In summary, then, one needs to consider not only the type and volume of traffic on the road but also how long the road will be in service when developing control plans.

Vehicle restrictions. These measures seek to limit the amount and type of traffic present on the road or to lower the mean vehicle speed. For example, many industrial plants have restricted employees from driving on plant property and have instead instituted bussing programs. This eliminates emissions due to employees traveling to/from their worksites. Although the heavier average vehicle weight of the busses increases the base emission factor, the decrease in vehicle-miles-traveled results in a lower overall emission rate.

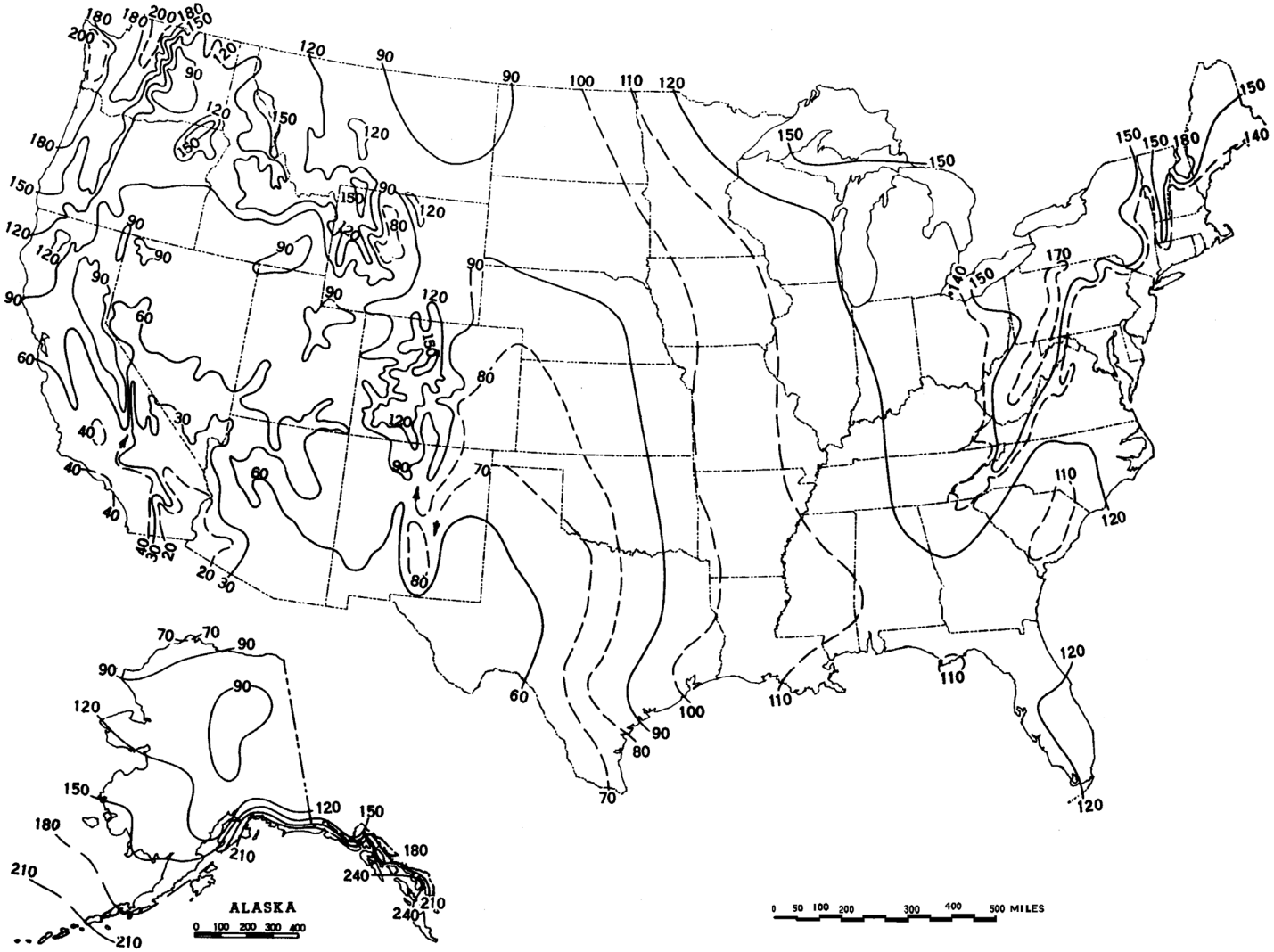


Figure 13.2.2-1. Mean number of days with 0.01 inch or more of precipitation in United States.

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DEPARTMENT ACCEPTED VALUES FOR:
AGGREGATE HANDLING, STORAGE PILE, and HAUL ROAD EMISSIONS

TO: Applicants and Air Quality Bureau Permitting Staff

SUBJECT: Department accepted default values for percent silt, wind speed, moisture content, and control efficiencies for haul road control measures

This guidance document provides the Department accepted default values for correction parameters in the emission calculation equations for aggregate handling and storage piles emissions in construction permit applications and notices of intent submitted under 20.2.72 and 20.2.73 NMAC; and the Department accepted control efficiencies for haul road control measures for applications submitted under 20.2.72 NMAC.

Aggregate Handling and Storage Pile Emission Calculations

Applicants should calculate the particulate matter emissions from aggregate handling and storage piles using the EPA's AP-42 Chapter 13.2.4.
http://www3.epa.gov/ttn/chief/ap42/ch13/final/c13s0204.pdf

Equation 1 from Chapter 13.2.4 requires users to input values for two correction parameters, U and M, where U = mean wind speed and M = material moisture content. Below are the accepted values for U and M:

Default Values for Chapter 13.2.4, Equation 1:

Parameter	Default Value
U = Mean wind speed (miles per hour)	11 mph
M = Material moisture content (% water)	2%

Applicants must receive preapproval from the Department if they wish to assume a higher moisture content and/or a lower wind speed in these calculations. Higher moisture contents may require site specific testing either as a permit condition or submitted with the application. Applicants may assume higher wind speeds and lower percent moisture content in their calculations without prior approval from the Department.

Haul Road Emissions and Control Measure Efficiencies

Applicants should calculate the particulate matter emissions from unpaved haul roads using the EPA's AP-42 Chapter 13.2.2. http://www3.epa.gov/ttn/chief/ap42/ch13/final/c13s0202.pdf

Equation 1(a) from Chapter 13.2.2 requires users to input values for two correction parameters, s and W, where s = surface material silt content (%) and W = mean vehicle weight (tons). The applicant should calculate the mean vehicle weight in accordance with the chapter's instructions. Below is the accepted value for the parameter s:

Default Values for Chapter 13.2.2, Equation 1(a):

Parameter	Default Value
s = surface material silt content (%)	4.8%

Applicants may use a higher silt content without prior approval from the Department. Use of a lower silt content requires prior approval from the Department and may require site specific testing in support of the request.

Equation 2 from Chapter 13.2.2 allows users to take credit for the number of days that receive precipitation in excess of 0.01 inches, in the annual emissions calculation, where P = number of days in a year with at least 0.01 inches of precipitation.

Default Values for Chapter 13.2.2, Equation 2:

Parameter	Default Value
P = number of days in a year with at least 0.01 inches of precipitation	70 days

Applications submitted under Part 72 may request to apply control measures to reduce the particulate matter emissions from facility haul roads. Applications submitted under Part 73 may not consider any emission reduction from control measures in the potential emission rate calculation, as registrations issued under Part 73 are not federally enforceable under the Clean Air Act or the New Mexico Air Quality Control Act. In order for those control measures to be federally enforceable, the controls must be a requirement in an air quality permit.

Below are the Department accepted control efficiencies for various haul road control measures:

Haul Road Control Measures and Control Efficiency:

Control Measure	Control Efficiency
None	0%
Base course **or** watering	60%
Base course **and** watering	80%
Base course **and** surfactant	90%
Paved **and** Swept	95%

13.2.4 Aggregate Handling And Storage Piles

13.2.4.1 General

Inherent in operations that use minerals in aggregate form is the maintenance of outdoor storage piles. Storage piles are usually left uncovered, partially because of the need for frequent material transfer into or out of storage.

Dust emissions occur at several points in the storage cycle, such as material loading onto the pile, disturbances by strong wind currents, and loadout from the pile. The movement of trucks and loading equipment in the storage pile area is also a substantial source of dust.

13.2.4.2 Emissions And Correction Parameters

The quantity of dust emissions from aggregate storage operations varies with the volume of aggregate passing through the storage cycle. Emissions also depend on 3 parameters of the condition of a particular storage pile: age of the pile, moisture content, and proportion of aggregate fines.

When freshly processed aggregate is loaded onto a storage pile, the potential for dust emissions is at a maximum. Fines are easily disaggregated and released to the atmosphere upon exposure to air currents, either from aggregate transfer itself or from high winds. As the aggregate pile weathers, however, potential for dust emissions is greatly reduced. Moisture causes aggregation and cementation of fines to the surfaces of larger particles. Any significant rainfall soaks the interior of the pile, and then the drying process is very slow.

Silt (particles equal to or less than 75 micrometers [μm] in diameter) content is determined by measuring the portion of dry aggregate material that passes through a 200-mesh screen, using ASTM-C-136 method.[1] Table 13.2.4-1 summarizes measured silt and moisture values for industrial aggregate materials.

Table 13.2.4-1. TYPICAL SILT AND MOISTURE CONTENTS OF MATERIALS AT VARIOUS INDUSTRIES[a]

Industry	No. Of Facilities	Material	Silt Content (%)			Moisture Content (%)		
			No. Of Samples	Range	Mean	No. Of Samples	Range	Mean
Iron and steel production	9	Pellet ore	13	1.3 - 13	4.3	11	0.64 - 4.0	2.2
		Lump ore	9	2.8 - 19	9.5	6	1.6 - 8.0	5.4
		Coal	12	2.0 - 7.7	4.6	11	2.8 - 11	4.8
		Slag	3	3.0 - 7.3	5.3	3	0.25 - 2.0	0.92
		Flue dust	3	2.7 - 23	13	1	—	7
		Coke breeze	2	4.4 - 5.4	4.9	2	6.4 - 9.2	7.8
		Blended ore	1	—	15	1	—	6.6
		Sinter	1	—	0.7	0	—	—
		Limestone	3	0.4 - 2.3	1.0	2	ND	0.2
Stone quarrying and processing	2	Crushed limestone	2	1.3 - 1.9	1.6	2	0.3 - 1.1	0.7
		Various limestone products	8	0.8 - 14	3.9	8	0.46 - 5.0	2.1
Taconite mining and processing	1	Pellets	9	2.2 - 5.4	3.4	7	0.05 - 2.0	0.9
		Tailings	2	ND	11	1	—	0.4
Western surface coal mining	4	Coal	15	3.4 - 16	6.2	7	2.8 - 20	6.9
		Overburden	15	3.8 - 15	7.5	0	—	—
		Exposed ground	3	5.1 - 21	15	3	0.8 - 6.4	3.4
Coal-fired power plant	1	Coal (as received)	60	0.6 - 4.8	2.2	59	2.7 - 7.4	4.5
Municipal solid waste landfills	4	Sand	1	—	2.6	1	—	7.4
		Slag	2	3.0 - 4.7	3.8	2	2.3 - 4.9	3.6
		Cover	5	5.0 - 16	9.0	5	8.9 - 16	12
		Clay/dirt mix	1	—	9.2	1	—	14
		Clay	2	4.5 - 7.4	6.0	2	8.9 - 11	10
		Fly ash	4	78 - 81	80	4	26 - 29	27
		Misc. fill materials	1	—	12	1	—	11

[a] References 1-10. ND = no data.

13.2.4.3 Predictive Emission Factor Equations

Total dust emissions from aggregate storage piles result from several distinct source activities within the storage cycle:

1. Loading of aggregate onto storage piles (batch or continuous drop operations).
2. Equipment traffic in storage area.
3. Wind erosion of pile surfaces and ground areas around piles.
4. Loadout of aggregate for shipment or for return to the process stream (batch or continuous drop operations).

Either adding aggregate material to a storage pile or removing it usually involves dropping the material onto a receiving surface. Truck dumping on the pile or loading out from the pile to a truck with a front-end loader are examples of batch drop operations. Adding material to the pile by a conveyor stacker is an example of a continuous drop operation.

The quantity of particulate emissions generated by either type of drop operation, per kilogram (kg) (ton) of material transferred, may be estimated, with a rating of A, using the following empirical expression:[11]

$$E = k(0.0016) \frac{\left(\frac{U}{2.2}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} \text{ (kg/megagram [Mg])} \quad (1)$$

$$E = k(0.0032) \frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} \text{ (pound [lb]/ton)}$$

where:

E = emission factor
k = particle size multiplier (dimensionless)
U = mean wind speed, meters per second (m/s) (miles per hour [mph])
M = material moisture content (%)

The particle size multiplier in the equation, k, varies with aerodynamic particle size range, as follows:

Aerodynamic Particle Size Multiplier (k) For Equation 1				
< 30 µm	< 15 µm	< 10 µm	< 5 µm	< 2.5 µm
0.74	0.48	0.35	0.20	0.053[a]

[a] Multiplier for < 2.5 µm taken from Reference 14.

The equation retains the assigned quality rating if applied within the ranges of source conditions that were tested in developing the equation, as follows. Note that silt content is included, even though silt content does not appear as a correction parameter in the equation. While it is reasonable to expect that silt content and emission factors are interrelated, no significant correlation between the 2 was found during the derivation of the equation, probably because most tests with high silt contents were conducted under lower winds, and vice versa. It is recommended that estimates from the equation be reduced 1 quality rating level if the silt content used in a particular application falls outside the range given:

Ranges Of Source Conditions For Equation 1			
Silt Content (%)	Moisture Content (%)	Wind Speed	
		m/s	mph
0.44 - 19	0.25 - 4.8	0.6 - 6.7	1.3 - 15

To retain the quality rating of the equation when it is applied to a specific facility, reliable correction parameters must be determined for specific sources of interest. The field and laboratory procedures for aggregate sampling are given in Reference 3. In the event that site-specific values for

correction parameters cannot be obtained, the appropriate mean from Table 13.2.4-1 may be used, but the quality rating of the equation is reduced by 1 letter.

For emissions from equipment traffic (trucks, front-end loaders, dozers, etc.) traveling between or on piles, it is recommended that the equations for vehicle traffic on unpaved surfaces be used (see Section 13.2.2). For vehicle travel between storage piles, the silt value(s) for the areas among the piles (which may differ from the silt values for the stored materials) should be used.

Worst-case emissions from storage pile areas occur under dry, windy conditions. Worst-case emissions from materials-handling operations may be calculated by substituting into the equation appropriate values for aggregate material moisture content and for anticipated wind speeds during the worst case averaging period, usually 24 hours. The treatment of dry conditions for Section 13.2.2, vehicle traffic, "Unpaved Roads", follows the methodology described in that section centering on parameter p. A separate set of nonclimatic correction parameters and source extent values corresponding to higher than normal storage pile activity also may be justified for the worst-case averaging period.

13.2.4.4 Controls[12-13]

Watering and the use of chemical wetting agents are the principal means for control of aggregate storage pile emissions. Enclosure or covering of inactive piles to reduce wind erosion can also reduce emissions. Watering is useful mainly to reduce emissions from vehicle traffic in the storage pile area. Watering of the storage piles themselves typically has only a very temporary slight effect on total emissions. A much more effective technique is to apply chemical agents (such as surfactants) that permit more extensive wetting. Continuous chemical treating of material loaded onto piles, coupled with watering or treatment of roadways, can reduce total particulate emissions from aggregate storage operations by up to 90 percent.[12]

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9. *PM-10 Emission Inventory Of Landfills In the Lake Calumet Area*, EPA Contract No. 68-02-3891, Midwest Research Institute, Kansas City, MO, September 1987.

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4.0 STORAGE PILES

Inherent in operations that use minerals in aggregate form is the maintenance of outdoor storage piles. Storage piles are usually left uncovered, partially because of the need for frequent material transfer into or out of storage.

Dust emissions occur at several points in the storage cycle, during material loading onto the pile, during disturbances by strong wind currents, and during loadout from the pile. The movement of trucks and loading equipment in the storage pile area is also a substantial source of dust.

4.1 ESTIMATION OF EMISSIONS

The quantity of dust emissions from aggregate storage operations varies with the volume of aggregate passing through the storage cycle. Also, emissions depend on three correction parameters that characterize the condition of a particular storage pile: age of the pile, moisture content, proportion of aggregate fines, and friability of the material.

When freshly processed aggregate is loaded onto a storage pile, its potential for dust emissions is at a maximum. Fines are easily disaggregated and released to the atmosphere upon exposure to air currents from transfer operations or high winds. As the aggregate weathers, however, potential for dust emissions is greatly reduced. Moisture causes aggregation and cementation of fines to the surfaces of larger particles.

Field investigations have shown that emissions from certain aggregate storage operations vary in direct proportion to the percentage of silt (particles <75 μm in diameter) in the aggregate material.[1-3] The silt content is determined by measuring the proportion of dry aggregate material that passes through a 200-mesh screen, using ASTM-C-136 method. Table 4-1 summarizes measured silt and moisture values for industrial aggregate materials.

Total dust emissions from aggregate storage piles are contributions of several distinct source activities within the storage cycle:

TABLE 4-1. TYPICAL SILT AND MOISTURE CONTENT VALUES OF MATERIALS AT VARIOUS INDUSTRIES

Industry	Material	No. of test samples	Silt, percent		No. of test samples	Moisture, percent	
			Range	Mean		Range	Mean
Iron and steel production[a]	Pellet ore	10	1.4-13	4.9	8	0.64-3.5	2.1
	Lump ore	9	2.8-19	9.5	6	1.6-8.1	5.4
	Coal	7	2-7.7	5	6	2.8-11	4.8
	Slag	3	3-7.3	5.3	3	0.25-2.2	0.92
	Flue dust	2	14-23	18.0	0	NA	NA
	Coke breeze	1		5.4	1		6.4
	Blended ore	1		15.0	1		6.6
	Sinter	1		0.7	0	NA	NA
	Limestone	1		0.4	0	NA	NA
Stone quarrying and processing[b]	Crushed limestone	2	1.3-1.9	1.6	2	0.3-1.1	0.7
Taconite mining and processing[c]	Pellets	9	2.2-5.4	3.4	7	0.05-2.3	0.96
	Tailings	2	NA	11.0	1		0.35
Western surface coal mining[d]	Coal	15	3.4-16	6.2	7	2.8-20	6.9
	Overburden	15	3.8-15	7.5	0	NA	NA
	Exposed ground	3	5.1-21	15.0	3	0.8-6.4	3.4

[a]References 2 through 5. NA = not applicable.
[b]Reference 1.
[c]Reference 6.
[d]Reference 7.

1. Loading of aggregate onto storage piles (batch or continuous drop operations).

2. Equipment traffic in storage area.

3. Wind erosion of pile surfaces and ground areas around piles.

4. Loadout of aggregate for shipment or for return to the process stream (batch or continuous drop operations).

4.1.1 Materials Handling

Adding aggregate material to a storage pile or removing it usually involves dropping the material onto a receiving surface. Truck dumping on the pile or loading out from the pile to a truck with a front-end loader are examples of batch drop operations. Adding material to the pile by a conveyor stacker is an example of a continuous drop operation.

The following equation is recommended for estimating emissions from transfer operations (batch or continuous drop):

$$E = k(0.0016) \frac{\left(\frac{U}{2.2}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} \text{ (kg/Mg)} \qquad (4\text{-}1)$$

$$E = k(0.0032) \frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} \text{ (lb/ton)}$$

where: E = emission factor

k = particle size multiplier (dimensionless)

U = mean wind speed, m/s (mph)

M = material moisture content, percent

The particle size multiplier k varies with aerodynamic particle diameter as shown below:

Aerodynamic Particle Size Multiplier, k

<30 um	<15 um	<10 um	<5 um	<2.5 um
0.74	0.48	0.35	0.20	0.11

Based on the criteria presented in AP-42, the above equation is rated A.

For emissions from equipment traffic (trucks, front-end loaders, dozers, etc.) traveling between or on piles, it is recommended that the equations for vehicle traffic on unpaved surfaces be used (see Section 3-0). For vehicle travel between storage piles, the silt value(s) for the areas among the piles (which may differ from the silt values for the stored materials) should be used.

4.1.2 Wind Erosion

Dust emissions may be generated by wind erosion of open aggregate storage piles and exposed areas within an industrial facility. These sources typically are characterized by nonhomogeneous surfaces impregnated with nonerodible elements (particles larger than approximately 1 cm in diameter). Field testing of coal piles and other exposed materials using a portable wind tunnel has shown that (a) threshold wind speeds exceed 5 m/s (11 mph) at 15 cm above the surface or 10 m/s (22 mph) at 7 m above the surface, and (b) particulate emission rates tend to decay rapidly (half life of a few minutes) during an erosion event. In other words, these aggregate material surfaces are characterized by finite availability of erodible material (mass/area) referred to as the erosion potential. Any natural crusting of the surface binds the erodible material, thereby reducing the erosion potential.

4.1.2.1 Emissions and Correction Parameters. If typical values for threshold wind speed at 15 cm are corrected to typical wind sensor height (7-10 m), the resulting values exceed the upper extremes of hourly mean wind speeds observed in most areas of the country. In other words, mean atmospheric wind speeds are not sufficient to sustain wind erosion from aggregate material surfaces. However, wind gusts may quickly deplete a substantial portion of the erosion potential. Because erosion potential has been found to increase rapidly with increasing wind speed, estimated emissions should be related to the gusts of highest magnitude.

The routinely measured meteorological variable which best reflects the magnitude of wind gusts is the fastest mile. This quantity represents the wind speed corresponding to the whole mile of wind movement which has passed by the 1-mi contact anemometer in the least amount of time. Daily measurements of the fastest mile are presented in the monthly Local Climatological Data (LCD) summaries. The LCD summaries can be obtained

from the National Climatic Center, Asheville, North Carolina. The duration of the fastest mile, typically about 2 min (for a fastest mile of 30 mph), matches well with the half life of the erosion process, which ranges between 1 and 4 min. It should be noted, however, that peak winds can significantly exceed the daily fastest mile.

The wind speed profile in the surface boundary layer is found to follow a logarithmic distribution:

$$u(z) = \frac{u^*}{0.4} \ln\left(\frac{z}{z_o}\right) \quad (z > z_o) \tag{4-2}$$

where: u = wind speed, cm/s

u^* = friction velocity, cm/s

z = height above test surface, cm

z_o = roughness height, cm

0.4 = von Karman's constant, dimensionless

The friction velocity (u^*) is a measure of wind shear stress on the erodible surface, as determined from the slope of the logarithmic velocity profile. The roughness height (z_o) is a measure of the roughness of the exposed surface as determined from the y-intercept of the velocity profile, i.e., the height at which the wind speed is zero. These parameters are illustrated in Figure 4-1 for a roughness height of 0.1 cm.

Emissions generated by wind erosion are also dependent on the frequency of disturbance of the erodible surface because each time that a surface is disturbed, its erosion potential is restored. A disturbance is defined as an action which results in the exposure of fresh surface material. On a storage pile, this would occur whenever aggregate material is either added to or removed from the old surface. A disturbance of an exposed area may also result from the turning of surface material to a depth exceeding the size of the largest pieces of material present.

4.1.2.2 Predictive Emission Factor Equation[8]. The emission factor for wind-generated particulate emissions from mixtures of erodible and nonerodible surface material subject to disturbance may be expressed in units of g/m^2-yr as follows:

$$\text{Emission factor} = k \sum_{i=1}^{N} P_i \tag{4-3}$$

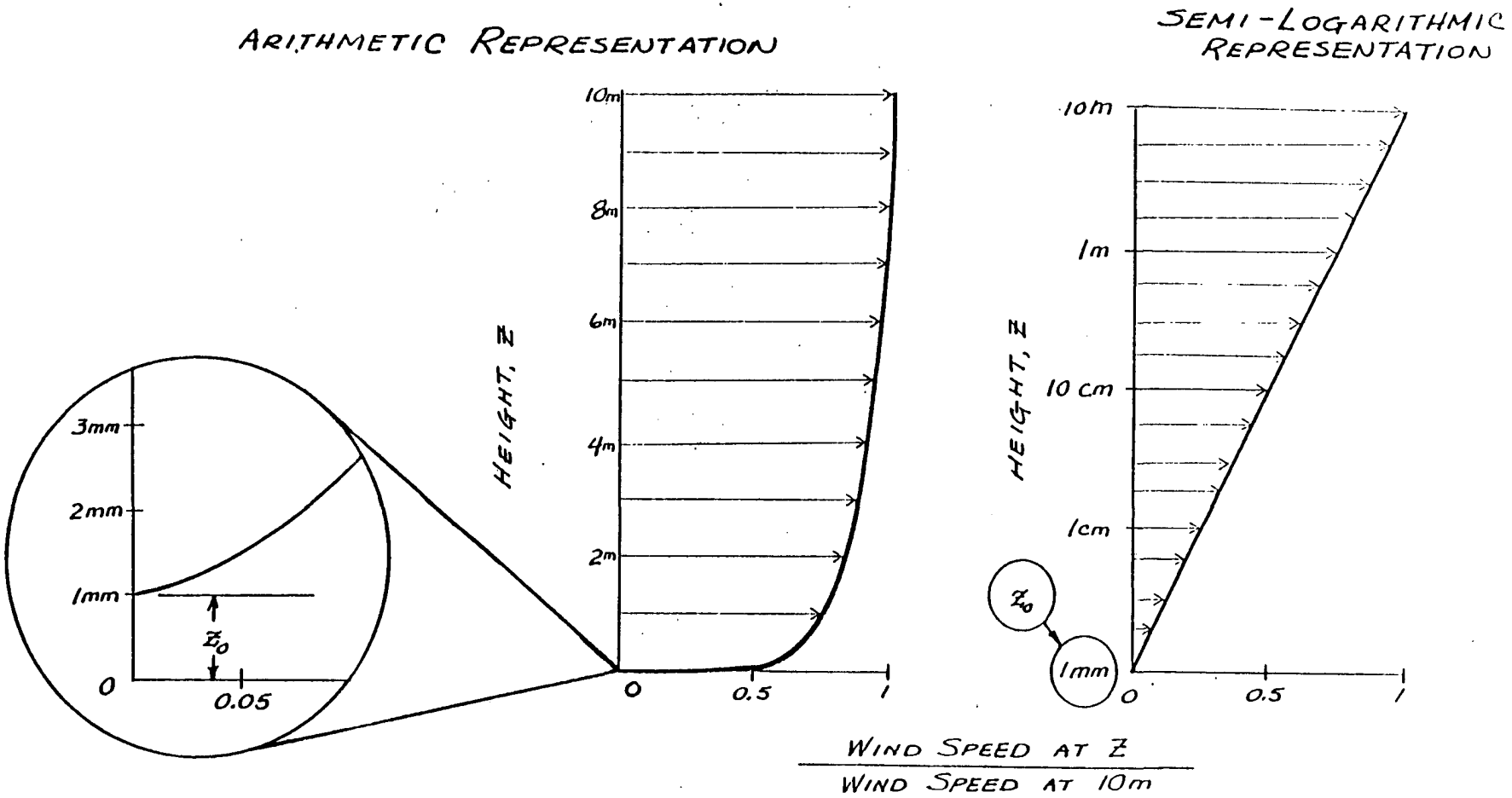


Figure 4-1. Illustration of logarithmic velocity profile.

where: k = particle size multiplier

N = number of disturbances per year

P_i = erosion potential corresponding to the observed (or probable) fastest mile of wind for the ith period between disturbances, g/m^2

The particle size multiplier (k) for Equation 4-3 varies with aerodynamic particle size, as follows:

AERODYNAMIC PARTICLE SIZE MULTIPLIERS FOR EQUATION 4-3

<30 μm	<15 μm	<10 μm	<2.5 μm
1.0	0.6	0.5	0.2

This distribution of particle size within the <30 μm fraction is comparable to the distributions reported for other fugitive dust sources where wind speed is a factor. This is illustrated, for example, in the distributions for batch and continuous drop operations encompassing a number of test aggregate materials (see AP-42 Section 11.2.3).

In calculating emission factors, each area of an erodible surface that is subject to a different frequency of disturbance should be treated separately. For a surface disturbed daily, N = 365/yr, and for a surface disturbance once every 6 mo, N = 2/yr.

The erosion potential function for a dry, exposed surface has the following form:

$$P = 58\ (u^* - u_t^*)^2 + 25\ (u^* - u_t^*) \qquad (4\text{-}4)$$

$$P = 0 \text{ for } u^* \leq u_t^*$$

where: u^* = friction velocity (m/s)

u_t^* = threshold friction velocity (m/s)

Table 4-2 presents the erosion potential function in matrix form. Because of the nonlinear form of the erosion potential function, each erosion event must be treated separately.

TABLE 4-2. EROSION POTENTIAL FUNCTION

u_*, m/s	u_+^* =	P (g/m^2)											
		0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4
0.2		0	0	0	0	0	0	0	0	0	0	0	0
0.4		7	0	0	0	0	0	0	0	0	0	0	0
0.6		19	7	0	0	0	0	0	0	0	0	0	0
0.8		36	19	7	0	0	0	0	0	0	0	0	0
1.0		57	36	19	7	0	0	0	0	0	0	0	0
1.2		83	57	36	19	7	0	0	0	0	0	0	0
1.4		114	83	57	36	19	7	0	0	0	0	0	0
1.6		149	114	83	57	36	19	7	0	0	0	0	0
1.8		188	149	114	83	57	36	19	7	0	0	0	0
2.0		233	188	149	114	83	57	36	19	7	0	0	0
2.2		282	233	188	149	114	83	57	36	19	7	0	0
2.4		336	282	233	188	149	114	83	57	36	19	7	0
2.6		394	336	282	233	188	149	114	83	57	36	19	7
2.8		457	394	336	282	233	188	149	114	83	57	36	19
3.0		525	457	394	336	282	233	188	149	114	83	57	36

Equations 4-3 and 4-4 apply only to dry, exposed materials with limited erosion potential. The resulting calculation is valid only for a time period as long or longer than the period between disturbances. Calculated emissions represent intermittent events and should not be input directly into dispersion models that assume steady state emission rates.

For uncrusted surfaces, the threshold friction velocity is best estimated from the dry aggregate structure of the soil. A simple hand sieving test of surface soil (adapted from a laboratory procedure published by W. S. Chepil[9]) can be used to determine the mode of the surface aggregate size distribution by inspection of relative sieve catch amounts, following the procedure specified in Section 6. The threshold friction velocity for erosion can be determined from the mode of the aggregate size distribution, as described by Gillette.[10] This conversion is also described in Section 6.

Threshold friction velocities for several surface types have been determined by field measurements with a portable wind tunnel.[10-13] These values are presented in Tables 4-3 and 4-4 for industrial aggregates and Arizona sites. Figure 4-2 depicts these data graphically.

The fastest mile of wind for the periods between disturbances may be obtained from the monthly LCD summaries for the nearest reporting weather station that is representative of the site in question.[14] These summaries report actual fastest mile values for each day of a given month. Because the erosion potential is a highly nonlinear function of the fastest mile, mean values of the fastest mile are inappropriate. The anemometer heights of reporting weather stations are found in Reference 15, and should be corrected to a 10 m reference height using Equation 4-2.

To convert the fastest mile of wind (u^+) from a reference anemometer height of 10 m to the equivalent friction velocity (u^*), the logarithmic wind speed profile may be used to yield the following equation:

$$u^* = 0.053\ u^+_{10} \qquad (4\text{-}5)$$

where: u^* = friction velocity (m/s)

u^+_{10} = fastest mile of reference anemometer for period between disturbances (m/s)

TABLE 4-3. THRESHOLD FRICTION VELOCITIES--INDUSTRIAL AGGREGATES

Material	Threshold friction velocity, m/s	Roughness height, cm	Threshold wind velocity at 10 m (m/s)		Ref.
			z_o = actual	z_o = 0.5 cm	
Overburden[a]	1.02	0.3	21	19	7
Scoria (roadbed material)[a]	1.33	0.3	27	25	7
Ground coal[a] (surrounding coal pile)	0.55	0.01	16	10	7
Uncrusted coal pile[a]	1.12	0.3	23	21	7
Scraper tracks on coal pile[a,b]	0.62	0.06	15	12	7
Fine coal dust on concrete pad[c]	0.54	0.2	11	10	12

[a]Western surface coal mine.
[b]Lightly crusted.
[c]Eastern power plant.

TABLE 4-4. THRESHOLD FRICTION VELOCITIES--ARIZONA SITES[1,2]

Location	Threshold friction velocity, m/sec	Roughness height, (cm)	Threshold wind velocity at 10 m, m/sec
Mesa - Agricultural site	0.57	0.0331	16
Glendale - Construction site	0.53	0.0301	15
Maricopa - Agricultural site	0.58	0.1255	14
Yuma - Disturbed desert	0.32	0.0731	8
Yuma - Agricultural site	0.58	0.0224	17
Algodones - Dune flats	0.62	0.0166	18
Yuma - Scrub desert	0.39	0.0163	11
Santa Cruz River, Tucson	0.18	0.0204	5
Tucson - Construction site	0.25	0.0181	7
Ajo - Mine tailings	0.23	0.0176	7
Hayden - Mine tailings	0.17	0.0141	5
Salt River, Mesa	0.22	0.0100	7
Casa Grande - Abandoned agricultural land	0.25	0.0067	8

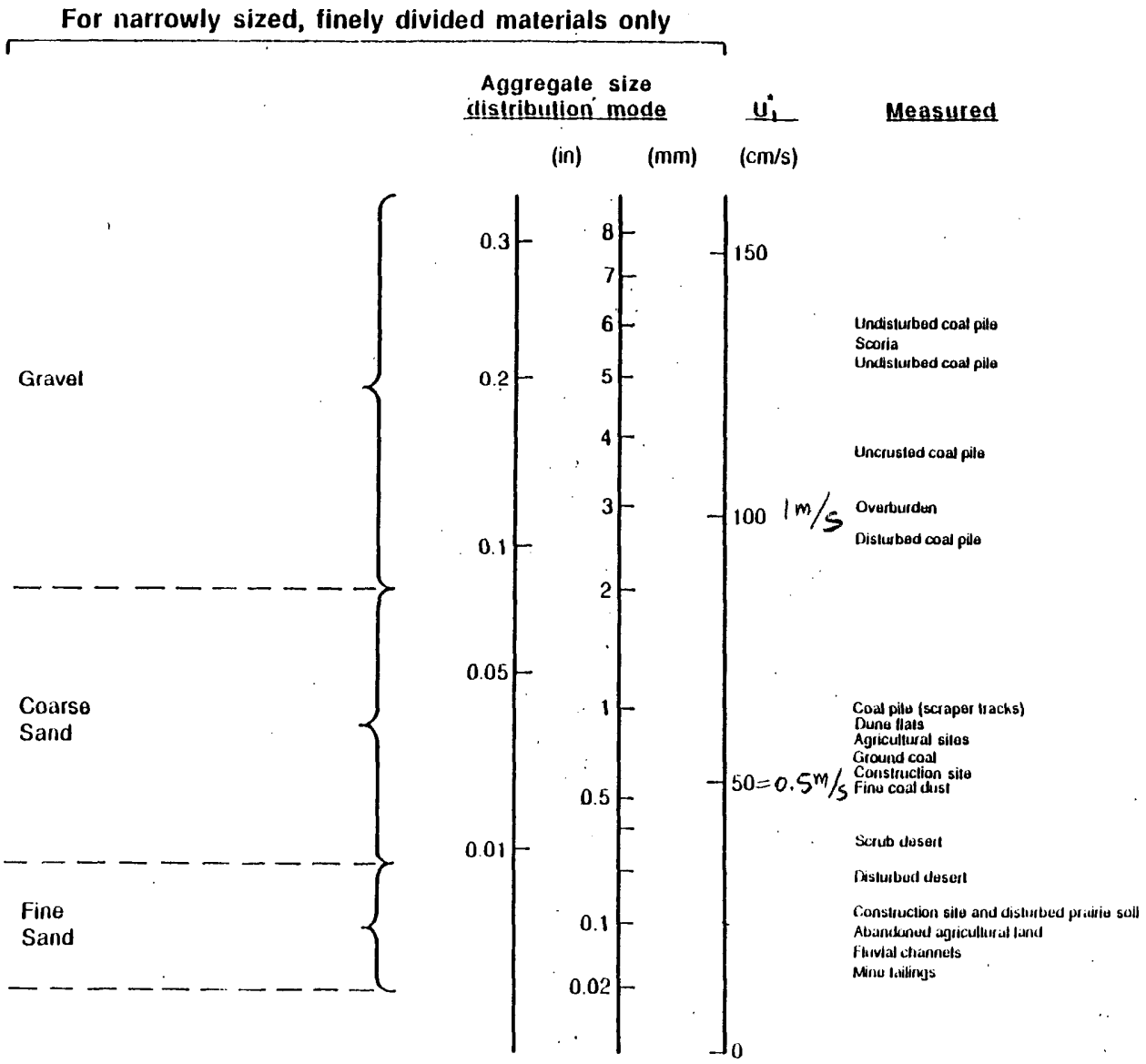


Figure 4-2. Scale of threshold friction velocities.

This assumes a typical roughness height of 0.5 cm for open terrain. Equation 4-5 is restricted to large relatively flat piles or exposed areas with little penetration into the surface wind layer.

If the pile significantly penetrates the surface wind layer (i.e., with a height-to-base ratio exceeding 0.2), it is necessary to divide the pile area into subareas representing different degrees of exposure to wind. The results of physical modeling show that the frontal face of an elevated pile is exposed to wind speeds of the same order as the approach wind speed at the top of the pile.

For two representative pile shapes (conical and oval with flat-top, 37 degree side slope), the ratios of surface wind speed (u_s) to approach wind speed (u_r) have been derived from wind tunnel studies.[11] The results are shown in Figure 4-3 corresponding to an actual pile height of 11 m, a reference (upwind) anemometer height of 10 m, and a pile surface roughness height (z_o) of 0.5 cm. The measured surface winds correspond to a height of 25 cm above the surface. The area fraction within each contour pair is specified in Table 4-5.

The profiles of u_s/u_r in Figure 4-3 can be used to estimate the surface friction velocity distribution around similarly shaped piles, using the following procedure:

1. Correct the fastest mile value (u^+) for the period of interest from the anemometer height (z) to a reference height of 10 m (u^+_{10}) using a variation of Equation 4-2, as follows:

$$u^+_{10} = u^+ \frac{\ln (10/0.005)}{\ln (z/0.005)} \qquad (4\text{-}6)$$

   where a typical roughness height of 0.5 cm (0.005 m) has been assumed. If a site specific roughness height is available, it should be used.

2. Use the appropriate part of Figure 4-3 based on the pile shape and orientation to the fastest mile of wind, to obtain the corresponding surface wind speed distribution (u^+_s), i.e.,

$$u^+_s = \left(\frac{u_s}{u_r}\right) u^+_{10} \qquad (4\text{-}7)$$

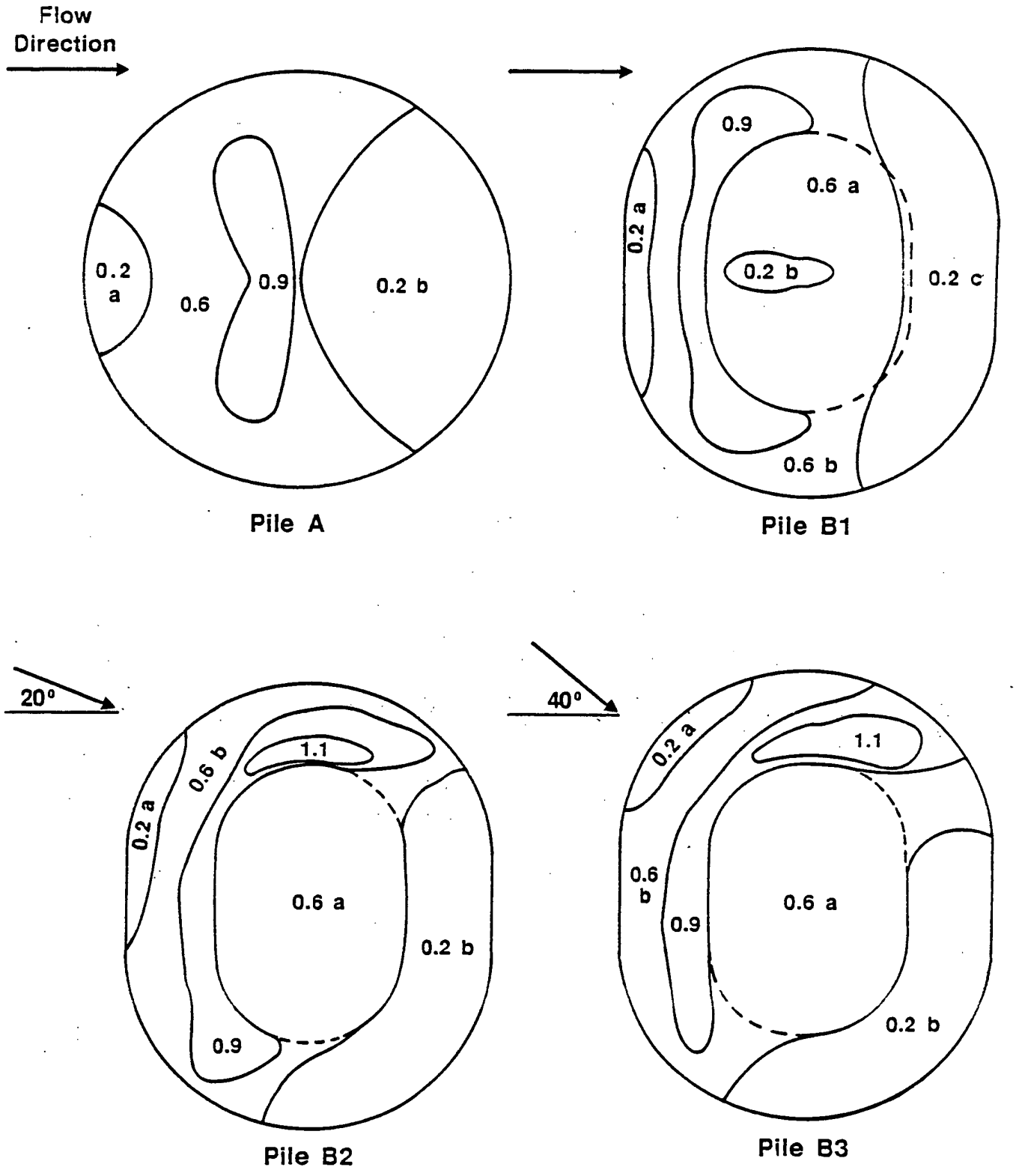


Figure 4-3. Contours of normalized surface wind speeds, u_s/u_r.

TABLE 4-5. SUBAREA DISTRIBUTION FOR REGIMES OF u_s/u_r

Pile subarea	Percent of pile surface area (Figure 4-3)			
	Pile A	Pile B1	Pile B2	Pile B3
0.2a	5	5	3	3
0.2b	35	2	28	25
0.2c	-	29	-	-
0.6a	48	26	29	28
0.6b	-	24	22	26
0.9	12	14	15	14
1.1	-	-	3	4

3. For any subarea of the pile surface having a narrow range of surface wind speed, use a variation of Equation 4-2 to calculate the equivalent friction velocity (u*), as follows:

$$u^* = \frac{0.4\ u_s^+}{\ln \frac{25}{0.5}} = 0.10\ u_s^+ \qquad (4\text{-}8)$$

From this point on, the procedure is identical to that used for a flat pile, as described above.

Implementation of the above procedure is carried out in the following steps:

1. Determine threshold friction velocity for erodible material of interest (see Tables 4-3 and 4-4 or Figure 4-2 or determine from mode of aggregate size distribution).

2. Divide the exposed surface area into subareas of constant frequency of disturbance (N).

3. Tabulate fastest mile values (u^+) for each frequency of disturbance and correct them to 10 m (u_{10}^+) using Equation 4-6.

4. Convert fastest mile values (u_{10}^+) to equivalent friction velocities (u*), taking into account (a) the uniform wind exposure of nonelevated surfaces, using Equation 4-5, or (b) the nonuniform wind exposure of elevated surfaces (piles), using Equations 4-7 and 4-8.

5. For elevated surfaces (piles), subdivide areas of constant N into subareas of constant u* (i.e., within the isopleth values of u_s/u_r in Figure 4-3 and Table 4-5) and determine the size of each subarea.

6. Treating each subarea (of constant N and u*) as a separate source, calculate the erosion potential (P_i) for each period between disturbances using Equation 4-4 and the emission factor using Equation 4-3.

7. Multiply the resulting emission factor for each subarea by the size of the subarea, and add the emission contributions of all subareas. Note that the highest 24-h emissions would be expected to occur on the windiest day of the year. Maximum emissions are calculated assuming a single wind event with the highest fastest mile value for the annual period.

The recommended emission factor equation presented above assumes that all of the erosion potential corresponding to the fastest mile of wind is lost during the period between disturbances. Because the fastest mile event typically lasts only about 2 min, which corresponds roughly to the half-life for the decay of actual erosion potential, it could be argued that the emission factor overestimates particulate emissions. However, there are other aspects of the wind erosion process which offset this apparent conservatism:

1. The fastest mile event contains peak winds which substantially exceed the mean value for the event.

2. Whenever the fastest mile event occurs, there are usually a number of periods of slightly lower mean wind speed which contain peak gusts of the same order as the fastest mile wind speed.

Of greater concern is the likelihood of overprediction of wind erosion emissions in the case of surfaces disturbed infrequently in comparison to the rate of crust formation.

4.1.3 Wind Emissions From Continuously Active Piles

For emissions from wind erosion of active storage piles, the following total suspended particulate (TSP) emission factor equation is recommended:

$$E = 1.9\ \left(\frac{s}{1.5}\right)\ \left(\frac{365-p}{235}\right)\ \left(\frac{f}{15}\right)\ \text{(kg/d/hectare)}$$

$$E = 1.7\ \left(\frac{s}{1.5}\right)\ \left(\frac{365-p}{235}\right)\ \left(\frac{f}{15}\right)\ \text{(lb/d/acre)} \qquad (4\text{-}9)$$

where: E = total suspended particulate emission factor

s = silt content of aggregate, percent

p = number of days with $\geq$0.25 mm (0.01 in.) of precipitation per year

f = percentage of time that the unobstructed wind speed exceeds 5.4 m/s (12 mph) at the mean pile height

The fraction of TSP which is PM_{10} is estimated at 0.5 and is consistent with the PM_{10}/TSP ratios for materials handling (Section 4.1.1) and wind erosion (Section 4.1.2). The coefficient in Equation (4-9) is taken from Reference 1, based on sampling of emissions from a sand and

gravel storage pile area during periods when transfer and maintenance equipment was not operating. The factor from Reference 1, expressed in mass per unit area per day, is more reliable than the factor expressed in mass per unit mass of material placed in storage, for reasons stated in that report. Note that the coefficient has been halved to adjust for the estimate that the wind speed through the emission layer at the test site was one half of the value measured above the top of the piles. The other terms in this equation were added to correct for silt, precipitation, and frequency of high winds, as discussed in Reference 2. Equation (4-9) is rated in AP-42 as C for application in the sand and gravel industry and D for other industries (see Appendix A).

Worst case emissions from storage pile areas occur under dry windy conditions. Worst case emissions from materials handling (batch and continuous drop) operations may be calculated by substituting into Equation (4-9) appropriate values for aggregate material moisture content and for anticipated wind speeds during the worst case averaging period, usually 24 h. The treatment of dry conditions for vehicle traffic (Section 3.0) and for wind erosion (Equation 4-9), centering around parameter p, follows the methodology described in Section 3.0. Also, a separate set of nonclimatic correction parameters and source extent values corresponding to higher than normal storage pile activity may be justified for the worst case averaging period.

4.2 DEMONSTRATED CONTROL TECHNIQUES

The control techniques applicable to storage piles fall into distinct categories as related to materials handling operations (including traffic around piles) and wind erosion. In both cases, the control can be achieved by (a) source extent reduction, (b) source improvement related to work practices and transfer equipment (load-in and load-out operations), and (c) surface treatment. These control options are summarized in Table 4-6. The efficiency of these controls ties back to the emission factor relationships presented earlier in this section.

In most cases, good work practices which confine freshly exposed material provide substantial opportunities for emission reduction without the need for investment in a control application program. For example, pile activity, loading and unloading, can be confined to leeward (downwind) side of the pile. This statement also applies to areas around

TABLE 4-6. CONTROL TECHNIQUES FOR STORAGE PILES

Material handling	
Source extent reduction	Mass transfer reduction
Source improvement	Drop height reduction Wind sheltering Moisture retention
Surface treatment	Wet suppression
Wind erosion	
Source extent reduction	Disturbed area reduction Disturbance frequency reduction Spillage cleanup
Source improvement	Spillage reduction Disturbed area wind exposure reduction
Surface treatment	Wet suppression Chemical stabilization

the pile as well as the pile itself. In particular, spillage of material caused by pile load-out and maintenance equipment can add a large source component associated with traffic-entrained dust. Emission inventory calculations show, in fact, that the traffic dust component may easily dominate over emissions from transfer of material and wind erosion. The prevention of spillage and subsequent spreading of material by vehicle tracking is essential to cost-effective emission control. If spillage cannot be prevented because of the need for intense use of mobile equipment in the storage pile area, then regular cleanup should be employed as a necessary mitigative measure.

The evaluation of preventative methods which change the properties or exposure of transfer streams or surface material are discussed in the following section.

4.3 EVALUATION OF ALTERNATIVE CONTROL MEASURES

Preventive methods for control of windblown emissions from raw material storage piles include chemical stabilization, enclosures, and wetting. Physical stabilization by covering the exposed surface with less erodible aggregate material and/or vegetative stabilization are seldom practical control methods for raw material storage piles.

To test the effectiveness of chemical stabilization controls for wind erosion of storage piles and tailings piles, wind tunnel measurements have been performed. Although most of this work has been carried out in laboratory wind tunnels, portable wind tunnels have been used in the field on storage piles and tailings piles.[16,17] Laboratory wind tunnels have also been used with physical models to measure the effectiveness of wind screens in reducing surface wind velocity.[11]

4.3.1 Chemical Stabilization

A portable wind tunnel has been used to measure the control of coal pile wind erosion emissions by a 17 percent solution of Coherex® in water applied at an intensity of 3.4 L/m^2 (0.74 gal/yard^2), and a 2.8 percent solution of Dow Chemical M-167 Latex Binder in water applied at an average intensity of 6.8 L/m^2 (1.5 gal/yard^2).[16] The control efficiency of Coherex® applied at the above intensity to an undisturbed steam coal surface approximately 60 days before the test, under a wind of 15.0 m/s (33.8 mph) at 15.2 cm (6 in.) above the ground, was 89.6 percent for TP

and approximately 62 percent for IP and FP. The control efficiency of the latex binder on a low volatility coking coal is shown in Figure 4-4.

Cost elements for chemical stabilization are presented in Table 4-7. The cost of a system for application of surface crusting chemicals to storage piles is $18,400 for the initial capital cost and $0.006 to $0.011/ft^2 for annual operating expenses based on April 1985 dollars.[18] Tables 4-8 and 4-9 provide recordkeeping forms for application of chemical dust suppressants.

4.3.2 Enclosures

Enclosures are an effective means by which to control fugitive particulate emissions from open dust sources. Enclosures can either fully or partially enclose the source. Included in the category of partial enclosures are porous wind screens or barriers. This particular type of enclosure is discussed in detail below.

With the exception of wind fences/barriers, a review of available literature reveals no quantitative information on the effectiveness of enclosures to control fugitive dust emissions from open sources. Types of passive enclosures traditionally used for open dust control include three-sided bunkers for the storage of bulk materials, storage silos for various types of aggregate material (in lieu of open piles), open-ended buildings, and similar structures. Practically any means that reduces wind entrainment of particles produced either through erosion of a dust-producing surface (e.g., storage silos) or by dispersion of a dust plume generated directly by a source (e.g., front-end loader in a three-sided enclosure) is generally effective in controlling fugitive particulate emissions. However, available data are not sufficient to quantify emission reductions.

Partial enclosures used for reducing windblown dust from large exposed areas and storage piles include porous wind fences and similar types of physical barriers (e.g., trees). The principle of the wind fence/barrier is to provide an area of reduced wind velocity which allows settling of the large particles (which cause saltation) and reduces the particle flux from the exposed surface on the leeward side of the fence/barrier. The control efficiency of wind fences is dependent on the physical dimensions of the fence relative to the source being

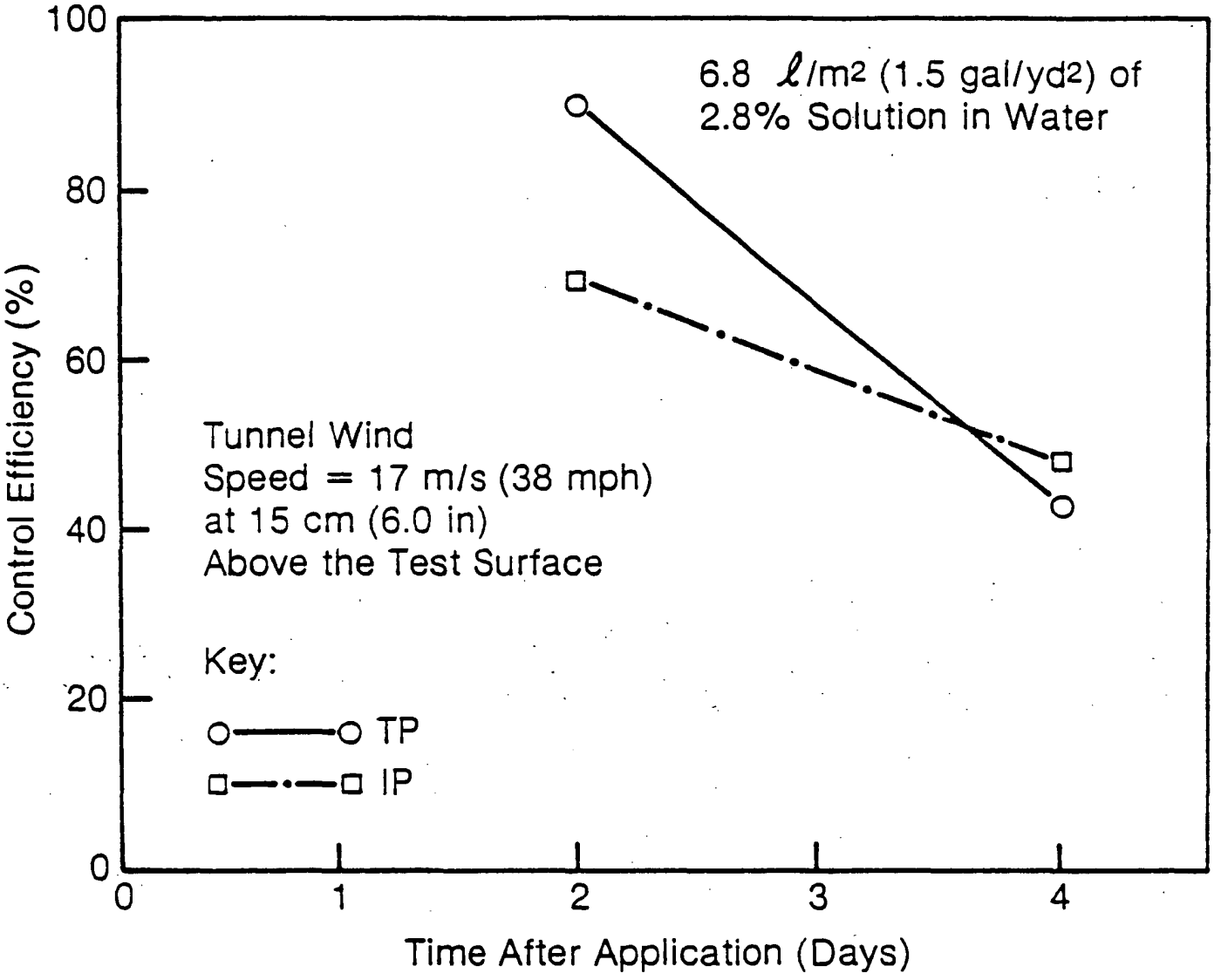


Figure 4-4. Decay in control efficiency of latex binder applied to coal storage piles.[15]

TABLE 4-7. CAPITAL AND O&M ITEMS FOR CHEMICAL STABILIZATION OF OPEN AREA SOURCES

Capital equipment

- Storage equipment
  - Tanks
  - Railcars
  - Pumps
  - Piping
- Application equipment
  - Trucks
  - Spray system
  - Piping (including winterizing)

O&M expenditures

- Utility or fuel costs
  - Water
  - Electricity
  - Gasoline or diesel fuel
- Supplies
  - Chemicals
  - Repair parts
- Labor
  - Application time
  - Road conditioning
  - System maintenance

TABLE 4-8. TYPICAL FORM FOR RECORDING CHEMICAL DUST SUPPRESSANT CONTROL PARAMETERS

Date	Time	Type of chemical	Dilution ratio	Application intensity, gal/yd^2	Area(s) treated	Equipment used	Operator initials	Comments

TABLE 4-9. TYPICAL FORM FOR RECORDING DELIVERY OF CHEMICAL DUST SUPPRESSANTS

Date	Time	Chemical delivered	Quantity delivered	Delivery agent	Facility destination[a]	Comments

[a]Denote whether suppressant will be applied immediately upon receipt or placed in storage.

controlled. In general, a porosity (i.e., percent open area) of 50 percent seems to be optimum for most applications. Wind fences/barriers can either be man-made structures or vegetative in nature.

A number of studies have attempted to determine the effectiveness of wind fences/barriers for the control of windblown dust under field conditions. Several of these studies have shown both a significant decrease in wind velocity as well as an increase in sand dune growth on the lee side of the fence.[19-22]

Various problems have been noted with the sampling methodology used in each of the field studies conducted to date. These problems tend to limit an accurate assessment of the overall degree of control achievable by wind fences/barriers for large open sources. Most of this work has either not thoroughly characterized the velocity profile behind the fence/barrier or adequately assessed the particle flux from the exposed surface.

A 1988 laboratory wind tunnel study of windbreak effectiveness for coal storage piles showed area-averaged wind speed reductions of ~50 to 70 percent for a 50 percent porosity windbreak with height equal to the pile height and length equal to the pile base. The windbreak was located three pile heights upwind from the base of the pile. This study also suggested "that fugitive dust emissions on the top of the pile may be controlled locally through the use of a windbreak at the top of the pile."

Based on the 1.3 power given in Equation (4-1), reductions of ~50 to 70 percent would correspond to ~60 to 80 percent control of material handling PM_{10} emissions. Estimation of wind erosion control requires source-specific evaluation because of the interrelation of u_t^* and u* (for both controlled and uncontrolled conditions) in Equation (4-14).

This same laboratory study showed that a storage pile may itself serve as a wind break by reducing wind speed on the leeward face (Figure 4-3). The degree of wind sheltering and associated wind erosion emission reduction is dependent on the shape of the pile and on the approach angle of the wind to an elongated pile.

One of the real advantages of wind fences for the control of PM_{10} involves the low capital and operating costs.[21,23] These involve the following basic elements:

- Capital equipment:
  - -- Fence material and supports
  - -- Mounting hardware
- Operating and maintenance expenditures:
  - -- Replacement fence material and hardware
  - -- Maintenance labor

The following cost estimates (in 1980 dollars) were developed for wind screens applied to aggregate storage piles:[24]

- Artificial wind guards:
  - -- Initial capital cost = $12,000 to $61,000
- Vegetative wind breaks
  - -- Initial capital costs = $45 to $425 per tree

Due to the lack of quantitative data on costs associated with wind screens, it is recommended that local vendors be contacted to obtain more detailed data for capital and operating expenses. Also, since wind fences and screens are relatively "low tech" controls, it may be possible for the site operator to construct the necessary equipment using site personnel with less expense.

As with other options mentioned above, the main regulatory approach involved with wind fences and screens would involve recordkeeping by the site operator. Parameters to be specified in the dust control plan and routinely recorded are:

General Information to be Specified in Plan

1. Locations of all materials storage and handling operations to be controlled with wind fences referenced on a plot plan available to the site operator and regulatory personnel

2. Physical dimensions of each source to be controlled and configuration of each fence or screen to be installed

3. Physical characteristics of material to be handled or stored for each operation to be controlled by fence(s) or screen(s)

4. Applicable prevailing meteorological data (e.g., wind speed and direction) for site on an annual basis

Specific Operational Records

1. Date of installation of wind fence or screen and initials of installer

2. Location of installation relative to source and prevailing winds

3. Type of material being handled and stored and physical dimensions of source controlled

4. Date of removal of wind fence or screen and initials of personnel involved

General Records to be Kept

1. Fence or screen maintenance record

2. Log of meteorological conditions for each day of site operation

4.3.3 Wet Suppression Systems

Fugitive emissions from aggregate materials handling systems are frequently controlled by wet suppression systems. These systems use liquid sprays or foam to suppress the formation of airborne dust. The primary control mechanisms are those that prevent emissions through agglomerate formation by combining small dust particles with larger aggregate or with liquid droplets. The key factors that affect the degree of agglomeration and, hence, the performance of the system are the coverage of the material by the liquid and the ability of the liquid to "wet" small particles. This section addresses two types of wet suppression systems--liquid sprays which use water or water/surfactant mixtures as the wetting agent and systems which supply foams as the wetting agent.

Liquid spray wet suppression systems can be used to control dust emissions from materials handling at conveyor transfer points. The wetting agent can be water or a combination of water and a chemical surfactant. This surfactant, or surface active agent, reduces the surface tension of the water. As a result, the quantity of liquid needed to achieve good control is reduced. For systems using water only, addition of surfactant can reduce the quantity of water necessary to achieve a good control by a ratio of 4:1 or more.[25,26]

The design specifications for wet suppression systems are generally based on the experience of the design engineer rather than on established design equations or handbook calculations. Some general design guidelines that have been reported in the literature as successful are listed below:

1. A variety of nozzle types have been used on wet suppression systems, but recent data suggest that hollow cone nozzles produce the greatest control while minimizing clogging.[27]

2. Optimal droplet size for surface impaction and fine particle agglomeration is about 500 μm; finer droplets are affected by drift and surface tension and appear to be less effective.[28]

3. Application of water sprays to the underside of a conveyor belt improves the performance of wet suppression systems at belt-to-belt transfer points.[29]

Micron-sized foam application is an alternative to water spray systems. The primary advantage of foam systems is that they provide equivalent control at lower moisture addition rates than spray systems.[29] However, the foam system is more costly and requires the use of extra materials and equipment. The foam system also achieves control primarily through the wetting and agglomeration of fine particles. The following guidelines to achieve good particle agglomeration have been suggested:[30]

1. The foam can be made to contact the particulate material by any means. High velocity impact or other brute force means are not required.

2. The foam should be distributed throughout the product material. Inject the foam into free-falling material rather than cover the product with foam.

3. The amount applied should allow all of the foam to dissipate. The presence of foam with the product indicates that either too much foam has been used or it has not been adequately dispersed within the material.

Available data for both water spray and foam wet suppression systems are presented in Tables 4-10 and 4-11, respectively. The data primarily included estimates of control efficiency based on concentrations of total particulate or respirable dust in the workplace atmosphere. Some data on mass emissions reduction are also presented. The data should be viewed with caution in that test data ratings are generally low and only minimal data on process or control system parameters are presented.

The data in Tables 4-10 and 4-11 do indicate that a wide range of efficiencies can be obtained from wet suppression systems. For conveyor transfer stations, liquid spray systems had efficiencies ranging from 42 to 75 percent, while foam systems had efficiencies ranging from 0 to

TABLE 4-10 SUMMARY OF AVAILABLE CONTROL EFFICIENCY DATA FOR WATER SPRAYS

Ref. No.	Type of process	Type of material	Process design/ operating parameters	Control system parameters	Measurement technique[a]	No. of tests	Test data rating[b]	Control efficiency, percent[c]
25	Chain feeder to belt transfer	Coal	3 ft drop, 8 tons coal per load	8 sprays, 2.5 gal/min, above belt only	Personnel samplers, Type 1 test scheme	10	C	RP 56 TP 59
				8 sprays, 2.5 gal/min and one one spray on underside of belt	Personnel samplers, Type 1 test scheme	4	C	RP 81 TP 87
	Belt-to-belt transfer	Coal	Not specified	8 sprays, 2.5 gal/min above belt only[a]	Personnel samplers, Type 1 test scheme	10	C	RP 53
				8 sprays, 2.5 gal/min and one one spray on underside of belt[a]	Personnel samplers, Type 1 test scheme	4	C	RP 42
27	Grizzly transfer to the bucket elevator	Run of mill sand	Not specified	Liquid volume 757 mL	Personnel samplers, Type 1 test scheme	NA	C	RP 46
				Liquid volume 1,324 mL	Personnel samplers, Type 1 test scheme	NA	C	RP 58
				Liquid volume 1,324 mL[e]	Personnel samplers, Type 1 test scheme	NA	C	RP 54
				Liquid volume 1,324 mL[f]	Personnel samplers, Type 1 test scheme	NA	C	RP 54
28	Conveyor transport and transfer	Coal	2 belts 0.91 m and 1.07 m widths, ~500 m length	3 spray bars/belt, underside of tail pulley, 5-10 cc H_2O/s per bar, Delevan "fanjet" sprays	Personnel samplers, Type 1 test scheme[g]	NA	D	RP-65-75

[a] RAM samples are from Realtime Aerosol Monitors, light scattering type instruments. Type 1 tests include measurements of a single source with and without control.
[b] Test rating scheme defined in Section 4.4.
[c] TP = Total particulate; RP = respirable particulate.
[d] Control applied at a point five transfers upstream.
[e] Water+1.5 percent surfactant.
[f] Water+2.5 percent surfactant.
[g] Individual test values not specified; no airflow data or QA/QC data.

TABLE 4-11. SUMMARY OF AVAILABLE CONTROL EFFICIENCY DATA FOR FOAM SUPPRESSION SYSTEMS

Ref. No.	Type of process	Type of material	Process design/ operating parameters	Control system parameters	Measurement technique[a]	No. of tests	Test data rating[b]	Control efficiency, percent[c]
27	Belt-to-belt transfer	30-mesh glass sand	Sand temp. ~120°F	Not specified	Personnel samplers, Type 1 test scheme	NA	C	RP 20[d]
	Belt-to-bin transfer	30-mesh glass sand	Sand temp. ~120°F	Not specified	Personnel samplers, Type 1 test scheme	NA	C	RP 33[d]
	Bulk loadout	30-mesh glass sand	Sand temp. ~120°F	Not specified	Personnel samplers, Type 1 test scheme	NA	C	RP 65[d]
	Screw-to-belt transfer	Cleaned run-of-mine sand	174 tons/h, sand temp. ~190°F	Moisture = 0.25 percent	Grav/RAM samplers, Type 1 scheme	4	C	RP 10[d]
	Bucket elevator discharge	Cleaned run-of-mind sand	179 tons/h, sand temp. ~190°F	Moisutre = 0.18 percent	RAM/personnel samplers, Type 1 test scheme	5	C	RP 8[d]
	Belt-to-belt transfer	Cleaned run-of-mine sand	193 tons/h, sand temp. ~190°F	Moisture = 0.18 percent	RAM/personnel samplers, Type 1 test scheme	8	C	RP 7[d]
	Feeder bar discharge	Cleaned run-of-mine sand	191 tons/h, sand temp. ~190°F	Moisutre = 0.19 percent	RAM/personnel samplers, Type 1 test scheme	6	C	RP 2[d]
	Grizzley transfer to bucket elevator	Dried run of mine sand	Not specified	Foam rate = 10.5 ft^3/ton sand Liquid rate = 0.38 gal/min	Personnel samplers, Type 1 test scheme	2	C	RP 92
				Foam rate = 8.2 ft^3/ton sand Liquid rate = 0.34 gal/min	Personnel samplers, Type 1 test scheme	1	C	RP 74
				Foam rate = 7.5 ft^3/ton sand Liquid rate = 0.20 gal/min	Personnel samplers. Type 1 test scheme	1	C	RP 68
25	Chain feeder to belt transfer	Coal	3-ft drop, 8 tons coal per load	50 psi H_2O, 2.5 percent reagent, four nozzles 15 to 20 ft^3 foam applied[d]	Personnel samplers. Type 1 test scheme	9	C	RP 96 TP 92
	Belt-to-belt transfer	Coal	Not specified	50 psi H_2O, 2.5 percent reagent, four nozzles 15 to 20 ft^3 foam applied[e]				RP 71

(continued)

TABLE 4-11. (continued)

Ref. No.	Type of process	Type of material	Process design/ operating parameters	Control system parameters	Measurement technique[a]	No. of tests	Test data rating[b]	Control efficiency, percent[c]
27	Grizzley	Dried run-of-mine sand	Not specified	Foam rate = 4.8 ft^3/ton sand Liquid rate = 0.18 gal/min	Personnel samplers, Type 1 test scheme	2	C	RP 0
				Foam rate = 2.6 ft^3/ton sand Liquid rate = 0.13 gal/min	Personnel samplers, Type 1 test scheme	NA	C	RP 0
				Liquid volume 1,420 mL	Personnel samplers, Type 1 test scheme	NA	C	RP 91
				Liquid volume 1,330 mL	Personnel samplers, Type 1 test scheme	NA	C	RP 73
				Liquid volume 764 mL	Personnel samplers, Type 1 test scheme	NA	C	RP 68

[a]RAM samples are from Realtime Aerosol Monitors, light scattering type instruments. Type 1 tests include measurements of a single source with and without control.
[b]Test rating scheme defined in Section 4.4.
[c]RP = respirable particulate.
[d]Efficiency based on concentrations only.

92 percent. The data are not sufficient to develop relationships between control or process parameters and control efficiencies. However, the following observations relative to the data in Tables 4-10 and 4-11 are noteworthy:

1. The quantity of foam applied to a system does have an impact on system performance. On grizzly transfer points, foam rates of 7.5 ft^3 to 10.5 ft^3 of foam per ton of sand produced increasing control efficiencies ranging from 68 to 98 percent.[31] Foam rates below 5 ft^3 per ton produced no measurable control.

2. Material temperature has an impact on foam performance. At one plant where sand was being transferred, control efficiencies ranged from 20 to 65 percent when 120°F sand was handled. When sand temperature was increased to 190°F, all control efficiencies were below 10 percent.[31]

3. Data at one plant suggest that underside belt sprays increase control efficiencies for respirable dust (56 to 81 percent).[29]

4. When spray systems and foam systems are used to apply equivalent moisture concentrations, foam systems appear to provide greater control.[31] On a grizzly feed to a crusher, equivalent foam and spray applications provided 68 percent and 46 percent control efficiency, respectively.

Capital and O&M cost elements for wet suppression are shown in Table 4-12.

In estimating the wind erosion control effectiveness of wet suppression, it can be assumed that emissions are inversely proportional to the square of the surface moisture content. The emission/moisture dependence is embedded in the agricultural wind erosion equation as described in Section 7. It also appears in the observed relationship between the role of emissions from an unpaved road and the surface moisture content, as illustrated in Figure 3-3.

In addition, a relationship between surface moisture content and daily moisture addition has been developed from field studies of storage piles exposed to natural precipitation. The results of that research are illustrated in the example problem to be presented at the end of this section.

Costs associated with wet suppression systems include the following basic elements:

TABLE 4-12. WET SUPPRESSION SYSTEM CAPITAL AND O&M COST ELEMENTS

Capital equipment

- Water spray system
  - Supply pumps
  - Nozzles
  - Piping (including winterization)
  - Control system
  - Filtering units
- Water/surfactant and foam systems only
  - Air compressor
  - Mixing tank
  - Metering or proportioning unit
  - Surfactant storage area

O&M expenditures

- Utility costs
  - Water
  - Electricity
- Supplies
  - Surfactant
  - Screens
- Labor
  - Maintenance
  - Operation

- Capital equipment:
  - -- Spray nozzles or other distribution equipment
  - -- Supply pumps and plumbing (plus weatherization)
  - -- Water filters and flow control equipment
  - -- Tanker truck (if used)
- Operating and maintenance expenditures:
  - -- Water and chemicals
  - -- Replacement parts for nozzles, truck, etc.
  - -- Operating labor
  - -- Maintenance labor

Reference 6 estimates the following costs (in 1985 dollars):

- Regular watering of storage piles:
  - -- Initial capital cost = $18,400 per system
- Watering of exposed areas:
  - -- Initial capital cost = $1,053 per acre
  - -- Annual operating cost = $25 to 67 per acre

The costs associated with a stationary wet suppression system using chemical surfactants for the unloading of limestone from trucks at aggregate processing plants (in 1980 dollars) have been estimated at: capital = $72,000; annual = $26,000. Typical costs for wet suppression of materials transfer operations are listed in Table 4-13.

As with watering of unpaved surfaces, enforcement of a wet suppression control program would consist of two complementary approaches. The first would be record keeping to document that the program is being implemented and the other would be spot-checks and grab sampling. Both were discussed previously above.

Records must be kept that document the control plan and its implementation. Pertinent parameters to be specified in a plan and to be regularly recorded include:

General Information to be Specified in Plan

1. Locations of all materials storage and handling operations referenced on plot plan of the site available to the site operator and regulatory personnel

2. Materials delivery or transport flow sheet which indicates the type of material, its handling and storage, size and composition of storage piles, etc.

TABLE 4-13. TYPICAL COSTS FOR WET SUPPRESSION OF MATERIAL TRANSFER POINTS

Source method	Initial cost, April 1985 dollars[b]	Unit operating cost, April 1985 dollars[b]
Railcar unloading station (foam spray)	48,700	NR
Railcar unloading station (charged fog)	168,000	NR
Conveyor transfer point (foam spray)	23,700	0.02 to 0.05/ton material treated
Conveyor transfer point (charged fog)	19,800	NR

[a]Reference 18. NR = not reported.
[b]January 1980 costs updated to April 1985 cost by Chemical Engineering Index. Factor = 1.315.
[c]Based on use of 16 large devices at $10,500 each.
[d]Based on use of three small devices at $6,600 each.

3. The method and application intensity of water, etc., to be applied to the various materials and frequency of application, if not continuous

4. Dilution ratio for chemicals added to water supply, if any

5. Complete specifications of equipment used to handle the various materials and for wet suppression

6. Source of water and chemical(s), if used

Specific Operational Records

1. Date of operation and operator's initials

2. Start and stop time of wet suppression equipment

3. Location of wet suppression equipment

4. Type of material being handled and number of loads (or other measure of throughput) loaded/unloaded between start and stop time (if material is being pushed, estimate the volume or weight)

5. Start and stop times for tank filling

General Records to be Kept

1. Equipment maintenance records

2. Meteorological log of general conditions

3. Records of equipment malfunctions and downtime

4.4 EXAMPLE DUST CONTROL PLAN--WATERING OF COAL STORAGE PILE

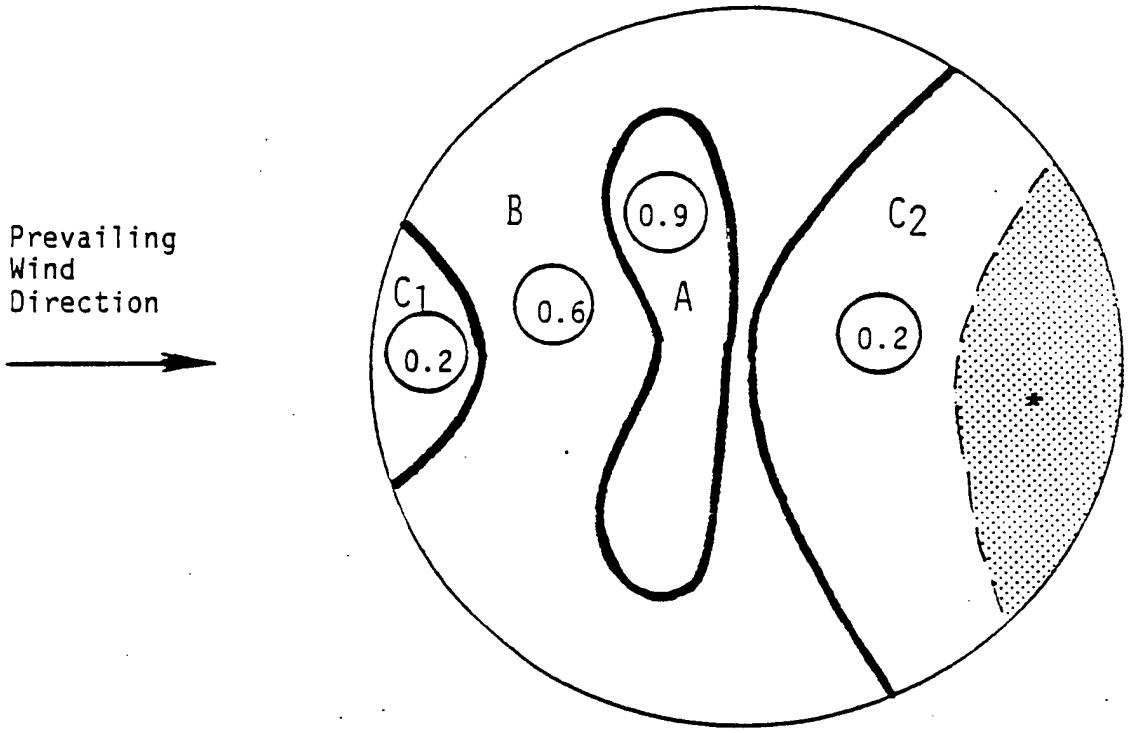
Description of Source

- Conically shaped pile (uncrusted coal)
- Pile height of 11 m; 29.2 m base diameter; 838 m^2 surface area
- Daily reclaiming of downwind face of pile; pile replenishment every 3 d affects entire pile surface (Figure 4-5)
- LCD as shown in Figure 4-6 for a typical month
- Coal surface moisture content of 1.5 percent

Calculation of Uncontrolled Emissions

Step 1: In the absence of field data for estimating the threshold friction velocity, a value of 1.12 m/s is obtained from Table 4-3.

Step 2: Except for a small area near the base of the pile (see Figure 4-5), the entire pile surface is disturbed every 3 d, corresponding to a value of N = 120/yr. It will be shown that the contribution of the area where daily activity occurs is negligible so that it does not need to be treated separately in the calculations.



* A portion of C_2 is disturbed daily by reclaiming activities.

Area ID	$\frac{u_s}{u_r}$	Pile Surface	
		%	Area (m^2)
A	0.9	12	101
B	0.6	48	402
$C_1 + C_2$	0.2	40	335
			838

Figure 4-5. Example 1: Pile surface areas within each wind speed regime.

Local Climatological Data

MONTHLY SUMMARY

WIND					
			FASTEST MILE		
RESULTANT DIR.	RESULTANT SPEED M.P.H.	AVERAGE SPEED M.P.H.	SPEED M.P.H.	DIRECTION	DATE
13	14	15	16	17	22
30	5.3	6.9	9	36	1
01	10.5	10.6	(14)	01	2
10	2.4	6.0	10	02	3
13	11.0	11.4	16	13	4
12	11.3	11.9	15	11	5
20	11.1	19.0	(23)	30	6
29	19.6	19.8	(30)	30	7
29	10.9	11.2	17	30	8
22	3.0	8.1	15	13	9
14	14.6	15.1	23	12	10
29	22.3	23.3	(31)	29	11
17	7.9	13.5	23	17	12
21	7.7	15.5	18	18	13
10	4.5	9.6	(22)	13	14
10	6.7	8.8	13	11	15
01	13.7	13.8	(21)	36	16
33	11.2	11.5	15	34	17
27	4.3	5.8	12	31	18
32	9.3	10.2	14	35	19
24	7.5	7.8	(16)	24	20
22	10.3	10.6	15	20	21
32	17.1	17.3	(25)	32	22
29	2.4	8.5	14	13	23
07	5.9	8.8	15	02	24
34	11.3	11.7	(17)	32	25
31	12.1	12.2	16	32	26
30	8.3	8.5	16	26	27
30	8.2	8.3	(13)	32	28
33	5.0	6.6	10	32	29
34	3.1	5.2	9	31	30
29	4.9	5.5	8	25	31
FOR THE MONTH:					
30	3.3	11.1	31	29	
—	—	—	DATE:	11	

Figure 4-6. Daily fastest miles of wind for periods of interest.

Step 3: The calculation procedure involves determination of the fastest mile for each period of disturbance. Figure 4-6 shows a representative set of values (for a 1-mo period) that are assumed to be applicable to the geographic area of the pile location. The values have been separated into 3-d periods, and the highest value in each period is indicated. In this example, the anemometer height is 7 m, so that a height correction to 10 m is needed for the fastest mile values.

From Equation (4-6)

$$u_{10}^{+} = u_{7}^{+} \frac{\ln (10/0.005)}{\ln (7/0.005)}$$

$$u_{10}^{+} = 1.05\ u_{7}^{+}$$

Step 4: The next step is to convert the fastest mile value for each 3-d period into the equivalent friction velocities for each surface wind regime (i.e., u_s/u_r ratio) of the pile, using Equations 4-7 and 4-8. Figure 4-5 shows the surface wind speed pattern (expressed as a fraction of the approach wind speed at a height of 10 m). The surface areas lying within each wind speed regime are tabulated below the figure.

The calculated friction velocities are presented in Table 4-14. As indicated, only three of the periods contain a friction velocity which exceeds the threshold value of 1.12 m/s for an uncrusted coal pile. These three values all occur within the $u_s/u_r = 0.9$ regime of the pile surface.

Step 5: This step is not necessary because there is only one frequency of disturbance used in the calculations. It is clear that the small area of daily disturbance (which lies entirely within the u_s/u_r = 0.2 regime) is never subject to wind speeds exceeding the threshold value.

Steps 6 and 7: The final set of calculations (shown in Table 4-15) involves the tabulation and summation of emissions for each disturbance period and for the affected subarea. The erosion potential (P) is calculated from Equation (4-4).

TABLE 4-14. EXAMPLE 1: CALCULATION OF FRICTION VELOCITIES

3-day period	u_7^+ mph	u_7^+ m/s	u_{10}^+ mph	u_{10}^+ m/s	u_s/u_r	$u^* = 0.1\ u_s^+$ (m/s) 0.2	0.6	0.9
1	14	6.3	15	6.6		0.13	0.40	0.59
2	29	13.0	31	13.7		0.27	0.82	1.23
3	30	13.4	32	14.1		0.28	0.84	1.27
4	31	13.9	33	14.6		0.29	0.88	1.31
5	22	9.8	23	10.3		0.21	0.62	0.93
6	21	9.4	22	9.9		0.20	0.59	0.89
7	16	7.2	17	7.6		0.15	0.46	0.68
8	25	11.2	26	11.8		0.24	0.71	1.06
9	17	7.6	18	8.0		0.16	0.48	0.72
10	13	5.8	14	6.1		0.12	0.37	0.55

TABLE 4-15. EXAMPLE 1: CALCULATION OF PM_{10} EMISSIONS[a]

3-Day period	u*, m/s	$u^* - u_t^*$, m/s	P, g/m^2	ID	Pile Surface Area, m^2	Pile Surface kPA, g
2	1.23	0.11	3.45	A	101	170
3	1.27	0.15	5.06	A	101	260
4	1.31	0.19	6.84	A	101	350
			Total PM_{10} emissions = 780			

[a]Where u_t^* = 1.12 m/s for uncrusted coal and k = 0.5 for PM_{10}.

For example, the calculation for the second 3-d period is:

$$P_2 = 58(1.23-1.12)^2+25(1.23-1.12)$$

$$= 0.70+2.75 = 3.45 \text{ g/m}^2$$

The PM_{10} emissions generated by each event are found as the product of the PM_{10} multiplier (k = 0.5), the erosion potential (P), and the affected area of the pile (A).

As shown in Table 4-15, the results of these calculations indicate a monthly PM_{10} emission total of 780 g.

Target Control Efficiency: 60 percent

Method of Control: Daily watering of erodible surfaces of coal pile (2 gal/m^2)

Demonstration of Control Program Adequacy: Wind-generated dust emissions are known to be strongly dependent (inverse square) on moisture content as described in Section 4.3.3. In addition, coal storage pile surface moisture, M, is correlated with weighted precipitation, P_w, as follows:[3]

$$M_c = 0.13\ P_w + 1.41 \qquad (4\text{-}10)$$

where: M = surface moisture content (percent)

$$P_w = \sum_{n=1}^{4\ d} P_n \exp[-(n - 0.5)] \text{ (mm)}$$

P_n = daily precipitation or watering amount (mm) for the nth day in the past

For uniform daily water application, $P_w \sim P_n$.

Uncontrolled PM_{10} wind erosion emissions, E_u, from the storage pile were shown to be 780 g for the month. To achieve a control efficiency of 60 percent, calculate the controlled emissions, E_c, using the following relationship.

$$E_C = E_U\ (1 - 0.60)$$

$$= 312\ g$$

The inverse square relationship of wind emissions with surface moisture content can be written as follows:

$$E_C = \frac{(M_U)^2}{(M_C)^2} E_U$$

Solving for the controlled surface moisture content, M_C, using an uncontrolled moisture content, M_U = 1.5 percent, produces:

$$M_C = M_U \quad \frac{E_U}{E_C} = 2.4 \text{ percent}$$

To achieve this moisture content, use Equation 4-10 to determine the daily water application rate.

$$P_W = \frac{M_C - 1.41}{0.13}$$

$$= 7.4 \text{ mm}$$

Convert this daily watering amount to gal/m² of erodible pile surface to obtain a recommended daily water application rate of 1.95 gal H_2O/m².

The upper pile area where $U_S/U_r \geq 0.9$ is the only surface which needs to be controlled in the example month since this area has been shown to produce virtually all the emissions. In this instance, it is only necessary to water the pile surface impacted by winds producing U_S/U_r values ≥ 0.9. This area can be estimated from Figure 4-5 if the 0.9 subarea is rotated about the pile center to represent the possible 360 degree impact of winds on the pile.

The surface area to be controlled is equivalent to the area of a cone with base diameter of about 21.3 m. This upper cone has an area of 53 percent of the entire coal pile surface, e.g., about 450 m². Consequently, 900 gal of water applied daily to the 450 m² of erodible surface will achieve a control efficiency of 60 percent.

4.5 POTENTIAL REGULATORY FORMATS

There are several possible regulatory formats for control of dust emissions from storage piles. Opacity standards are suitable for a standard observed at the point of emissions, such as continuous drop from a stacker; however, they may not be legally applied at the property line.

For wet suppression and chemical stabilization, suitable recordkeeping forms, such as those provided above, would provided evidence of control plan implementation. In addition, simple measurements of moisture level in transferred material or of the crust strength of the chemically treated surface could be used to verify compliance. In addition, the loading as well as the texture of material deposited around the pile could be used to check whether good work practices are being employed relative to pile reclamation and maintenance operations. The suitability of these measurements of surrogate parameters for source emissions stems from the emission factor models which relate the parameters directly to emission rate.

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8.19.1 SAND AND GRAVEL PROCESSING

8.19.1.1 Process Description[1-3]

Deposits of sand and gravel, the consolidated granular materials resulting from the natural disintegration of rock or stone, are generally found in near-surface alluvial deposits and in subterranean and subaqueous beds. Sand and gravel are products of the weathering of rocks and unconsolidated or poorly consolidated materials and consist of siliceous and calcareous components. Such deposits are common throughout the country.

Depending upon the location of the deposit, the materials are excavated with power shovels, draglines, front end loaders, suction dredge pumps or other apparatus. In rare situations, light charge blasting is done to loosen the deposit. The materials are transported to the processing plant by suction pump, earth mover, barge, truck or other means. The processing of sand and gravel for a specific market involves the use of different combinations of washers, screens and classifiers to segregate particle sizes; crushers to reduce oversize material; and storage and loading facilities. Crushing operations, when used, are designed to reduce production of fines, which often must be removed by washing. Therefore, crusher characteristics, size reduction ratios and throughput, among other factors, are selected to obtain the desired product size distribution.

In many sand and gravel plants, a substantial portion of the initial feed bypasses any crushing operations. Some plants do no crushing at all. After initial screening, material is conveyed to a portion of the plant called the wet processing section, where wet screening and silt removal are conducted to produce washed sand and gravel. Negligible air emissions are expected from the wet portions of a sand and gravel plant.

Industrial sand processing is similar to that of construction sand, insofar as the initial stages of crushing and screening are concerned. Industrial sand has a high (90 to 99 percent) quartz or silica content and is frequently obtained from quartz rich deposits of sand or sandstone. At some plants, after initial crushing and screening, a portion of the sand may be diverted to construction sand use. Industrial sand processes not associated with construction sand include wet milling, scrubbing, desliming, flotation, drying, air classification and cracking of sand grains to form very fine sand products.

8.19.1.2 Emissions and Controls[1]

Dust emissions can occur from many operations at sand and gravel processing plants, such as conveying, screening, crushing, and storing operations. Generally, these materials are wet or moist when handled, and process emissions are often negligible. A substantial portion of these emissions may consist of heavy particles that settle out within the plant. Emission factors (for process or fugitive dust sources) from sand and gravel processing plants are shown in Table 8.19.1-1. (If processing is dry, expected emissions could be similar to those given in Section 8.19.2, Crushed Stone Processing).

Emission factors for crushing wet materials can be applied directly or on a dry basis, with a control efficiency credit being given for use of wet

materials (defined as 1.5 to 4.0 percent moisture content or greater) or wet suppression. The latter approach is more consistent with current practice.

The single valued fugitive dust emission factors given in Table 8.19.1-1 may be used for an approximation when no other information exists. Empirically derived emission factor equations presented in Section 11.2 of this document are preferred and should be used when possible. Each of those equations has been developed for a single source operation or dust generating mechanism which crosses industry lines, such as vehicle traffic on unpaved roads. The predictive equation explains much of the observed variance in measured emission factors by relating emissions to the differing source variables. These variables may be grouped as (1) measures of source activity or expended energy (e. g., feed rate, or speed and weight of a vehicle traveling on an unpaved road), (2) properties of the material being disturbed (e. g., moisture content, or content of suspendable fines in the material) and (3) climate (e. g., number of precipitation free days per year, when emissions tend to a maximum).

Because predictive equations allow for emission factor adjustment to specific conditions, they should be used instead of the factors given in Table 8.19.1-1 whenever emission estimates are needed for sources in a specific sand and gravel processing facility. However, the generally higher quality ratings assigned to these equations are applicable only if (1) reliable values of correction parameters have been determined for the specific sources of interest, and (2) the correction parameter values lie within the ranges found in developing the equations. Section 11.2 lists measured properties of aggregate materials used in operations similar to the sand and gravel industry, and these properties can be used to approximate correction parameter values for use in the predictive emission factor equations, in the event that site specific values are not available. Use of mean correction parameter values from Chapter 11 reduces the quality ratings of the emission factor equations by at least one level.

Since emissions from sand and gravel operations usually are in the form of fugitive dust, control techniques applicable to fugitive dust sources are appropriate. Some successful control techniques used for haul roads are application of dust suppressants, paving, route modifications, soil stabilization, etc.; for conveyors, covering and wet suppression; for storage piles, wet dust suppression, windbreaks, enclosure and soil stablizers; and for conveyor and batch transfer points (loading and unloading, etc.), wet suppression and various methods to reduce freefall distances (e. g., telescopic chutes, stone ladders, and hinged boom stacker conveyors); for screening and other size classification, covering and wet suppression.

Wet suppression techniques include application of water, chemicals and/or foam, usually at crusher or conveyor feed and/or discharge points. Such spray systems at transfer points and on material handling operations have been estimated to reduce emissions 70 to 95 percent.[7] Spray systems can also reduce loading and wind erosion emissions from storage piles of various materials 80 to 90 percent.[8] Control efficiencies depend upon local climatic conditions, source properties and duration of control effectiveness. Wet suppression has a carryover effect downstream of the point of application of water or other wetting agents, as long as the surface moisture content is high enough to cause the fines to adhere to the larger rock particles.

TABLE 8.19.1-1. UNCONTROLLED PARTICULATE EMISSION FACTORS FOR SAND AND GRAVEL PROCESSING PLANTS[a]

Uncontrolled Operation	Emissions by Particle Size Range (aerodynamic diameter)[b]				Emission Factor Rating
	Total Particulate	TSP (≤ 30 μm)	PM_{10} (≤ 10 μm)	Units	
Process Sources[c]					
Primary or secondary crushing (wet)	NA	0.009 (0.018)	NA	kg/Mg (lb/ton)	D
Open Dust Sources[c]					
Screening[d]					
Flat screens (dry product)	NA	0.08 (0.16)	0.06 (0.12)	kg/Mg (lb/ton)	C
Continous drop[c]					
Transfer station	0.014 (0.029)	NA	NA	kg/Mg (lb/ton)	E
Pile formation - stacker	NA	0.065 (0.13)	0.03 (0.06)[e]	kg/Mg (lb/ton)	E
Batch drop[c]					
Bulk loading	0.12 (0.024)	0.028 (0.056)[f]	0.0012 (0.0024)[f]	kg/Mg (lb/ton)	E
Active storage piles[g]					
Active day	NA	14.8 (13.2)	7.1 (6.3)[e]	kg/hectare/day[h] (lb/acre/day)	D
Inactive day (wind erosion only)	NA	3.9 (3.5)	1.9 (1.7)[e]	kg/hectare/day[h] (lb/acre/day)	D
Unpaved haul roads					
Wet materials	i	i	i		D

[a]NA = not available. TSP = total suspended particulate. Predictive emission factor equations, which generally provide more accurate estimates of emissions under specific conditions, are presented in Chapter 11. Factors for open dust sources are not necessarily representative of the entire industry or of a "typical" situtation.

[b]Total particulate is airborne particles of all sizes in the source plume. TSP is what is measured by a standard high volume sampler (see Section 11.2).

[c]References 5-9.

[d]References 4-5. For completely wet operations, emissions are likely to be negligible.

[e]Extrapolation of data, using k factors for appropriate operation from Chapter 11.

[f]For physical, not aerodynamic, diameter.

[g]Reference 6. Includes the following distinct source operations in the storage cycle: (1) loading of aggregate onto storage piles (batch or continuous drop operations), (2) equipment traffic in storage areas, (3) wind erosion of pile (batch or continuous drop operations). Assumes 8 to 12 hours of activity/24 hours.

[h]Kg/hectare (lb/acre) of storage/day (includes areas among piles).

[i]See Section 11.2 for empirical equations.

References for Section 8.19.1

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From: Martinez, David <David.Martinez2@pnm.com>
Sent: Thursday, August 6, 2020 5:27 PM
To: Carey Slater <Carey.Slater@americangypsum.com>
Cc: van Moorsel, Emma <Emma.vanMoorsel@pnm.com>; Saavedra-Torres, Elisha <Elisha.Saavedra-Torres@pnm.com>; Buck, Cindy <Cindy.Buck@pnm.com>
Subject: FW: [External] RE: [EXT] RE: American Gypsum/PNM Weekly Update

Good afternoon Carey,

Please see the planning review from Cindy in the thread below.

On PNM's side of things, we are going to have to upgrade the 4/0 AL conductor to the larger 750 AL size. This is the wire that runs through the riser on the pole to the primary meter. Approx. 30' or less. An outage will be necessary to do this work. The best way to do this is simply disconnect the old wire, remove it through the riser and conduit, pull the new wire in, and terminate. I would prepare for a day's outage, although I don't believe it will last a full eight hours. There is another way to do this to shorten the outage duration, although it will require more customer responsibilities. This way would require the customer to build the new riser, install new conduit from riser to primary meter, and then stub in conduit to the existing primary meter. This is normal customer responsibility. Now that the conduit is installed, PNM could pull new wire and be ready for the cut over. The cut over would shorten the outage time since the 750 would be ready to go. It would be a matter of disconnecting the old and terminating the new. Another item PNM would need to do is double check the sizes of the CTs and PTs inside the primary meter enclosure.

On the customer's side, there is a limitation that Cindy noted regarding the large HP motors. I highlighted it below.

Please let me know what else you may need at this time.

Thank you,

David "Christian" Martinez
Engineer II, Metro New Service Delivery
PNM, Electric Service Center
4201 Edith Blvd NE, Albuquerque, NM 87107
(505) 241-0502 office, (575) 494-0979 cell
David.Martinez2@pnm.com

From: Buck, Cindy <Cindy.Buck@pnm.com>
Sent: Thursday, July 30, 2020 8:59 AM
To: Saavedra-Torres, Elisha <Elisha.Saavedra-Torres@pnm.com>
Cc: Martinez, David <David.Martinez2@pnm.com>; van Moorsel, Emma <Emma.vanMoorsel@pnm.com>
Subject: RE: [External] RE: [EXT] RE: American Gypsum/PNM Weekly Update

Good morning,

I have completed the review for American Gypsum to commission their new load with the old load still online. The new projected demand load of 2.2 MVA was added to the actual metered peak load of 2.7 MVA for this analysis. Per the PM-2020-1 for the project that was previously sent out, it was recommended that the existing 4/0 AL conductor to their Primary Meter be upgraded to 750 AL. The new load in addition to the old will exceed the ratings of the 4/0 AL, so the previous recommendation to upgrade that conductor is necessary for the customer to proceed. With the 750 AL in place, the Synergi model showed that there were no voltage or thermal issues when modeling the new load in addition to the existing load. Also, per the PM, running the locked rotor analysis for their large motors with VFD's, showed that starting either large HP motor resulted in a maximum voltage dip that was acceptable with the limit of no more than three non-simultaneous motor starts per hour. The primary meter and CT's will need to be verified and potentially upgraded as well. No additional improvements were identified.

I'm sorry this has taken so long to get to. Please let me know if there are any questions.

Thanks ,

Cindy Buck
Distribution Planning

II. Summary:

Table 1: Data Summary

Location / Data	Kettle No. 1	Kettle No. 2	Kettle No. 3	Kettle No. 4	Raymond Mill	Dryer	Trim Saw
Date of Sampling (2000)	6/12, 19	6/13, 19	7/19	6/22	6/16	6/15	6/15
Process Rate	Process	Rate	Data	Collected	By	A/BC	APCI
TSP Flow, DSCFM	2061	2172	1562	5056	3209	--	5482
NOx-CO Flow, DSCFM	5358	3149	4635	6354	3209	17012	--
Baghouse ΔP, in H2O	4.6	2.2	--	5.0	--	--	7.0
NOx Emissions:							
Test Run #1: (lb/hr)	1.90	0.92	1.42	2.21	0.06	1.58	--
Test Run #2: (lb/hr)	1.87	0.91	1.57	2.28	0.02	1.62	--
Test Run #3: (lb/hr)	2.02	0.93	1.60	2.39	0.02	2.35	--
Average: Lb/Hr NOx	**1.93**	**0.92**	**1.53**	**2.29**	**0.30**	**1.20**	**--**
Permit Max. lb/hr NOx	**3.0**	**2.0**	**3.0**	**3.0**	**0.7**	**22.6**	**--**
CO Emissions:							
Test Run #1: (lb/hr)	0.09	0.08	0.20	0.19	0.37	1.17	--
Test Run #2: (lb/hr)	0.09	0.06	0.13	0.26	0.27	1.24	--
Test Run #3: (lb/hr)	0.11	0.06	0.15	0.22	0.25	1.18	--
Average Lb/Hr CO	**0.10**	**0.07**	**0.16**	**0.22**	**0.30**	**1.20**	**--**
Permit Max. CO	**0.7**	**0.5**	**0.7**	**0.7**	**0.5**	**18.5**	**--**
TSP Emissions:							
Test Run #1, lb/hr	0.104	0.125	0.06	0.176	0.052	--	0.067
Test Run #2, lb/hr	0.036	0.102	0.061	0.127	0.076	--	0.153
Test Run #3, lb/hr	0.029	0.117	0.068	0.135	0.038	--	0.039
Average Lb/Hr TSP	**0.056**	**0.115**	**0.063**	**0.146**	**0.055**	**--**	**0.086**
Permit Max. lb/hr	**2.2**	**1.4**	**2.2**	**2.2**	**1.6**	**--**	**1.1**

Note: Additional sampling and analysis data including all field data are in Data & Calculations Section of this report.

November 19, 2014

LMS# 3138

LMS# 3139

Initial 52.2 TEST REPORT

LMS Technologies, Inc.

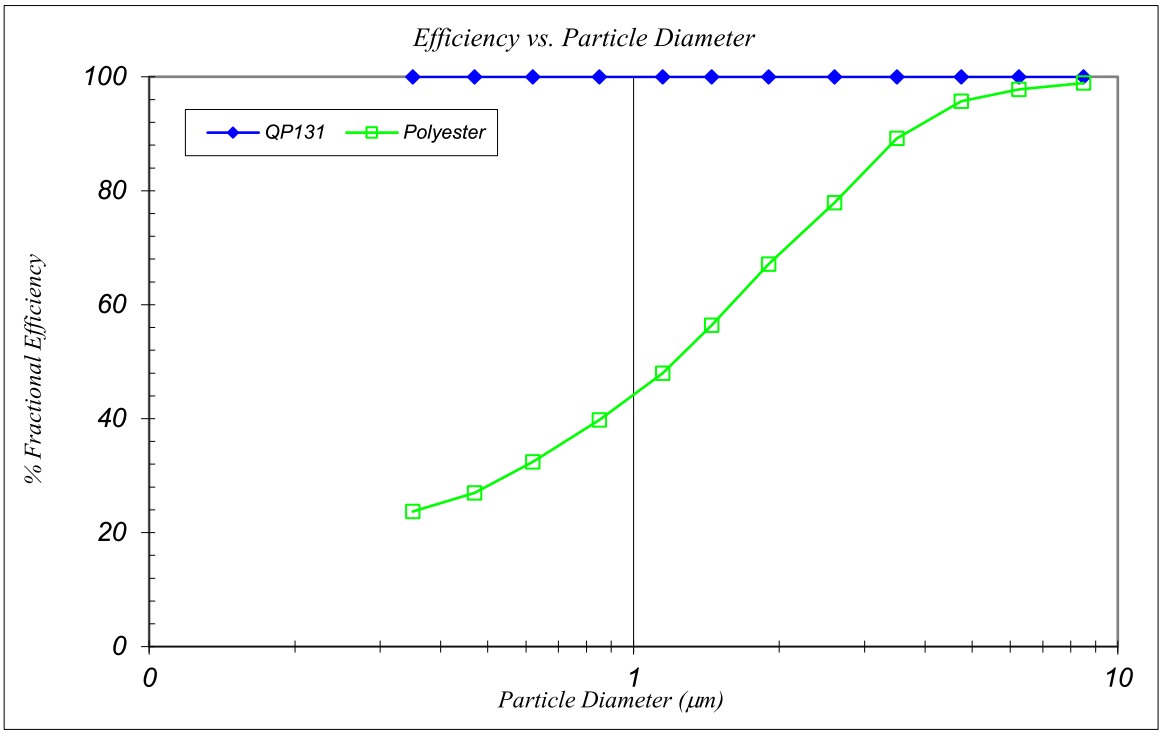
6423 Cecilia Circle
Bloomington, MN 55439

Tel.: (952)-918-9060
Fax: (952) 918-9061

Test Type :	Initial 52.2	**Test Requested by:**	PPG
Test Number:	T111914A	**Media Manufacturer:**	Clarcor
Media/Filter Size:	12"x12"	**Filter Manufacturer:**	
Test Aerosol:	KCl, Neutralized	**Test Air Velocity**	10 fpm

Filter ID	QP131	Polyester
Size Range (µm)	% Efficiency	
ΔP ("H_2O)	**1.055**	**0.217**
0.3-0.4	99.999	23.7
0.4-0.55	100.000	27.0
0.55-0.7	100.000	32.4
0.7-1.0	100.000	39.8
1.0-1.3	100.000	48.0
1.3-1.6	100.000	56.4
1.6-2.2	100.000	67.1
2.2-3.0	100.000	77.9
3.0-4.0	100.000	89.2
4.0-5.5	100.000	95.7
5.5-7.0	100.000	97.8
7.0-10.0	100.000	98.9

Data verified by LMS Calibration Filter* Patent Pending



TEST SUPERVISOR
EMILE TADROS_____

ENGINEERING APPROVAL
K.C. KWOK, PH.D._____

GE Energy

8800 East 63rd Street
Kansas City, Missouri 64133
USA

T 800 821 2222
T 816 356 8400
F 816 353 1873

May 31, 2012

American Gypsum
4600 Paseo Del Norte
Albuquerque, NM 87113

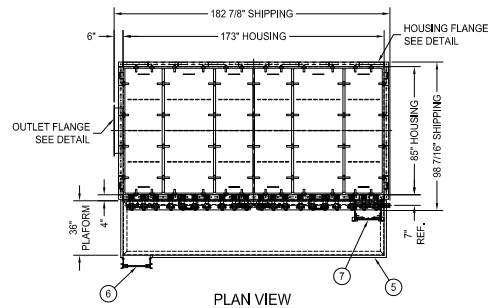
Attn: Paul Gallardo
Subj: Pleated Filter Efficiency

Dear: Paul

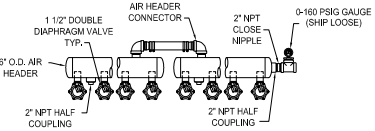
The following will confirm our conversation earlier today. The Spun bonded polyester pleated filter elements will meet or exceed .02 gr/acf, total particulate, PM10 and PM2.5. This achievement is based on good maintenance, control and operating practices.

Sincerely,
Anthony L Johnson

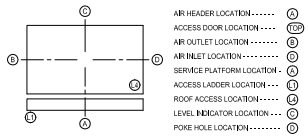
GE ENERGY



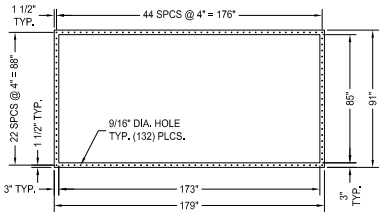
PLAN VIEW



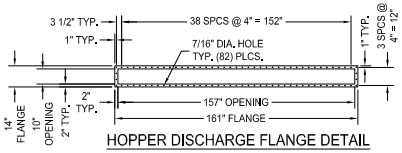
HEADER DETAIL
FOR REFERENCE ONLY



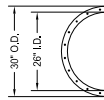
ORIENTATIONS



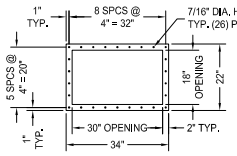
HOUSING FLANGE DETAIL
TYP. FOR CLEAN AIR PLENUM, DIRTY AIR PLENUM AND HOPPER FLANGES



HOPPER DISCHARGE FLANGE DETAIL



INLET FLANGE DETAIL
SCALE 2x



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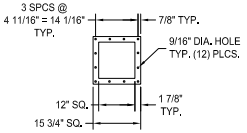
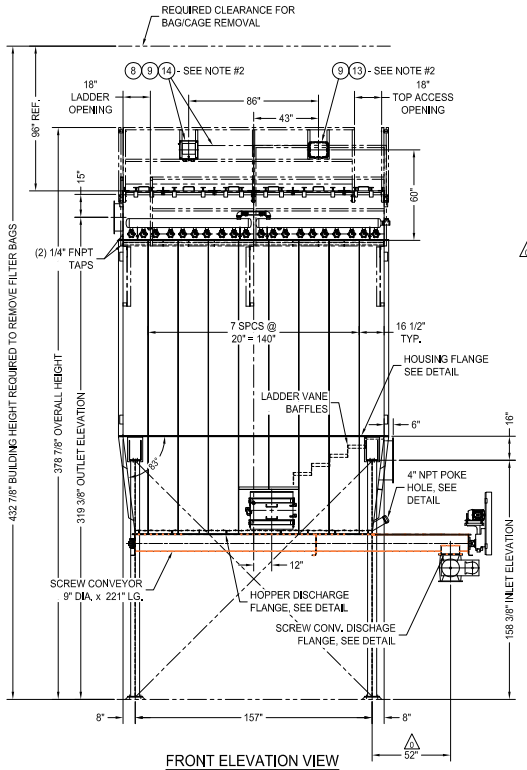
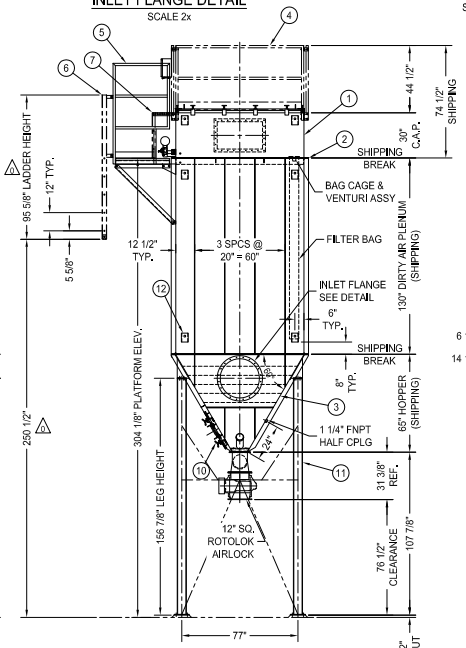


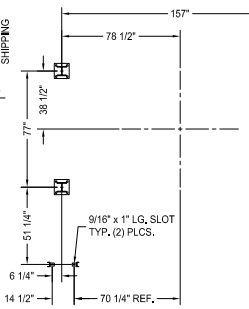
SCREW CONVEYOR DISCHARGE FLANGE DETAIL
MATES TO 12" SQ. ROTOLOK AIRLOCK
SCALE 2x



FRONT ELEVATION VIEW
LADDER NOT SHOWN FOR CLARITY



SIDE ELEVATION VIEW
LADDER & TOP HANDRAIL SHOWN IN PHANTOM



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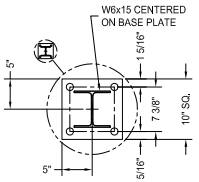
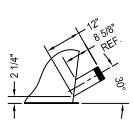


BASE PLATE DETAIL
SCALE 4x



POKE HOLE DETAIL
PIPE CAP NOT SHOWN
SCALE 2x

ITEM	PART NO.	DWG NO.	DESCRIPTION	QTY	SUP'R	STATUS
1	312-0387 S1	312-0387 SA-1	CLEAN AIR PLENUM - TB-BVT-200:S6	1	FAB	SUBASSY
2	501-0546	501-0546	TUBESHEET - TB-BVT-200:S6	1	FAB	STD
3	312-0387 S2	312-0387 SA-2	HOPPER	1	FAB	SUBASSY
4	312-0387 S3	312-0387 SA-3	TOP HANDRAIL	1	FAB	SUBASSY
5	312-0387 S4	312-0387 SA-4	SERVICE PLATFORM	1	FAB	SUBASSY
6	MD504-34	MD504-34	ACCESS LADDER	1	FAB	REF
7	MD504-21	MD504-21	STEP-UP LADDER	1	FAB	REF
8	209-1214	209-1211	TIMER BOX, N4, 10 VLVS,	1	IAC	REF
9	312-0387 S5	312-0387 SA-5	TIMER BOX MOUNTING BARS	2	FAB	SUBASSY
10	542-7070	542-7070	24" SQ. HINGED DOOR, w/SAFETY LATCH	1	FAB	STD
11	312-0387 S6	312-0387 SA-6	SUPPORT STRUCTURE	1	FAB	SUBASSY
12	504-0005	504-0005	LIFTING LUG	12	FAB	STD
13	209-1208	209-1208	TIMER BOX, N4, 10 VLVS, EXPANDER MODULE	1	IAC	REF
14	140-0176	140-0176	DWYER DCT MATER/SLAVE ENCLOSUE CABLE CONNECTION	1	FAB	STD

GENERAL NOTES:

1) DESIGN PRESSURE IS 20" W.C., DESIGN VACUUM IS 20" W.C.

2) SOLENOIDS AND TIMER PREWIRED IN NEMA 4 HOUSING PER DWG 140-0160 FOR ON-DEMAND CLEANING. ENCLOSURE w/ PULSE TIMER REQUIRES 110 VAC, 50/60 HZ FIELD CONNECTION, 6.3 VA MAX CONSUMPTION WITHOUT LOADS.

3) UNIT REQUIRES 90-100 P.S.I. OF CLEAN, DRY AIR FOR TUBULAR BAG PULSE CLEANING.

4) MATERIALS OF CONSTRUCTION:
CLEAN AIR PLENUM/HOUSING/HOPPER - 3/16" H.R.S.
TUBESHEET (WELDED TO D.A.P.) - 3/16" H.R.S. w/ 1/4" STIFFENERS
INLET/OUTLET/DISCHARGE/ASSEMBLY FLANGES - 1/4" H.R.S.
HOUSING STIFFENERS - 1/4" x 3" H.R.S, w/ 3/4" x 3/4" CHAMFER AT INTERIOR ENDS OF ALL STIFFENERS.
BULK HEADS - ALUMINUM
AIR HEADER/FITTINGS/BLOW PIPES - 11 GA. H.R.S. TUBE w/DISHED ENDS, 150# NPT FITTINGS, SCH. 40 PIPE COMPONENTS
SOLENOID TO PULSE VALVE CONNECTING TUBING - 1/4" NYLON w/ PLATED PUSH-LOCK FITTINGS
"DP" INSTRUMENT/GAUGE CONNECTING TUBING - 1/4" NYLON w/ PLATED PUSH-LOCK FITTINGS
INTERNAL INLET BAFFLES - 1/4" H.R.S.
INLET/OUTLET STUB - 3/16" H.R.S
SUPPORT STRUCTURE -
W6x15 H.R.S. STRUCTURE LEGS
W6x15 H.R.S. HORIZONTAL BRACE ON SIDE 'B' & 'D'
4" x 4" x 1/4" H.R.S. ANGLE BRACES
3/8" H.R.S. GUSSETS/ASSEMBLY BRACKETS
3/8" H.R.S. LEG TOPS
1/2" H.R.S. BASE PLATES
SUPPORT LUGS - 3/8" H.R.S.
LIFTING LUGS - 1/4" H.R.S.
TOP ACCESS DOORS - VARIOUS H.R.S. COMPONENTS w/12 GA. H.R.S. PANEL & PLATED HARDWARE
ACCESS DOOR GASKET - 3/8" x 1" WHITE SILICONE
INSPECTION DOOR - 10 GA. H.R.S. w/ 3/8"Ø H.R.S. ROD HANDLE & PLATED HARDWARE
INSPECTION DOOR GASKET - 1/4" WHITE SILICONE
ACCESS LADDER - 3" x 4.1# H.R.S. CHANNEL w/ 3/4"Ø H.R.S. RUNGS
ACCESS LADDER FOOT PADS - 3" x 3" x 3/8" H.R.S. ANGLE
SERVICE PLATFORM FRAME & BRACES - 2 1/2" x 2 1/2" x 1/4" H.R.S. ANGLE
SERVICE PLATFORM DECK - WELDED OPEN BAR GRATE, NON-SERRATED, 1 1/4" x 3/16" BEARING BARS @ 1 3/16" O.C., 1/4" SQUARE TWISTED CROSS BARS @ 4" O.C., TYPE 19-W-4 OR EQUAL, GALVANIZED CARBON STEEL
PLATFORM HANDRAIL - 1 1/2" x 11 GA. C.R.S. ASTM A-500 or A-513 SQUARE TUBE w/ 1/4" H.R.S. KICK PLATE
TOP HANDRAIL - 1 1/2" x 11 GA. C.R.S. ASTM A-500 or A-513 SQUARE TUBE w/ 12 GA. H.R.S. KICK PLATE
LADDER/PLATFORM ATTACHMENT BRACKETS & CLIPS - 1/4" & 3/8" H.R.S.
BAG GRATE - 4" x 4" x 1/4"Ø H.R.S. LOCK CRIMP WIRE CLOTH w/ 1/4" H.R.S. SUPPORTS, REMOVABLE SECTIONS
POKE HOLE - 4" SCH. 40 PIPE, 12" OAL w/ NPT CAP
LEVEL INDICATOR COUPLING - 150# CARBON STEEL
FLANGE ASSEMBLY SEALANT - 100% CLEAR F.D.A. SILICONE CAULK (GE IS808)
ASSEMBLY HARDWARE - GRADE 5 ZINC PLATED STEEL UNLESS NOTED OTHERWISE
TOP HANDRAIL ASSEMBLY HARDWARE - GRADE 8 PLATED STEEL
STRUCTURE & PLATFORM ASSEMBLY/MOUNTING HARDWARE - ASTM A325 GALVANIZED STEEL w/ WASHER UNDER NUT

5) WELDING SPECIFICATIONS -- PER AWS D1.1 & D1.3
INTERIOR - AS REQUIRED FOR FABRICATION
EXTERIOR - CONTINUOUS/UNIFORM WELD HOUSING SEAMS AND FLANGES. STITCH WELD STIFFENERS 2" LONG ON 12" CENTERS, BOTH SIDES, STAGGERED. CAULK STIFFENERS BOTH SIDES BETWEEN STITCH WELDS AFTER FINAL PAINTING.
VERTICAL SHEET SEAMS - MUST BE OFFSET A MINIMUM OF 18".

6) MATERIAL FINISH PREPARATION AND FINISH SCHEDULE PER PAINT SPECIFICATION DOCUMENT - 16164PS. UNPAINTED CARBON STEEL SURFACES SUCH AS INTERIOR AND FLANGE MATING SURFACES MAY OXIDIZE DURING TRANSIT OR STORAGE DEPENDING ON ENVIRONMENTAL CONDITIONS.

7) FILTRATION MEDIA - 16 oz. POLYESTER WITH PTFE MEMBRANE (5.79"Ø x 120 1/2" L SBD).

8) BAG SUPPORT CAGES - GALVANIZED, 12 WIRE, 11 GA. WITH INTEGRAL VENTURI (5.625"Ø x 120" L RFTSVP).

10) DIFFERENTIAL PRESSURE TRANSMITTER & AIR HEADER PRESSURE GAUGE ARE PROVIDED w/ UNIT, (2) 1/4" TAPS FOR 'DP' TRANSMITTER TO BE LOCATED ON SIDE 'B' AS SHOWN.

11) ALL SHOP AND FIELD ASSEMBLED FLANGES TO BE SEALED WITH CAULK BETWEEN MATING SURFACES. SEE DRAWING MD504-61.

12) SHIPPING - UNIT IS TO SHIP DISASSEMBLED IN (3) MAJOR SECTIONS AS DESIGNATED. PRESSURE GAUGE, 'DP' GAUGE TUBING, BAGS, CAGES, PLATFORM, SCREW CONVEYOR, STRUCTURE AND LADDER WILL SHIP LOOSE FOR FIELD ATTACHMENT. ALL OPENINGS TO BE COVERED WITH PLASTIC PIPE PLUGS OR 1/4" PLYWOOD AND HELD IN PLACE WITH INDUSTRIAL GRADE DUCT TAPE OR BOLTS.

13) I.D. CLASS - STANDARD, APPLY LOGOS AND DECALS PER DWG#MD212-01.

APPLICATION INFORMATION

UNIT APPLICATION:	BAGHOUSE
PRODUCT COLLECTED:	GYPSUM DUST
BULK DENSITY:	50 #/Cu. Ft.
PARTICLE SIZE:	GYPSUM DUST
MOISTURE CONTENT:	<5%
AIR TEMPERATURE:	70° F
AIR VOLUME:	14,000 CFM
AIR TO CLOTH RATIO:	4.32 TO 1
INLET LOADING:	3,000 PPH INSTANTANEOUS
INTERSTITIAL VELOCITY:	233 FPM
FILTRATION EFFICIENCY:	.005 GRS/DSCF MAX. EMISSION BETWEEN 2" TO 4" DIFFERENTIAL PRESSURE AND OVER 5 MICRON PARTICLE SIZE

CERTIFIED FOR CONSTRUCTION
IAC SYSTEMS, INC.
MISSION, KS
CAD APP'D. JMO DATE: 12/16/2016
Proj Engr APP'D. JMO DATE: 12/16/2016

No.	By	Date	Description of Revision
1	JMO	1/9/2017	UPDATED GEOMETRY TO SHOW ACTUAL SCREW CONVEYOR
0	JMO	12/16/2016	UPDATED PER CUSTOMER COMMENTS AND CERTIFIED FOR CONSTRUCTION
A	JMO	12/6/2016	ISSUED FOR CUSTOMER APPROVAL

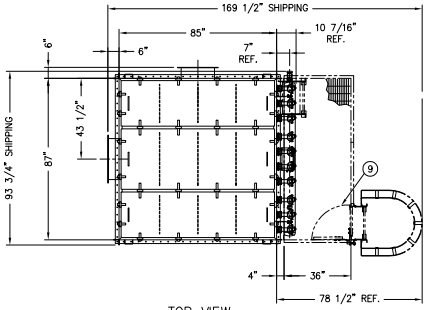
ARR.	NO. OF SOL'D. VALVES	NO. OF BAGS	BAG LENGTH (IN.)	FILTER AREA SQ. FT.	NORMAL COMP. AIR REQ'D.	MAXIMUM COMP. AIR REQ'D.	SHIP. WGT. (LBS.)
III	20	200	120	3,240	32 CFM	47 CFM	12,400

IAC
Industrial Accessories Company
4900 LAMAR
MISSION, KANSAS 66202
(913) 384-5511 fax (913) 384-5577

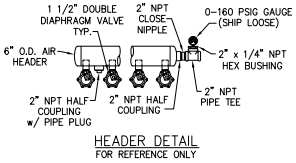
CUSTOMER: AMERICAN GYPSUM
ALBUQUERQUE, NM
CUSTOMER P.O.: 95007/95006
QTY.: 1
DESCRIPTION: GENERAL ARRANGEMENT/INSTALLATION
BAGHOUSE MODEL: 120TB-BHT-200:S6
DRAWN: JMO 12/6/2016
SCALE: 1:40
PART NO.: 312-0387
JOB NO.: 16164
CHK'D.: APP'D.:
DRAWING NO.: 312-0387
REV.: 1
SHT. 1 OF 1

E:\Ga2016\164\Drawings\MECHANICAL\EQUIPMENT\3120387C-R1.dwg, 1/9/2017 10:53:49 AM, jomalley

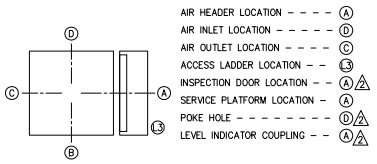
ITEM	PART NO.	DWG NO.	DESCRIPTION	QTY	SUP'R	STATUS
1	306-0059	306-0059	CLEAN AIR PLENUM – BVT-100:S6	1	FAB	STD
2	501-0027	501-0027	TUBESHEET – BVT-100:S6	1	FAB	STD
3	504-0077	504-0077	16"ø INSPECTION DOOR	1	FAB	STD
4	– –	MD504-06	BVT/BHT TOP HANDRAIL	1	FAB	STD
5	– –	MD504-21	STEP-UP LADDER, 22 7/16" TALL	1	FAB	STD
6	– –	MD504-34	ACCESS LADDER	1	FAB	STD
7	504-0503	504-0499	ENCLOSURE MOUNTS, CSD1212 SIZE (SET)	1	FAB	STD
8	523-4036	523-4036 SHT 1	36" BVT/BHT SERVICE PLATFORM	1	FAB	STD
9	211-0058	– –	SELF CLOSING SAFETY GATE, YELLOW	1	IAC	–
10	209-1214	209-1211	PULSE CONTROLLER, N4, 110VAC	1	IAC	STD
11	312-0393-1	312-0393 SA1	CONSTRUCTION DETAILS	1	FAB	SUB' ASSY



TOP VIEW
SOME ITEMS SHOWN IN PHANTOM 1

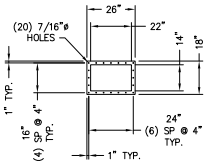


HEADER DETAIL
FOR REFERENCE ONLY

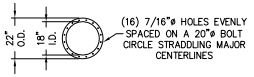


AIR HEADER LOCATION – – – – A
AIR INLET LOCATION – – – – – D
AIR OUTLET LOCATION – – – – C
ACCESS LADDER LOCATION – – L3
INSPECTION DOOR LOCATION – – A 2
SERVICE PLATFORM LOCATION – A
POKE HOLE – – – – – – – – D 2
LEVEL INDICATOR COUPLING – – A 2

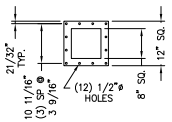
ORIENTATIONS



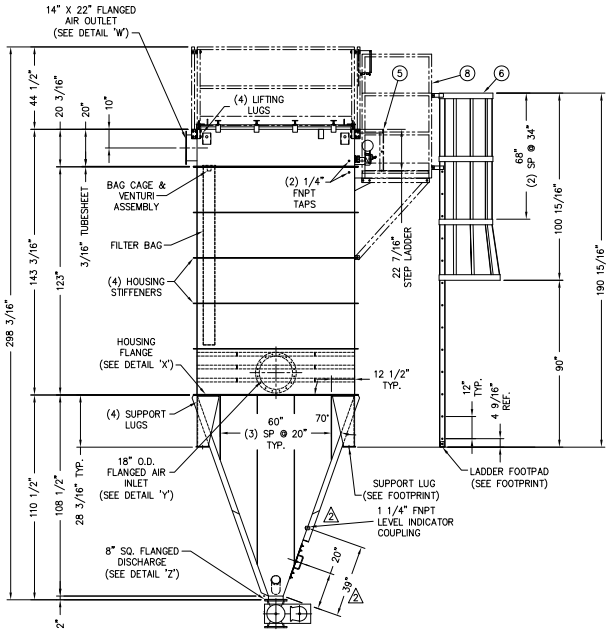
OUTLET FLANGE DETAIL 'W'
IAC STANDARD BOLT PATTERN



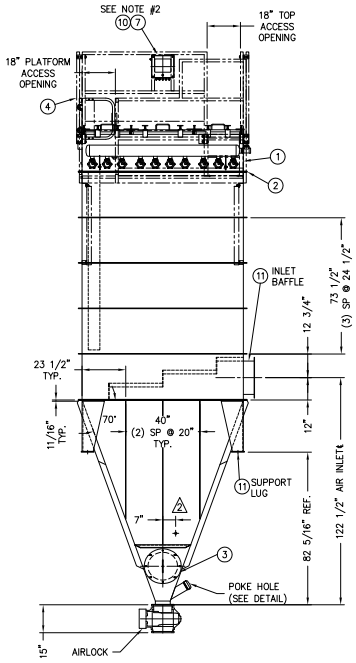
INLET FLANGE DETAIL 'Y'
IAC STANDARD BOLT PATTERN



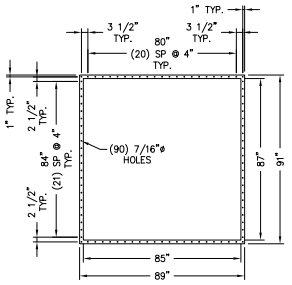
DISCHARGE FLANGE DETAIL 'Z'
MATES TO 8" ROTOLOK
SCALE 2X



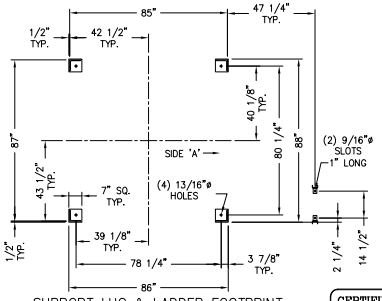
SIDE VIEW
SOME ITEMS SHOWN IN PHANTOM



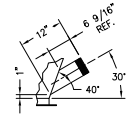
FRONT VIEW
SOME ITEMS SHOWN IN PHANTOM 2
LADDER NOT SHOWN



HOUSING FLANGE DETAIL 'X'
IAC STANDARD BOLT PATTERN



SUPPORT LUG & LADDER FOOTPRINT



POKE HOLE DETAIL
SCALE 2X

GENERAL NOTES:

1) DESIGN PRESSURE IS 20" W.C., DESIGN VACUUM IS 20" W.C.

2) SOLENOIDS AND TIMER PREWIRED IN NEMA 4 HOUSING PER DWG 140-0246 FOR ON-DEMAND CLEANING. ENCLOSURE w/ PULSE TIMER REQUIRES 110 VAC, 50/60 HZ FIELD CONNECTION, 6.3 VA MAX CONSUMPTION WITHOUT LOADS.

3) UNIT REQUIRES 90-100 P.S.I. OF CLEAN, DRY AIR FOR TUBULAR BAG PULSE CLEANING.

4) MATERIALS OF CONSTRUCTION:
CLEAN AIR PLENUM – 12 GA. H.R.S.
TUBE SHEET (SANDWICHED) – 3/16" H.R.S., w/ 1/4" STIFFENERS
HOUSING/HOPPER – 3/16" H.R.S
INLET/OUTLET/DISCHARGE/ASSEMBLY FLANGES – 1/4" H.R.S.
STIFFENERS – 1/4" x 3" H.R.S, w/ 3/4" x 3/4" CHAMFER AT INTERIOR ENDS OF ALL STIFFENERS.
AIR HEADER/FITTINGS/BLOW PIPES – 11 GA. H.R.S. TUBE w/DISHED ENDS, 150# NPT FITTINGS, SCH. 40 PIPE COMPONENTS
SOLENOID TO PULSE VALVE CONNECTING TUBING – 1/4" NYLON w/ PLATED PUSH-LOCK FITTINGS
'DP' INSTRUMENT/GAUGE CONNECTING TUBING – 1/4" NYLON w/ PLATED PUSH-LOCK FITTINGS
INLET STUB – 3/16" H.R.S.
INTERNAL INLET BAFFLES – 1/4" H.R.S.
OUTLET STUB – 12 GA. H.R.S.
SUPPORT LUGS – 3/8" H.R.S., W/ 1/2" H.R.S. BASE PLATE
LIFTING LUGS – 1/4" H.R.S.
TOP ACCESS DOORS – VARIOUS H.R.S. COMPONENTS w/12 GA. H.R.S. PANEL & PLATED HARDWARE
ACCESS DOOR GASKET – 3/8" x 1" WHITE SILICONE
INSPECTION DOOR – 10 GA. H.R.S. w/ 3/8"ø H.R.S. ROD HANDLE & PLATED HARDWARE
INSPECTION DOOR GASKET – 1/4" WHITE SILICONE
ACCESS LADDER – 3" x 4.1# H.R.S. CHANNEL w/ 3/4"ø H.R.S. RUNGS
ACCESS LADDER FOOT PADS – 3" x 3" x 3/8" H.R.S. ANGLE
ACCESS LADDER CAGE – 1/4" x 1 1/2" H.R.S. FLAT VERTICALS w/ 1/4" x 3" H.R.S. HOOPS
SERVICE PLATFORM FRAME & BRACES – 2 1/2" x 2 1/2" x 1/4" H.R.S. ANGLE
SERVICE PLATFORM DECK – WELDED OPEN BAR GRATE, NON-SERRATED, 1 1/4" x 3/16" BEARING BARS @ 1 3/16" O.C., 1/4" SQUARE TWISTED CROSS BARS @ 4" O.C., TYPE 19-W-4 OR EQUAL, GALVANIZED CARBON STEEL
TOP/PLATFORM HANDRAIL – 1 1/2" x 11 GA. C.R.S. ASTM A-500 or A-513 SQUARE TUBE w/ 1/4" H.R.S. KICK PLATE
POKE HOLE – 4" SCH. 40 PIPE, 12" OAL w/ NPT CAP
LEVEL INDICATOR COUPLING – 150# CARBON STEEL
FLANGE ASSEMBLY SEALANT – 100% CLEAR F.D.A. SILICONE CAULK (GE IS808)
ASSEMBLY HARDWARE – GRADE 5 ZINC PLATED STEEL UNLESS NOTED OTHERWISE
HANDRAIL ASSEMBLY HARDWARE – GRADE 8 PLATED STEEL
STRUCTURE & PLATFORM ASSEMBLY/MOUNTING HARDWARE – ASTM A325 GALVANIZED STEEL w/ WASHER UNDER NUT

5) WELDING SPECIFICATIONS – – PER AWS D1.1 & D1.3
INTERIOR – AS REQUIRED FOR FABRICATION
EXTERIOR – CONTINUOUS/UNIFORM WELD HOUSING SEAMS AND FLANGES. STITCH WELD STIFFENERS 2" LONG ON 12" CENTERS, BOTH SIDES, STAGGERED. CAULK STIFFENERS BOTH SIDES BETWEEN STITCH WELDS AFTER FINAL PAINTING.
VERTICAL SHEET SEAMS – MUST BE OFFSET A MINIMUM OF 18".

6) MATERIAL FINISH PREPARATION AND FINISH SCHEDULE PER PAINT SPECIFICATION DOCUMENT – 17105PS. UNPAINTED CARBON STEEL SURFACES SUCH AS INTERIOR AND FLANGE MATING SURFACES MAY OXIDIZE DURING TRANSIT OR STORAGE DEPENDING ON ENVIRONMENTAL CONDITIONS.

7) FILTRATION MEDIA – 16 oz. HOMOPOLYMER ACRYLIC, WITH TTG PTFE MEMBRANE (5.79"ø x 96 1/2" L SBDI3WG) WITH 3" BOTTOM WEAR GUARD.

8) BAG SUPPORT CAGES – GALVANIZED, 12 WIRE, 11 GA. WITH INTEGRAL VENTURI (5.625"ø x 96" L RFTSVP).

9) 'DP' TRANSMITTER (INTERGRAL TO TIMER) & AIR HEADER PRESSURE GAUGE ARE PROVIDED w/ UNIT, (2) 1/4" TAPS FOR 'DP' LOCATED ON SIDE 'B' AS SHOWN.

10) ALL SHOP AND FIELD ASSEMBLED FLANGES TO BE SEALED WITH CAULK BETWEEN MATING SURFACES. SEE DRAWING, MD504-61.

11) SHIPPING – UNIT IS TO SHIP ASSEMBLED IN ONE PIECE AS SHOWN LYING ON SIDE 'C'. PRESSURE GAUGE, 'DP' GAUGE TUBING, BAGS, CAGES, PLATFORM, AIRLOCK, AND LADDER WILL SHIP LOOSE FOR FIELD ATTACHMENT.

12) I.D. CLASS – STANDARD, APPLY LOGOS AND DECALS PER DWG#MD212-01.

APPLICATION INFORMATION

UNIT APPLICATION:	BAGHOUSE
PRODUCT COLLECTED:	HOT STUCCO
BULK DENSITY:	50 LBS/CU FT
PARTICLE SIZE:	UNKNOWN
MOISTURE CONTENT:	<5%
AIR TEMPERATURE:	250°F
AIR VOLUME:	6000 ACFM
AIR TO CLOTH RATIO:	4.62 TO 1
INLET LOADING:	UNKNOWN
INTERSTITIAL VELOCITY:	183 FT/MIN
FILTRATION EFFICIENCY:	0.005 GRS/DSCF MAX. EMISSION BETWEEN 2" TO 4" DIFFERENTIAL PRESSURE AND OVER 5 MICRON PARTICLE SIZE

No.	By	Date	Description of Revision
2	TAK	3/23/17	CORRECTED ORIENTATION BLOCK & MOVE LEVEL INDICATOR
1	TAK	2/17/17	MOVED LADDER FROM L2 TO L3.
0	TAK	2/3/17	CERTIFIED FOR CONSTRUCTION; ISSUED FOR FABRICATION
A	TAK	1/27/17	Issued for approval review.

ARR.	NO. OF SOL'D. VALVES	NO. OF BAGS	BAG LENGTH (IN.)	FILTER AREA SQ. FT.	NORMAL COMP. AIR REQ'D.	MAXIMUM COMP. AIR REQ'D.	SHIP. WT. (LBS.)
III	10	100	96	1296	13.5 cfm	27.0 cfm	4100

CERTIFIED FOR CONSTRUCTION
IAC SYSTEMS, INC.
MISSION, KS
CAD APP'D. TAK DATE: 2/3/17
Prj Eng APP'D. BSE DATE: 2/3/17

IAC
Industrial Accessories Company
4800 LAMAR
MISSION, KANSAS 66202
(913) 384-5511 fax (913) 384-6577

CUSTOMER: AMERICAN GYPSUM (EAGLE MATERIALS) BERNALILIO, NM
CUSTOMER P.O.: B772007
QTY.: 1
DRAWN: TAK
DATE: 1/25/17
SCALE: 1:32
PART NO.: 312-0393
REV.:
JOB NO.: 17105
CHK'D.:
APP'D.:
DRAWING NO.: 312-0393
REV.: 2
DESCRIPTION: GENERAL ARRANGEMENT/INSTALLATION
BAGHOUSE MODEL: 96TB-BHT-100:S6
SHT. 1 OF 1

3. OPERATION PLAN – AIR EMISSIONS DURING SSM

A startup, shutdown, and malfunction plan is included in this section. Additionally, literature is provided by the manufacturer for startup and shutdown operations.

STARTUP SHUTDOWN
AND MALFUNCTION PLAN

Revision 0
January 2021

TABLE OF CONTENTS

TABLES

1.0 INTRODUCTION

American Gypsum (AG) has developed a Startup, Shutdown, and Malfunction Plan (SSMP). Provided in this section is a discussion of the purpose of the SSMP, definitions, and documentation.

1.1 PURPOSE

The purpose of the SSMP is to describe the procedures for operating and maintaining an applicable source during periods of startup, shutdown, and malfunction. The SSMP also includes a program of corrective actions for malfunctioning process and air pollution control equipment used to comply with the relevant standards. This SSMP identifies all known routine and otherwise predictable malfunctions. The purpose of the SSMP is to:

- Ensure that affected sources, including associated air pollution control equipment, are operated and maintained in a manner consistent with good air pollution control practices for minimizing emissions at least to the levels required by all relevant standards; and

- Ensure that procedures are prepared to correct malfunctions as soon as practicable after their occurrence in order to minimize excess emissions of hazardous air pollutants; and

- Reduce the reporting burden associated with periods of startup, shutdown, and malfunction (including corrective action taken to restore malfunctioning process and air pollution control equipment to its normal or usual manner of operation).

1.2 DEFINITIONS

The following terms are used throughout this document. These definitions are based on generally accepted industry standards.

Startup means the setting in operation of an affected source or portion of an affected source for any purpose.

Shutdown means the cessation of operation of an affected source or portion of an affected source for any purpose.

Malfunction means any sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner which causes, or has the potential to cause, the emission limitations in an applicable standard to be exceeded. Failures that are caused in part by poor maintenance or careless operation are not malfunctions.

1.3 DOCUMENTATION

When actions during SSM (including actions to correct a malfunction that results in excess emissions) are consistent with the procedures specified in this plan, documentation will occur for that event demonstrating that the procedures specified in the plan were followed. This documentation for compliance with the SSMP may be in the form of a checklist, either using computer capabilities, which can be used to create reports, or other effective form of recordkeeping including programming logic for HMI control system logic sequence.

2.0 AFFECTED UNITS

The affected units are shown in Table 1.

Table 1 – Affected Units

Vertical Mill System
Material Handling System

Table 1.a. Summary of Affected Sources and Standards.

Affected Source	Pollutant	Emission Limit
Vertical Mill System	Opacity	7%[1]
Material Handling System	Opacity	7%[1]
[1] Per 40 CFR Part 60, Subpart OOO		

3.0 STARTUP, SHUTDOWN, AND MALFUNCTION SCENARIOS

3.1 VERTICAL MILL

Vertical Mill Startup
The vertical mill startup is performed according to vendor guidelines, but the associated air pollution control device will be in operation prior to startup. Various malfunctions may occur during startups. These are discussed in the malfunction section.

Vertical Mill Shutdown – Normal/Emergency
The vertical mill shutdown is performed according to vendor guidelines, but the associated air pollution control device will be in operation throughout the shutdown period. Various malfunctions may occur during shutdowns. These are discussed in the malfunction section.

Vertical Mill Malfunction
Malfunction conditions may occur during startup, shutdown, and regular operation. Possible malfunctions and the procedures designed to respond and correct include but are not limited to those malfunctions shown in Table 2. A malfunction is not assumed to occur unless an applicable emission standard has been exceeded.

Table 2 –Vertical Mill Malfunctions

Malfunction Description	May Result In	Corrective Actions/Procedures
Failure of Hot Gas Generator	Emissions and/or System Stop	Inspect, clean, adjust, repair and/or replace damaged parts as necessary.
Failure of Ductwork/Dampers	Emissions and/or System Stop	Inspect, clean, adjust, repair and/or replace damaged parts as necessary.
Fan Failure	Emissions and/or System Stop	Inspect, clean, adjust, repair and/or replace damaged parts as necessary.
Drive Failure	Emissions and/or System Stop	Inspect, clean, adjust, repair and/or replace damaged parts as necessary.
Hole in Mill	Emissions and/or System Stop	Inspect, clean, adjust, repair and/or replace damaged parts as necessary.

3.2 VERTICAL MILL APCD

Vertical Mill APCD Startup

The vertical mill APCD startup is performed according to vendor guidelines. Various malfunctions may occur during startups. These are discussed in the malfunction section.

Vertical Mill APCD Shutdown – Normal/Emergency

The vertical mill APCD shutdown is performed according to vendor guidelines. Various malfunctions may occur during shutdowns. These are discussed in the malfunction section.

Vertical Mill APCD Malfunction

Malfunction conditions may occur during startup, shutdown, and regular operation. Possible malfunctions and the procedures designed to respond and correct include but are not limited to those malfunctions shown in Table 3. A malfunction is not assumed to occur unless an applicable emission standard has been exceeded.

Table 3 – Vertical Mill APCD Malfunctions

Malfunction Description	May Result In	Corrective Actions/Procedures
APCD Failure	Emissions and/or System Stop	Inspect, clean, adjust, repair and/or replace damaged parts as necessary.
Dust Conveying System Failure	Emissions and/or System Stop	Inspect, clean, adjust, repair and/or replace damaged parts as necessary.

3.3 MATERIAL HANDLING OPERATION

Material Handling Startup

The operator, before starting the transport device, should determine that the proper equipment is in place and properly maintained to minimize dust emissions.

Material Handling Shutdown

No procedures are required to minimize dust emissions during shutdowns.

Material Handling Malfunction

The potential of a transfer point malfunction to cause an opacity problem is dependant upon the properties (moisture content, size, etc.) of the material. Transfer point malfunctions with the potential to cause an opacity problem and the procedures designed to respond and correct the problem include but are not limited to those malfunctions shown in Table 4. A malfunction is not assumed to occur unless an applicable emission standard has been exceeded.

Table 4 – Material Handling Malfunctions

Malfunction Description	May Result In	Corrective Actions/Procedures
APCD Failure	Emissions and/or System Stop	Inspect, clean, adjust, repair and/or replace damaged parts as necessary.
Dust Conveying System Failure	Emissions and/or System Stop	Inspect, clean, adjust, repair and/or replace damaged parts as necessary.
Material Handling System Failure	Emissions and/or System Stop	Inspect, clean, adjust, repair and/or replace damaged parts as necessary.

Cool down procedure of the gypsum calcining mill type MPS xxxx GC

When the gypsum calcining plant is shut-down, the interlocking system shuts down all drives in reverse order (compared to starting procedure).

In order to protect the grinding rollers, the seal air fan will continue to run for two more hours. It will then also be shut-down automatically by the interlocking system.

The oil supply unit for the mill drive will continue to run for 3 hours. If the mill is to be restarted in the foreseeable future, you should not shut-down the gearbox oil supply unit. It should continue to run until the mill is restarted.

The unit for the oil circulating lubrication of the grinding rollers is running continuously. It is only shut-down in case of a longer standstill, for instance if maintenance works are to be carried out.

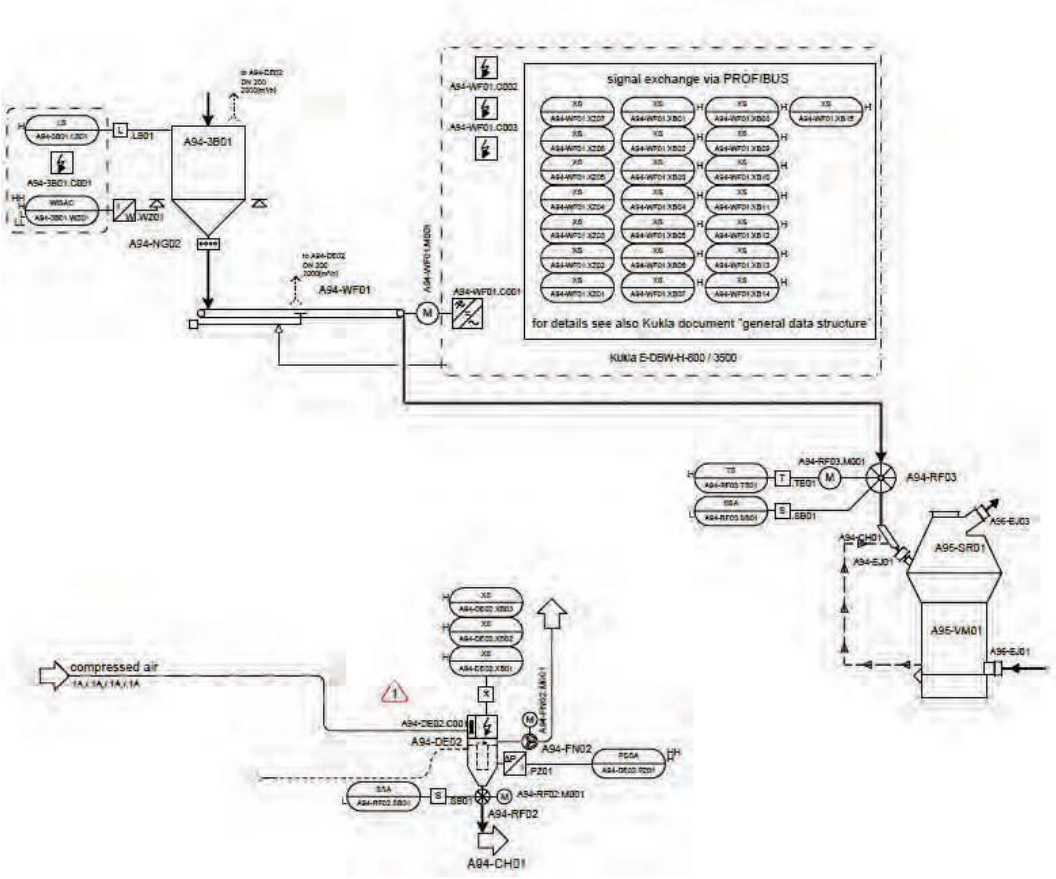
If the mill is shut-down for maintenance works, the filter and the filter fan should continue to run – with the recirculation air flap being shut and the fresh air flap being open – until the temperature after classifier is below 30 °C.

Functional Description

Gebr. Pfeiffer Gypsum Grinding/Calcining Production Line

1.1 Group A94-02. Gypsum Dosing for Mill Feed.

This functional Group provides raw gypsum to be grinded by the mill. The weighfeeder A94-WF01 doses the gypsum according to the setpoint. Gypsum is fed to mill using the rotary valve A94-RF03.M001 (Group A96-05).



1.1.1 Start Sequence.

- The operator must open the Group A94-02 faceplate
- The operator must verify the Group Ready status.
- When all the conditions to start grinding prouct are met (see process conditions for each Group), the operator must open the selection window “Start Grinding” and select A94-G02.SEL2 = True, the Group should start automatically.
- After a 20 second delay, the weighfeeder A94-WF01.C001 starts.

  The A94-02 Group should indicate Completely Running.

  The operator can start the Group using the Groups’ pop up window Start pushbutton; however, stating using the seleccion “Start Grinding” synchronizes the weighfeeder start and the lower rollers function. The Group start pushbutton starts the weighfeeder but it does not command the “lower rollers” function.

1.1.2 Stop Sequence.

- The operator must open the Group A94-01 faceplate, then hit the STOP pushbutton.
- After 1 seconds, weighfeeder A94-WF01.C001 stops.
  The Group A94-02 should indicate Completely Stopped.

Deselecting “Start Grinding” stops the feed system and commands the rollers. The Group stop pushbutton stops inly the feeder.

2. GPAC A96. STUCCO GRINDING AND GAS HANDLING.

2.1 General Functions. Group GPAC A96

The Group GPAC A96 receives the raw product at a rate specified by the operator (Fresh Feed Control) or by Mill Feed Control loop.

The material is introduced to the mill to the rotating grinding table driven by the mill main motor A96-MD01.M001. Three grinding rollers exert pressure on the material against the rotating table resulting on the material being grounded. The rollers are powered by the hydraulic unit A96-HS01.C001.

Gas flow though the mill is needed to lift the material from the table. This gas flow is produced by the system ID fan A96-FN02.M001. This process gas-gysum dust passes though the classifier A96-SR01. The rotating classifier allows a certain particle size material in the gas to exit the mill. Material not passing the rotating classifier cage returns to the mill to continue the grinding process, mixing with fresh material entering the mill.

At the mill exit chute, process gas-gypsum dust must pass through a bag filter to collect the gypsum dust. The filter A96-BF01 accomplishes this task by collecting the dust attached to the bag fabric, then applying compressed air bursts to the bags to dump the dust to the bagfilter collecting hopper. Ground gypsum collected by the bag filter is transported for futher processing downstream (this is purpose of the Group GPAC A99 later on this document).

In addition to the main equipment named above, the mill operation requires other subsystems to accomplish the basic gypsum grinding task.

- The unit A96-LQ02.C001 lubricates the grinding rollers.
- The unit A96-LQ01.C001 lubricates the grinding table.
- The process requires a heat source to dry and grind the raw material. The heat is generated by the Hot Gas Generator A96-HG01.C001.

The functions provided by the Group GPAC A96 should be handled by the following functional Groups:

A96-01 Gearbox Oil Lubricacion Unit A96-LQ01
A96-02 Circulating Oil Lubrication Unit A96-LQ02
A96-03 Hydraulic Tension Unit A96-HS01
A96-04 Main Motor
A96-05 Gas-Grinding Circuit
A96-06 Hot Generator Unit A96-HG01

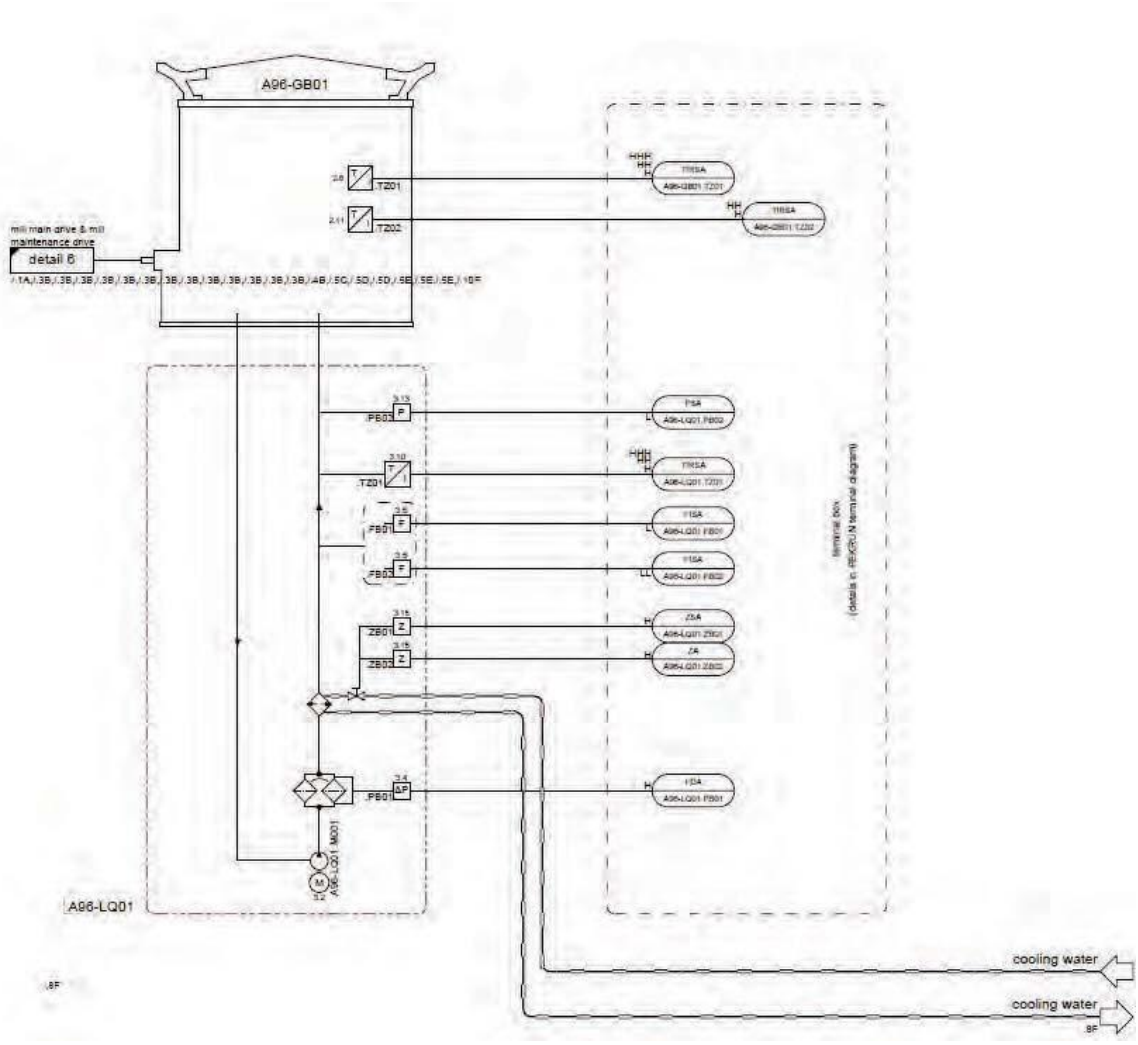
2.2 Group A96-01. Gearbox Lubrication Unit A96-LQ01.

This functional Group keeps the main motor gearbox lubricated. The unit should be started ahead of time the mill start up process to attain the proper levels of oil temperature.

Oil flow and pressure are monitored to ensure the gearbox thrust pad gets enough oil.

An interlock for the mill operation is generated when the gearbox lubrication is ready.

Please refer to the following P&I D.



2.2.1 Start Sequence.

- The operator must open the Group A96-01 faceplate
- The operator must verify the Group Ready status.
- If the Group is READY, then the operator may proceed to start the Group by pressing the START pushbutton on the faceplate.
- Horn blows for 10 seconds.

- The pump A96-LQ01.M001 starts.

The A96-01 Group should indicate Completely Running.

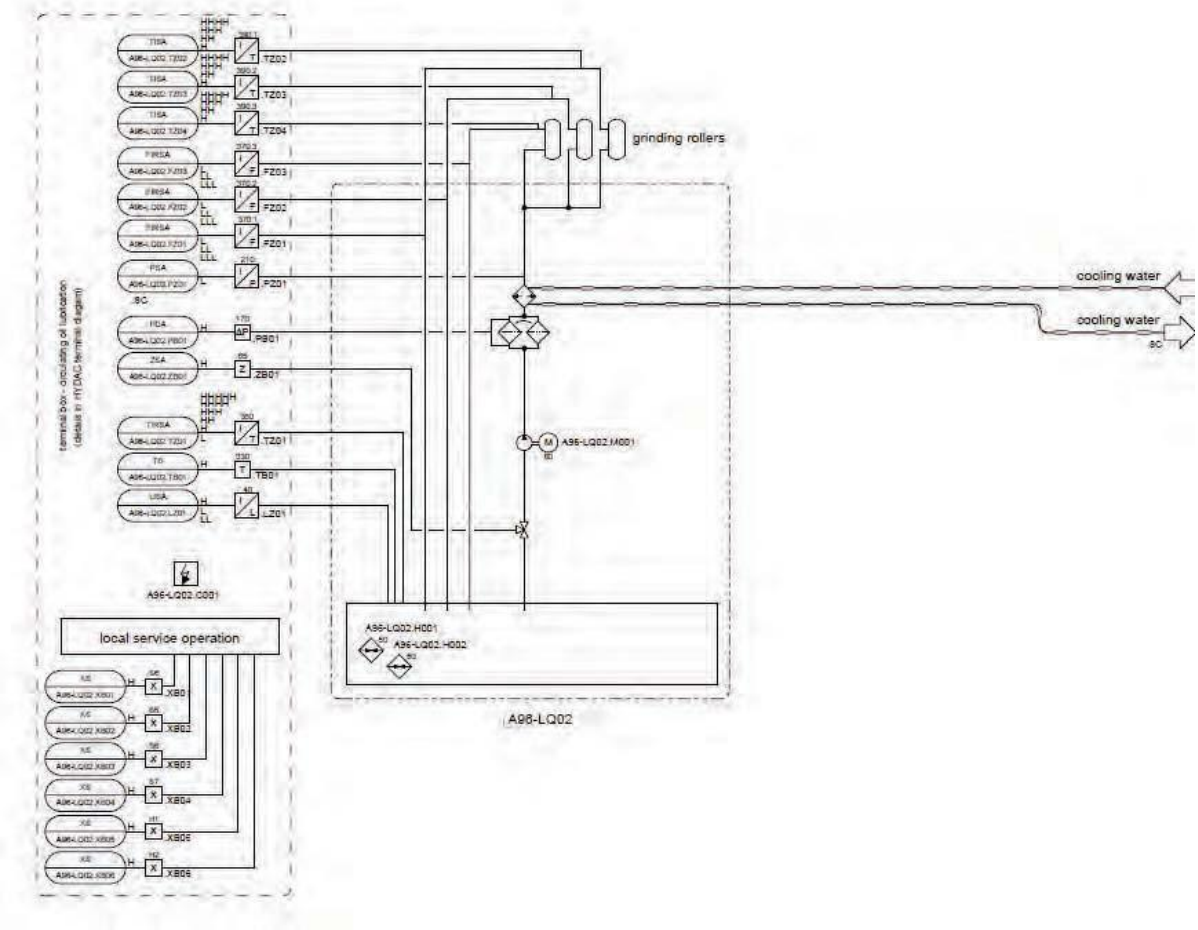
2.2.2 Stop Sequence.

- The operator must open the Group A96-01 faceplate, then hit the STOP pushbutton.
- After 1 seconds, the Lubrication Pump A96-LQ01.M001 stops.

The Group A96-01 should indicate Completely Stopped.

2.3 Group A96-02. Circulating Oil Lubrication Unit A96-LQ02.

This functional Group controls the oil lubrication for the 3-grinding rollers. Please refer to the following P&I D.



The unit can be operated locally from the control box or in automatic from the main PLC room. To run the mill, the system must be operated automatically.

There are 4 functions provided by the unit.

- Oil Flushing. It is performed from the local control box.
- Oil Filling/Emptying. Also requested from the local control box.
- Pump start. Requested at the local control box.
- Remote Operation. Selected at the local control box.

2.3.1 Start Sequence.

- The operator must open the Group A96-02 faceplate
- The operator must verify the Group Ready status.
- If the Group is READY, then the operator may proceed to start the Group by pressing the START pushbutton on the faceplate.
- Horn blows for 10 seconds.
- Oil Lubication Pump A96-LQ02.M001 starts.
- Oil Tank Heater A96-LQ02.H001 is enabled.
- Oil Tank Heater A96-LQ02.H002 is enabled.
-

  The A96-02 Group should indicate Completely Running.

Heaters Normal Operation in Automatic.

Heaters should turn on if :

- Oil Temperature A96-LQ02.TZ01 < SL (50 °C) AND A96-LQ02.LZ01 > H

Heaters should turn off if :

- Oil Temperature A96-LQ02.TZ01 > SH (55 °C), OR
- Oil Temperature Switch A96-LQ02.TB01 is False OR
- A96-LQ02.LZ01 < LL OR
- A96-LQ02.OilLeak = True

2.3.2 Stop Sequence.

- The operator must open the Group A96-02 faceplate, then hit the STOP pushbutton.
- After 1 seconds, the heaters A96-LQ02.H001 and H002 stop.
- After 5 seconds, the pump A96-LQ02.M001 stops.
-

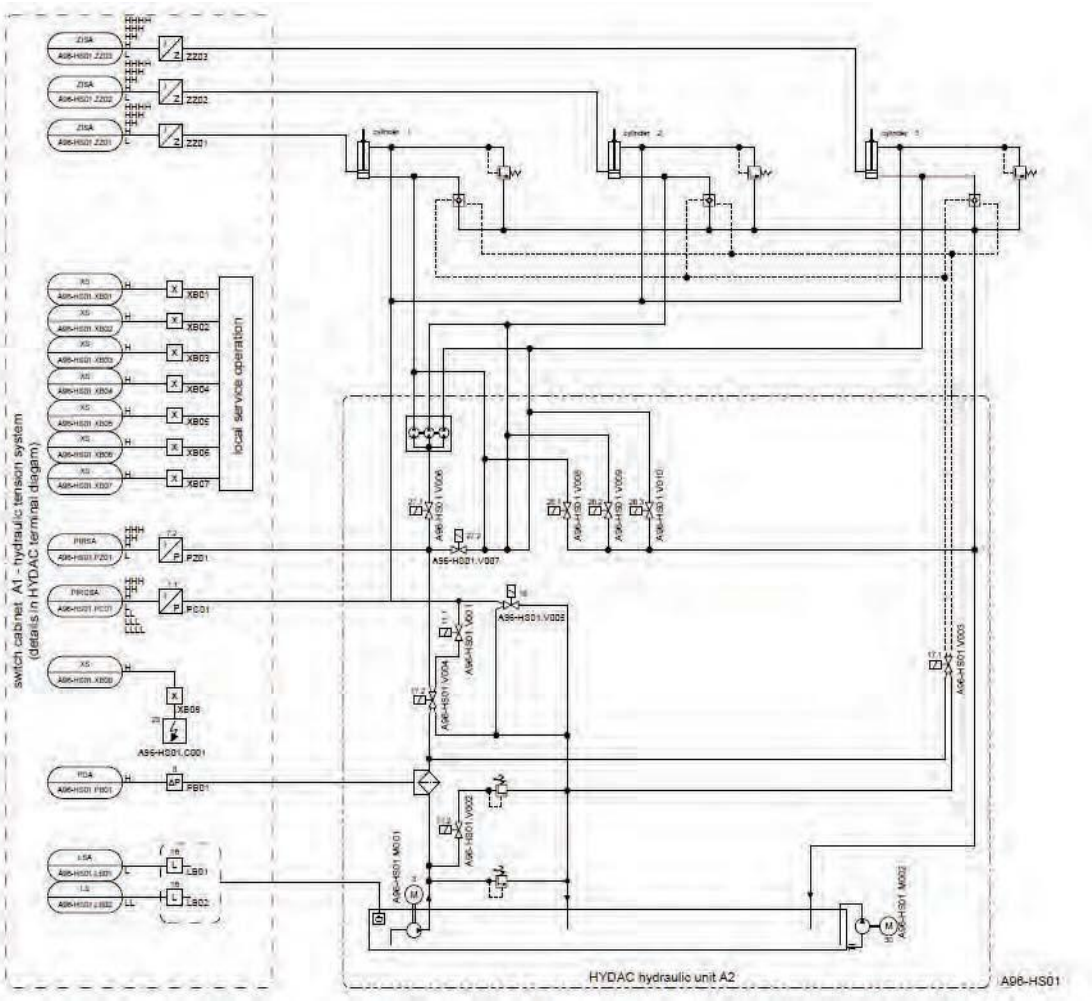
  The Group A96-02 should indicate Completely Stopped.

2.4 Group A96-03. Hydraulic Tension Unit A96-HS1.

This functional Group controls the hydraulic pressure applied to the rollers to obtain uniform grinding. Hydraulic pump A96-HS01.M001 provides the oil flow from the oil tank to the roller's cylinders.A train valve insures the same pressure is applied to the rollers. The unit must be operational before starting the mill grinding process.

All the instrument wiring is concentrated in a local box. From the local box it is possible to initiate local functions. These functions will be described later on this section.

Please refer to the following P&I D.



2.4.1 Start Sequence.

- The operator must open the Group A96-02 faceplate
- The operator must verify the Group Ready status.
- If the Group is READY, then the operator may proceed to start the Group by pressing the START pushbutton on the faceplate.
- Horn blows for 10 seconds.

- Pump A96-HS01.M001 is enabled
- Valve A96-HS01.V001 is enabled
- Valve A96-HS01.V002 is enabled
- Valve A96-HS01.V003 is enabled
- Valve A96-HS01.V004 is enabled
- Valve A96-HS01.V005 is enabled
- Valve A96-HS01.V006 is enabled
- Valve A96-HS01.V007 is enabled
- Valve A96-HS01.V008 is enabled
- Valve A96-HS01.V009 is enabled
- Valve A96-HS01.V010 is enabled
-
-

The A96-03 Group should indicate Completely Running.

The hydraulic unit logic should be developed in 5 sequences. It is recomemded to use a SR flip flop to store the current sequence and be to transfer to the next sequence. The state of valves/pump required on each sequence will be indicated in the following paragraphs.

2.4.1 Stop Sequence.

- The operator must open the Group A96-03 faceplate, then hit the STOP pushbutton.
- After 1 seconds, the Pump A96-HS01.M001 is disabled
- After 1 seconds, Valve A96-HS01.V001 is disabled
- After 1 seconds, Valve A96-HS01.V002 is disabled
- After 1 seconds, Valve A96-HS01.V003 is disabled
- After 1 seconds, Valve A96-HS01.V004 is disabled
- After 1 seconds, Valve A96-HS01.V005 is disabled
- After 1 seconds, Valve A96-HS01.V006 is disabled
- After 1 seconds, Valve A96-HS01.V007 is disabled
- After 1 seconds, Valve A96-HS01.V008 is disabled
- After 1 seconds, Valve A96-HS01.V009 is disabled

- After 1 seconds, Valve A96-HS01.V00101 is disabled
- After 1 seconds, Pump A96-HS01.M002 stops.
-

  The Group A96-03 should indicate Completely Stopped.

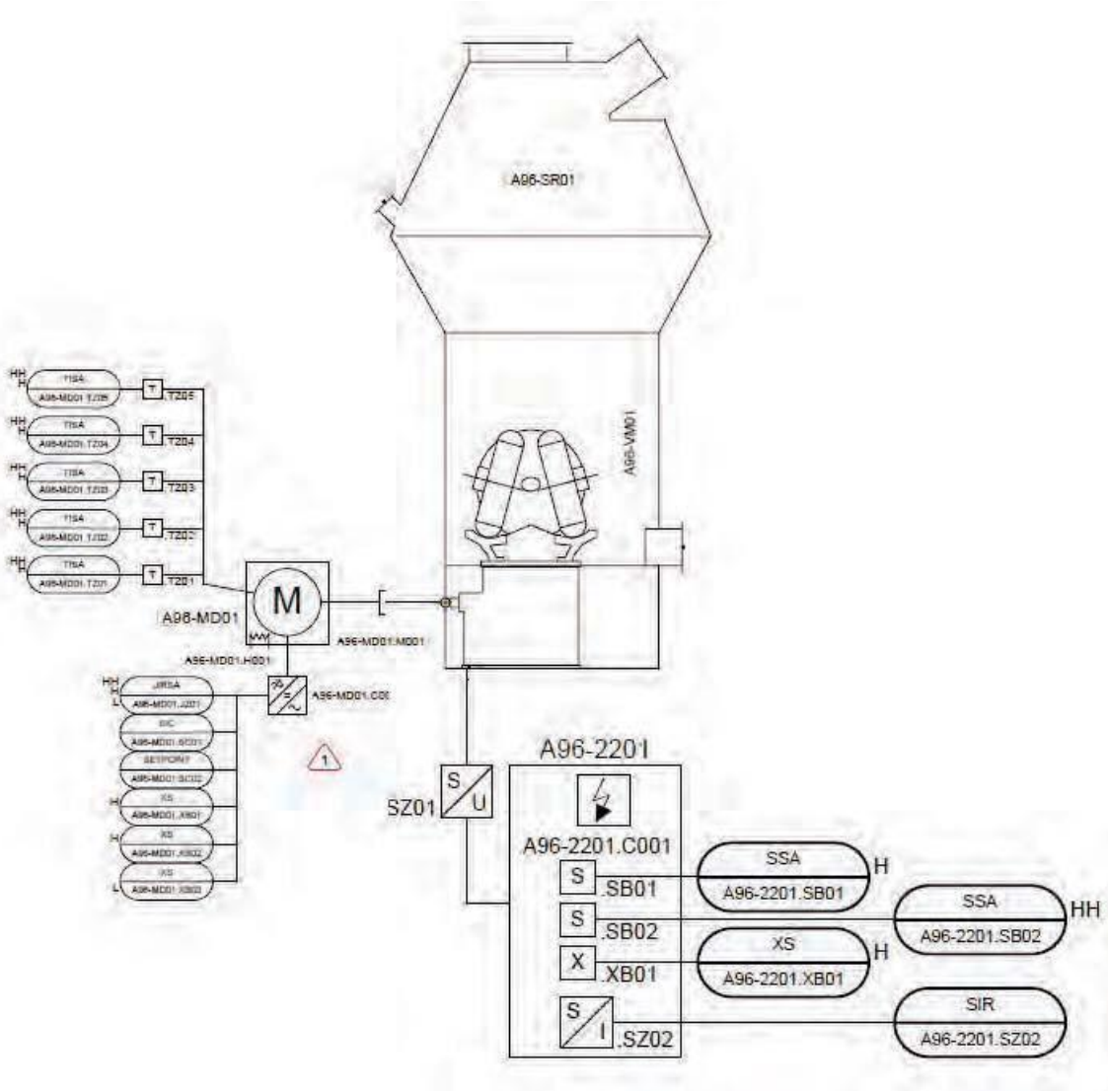
2.5 Group A96-04. Main Motor.

This functional Group controls the main mill motor A96-MD01. The motor provides the power to run the grinding table.

Please refer to the following P&I D.

The mill main motor is run by a VFD. This allows the mill to run at low throughput rate durin the heating process as well during the continuous production regime. The VFD allows the mill to run 50%-60% nominal capacity if required.

A vibration monitoring system is used to protect the gearbox-main drive.



2.5.1 Start Sequence.

- The operator must open the Group A96-04 faceplate
- The operator must verify the Group Ready status.
- If the Group is READY, then the operator may proceed to start the Group by pressing the START pushbutton on the faceplate.
- Horn blows for 10 seconds.

- A96-MD01.M001 starts.
-

  The A96-04 Group should indicate Completely Running.

2.5.2 Stop Sequence.

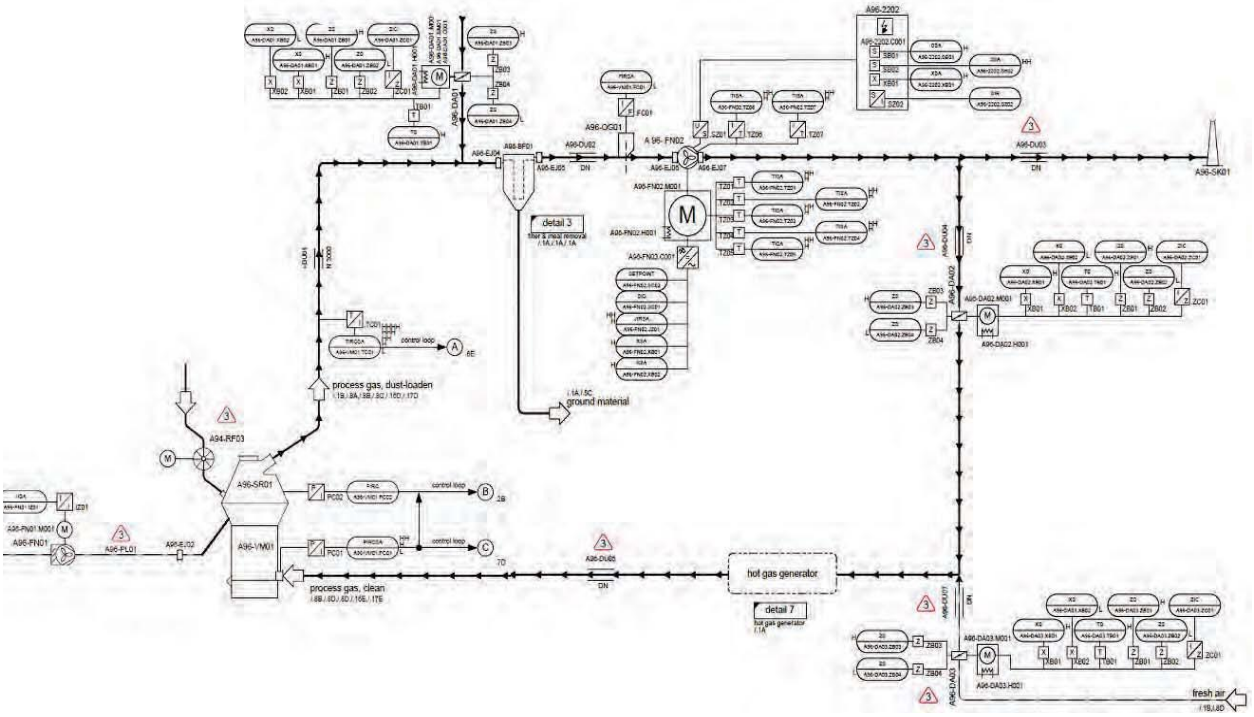
- The operator must open the Group A96-04 faceplate, then hit the STOP pushbutton.
- After 1 seconds, main motor A96-MD01.M001 stops.

  The Group A96-04 should indicate Completely Stopped.

2.6 Group A96-05. Gas and Grinding Circuit.

This functional Group uses the services provided by other others within this GPAC Group as well as the machines necessary to process the product. The ID fan A96-FN02 produces the airflow necessary to lift the ground product from the grinding table. The separator A96-SR01 classifies the material so only the proper size material gets to the bagfilter A96-BF01 where it is collected. A94-RF03 is included on this Group to prevent any structure deformation due to heat.

Most of the control loops required to automatically run the grinding mill are referred to this Group. Please refer to the following P&ID.



2.6.1 Start Sequence.

- The operator must open the Group A96-05 faceplate
- The operator must verify the Group Ready status.
- If the Group is READY, then the operator may proceed to start the Group by pressing the START pushbutton on the faceplate.
- Horn blows for 10 seconds.
- Mill Feed Rotary Valve A94-RF03 starts
- Mill Seal Fan A96-FN01.M001 starts, then
- After a 120 second delay, A96-SR01.M001 starts,
- After a 120 second delay, A96-FN02.M001 starts,
- After a 10 second delay, A96-BF01.C001 starts.

The A96-05 Group should indicate Completely Running.

2.6.2 Stop Sequence.

- The operator must open the Group A96-06 faceplate, then hit the STOP pushbutton.
- After 1 seconds, Mill Process Fan A96-FN02.M001 stops.
- After 20 seconds, Separator A96-SR1.M001, stops and after 600 secs. A96-BF01.C001 stops.
- After 30 seconds, Seal Fan A96-FN01.M001 stops.
- A94-RF03.M001 should stop when A96-FN01.M001 stops and A96-VM01.TC01 < L

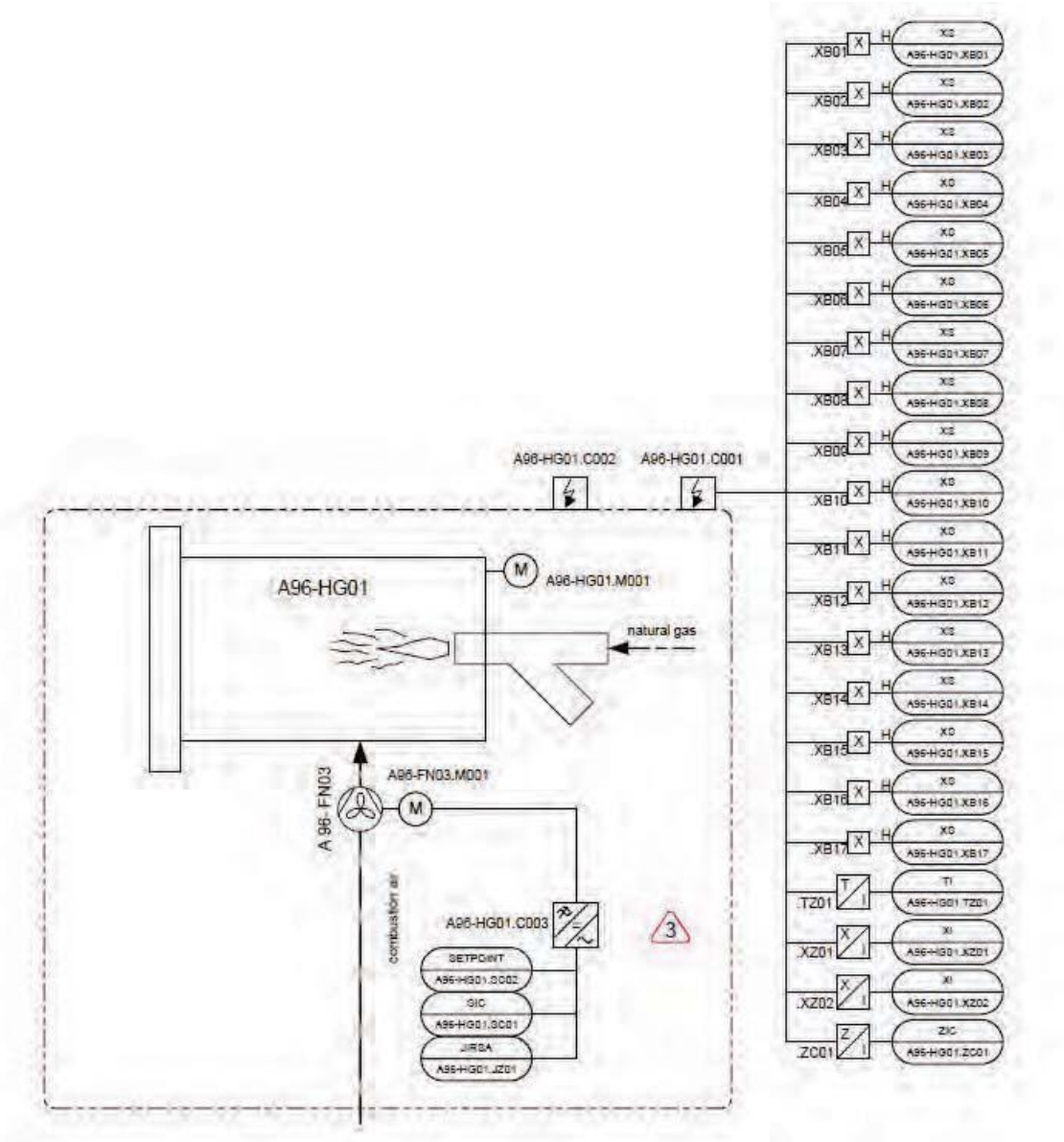
The Group A96-05 should indicate Completely Stopped.

2.7 Group A96-06. Hot Gas Generator A96-HG01.

This functional Group controls hot gas generator. The hot gas generator is necessary to raise the gas temperature to calcine the gypsum.

Control is provided by the OEM and the control system uses a digital interface to start/stop this subsystem. At the same time, a PROFIBUS connection to the unit allows to retrieve additional information, unit status and alarm indications.

Please refer to the following P&ID.



2.7.1 Start Sequence.

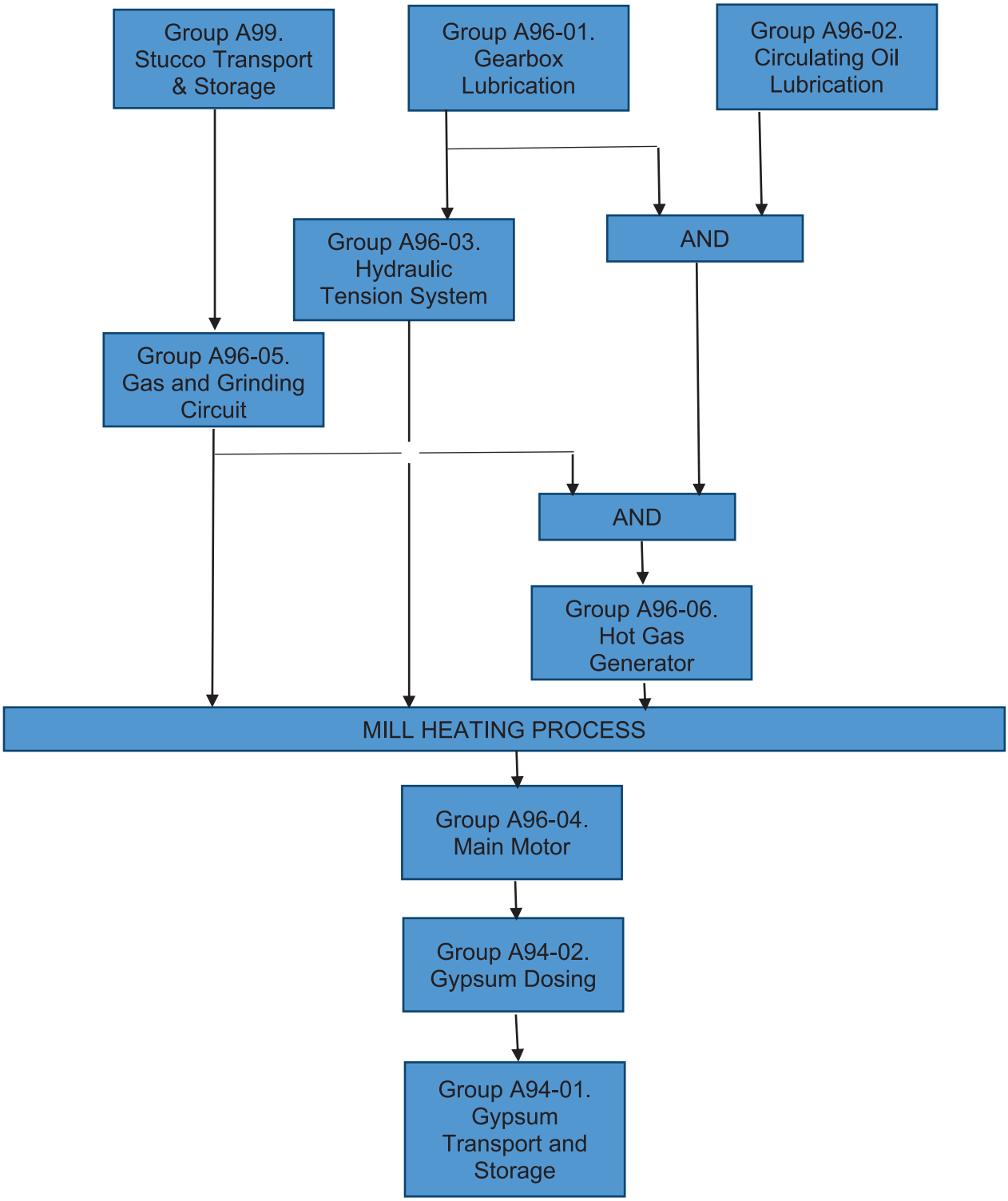
- The operator must open the Group A96-06 faceplate
- The operator must verify the Group Ready status.
- If the Group is READY, then the operator may proceed to start the Group by pressing the START pushbutton on the faceplate.
- Horn blows for 10 seconds.
- System ID Fan A96-FN02 should run at 20%.
- Combustion Fan A96-FN03.M001 starts, then when the combustion reaches full sped, the system ID fan speed shoul change to 55%.
- After 30 seconds, A96-HG01.XB02 = True
- After 5 seconds, A96-HG01.XB03 = True
- When A96-HG01.XB05 = True and A96-HG01.XB09 = True, then
  The A96-06 Group should indicate Completely Running.

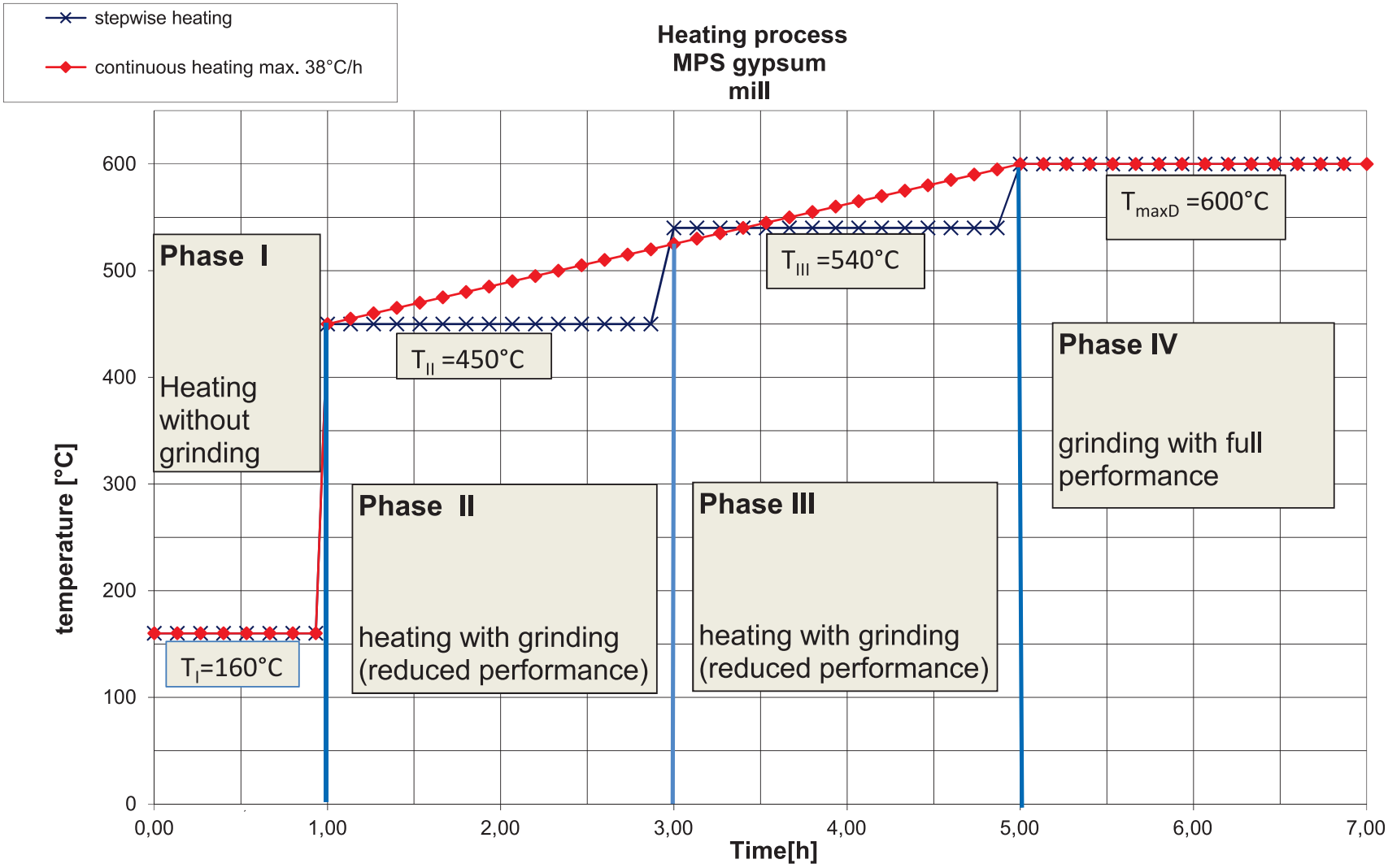
2.7.2 Stop Sequence.

- The operator must open the Group A96-06 faceplate, then hit the STOP pushbutton.
- After 1 seconds, the signal A96-HG01.XB04 (Stop Command) is generated, then
- After 120 seconds, the combustion air fan A96-FN03.M001 stops.
  The Group A96-06 should indicate Completely Stopped.

3. MASTER GROUP SEQUENCE.

In order to simplify the operator's task, a Master Group should be implemented.




stepwise heating
continuous heating max. 38°C/h
Heating process
MPS gypsum
mill
temperature [°C]
Time[h]
0
100
200
300
400
500
600
0,00
1,00
2,00
3,00
4,00
5,00
6,00
7,00
Phase I
Heating without grinding
Phase II
heating with grinding (reduced performance)
Phase III
heating with grinding (reduced performance)
Phase IV
grinding with full performance
T_I=160°C
T_II =450°C
T_III =540°C
T_maxD =600°C

4. AIR DISPERSION MODELING WAIVER

An air dispersion modeling waiver was submitted to the EHD for this facility on July 15, 2024. The EHD approved the modeling waiver on August 9, 2024.

The original waiver and approval email are all included in this section.

City of Albuquerque – Environmental Health Department

Air Quality Program

Air Dispersion Modeling Waiver Request Form

The following information is required to ensure that the modeling section of the Air Quality Program can make a reliable determination regarding whether modeling will be required for a project and, if so, what pollutants will need to be modeled.

Applicant Company: American Gypsum Company, LLC

Facility Name: Albuquerque Plant

Describe the proposed change/modification and why you believe modeling should be waived.

American Gypsum Company LLC (AMG) currently operates its Gypsum Wallboard Manufacturing Plant in Albuquerque, New Mexico under Construction Permit #0752-M4. The Albuquerque Plant (herein referred to as the facility) receives raw material via ore truck which it processes to form wallboard. The most recent permit modification (issued November 17, 2023) authorized the construction and operation of a new vertical mill and associated processes and control equipment. The new proposed sources were authorized to operate simultaneously with all existing, permitted, equipment although a portion of the existing equipment will be decommissioned once the new mill is constructed and operational. AMG is now proposing permit modification – project details are included below.

AMG is requesting to modify their existing air permit (#0752-M4) to true-up emissions associated with the new vertical roller mill's hot gas generator and baghouse (unit DC-11). A pre-application meeting was held on July 2, 2024 with the Environmental Health Department Air Quality Program. During this meeting we discussed that an incorrect burner was provided by the manufacturer and subsequently installed with unit DC-11. AMG is working with the burner manufacturer (Honeywell) to modify or replace the burner that was installed. Based on an emissions guarantee from Honeywell, the size of the burner will remain unchanged at 51.2 MMBtu/hr from the currently permitted burner and thus there will be no changes to the emissions of PM, VOC, or SO_2. Additionally, there are no changes to NOx emissions since Honeywell provided the same guarantee as currently permitted. Emissions will also remain unchanged for all pollutants except for Carbon Monoxide (CO) which will increase from 2.12 lb/hr to 16.2 lb/hr.

The last modeling for AMG shows that CO was not significant. These results were then scaled and presented within Table 2 below.

Table 1. Modeling from last application for Permit #0752-M4

Pollutant	Averaging Period	Sig. Level	Modeled	Percent of Sig. Level	Location of Max. Conc.		Elevation (m)	Distance (m)	ROI (m)
		µg/m³	µg/m³		X	Y			
CO	8-hr	500	4.74039	0.9%	354484.40	3893243.00	1554.78	2820.00	N/A
CO	1-hr	2000	6.97841	0.3%	357684.40	3893243.00	1636.00	2820.00	N/A

Table 2 below provides scaled percentages of ambient air quality standards on the previous modeling results and the proposed emission rates. The results of the analysis show that modeling is not required as the proposed emission rates will not exceed the Significance levels for CO.

Table 2 Scaled Model Results for CO

Pollutant	Averaging period	Previously modeled emission rate (lb/hr)	Proposed emission rate (lb/hr)	Modeled Impact (% of standard)	Scaled Impact (% of standard)	Standard
CO	8-hr	2.12	16.2	0.9%	6.88%	Significance
CO	1-hr	2.12	16.2	0.3%	2.99%	Significance

Attach a map of the facility, including a layout of sources and buildings. If this is a relocation, be sure to include new location address.

A map of relevant sources (DC-11 only) is included in Appendix A. Note, unit DC-11 is the only source at the facility that is changing with this application.

Are there changes between current emissions and emissions with the proposed change? If so, explain below and fill out Table X.

Emissions will remain unchanged for all pollutants except for Carbon Monoxide (CO) which will increase from 2.12 lb/hr to 16.2 lb/hr. Reder to Table 2 above.

Are there changes in the stack parameters between existing and proposed equipment? If so, explain below and fill out Table Y.

There are no proposed changes to stack parameters.

Are there any changes to fugitive sources such as haul roads or piles? If so, explain below and fill out Table Z.

There are no proposed changes to hourly fugitive emissions, only the CO emissions for unit DC-11 are proposed to be increased.

What fuel will be used in any proposed engine/generator or combustion source and is this a change from the previous equipment?

Unit DC-11 is a natural gas fired burner.

Is the property surrounded by a fence or some other barrier that restricts access?

Yes, the property is surrounded by a fence.

Are there any other sources or facilities located on the same site?

No – there are no other sources located at this location.

Operating hours and days. Is this a change?

24/7/365 – Continuous operation. This is unchanged.

Air Dispersion Modeling Waiver Request Form

Standards requested to be waived from modeling.

Pollutant		Averaging Period(s)
NO_2	☒	All
SO_2	☒	All
CO	☒	All
PM_{10}	☒	All
$PM_{2.5}$	☒	All
Lead	☒	All
H_2S	☒	All

Any comments regarding standards.

All standards for all pollutants are proposed to be waived. Only CO will increase on unit DC-11 and scaled results of Table 2 show that the concentrations will not be significant.

Issuance date of current permit. If known, was modeling completed as part of this permit application?

March 11, 2022. Full air dispersion modeling was completed as part of this modification for all pollutants and averaging periods.

Are any generators emergency generators that are only used to backup PNM power or are they used as part of the process?

N/A

Are boilers used for process or for comfort heat?

N/A

Table X. Emissions Changes

Unit No.	NO_x lb/hr	CO lb/hr	VOC lb/hr	SO_2 lb/hr	PM_{10} lb/hr	$PM_{2.5}$ lb/hr	Pb lb/hr	H_2S lb/hr
Existing Equipment								
DC-11	2.46	2.12	0.29	0.032	2.44	0.63	-	-
Proposed Modification								
DC-11	2.46	16.2	0.29	0.032	2.44	0.63		
Total Change	**0.00**	**+14.08**	**0.00**	**0.00**	**0.00**	**0.00**		

Air Dispersion Modeling Waiver Request Form

Table Y. Equipment Parameters*

Process Equipment Number	Pollutant (CO, NOx, SO2, PM10, etc.)	UTM Location of Source	Control Equipment	Control Efficiency	Stack Height & Diameter in feet	Stack Temp.	Stack Velocity & Exit Direction
Existing Equipment – N/A*							
					H- D-		V- Exit-
					H- D-		V- Exit-
					H- D-		V- Exit-
					H- D-		V- Exit-
New Equipment							
					H- D-		V- Exit-
					H- D-		V- Exit-
					H- D-		V- Exit-
					H- D-		V- Exit-

*There are no proposed changes to existing point source locations or parameters as a result of this permit modification. DC-11 stack parameters will remain unchanged.

Table Z. Fugitive Sources (crushers, screens, piles, haul roads, etc.)*

Process Equipment Number	Pollutant (CO, NOx, SO2, PM10, etc.)	UTM Location of Source	Control Method	Control Efficiency	Dimensions (height, width, length)	Material Involved	Type of Transport Into/Out of Property
Existing Equipment – N/A*							

*There are no proposed changes to the existing source parameters

Appendix A

Site Plan

City of Albuquerque

Environmental Health Department
Air Quality Program

Modeling Waiver Review

August 9, 2024

To: Permit File

From: Kyle Tumpane, Senior Environmental Health Scientist

Subject: Modeling Waiver Request Review for American Gypsum, Permit #0752-M4 Modification

The Air Quality Program (AQP) has completed a review of the modeling waiver request submitted on July 16, 2024 for the American Gypsum facility located at 4600 Paseo Del Norte NE, Albuquerque, NM.

Background:

A pre-application meeting was held with American Gypsum and Trinity Consultants on July 2, 2024 to discuss a modification to their air quality construction permit #0752-M4. American Gypsum explained that adjustments are needed to the CO emissions for the new vertical roller mill's hot gas generator and baghouse (Unit DC-11) because an incorrect burner was provided by the manufacturer and installed with Unit DC-11. American Gypsum is working with the burner manufacturer, Honeywell, to modify or replace the burner that was installed. Despite this issue, several emissions guarantees were received by American Gypsum from Honeywell: the size of the burner will remain the same 51.2 MMBtu/hr as currently permitted and there will therefore be no changes to the PM, VOC or SO_2 emissions; there are no changes to the NO_x emissions based on the same emissions guarantee. The only emission rate that is changing due to this incorrect burner is CO, which will increase from 2.12 lb/hr to 16.2 lb/hr. American Gypsum's consultant, Trinity, states that the last modeling done for American Gypsum's permit #0752-M4 showed that both 1-hour and 8-hour CO were below the significant impact levels (SILs). Trinity then argues that these modeled impacts can be scaled using the previously modeled emission rate and the updated emission rate for Unit DC-11 to show that the impact of the updated CO emission rate will still be below the SILs.

However, there are some issues with the statements made, and the values provided, by Trinity. There is a little confusion regarding for which permit modeling was completed based on the information in the modeling waiver request and this should be cleared up. According to the response on page 3 of the modeling waiver request form, full modeling was completed with the application for the current permit issued on March 11, 2022 and Table 1 on page 1 of the form represents these impacts as being from modeling for permit #0752-M4. The permit issued on March 11, 2022 was permit #0752-M3, which did have full modeling submitted with the application but is not the current permit. The modeled impacts submitted as part of the permit #0752-M3 3rd updated application submittal on May 19, 2021, which was the accepted submittal, are very close but do not exactly match the impacts in Table 1, although the percent of significance level values are the same when truncated to one decimal place. The values in Table 1 match the modeled impacts in the original 0752-M3 submittal on November 23, 2020, which was ruled incomplete. The application for permit #0752-M4, submitted on February 27, 2023, included a modeling waiver

request and waiver approval from January 6, 2023. This waiver request was approved for an increase in the annual throughput for the gypsum stockpile that affected the ton/year emissions for Units 12a and 12b but did not alter the hourly emission rates. Current permit #0752-M4 was issued on November 17, 2023 as stated on the first page of the modeling waiver request, so it is unclear why there are confusing answers provided in other parts of this waiver request. Trinity states at the bottom of page 1, and in Table 2 on page 2, that the scaled and modeled percentages they provide are percentages of the ambient air quality standards. This is incorrect. The scaled and modeled percentages provided by Trinity are percentages of the SILs. If the values provided by Trinity were percentages of the standards, some values would exceed the SILs. For example, 6.88% of the 8-hour CO standard, 9967 µg/m^3, would be 685.73 µg/m^3, which would be above the SIL of 500 µg/m^3.

This modeling waiver request submitted by Trinity for the increase in CO emissions from Unit DC-11 failed to account for the change to ambient modeled stack temperatures for DC-11, DC-12 and DC-13 that AQP tested in August – September 2023 as part of the 0752-M4 review, which led to higher modeled impacts. The previous two permits, 0752-M3 and 0752-M3-1TR, included permit conditions requiring stack temperatures of at least 327°F for DC-11, DC-12 and DC-13. American Gypsum requested that these permit conditions be changed during 0752-M4 review because the baghouses operate at ambient temperature. American Gypsum stated that the 327°F temperature is the maximum temperature the baghouses can handle, that temperature was inadvertently given to Trinity as the operating temperature for modeling, and the bags would melt if operated at that temperature. DC-11 is the only one of these three units with CO emissions so the increase in modeled CO impacts observed in the 0752-M4 AQP modeling is due to the decreased stack temperature for this unit.

The table below shows the modeled impacts, percent of SIL, modeled and proposed emission rates, and the scaled percent of SIL impact for Unit DC-11 as presented in the submitted modeling waiver request. The table also shows the values found and calculated by AQP for two submittals for permit #0752-M3 and the AQP modeling results for permit #0752-M4. AQP added the scaled impacts in µg/m^3 for the three sets of values that AQP calculated. The modeled impacts and percent of SIL values were multiplied by the scaling factor (16.2/2.12 = 7.64) to get the scaled impact values. These results show that Trinity appears to have over-estimated the scaled percent of SIL impact for 1-hour CO and under-estimated the scaled percent of SIL impact for 8-hour CO based on comparison to the values for the two 0752-M3 submittals. The difference in the 8-hour CO scaled percent of SIL impact is due to Trinity using the truncated 0.9% of SIL value. It is unclear how Trinity reached the 1-hour CO scaled percent of SIL impact value of 2.99%. When using the truncated 0.3% of SIL value, the AQP gets a 1-hour CO scaled percent of SIL impact value of 2.29%.

Modeling Document	Pollutant/ Averaging Period	Significant Impact Level (µg/m^3)	Modeled Impact (µg/m^3)	Percent of SIL	Modeled Emission Rate (lb/hr)	Proposed Emission Rate (lb/hr)	Scaled Impact (µg/m^3)	Scaled Impact (% of SIL)
This Waiver Request	1-hr CO	2000	6.97841	0.3%	2.12	16.2	-	2.99%
	8-hr CO	500	4.74039	0.9%			-	6.88%
0752-M3 11/23/2020 Submittal	1-hr CO	2000	6.97841	0.349%			53.32	2.67%
	8-hr CO	500	4.74039	0.948%			36.22	7.24%
0752-M3 05/19/2021 Submittal	1-hr CO	2000	6.98326	0.349%			53.35	2.67%
	8-hr CO	500	4.65072	0.930%			35.53	7.11%
0752-M4 AQP Modeling	1-hr CO	2000	81.8	4.09%			624.95	31.25%
	8-hr CO	500	58.3	11.66%			445.41	89.08%

The modeled CO impacts from the 0752-M4 AQP modeling are significantly higher than the impacts submitted by Trinity in either 0752-M3 modeling demonstration and in this modeling waiver request due to the decrease to ambient stack exit temperature for Unit DC-11, as discussed above. However, the scaled impact and scaled percent of SIL impact values both show that American Gypsum will remain below the SILs for the 1-hour and 8-hour CO standards.

On August 6, 2024 AQP requested documentation for the emissions guarantee from Honeywell that American Gypsum/Trinity referenced in the modeling waiver request to support the claim that none of the pollutants other than CO will have emission rate increases. American Gypsum provided a one-page summary of the emissions guarantee for NO_x and CO from Honeywell on August 6, 2024. The document referred to an attached emissions statement so AQP requested the pages that were attached to this summary page. A partial screenshot of the requested page was provided by Trinity so AQP again requested the full document. Trinity provided the full page on August 6, 2024 so AQP could continue this review. The documents from Honeywell provided by American Gypsum and Trinity do indeed state emission guarantees of less than 2.46 lb/hr for NO_x and less than 16.2 lb/hr for CO. The other pollutants are not specifically mentioned with any sort of emissions guarantee in the documents from Honeywell. However, the permitted hourly VOC, SO_2 and PM emissions were calculated using AP-42 emission factors and the system firing rate of 51.2 MMBtu/hr so those emissions should not change if the firing rate stays the same, and the 51.2 MMBtu/hr system firing rate is listed on the emissions guarantee document.

Recommendation:

The argument regarding the use of scaled modeled impacts for CO emissions is reasonable overall. Modeled impacts in AERMOD can generally be scaled when the only thing changing is the emission rate. The modeled and scaled impacts are significantly higher than those presented by Trinity when the ambient stack exit temperature for DC-11 from the 0752-M4 AQP modeling is taken into account. However, the impacts are still below the SILs for the 1-hour and 8-hour CO standards. The AQP wanted to be sure the modeled impacts matched the calculated scaled results so a quick test CO model was run with the emissions of all CO-emitting units scaled by the same 7.64 factor as DC-11 and the results were very close matches to the calculated scaled results. When a test CO model was run with only the DC-11 emissions increased, the modeled impacts were quite a bit lower than the scaled impacts. This indicates that scaling impacts is an acceptable and conservative approach, especially when the emissions from only one unit are increasing.

It is recommended that a modeling waiver be granted for both 1-hour and 8-hour CO for Unit DC-11. A modeling waiver is not required for other pollutants, averaging periods or emission units because none of those emissions are changing.

RE: Air Dispersion Modeling Waiver Request - American Gypsum Company

Tumpane, Kyle <ktumpane@cabq.gov>
Fri 8/9/2024 3:52 PM

To:Adam Erenstein <AErenstein@trinityconsultants.com>;Carey Slater <Carey.Slater@americangypsum.com>
Cc:Stonesifer, Jeff W. <JStonesifer@cabq.gov>;Joseph Marini <Jmarini@eaglematerials.com>;McKinstry, Michael W. <mmckinstry@cabq.gov>

1 attachments (186 KB)
AmerGyp_0752-M4mod_Modeling Waiver Request Review.pdf;

Adam,
The Air Quality Program (AQP) has finished reviewing the modeling waiver request submitted on July 16, 2024 on behalf of American Gypsum for the proposed modification to permit #0752-M4. The modeling waiver request is approved for both 1-hour and 8-hour CO for Unit DC-11. A modeling waiver is not required for other pollutants, averaging periods or emission units because none of those emissions are changing. Attached is the modeling waiver request review document. Please include this email and the waiver review document as part of your permit modification application package.

Thank you,
Kyle

From: Tumpane, Kyle
Sent: Wednesday, August 7, 2024 7:52 AM
To: Adam Erenstein <AErenstein@trinityconsultants.com>; Carey Slater <Carey.Slater@americangypsum.com>
Cc: Stonesifer, Jeff W. <JStonesifer@cabq.gov>; Joseph Marini <Jmarini@eaglematerials.com>
Subject: RE: Air Dispersion Modeling Waiver Request - American Gypsum Company

Adam,
Thank you for providing the document. I will let you know if I have any further questions during my review.

Thank you,
Kyle

From: Adam Erenstein <AErenstein@trinityconsultants.com>
Sent: Tuesday, August 6, 2024 3:21 PM
To: Tumpane, Kyle <ktumpane@cabq.gov>; Carey Slater <Carey.Slater@americangypsum.com>
Cc: Stonesifer, Jeff W. <JStonesifer@cabq.gov>; Joseph Marini <Jmarini@eaglematerials.com>
Subject: RE: Air Dispersion Modeling Waiver Request - American Gypsum Company

[EXTERNAL] Forward to phishing@cabq.gov and delete if an email causes any concern.

Kyle,
Please see attached. Contact me if you have any questions.

Regards,

Adam Erenstein
Principal Consultant, Manager of Consulting Services

P 505.266.6611 M 480.760.3860
Email: aerenstein@trinityconsultants.com
9400 Holly Avenue NE, Building 3, Suite B, Albuquerque, NM 87122

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Book time to meet with me

From: Tumpane, Kyle <ktumpane@cabq.gov>
Sent: Tuesday, August 6, 2024 2:56 PM
To: Adam Erenstein <AErenstein@trinityconsultants.com>; Carey Slater <Carey.Slater@americangypsum.com>
Cc: Stonesifer, Jeff W. <JStonesifer@cabq.gov>; Joseph Marini <Jmarini@eaglematerials.com>
Subject: RE: Air Dispersion Modeling Waiver Request - American Gypsum Company

Adam,
Can you or Carey please provide the full emissions guarantee? I see the clipped page you sent below but it is cut off. I would like to be able to review the full guarantee document.

Thank you,
Kyle

From: Adam Erenstein <AErenstein@trinityconsultants.com>
Sent: Tuesday, August 6, 2024 2:47 PM

To: Tumpane, Kyle <ktumpane@cabq.gov>; Carey Slater <Carey.Slater@americangypsum.com>
Cc: Stonesifer, Jeff W. <JStonesifer@cabq.gov>; Joseph Marini <Jmarini@eaglematerials.com>
Subject: RE: Air Dispersion Modeling Waiver Request - American Gypsum Company

Hi Kyle,
The cover letter references this page below for the emissions guarantee. Hope this helps.

EMISSIONS GUARANTEE

APPROVAL PROVISIONS

Maxon Crossfire Ladder Arrangement Burner
Maximum Firing rate: 51.2MM Btu/hr @ 50% Excess Air
Slate Air-Fuel ratio control

NOx	Less than 2.46 lb/hr
CO	Less than 16.2 lb/hr
Other	

Requirements and Conditions

Honeywell will guarantee, after acceptance by the customer of the combustion products being supplied by Honeywell ("Products"), that the stated burner(s) will achieve the emission performance stated on this form. This guarantee is valid through the Product warranty period agreed to at the time the burner is purchased. This guarantee applies to the Product(s) purchased within 6 months, and tested within 12 months, of the date for the installation described on this form. Failure to test within this time frame constitutes full acceptance of the Products. The content of this guarantee is restricted to the original installation only as referenced on this form. The guarantee is made only at the specific operating conditions stated on this form.

This guarantee is not a general guarantee for all Products, nor across all installations. Any unauthorized alterations to the Products, the control scheme, or relocation of the user equipment shall void this commitment. This emission guarantee requires the use of an air/fuel ratio control scheme as supplied by Honeywell. Additionally, this guarantee is valid only when the startup is performed or supervised by a Honeywell service technician or engineer, and the Products are maintained in accordance with Honeywell specifications. Honeywell will not be responsible for process or environmental influences on emission levels.

The guarantee may only be substantiated by an AETB accredited independent testing agency which has the required equipment capable of measuring emissions in a highly diluted air stream and such subastantiation will be at customer's sole expense. If required by Honeywell, the testing agency will sample emissions at a location in the process that accurately reflects the specific Product's performance, and may be as close as 12

Regards,

Adam Erenstein
Principal Consultant, Manager of Consulting Services

P 505.266.6611 M 480.760.3860
Email: aerenstein@trinityconsultants.com
9400 Holly Avenue NE, Building 3, Suite B, Albuquerque, NM 87122

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From: Tumpane, Kyle <ktumpane@cabq.gov>
Sent: Tuesday, August 6, 2024 10:11 AM
To: Carey Slater <Carey.Slater@americangypsum.com>; Adam Erenstein <AErenstein@trinityconsultants.com>
Cc: Stonesifer, Jeff W. <JStonesifer@cabq.gov>; Joseph Marini <Jmarini@eaglematerials.com>
Subject: RE: Air Dispersion Modeling Waiver Request - American Gypsum Company

Carey,
Thank you for providing that document. The single page in the attachment you sent provides a summary emission rate guarantee for NOx and CO. The page also seems to indicate that there should be other pages attached that contain the full emissions statement for the burner. Can you provide the other pages?

Thank you,
Kyle

From: Carey Slater <Carey.Slater@americangypsum.com>
Sent: Tuesday, August 6, 2024 9:41 AM
To: Tumpane, Kyle <ktumpane@cabq.gov>; Adam Erenstein <AErenstein@trinityconsultants.com>
Cc: Stonesifer, Jeff W. <JStonesifer@cabq.gov>; Joseph Marini <Jmarini@eaglematerials.com>
Subject: RE: Air Dispersion Modeling Waiver Request - American Gypsum Company

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Good Morning Kyle,

Can you review the attached and let me know if this is what you need?

Carey Slater
Plant Manager
American Gypsum Company
Albuquerque, New Mexico
(505) 346-2142

From: Tumpane, Kyle <ktumpane@cabq.gov>
Sent: Tuesday, August 6, 2024 9:12 AM
To: Carey Slater <Carey.Slater@americangypsum.com>; Adam Erenstein <AErenstein@trinityconsultants.com>
Cc: Stonesifer, Jeff W. <JStonesifer@cabq.gov>; Joseph Marini <Jmarini@eaglematerials.com>
Subject: RE: Air Dispersion Modeling Waiver Request - American Gypsum Company

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Adam,
Can you please provide documentation for the emissions guarantee from Honeywell referenced in the modeling waiver request? This emissions guarantee is used as support for the statement that all pollutant emission rates, except for CO, will stay the same as permitted rates. The AQP needs to see the documentation to verify that the other pollutant emission rates will remain as permitted as part of the modeling waiver request review.

Thank you,
Kyle

From: Carey Slater <Carey.Slater@americangypsum.com>
Sent: Tuesday, July 16, 2024 7:36 AM
To: Tumpane, Kyle <ktumpane@cabq.gov>; Adam Erenstein <AErenstein@trinityconsultants.com>
Cc: Stonesifer, Jeff W. <JStonesifer@cabq.gov>; Joseph Marini <Jmarini@eaglematerials.com>
Subject: RE: Air Dispersion Modeling Waiver Request - American Gypsum Company

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Thank you Kyle, have a great week.

Carey Slater
Plant Manager
American Gypsum Company
Albuquerque, New Mexico
(505) 346-2142

From: Tumpane, Kyle <ktumpane@cabq.gov>
Sent: Tuesday, July 16, 2024 7:33 AM
To: Adam Erenstein <AErenstein@trinityconsultants.com>
Cc: Stonesifer, Jeff W. <JStonesifer@cabq.gov>; Carey Slater <Carey.Slater@americangypsum.com>; Joseph Marini <Jmarini@eaglematerials.com>
Subject: RE: Air Dispersion Modeling Waiver Request - American Gypsum Company

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Adam,
The Air Quality Program (AQP) has received the modeling waiver request for the permit modification for American Gypsum. The AQP normally reviews waiver requests and responds within 6 weeks. The AQP will review this waiver request and respond as soon as possible.

Thank you,
Kyle

From: Adam Erenstein <AErenstein@trinityconsultants.com>
Sent: Monday, July 15, 2024 5:52 PM
To: Tumpane, Kyle <ktumpane@cabq.gov>
Cc: Stonesifer, Jeff W. <JStonesifer@cabq.gov>; Carey.Slater@americangypsum.com; Joseph Marini <Jmarini@eaglematerials.com>
Subject: Air Dispersion Modeling Waiver Request - American Gypsum Company

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Hi Kyle,
Thank you for the existing modeling waiver form. On behalf of American Gypsum Company, we are submitting the attached modeling waiver for your review. Please contact us if you have any questions.

Regards,

Adam Erenstein
Principal Consultant, Manager of Consulting Services

P 505.266.6611 M 480.760.3860
Email: aerenstein@trinityconsultants.com
9400 Holly Avenue NE, Building 3, Suite B, Albuquerque, NM 87122

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Book time to meet with me

From: Tumpane, Kyle <ktumpane@cabq.gov>
Sent: Monday, July 15, 2024 2:15 PM
To: Adam Erenstein <AErenstein@trinityconsultants.com>; Stonesifer, Jeff W. <JStonesifer@cabq.gov>
Subject: RE: Air Dispersion Modeling Waiver Request Form

Adam,
We have indeed been working on an updating Modeling Waiver Request Form but it is not ready yet. The form is not on our website. We provide it to consultants when requested. The updated form will hopefully be finished in the next few weeks. However, if you have a waiver request you are going to submit very soon you can use the existing form. I have attached it in case you need it.

Thank you,
Kyle

From: Adam Erenstein <AErenstein@trinityconsultants.com>
Sent: Saturday, July 13, 2024 12:27 PM
To: Stonesifer, Jeff W. <JStonesifer@cabq.gov>
Cc: Tumpane, Kyle <ktumpane@cabq.gov>
Subject: Air Dispersion Modeling Waiver Request Form

[EXTERNAL] Forward to phishing@cabq.gov and delete if an email causes any concern.

Jeff,
Hope you have been well. You mentioned in our meeting that there is an updated Air Dispersion Modeling Waiver Request Form on your website. I am having trouble locating it and was hoping you could send me the link to the new form.

Regards,

Adam Erenstein
Principal Consultant, Manager of Consulting Services

P 505.266.6611 M 480.760.3860
Email: aerenstein@trinityconsultants.com
9400 Holly Avenue NE, Building 3, Suite B, Albuquerque, NM 87122

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APPENDIX A. APPLICATION FORMS

Application for Air Pollutant Sources in Bernalillo County Source Registration (20.11.40 NMAC) and Construction Permits (20.11.41 NMAC) – Updated February 2022

Permit Application Checklist

Permit Review Fee Checklist

Compliance History Form

City of Albuquerque – Environmental Health Department
Air Quality Program

Please mail this application to **P.O. Box 1293, Albuquerque, NM 87103**
or hand deliver between 8:00 am – 5:00 pm Monday – Friday to:
3rd Floor, Suite 3023 – One Civic Plaza NW, Albuquerque, NM 87102
(505) 768-1972 aqd@cabq.gov

Application for Air Pollutant Sources in Bernalillo County
Source Registration (20.11.40 NMAC) and Construction Permits (20.11.41 NMAC)

Submittal Date:

Owner/Corporate Information ☒ **Check here and leave this section blank if information is exactly the same as Facility Information below.**

Company Name:			
Mailing Address:	City:	State:	Zip:
Company Phone:	Company Contact:		
Company Contact Title:	Phone:	E-mail:	

Stationary Source (Facility) Information: **Provide a plot plan (legal description/drawing of the facility property) with overlay sketch of facility processes, location of emission points, pollutant type, and distances to property boundaries.**

Facility Name: **Albuquerque Plant**			
Facility Physical Address: **4600 Paseo Del Norte**	City: **Albuquerque**	State: **NM**	Zip: **87109**
Facility Mailing Address (if different): **N/A**	City: **N/A**	State: **N/A**	Zip: **N/A**
Facility Contact: **Carey Slater**	Title: **Plant Manager**		
Phone: **(505) 346-2142**	E-mail: **Carey.Slater@americangypsum.com**		
Authorized Representative Name[1]: **N/A**	Authorized Representative Title: **N/A**		

Billing Information ☐ **Check here if same contact and mailing address as corporate** ☒ **Check here if same as facility**

Billing Company Name:			
Mailing Address:	City:	State:	Zip:
Billing Contact:	Title:		
Phone:	E-mail:		

Preparer/Consultant(s) Information ☐ **Check here and leave section blank if no Consultant used or Preparer is same as Facility Contact.**

Name: **Adam Erenstein**	Title: **Principal Consultant**		
Mailing Address: **9400 Holly Ave NE, Bldg 3, Suite B**	City: **Albuquerque**	State: **NM**	Zip: **87122**
Phone: **(505) 266-6611**	Email: **aerenstein@trinityconsultants.com**		

1. See 20.11.41.13(E)(13) NMAC.

Application for Air Pollutant Sources in Bernalillo County
Source Registration (20.11.40 NMAC) and Construction Permits (20.11.41 NMAC)

General Operation Information (if any question does not pertain to your facility, type N/A on the line or in the box)

Permitting action being requested (please refer to the definitions in 20.11.40 NMAC or 20.11.41 NMAC):			
☐ New Permit	☒ Permit Modification Current Permit #: **0752-M4**	☐ Technical Permit Revision Current Permit #:	☐ Administrative Permit Revision Current Permit #:
☐ New Registration Certificate	☐ Modification Current Reg. #:	☐ Technical Revision Current Reg. #:	☐ Administrative Revision Current Reg. #:
UTM coordinates of facility (Zone 13, NAD 83): **354,737 m E, 3,893,360 m N (Front Gate)**			
Facility type (*i.e.*, a description of your facility operations): **Gypsum Wallboard Manufacturing Plant**			
Standard Industrial Classification (SIC Code #): **3275**		North American Industry Classification System (NAICS Code #): **327420**	
Is this facility currently operating in Bernalillo County? **Yes**		If **YES**, list date of original construction: **1959** If **NO**, list date of planned startup: **N/A**	
Is the facility permanent? **Yes**		If **NO**, list dates for requested temporary operation: From **N/A** Through **N/A**	
Is the facility a portable stationary source? **No**		If **YES**, is the facility address listed above the main permitted location for this source? **N/A**	
Is the application for a physical or operational change, expansion, or reconstruction (*e.g.*, altering process, or adding, or replacing process or control equipment, etc.) to an existing facility? **No**			
Provide a description of the requested changes: **Existing Vertical Mill Roller Hot Gas Generator & Baghouse (Unit DC-11) will true-up lb/hr emissions of Carbon Monoxide (CO) from 2.12 to 16.2**			
What is the facility's operation? ☒ Continuous ☐ Intermittent ☐ Batch			
Estimated percent of production/operation:	Jan-Mar: **25%**	Apr-Jun: **25%**	Jul-Sep: **25%**	Oct-Dec: **25%**
Requested operating times of facility:	**24** hours/day	**7** days/week	**4** weeks/month	**12** months/year
Will there be special or seasonal operating times other than shown above? This includes monthly- or seasonally-varying hours. **No**				
If **YES**, please explain: **N/A**				
List raw materials processed: **Gypsum Ore**				
List saleable item(s) produced: **Gypsum Wallboard**				

USE INSTRUCTIONS: For the forms on the following pages, please do not alter or delete the existing footnotes or page breaks. If additional footnotes are needed then add them to the end of the existing footnote list for a given table. Only update the rows and cells within tables as necessary for your project. Unused rows can be deleted from tables. If multiple scenarios will be represented then the Uncontrolled and Controlled Emission Tables, and other tables as needed, can be duplicated and adjusted to indicate the different scenarios.

Regulated Emission Sources Table

(*E.g.*, Generator-Crusher-Screen-Conveyor-Boiler-Mixer-Spray Guns-Saws-Sander-Oven-Dryer-Furnace-Incinerator-Haul Road-Storage Pile, etc.) Match the Units listed on this Table to the same numbered line if also listed on Emissions Tables & Stack Table.

Unit Number and Description[1]		Manufacturer	Model #	Serial #	Manufacture Date	Installation Date	Modification Date[2]	Process Rate or Capacity (Hp, kW, Btu, ft^3, lbs, tons, yd^3, etc.)[3]	Fuel Type
Ex. 1.	Generator	Unigen	B-2500	A567321C	7/1996	7/1997	11/2020	250 Hp/HR	Diesel
Ex. 2.	Spray Gun	HVLP Systems	Spra-N-Stay 1100	K26-56-95	01/2017	11/2017	N/A	0.25 gal./HR	Electric Compressor
1a	**Kettle #1 (Combustion Stack)**	**North American**	**Unknown**	**Unknown**	**6/98**	**<2000**	**N/A**	**19 million Btu/hr**	**N/A**
1b	**Kettle #1 (Baghouse Stack)**	**North American**	**Unknown**	**Unknown**	**6/98**	**<2000**	**N/A**	**19 million Btu/hr**	**N/A**
2a	**Kettle #2 (Combustion Stack)**	**North American**	**Unknown**	**Unknown**	**10/96**	**<2000**	**N/A**	**13 million Btu/hr**	**N/A**
2b	**Kettle #2 (Baghouse Stack)**	**North American**	**Unknown**	**Unknown**	**10/96**	**<2000**	**N/A**	**13 million Btu/hr**	**N/A**
3a	**Kettle #3 (Combustion Stack)**	**North American**	**Unknown**	**Unknown**	**Unknown**	**<2000**	**N/A**	**13 million Btu/hr**	**N/A**
3b	**Kettle #3 (Baghouse Stack)**	**North American**	**Unknown**	**Unknown**	**Unknown**	**<2000**	**N/A**	**13 million Btu/hbr**	**N/A**
4a	**Kettle #4 (Combustion Stack)**	**North American**	**Unknown**	**Unknown**	**3/98**	**<2000**	**N/A**	**19 million Btu/hr**	**N/A**
4b	**Kettle #4 (Baghouse Stack)**	**North American**	**Unknown**	**Unknown**	**3/98**	**<2000**	**N/A**	**19 million Btu/hr**	**N/A**
6	**Raymond Mill #1**	**Raymond**	**Unknown**	**60501**	**1960**	**<2000**	**N/A**	**5 million Btu/hr**	**N/A**
7	**Raymond Mill #2**	**Raymond**	**Unknown**	**72009**	**1972**	**<2000**	**N/A**	**5 million Btu/hr**	**N/A**
101	**Raymond Mill #3**	**Raymond**	**Unknown**	**Unknown**	**Unknown**	**<2000**	**N/A**	**6 million Btu/hr**	**N/A**
8	**Miscellaneous Mill Equipment**	**FMC**	**MF20C**	**773313**	**12/97**	**<2000**	**N/A**	**110 tph**	**N/A**
9	**Rock Feeder and Hammer Mill Crusher**	**Williams**	**N/A**	**19655**	**Unknown**	**<2000**	**N/A**	**100 tph**	**N/A**
10	**Bucket Elevator and Two (2) Rock Tanks**	**Unknown**	**Unknown**	**Unknown**	**Unknown**	**<2000**	**N/A**	**100 tph**	**N/A**
11	**Stucco Silos and Equipment**	**Unknown**	**Unknown**	**Unknown**	**Unknown**	**<2000**	**N/A**	**65 tph**	**N/A**
12a	**Dump Truck to Stockpile**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**200 tph**	**N/A**

Unit Number and Description[1]		Manufacturer	Model #	Serial #	Manufacture Date	Installation Date	Modification Date[2]	Process Rate or Capacity (Hp, kW, Btu, ft^3, lbs, tons, yd^3, etc.)[3]	Fuel Type
	Front-End Loader Front-End Loader Traffic Haul Truck Traffic								
12b	**Stockpile Loader (Front-End Loader to Trucks)**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**200 tph**	**N/A**
13	**Materials Drop**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**60 tph**	**N/A**
14	**Ball Mill Crushers (6 Total)**	**John Broeders Machine CO LTD**	**BM-010**	**Varies**	**1997**	**<2000**	**N/A**	**3 tph (0.5 tph each)**	**N/A**
15	**Dryer**	**AKI, Inc.**	**Unknown**	**Unknown**	**9/98**	**<2000**	**N/A**	**100.3 million Btu/hr**	**N/A**
16	**Dryer Wet End Seal**	**AKI, Inc.**	**Unknown**	**Unknown**	**9/98**	**<2000**	**N/A**	**100.3 million Btu/hr**	**N/A**
17	**Final Trim Saw**	**Gypsum Technologies**	**Unknown**	**Unknown**	**9/98**	**<2000**	**N/A**	**81 tph**	**N/A**
18	**Reclaimed Wallboard Recylcing System**	**Unknown**	**N/A**	**N/A**	**> 2000**	**>2000**	**N/A**	**15 tph**	**N/A**
DC-01	**Material Unloading (Material Handling)**	**IAC**	**120TB-BHT-100:S6**	**3120488**	**November 2021**	**N/A**	**N/A**	**6,500 acfm**	**N/A**
DC-02	**Mill Feed (Material Handling)**	**IAC**	**120TB-BHT-100:S6**	**3120489**	**November 2021**	**N/A**	**N/A**	**6,000 acfm**	**N/A**
DC-03	**Rock Storage (Material Handling)**	**IAC**	**120TB-BVT-64:S6**	**3030546**	**November 2021**	**N/A**	**N/A**	**4,000 acfm**	**N/A**
DC-11	**Mill and Hot Gas Generator (Vertical Mill)**	**Redecam *Updated Burner manufactured by Honeywell**	**2 SDPZ 60x 10/7.5 W**	**C121011**	**06/2022**	**2024**	**N/A**	**51.2 MMB tu/hr**	**N/A**
DC-11a	**Stucco Siles and Equipment**	**Sta-Clean**	**56-833-ADS**	**16008**	**Unknown**	**N/A**	**N/A**	**5,225 acfm**	**N/A**
DC-12	**Conditioning (Stucco)**	**IAC**	**120TB-BHT-100:S6**	**3120490**	**November 2021**	**N/A**	**N/A**	**6,200 acfm**	**N/A**
DC-13	**Start-up Bin (Material Handling)**	**IAC**	**120TB-BVT-36:S6**	**3030547**	**November 2021**	**N/A**	**N/A**	**2,000 acfm**	**N/A**
FUG-01	**Dump to Hopper**	**CCC Group**	**N/A**	**N/A**	**3/2023**	**N/A**	**N/A**	**110 tph**	**N/A**
HAUL-1	**Unpaved Haul Roads**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**120 trucks entering the facility per day**	**N/A**

Unit Number and Description[1]		Manufacturer	Model #	Serial #	Manufacture Date	Installation Date	Modification Date[2]	Process Rate or Capacity (Hp, kW, Btu, ft^3, lbs, tons, yd^3, etc.)[3]	Fuel Type
HAUL-2	**Paved Haul Roads**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**120 trucks entering the facility per day**	**N/A**
HAUL-3	**Truck Staging Area**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**120 trucks entering the facility per day**	**N/A**

NOTE: To add extra rows in Word, click anywhere in the last row. A plus (+) sign should appear on the bottom right corner of the row. Click the plus (+) sign to add a row. Repeat as needed.

1. Unit numbers must correspond to unit numbers in the previous permit unless a complete cross reference table of all units in both permits is provided.
2. To determine whether a unit has been modified, evaluate if changes have been made to the unit that impact emissions or that trigger modification as defined in 20.11.41.7(U) NMAC. If not, put N/A.
3. Basis for Equipment Process Rate or Capacity (*e.g.*, Manufacturer's Data, Field Observation/Test, etc.) _____
   Submit information for each unit as an attachment.

Emissions Control Equipment Table

Control Equipment Units listed on this Table should either match up to the same Unit number as listed on the Regulated Emission Sources, Controlled Emissions and Stack Parameters Tables (if the control equipment is integrated with the emission unit) or should have a distinct Control Equipment Unit Number and that number should then also be listed on the Stack Parameters Table.

Control Equipment Unit Number and Description		Controlling Emissions for Unit Number(s)	Manufacturer	Model # | Serial #	Date Installed	Controlled Pollutant(s)	% Control Efficiency[1]	Method Used to Estimate Efficiency	Rated Process Rate or Capacity or Flow
Ex. 8b	Baghouse	3,4,5	Best Baghouses	C-12010 | A16925	11/12/2019	PM_{10}, $PM_{2.5}$	99%	Manufacturer's Data	1,500 ACFM
	Baghouse	**1b**	**CP Environmental**	**120 TNFD | 4976**			**99.7%**		**12,000 acfm**
	Baghouse	**2b**	**CP Environmental**	**120 TNFD 081 C | 4977**			**99.7%**		**6,000 acfm**
	Baghouse	**3b**	**CP Environmental**	**120 TNFD 196 C | 4977**			**99.7%**		**6,000 acfm**
	Baghouse	**4b**	**CP Environmental**	**120 TNFD 196 C | 4976**			**99.7%**		**12,000 acfm**
	Pulsejet Baghouse (Polyester Bags)	**6**	**CP Environmental**	**84 TNFW 147C | 4267**			**99%**		**8,000 acfm**
	Pulsejet Baghouse (Polyester Bags)	**7**	**CP Environmental**	**84 TNFW 147C | 4267**			**99%**		**8,000 acfm**
	Pulsejet Baghouse (Polyester Bags)	**101**	**CP Environmental**	**120 TNFD 196 C | 4969**			**99%**		**12,500 acfm**
	Pulsejet Baghouse (Polyester Bags)	**8**	**CP Environmental**	**84 NF 100C | 4394**			**98%**		**5,000 acfm**
	Pulsejet Baghouse (36 Polyester Bags)	**9**	**Sta-Clean**	**36-833-ADS | 16005**			**99.5%**		**2,300 acfm**
	Pulsejet Baghouse (36 Polyester Bags)	**10**	**Sta-Clean**	**36-88-BDS | 16006**			**98%**		**2,300 acfm**
	Pulsejet Baghouse (56 Polyester Bags)	**11**	**Sta-Clean**	**56-833-ADS | 16008**			**98%**		**3,600 acfm**
	Pulsejet Baghouse (25 Baghouse Bags)	**14**	**IAC**	**100-BVT-A2 25 | Unknown**			**98%**		**3,600 acfm**
	Pulsejet Baghouse (80 Polyester Bags)	**17**	**IAC**	**120TB-BHT-100:S6 | Unknown**			**0.02 gr/ft^3**		**5,000 acfm**
	Reclaimed Wallboard Recylcing System	**18**	**IAC**	**120TB-BHT-200:S6 | Unknown**			**0.009 gr/ft^3**		**14,000 acfm**
	Unloading Baghouse (Material Unloading)	**DC-01**	**IAC**	**120TB-BHT-100:S6 | 3120488**			**0.005 gr/ft^3**		**6,500 acfm**
	Mill Feed Baghouse	**DC-02**	**IAC**	**120TB-BHT-**			**0.005 gr/ft^3**		**6,000 acfm**

Control Equipment Unit Number and Description		Controlling Emissions for Unit Number(s)	Manufacturer	Model # | Serial #	Date Installed	Controlled Pollutant(s)	% Control Efficiency[1]	Method Used to Estimate Efficiency	Rated Process Rate or Capacity or Flow
				100:S6 | 3120489					
	Rock Storage Baghouse	**DC-03**	**IAC**	**120TB-BVT-64:S6 | 3030546**			**0.005 gr/ft^3**		**4,000 acfm**
	Calciner (Hot Gas Generator) Baghouse	**DC-11**	**Redecam**	**2 SDPZ 60x10/7.5 W | C121011**	**N/A**	**PM_{10}, $PM_{2.5}$**	**0.005 gr/ft^3**	**Manufacturer's Data**	**50,000 acfm**
	Stucco Silos and Equipment Baghouse	**DC-11a**	**Sta-Clean**	**56-833-ADS | 16008**			**0.005 gr/ft^3**		**5,225 acfm**
	Conditioning Baghouse	**DC-12**	**IAC**	**120TB-BHT-100:S6 | 3120490**			**0.005 gr/ft^3**		**6,200 acfm**
	Start-up Baghouse	**DC-13**	**IAC**	**120TB-BVT-36:S6 | 3030547**			**0.005 gr/ft^3**		**2,000 acfm**

NOTE: To add extra rows in Word, click anywhere in the last row. A plus (+) sign should appear on the bottom right corner of the row. Click the plus (+) sign to add a row. Repeat as needed.

1. Basis for Control Equipment % Efficiency (*e.g.*, Manufacturer's Data, Field Observation/Test, AP-42, etc.). _____
   Submit information for each unit as an attachment.

Exempted Sources and Exempted Activities Table

See 20.11.41 NMAC for exemptions.

Unit Number and Description		Manufacturer	Model #	Serial #	Manufacture Date	Installation Date	Modification Date[1]	Process Rate or Capacity (Hp, kW, Btu, ft^3, lbs, tons, yd^3, etc.)[2]	Fuel Type
Ex. 1.	Boiler	Unigen	B-2500	A567321C	7/1996	7/1997	11/2020	3.5 MMBtu/HR	Natural Gas
Ex. 2.	Hot Water Heater	HVLP Systems	6500A	K26-56-95	01/2017	11/2017	N/A	80 gal./HR	Natural Gas
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NOTE: To add extra rows in Word, click anywhere in the last row. A plus (+) sign should appear on the bottom right corner of the row. Click the plus (+) sign to add a row. Repeat as needed.

1. To determine whether a unit has been modified, evaluate if changes have been made to the unit that impact emissions or that trigger modification as defined in 20.11.41.7(U) NMAC. Also, consider if any changes that were made alter the status from exempt to non-exempt. If not, put N/A.
2. Basis for Equipment Process Rate or Capacity (*e.g.*, Manufacturer's Data, Field Observation/Test, etc.) _____
   Submit information for each unit as an attachment.

Uncontrolled Emissions Table

(Process potential under physical/operational limitations during a 24 hr/day and 365 day/year = 8760 hrs)

Regulated Emission Units listed on this Table should match up to the same numbered line and Unit as listed on the Regulated Emissions and Controlled Tables. List total HAP values per Emission Unit if overall HAP total for the facility ≥ 1 ton/yr.

Unit Number*	Nitrogen Oxides (NO_x)		Carbon Monoxide (CO)		Nonmethane Hydrocarbons/Volatile Organic Compounds (NMHC/VOCs)		Sulfur Dioxide (SO_2)		Particulate Matter ≤ 10 Microns (PM_{10})		Particulate Matter ≤ 2.5 Microns ($PM_{2.5}$)		Hazardous Air Pollutants (HAPs)		Method(s) used for Determination of Emissions (AP-42, Material Balance, Field Tests, etc.)
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	
1. Kettle #1	2.85	9.98	0.28	0.98	0.1	0.36	0.028	0.098	0.14	0.5	0.14	0.5	**N/A**	**N/A**	**AP-42**
1b. Kettle #2	-	-	-	-	-	-	-	-	468	2049.84	147.6	646.49	**N/A**	**N/A**	**AP-42**
2a. Kettle #2	1.90	6.65	0.2	0.7	0.07	0.25	0.019	0.067	0.097	0.34	0.097	0.34	**N/A**	**N/A**	**AP-42**
2b. Kettle #2	-	-	-	-	-	-	-	-	286	1252.68	90.2	395.08	**N/A**	**N/A**	**AP-42**
3a. Kettle #3	1.90	6.65	0.2	0.7	0.07	0.25	0.019	0.067	0.097	0.34	0.097	0.34	**N/A**	**N/A**	**AP-42**
3b. Kettle #3	-	-	-	-	-	-	-	-	468	2049.84	147.6	646.49	**N/A**	**N/A**	**AP-42**
4a. Kettle #4	2.85	9.98	0.28	0.98	0.1	0.36	0.028	0.098	0.14	0.5	0.14	0.5	**N/A**	**N/A**	**AP-42**
4b. Kettle #4	-	-	-	-	-	-	-	-	468	2049.84	147.6	646.49	**N/A**	**N/A**	**AP-42**
6. Raymond Mill #1	0.49	1.72	0.43	1.51	0.027	0.094	0.0074	0.026	59.71	261.48	19.93	87.25	**N/A**	**N/A**	**AP-42**
7. Raymond Mill #2	0.49	1.72	0.43	1.51	0.027	0.094	0.0074	0.026	59.71	261.48	19.93	87.25	**N/A**	**N/A**	**AP-42**
101. Raymond Mill #3	0.588	2.06	0.43	1.51	0.032	0.11	0.0088	0.031	70.24	307.63	23.44	102.65	**N/A**	**N/A**	**AP-42**
8. EU 8 (Misc. Mill Equip)	-	-	-	-	-	-	-	-	5.69	24.92	1.9	8.32	**N/A**	**N/A**	**AP-42**

9. Rock Feeder and Hammermill Crusher	-	-	-	-	-	-	-	-	0.26	1.16	0.18	0.77	N/A	N/A	AP-42
10. Bucket Elevator and Rock Tank	-	-	-	-	-	-	-	-	0.12	0.53	0.1	0.43	N/A	N/A	AP-42
11. Stucco Silos and Equipment	-	-	-	-	-	-	-	-	4.36	19.1	1.45	6.35	N/A	N/A	AP-42
12a. Stockpile	-	-	-	-	-	-	-	-	1.16	1.77	0.12	0.18	N/A	N/A	AP-42
12b. Stockpile Loader	-	-	-	-	-	-	-	-	0.02	0.002	0.003	0.0003	N/A	N/A	AP-42
13. Material Drop	-	-	-	-	-	-	-	-	0.22	0.96	0.14	0.61	N/A	N/A	AP-42
14. Ball Mill Crushers	-	-	-	-	-	-	-	-	0.014	0.059	0.0049	0.021	N/A	N/A	AP-42
15. Dryer	9.8	43.1	8.3	36.2	0.54	2.4	0.15	0.65	0.75	3.27	0.75	3.27	N/A	N/A	AP-42
16. Dryer Wet End Seal	0.1	0.43	0.08	0.36	0.01	0.02	0.0023	0.01	0.0075	0.033	0.0075	0.033	N/A	N/A	AP-42
17. Final Trim	-	-	-	-	-	-	-	-	456.76	2000.61	152.26	666.9	N/A	N/A	AP-42
18. Reclaimed Wallboard Recycling System[1]	-	-	-	-	-	-	-	-	108	473.04	16.35	71.63	N/A	N/A	AP-42
DC-01 – Unloading Baghouse	-	-	-	-	-	-	-	-	27.86	122.01	4.22	18.48	N/A	N/A	AP-42
DC-02 – Mill Feed Baghouse	-	-	-	-	-	-	-	-	25.71	112.63	3.89	17.06	N/A	N/A	AP-42
DC-03 – Rock Storage Baghouse	-	-	-	-	-	-	-	-	17.14	75.09	2.6	11.37	N/A	N/A	AP-42

DC-11a – Stucco Silos and Equipment	-	-	-	-	-	-	-	-	22.39	98.08	3.39	14.85	N/A	N/A	AP-42
DC-11 – Mill Baghouse	2.46	10.76	16.2	70.95	0.29	1.28	0.032	0.14	244.49	1070.87	62.65	274.42	N/A	N/A	AP-42
DC-12 – Conditioning Baghouse System	-	-	-	-	-	-	-	-	26.57	116.38	4.02	17.62	N/A	N/A	AP-42
DC-13 – Start-up Baghouse	-	-	-	-	-	-	-	-	8.57	37.54	1.3	5.69	N/A	N/A	AP-42
FUG-01 – Dump to Hopper	-	-	-	-	-	-	-	-	0.0018	0.0077	0.00027	0.0012	N/A	N/A	AP-42
HAUL-1 – Unpaved Haul Roads	-	-		-	-	-	-	-	4.99	12.7	0.5	1.27	N/A	N/A	AP-42
HAUL-2 – Paved Haul Roads	-	-		-	-	-	-	-	0.12	0.36	0.03	0.089	N/A	N/A	AP-42
HAUL-3 – Truck Staging Area	-	-	-	-	-	-	-	-	3.65	6.45	0.36	0.64	N/A	N/A	AP-42
Totals of Uncontrolled Emissions	**23.43**	**93.03**	26.83	**115.40**	**1.27**	**5.22**	**0.30**	**1.21**	**3306.99**	**14461.88**	**1000.60**	**4379.87**	**N/A**	**N/A**	

NOTE: To add extra rows in Word, click anywhere in the second-to-last row. A plus (+) sign should appear on the bottom right corner of the row. Click the plus (+) sign to add a row. Repeat as needed.

*A permit is required and this application along with the additional checklist information requested on the Permit Application checklist must be provided if:

(1) any one of these process units or combination of units, has an uncontrolled emission rate greater than or equal to (≥) 10 lbs/hr or 25 tons/yr for any of the above pollutants, excluding HAPs, based on 8,760 hours of operation; or

(2) any one of these process units or combination of units, has an uncontrolled emission rate ≥ 2 tons/yr for any single HAP or ≥ 5 tons/yr for any combination of HAPs based on 8,760 hours of operation; or

(3) any one of these process units or combination of units, has an uncontrolled emission rate ≥ 5 tons/yr for lead (Pb) or any combination of lead and its compounds based on 8,760 hours of operation; or

(4) any one of the process units or combination of units is subject to an Air Board or federal emission limit or standard.

* If all of these process units, individually and in combination, have an uncontrolled emission rate less than (<) 10 lbs/hr or 25 tons/yr for all of the above pollutants (based on 8,760 hours of operation), but > 1 ton/yr for any of the above pollutants, then a source registration is required. A Registration is required, at minimum, for any amount of HAP emissions. Please complete the remainder of this form.

Controlled Emissions Table

(Based on current operations with emission controls OR requested operations with emission controls)

Regulated Emission Units listed on this Table should match up to the same numbered line and Unit as listed on the Regulated Emissions and Uncontrolled Tables. List total HAP values per Emission Unit if overall HAP total for the facility is ≥ 1 ton/yr.

Unit Number	Nitrogen Oxides (NO_X)		Carbon Monoxide (CO)		Nonmethane Hydrocarbons/Volatile Organic Compounds (NMHC/VOCs)		Sulfur Dioxide (SO_2)		Particulate Matter ≤ 10 Microns (PM_{10})		Particulate Matter ≤ 2.5 Microns ($PM_{2.5}$)		Hazardous Air Pollutants (HAPs)		Control Method	% Efficiency[1]
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr		
1. Kettle #1	2.85	9.98	0.28	0.98	0.10	0.36	0.028	0.098	0.14	0.50	0.14	0.50	**N/A**	**N/A**	**N/A**	**N/A**
1b. Kettle #2	-	-	-	-	-	-	-	-	1.40	6.15	0.44	1.94	**N/A**	**N/A**	**Baghouse**	**99.7**
2a. Kettle #2	1.90	6.65	0.20	0.70	0.070	0.25	0.019	0.067	0.097	0.34	0.097	0.34	**N/A**	**N/A**	**N/A**	**N/A**
2b. Kettle #2	-	-	-	-	-	-	-	-	0.86	3.76	0.27	1.19	**N/A**	**N/A**	**Baghouse**	**99.7**
3a. Kettle #3	1.90	6.65	0.20	0.70	0.070	0.25	0.019	0.067	0.097	0.34	0.097	0.34	**N/A**	**N/A**	**N/A**	**N/A**
3b. Kettle #3	-	-	-	-	-	-	-	-	1.40	6.15	0.44	1.94	**N/A**	**N/A**	**Baghouse**	**99.7**
4a. Kettle #4	2.85	9.98	0.28	0.98	0.10	0.36	0.028	0.098	0.14	0.50	0.14	0.50	**N/A**	**N/A**	**N/A**	**N/A**
4b. Kettle #4	-	-	-	-	-	-	-	-	1.40	6.15	0.44	1.94	**N/A**	**N/A**	**Baghouse**	**99.7**
6. Raymond Mill #1	0.49	1.72	0.43	1.51	0.027	0.094	0.0074	0.026	0.63	2.74	0.24	1.00	**N/A**	**N/A**	**Pulsejet Baghouse (Polyester Bags)**	**99**
7. Raymond Mill #2	0.49	1.72	0.43	1.51	0.027	0.094	0.0074	0.026	0.63	2.74	0.24	1.00	**N/A**	**N/A**	**Pulsejet Baghouse (Polyester Bags)**	**99**

101. Raymond Mill #3	0.59	2.06	0.43	1.51	0.032	0.11	0.0088	0.031	0.75	3.23	0.28	1.18	N/A	N/A	Pulsejet Baghouse (Polyester Bags)	99
8. EU 8 (Misc. Mill Equip)	-	-	-	-	-	-	-	-	0.11	0.50	0.040	0.17	N/A	N/A	Pulsejet Baghouse (Polyester Bags)	99
9. Rock Feeder and Hammermill Crusher	-	-	-	-	-	-	-	-	0.0053	0.023	0.0035	0.015	N/A	N/A	Pulsejet Baghouse (36 Polyester Bags)	99.5
10. Bucket Elevator and Rock Tank	-	-	-	-	-	-	-	-	0.0024	0.011	0.0020	0.0087	N/A	N/A	Pulsejet Baghouse (36 Polyester Bags)	98
11. Stucco Silos and Equipment	-	-	-	-	-	-	-	-	0.090	0.38	0.030	0.13	N/A	N/A	Pulsejet Baghouse (56 Polyester Bags)	98
12a. Stockpile	-	-	-	-	-	-	-	-	0.48	1.67	0.051	0.180	N/A	N/A	N/A	N/A
12b. Stockpile Loader	-	-	-	-	-	-	-	-	0.020	0.0480	0.0030	7.30E-03	N/A	N/A	N/A	N/A
13. Material Drop	-	-	-	-	-	-	-	-	0.11	0.49	0.040	0.16	N/A	N/A	N/A	N/A
14. Ball Mill Crushers	-	-	-	-	-	-	-	-	0.00024	0.0012	0.000097	0.00043	N/A	N/A	Pulsejet Baghouse (25 Baghouse Bags)	98
15. Dryer	9.80	43.10	8.30	36.20	0.54	2.40	0.15	0.65	0.75	3.27	0.75	3.27	N/A	N/A	N/A	N/A
16. Dryer Wet End Seal	0.10	0.43	0.080	0.36	0.010	0.020	0.0023	0.010	0.0075	0.033	0.0075	0.033	N/A	N/A	N/A	N/A

17. Final Trim	-	-	-	-	-	-	-	-	0.86	3.75	0.86	3.75	N/A	N/A	Pulsejet Baghouse (80 Polyester Bags)	0.02 gr/ft^3
18. Reclaimed Wallboard Recycling System[1]	-	-	-	-	-	-	-	-	1.08	4.73	0.16	0.72	N/A	N/A	Reclaimed Wallboard Recylcing System	0.009 gr/ft^3
DC-01 – Unloading Baghouse	-	-	-	-	-	-	-	-	0.28	1.22	0.042	0.18	N/A	N/A	Unloading Baghouse (Material Unloading)	0.005 gr/ft^3
DC-02 – Mill Feed Baghouse	-	-	-	-	-	-	-	-	0.26	1.13	0.039	0.17	N/A	N/A	Mill Feed Baghouse	0.005 gr/ft^3
DC-03 – Rock Storage Baghouse	-	-	-	-	-	-	-	-	0.17	0.75	0.026	0.11	N/A	N/A	Rock Storage Baghouse	0.005 gr/ft^3
DC-11a – Stucco Silos and Equipment	-	-	-	-	-	-	-	-	0.22	0.98	0.034	0.15	N/A	N/A	Stucco Silos and Equipment Baghouse	0.005 gr/ft^3
DC-11 – Mill Baghouse	2.46	10.76	16.20	70.95	0.29	1.28	0.032	0.14	2.44	10.71	0.63	2.74	N/A	N/A	Calciner (Hot Gas Generator) Baghouse	0.005 gr/ft^3
DC-12 – Conditioning Baghouse System	-	-	-	-	-	-	-	-	0.27	1.16	0.040	0.18	N/A	N/A	Conditioning Baghouse	0.005 gr/ft^3
DC-13 – Start-up Baghouse	-	-	-	-	-	-	-	-	0.086	0.38	0.013	0.057	N/A	N/A	Start-up Baghouse	0.005 gr/ft^3
FUG-01 – Dump to Hopper	-	-	-	-	-	-	-	-	0.0018	0.0077	0.00027	0.0012	N/A	N/A	N/A	N/A

HAUL-1 – Unpaved Haul Roads	-	-	-	-	-	-	-	-	2.00	5.08	0.20	0.51	N/A	N/A	N/A	N/A
HAUL-2 – Paved Haul Roads	-	-	-	-	-	-	-	-	0.12	0.36	0.030	0.089	N/A	N/A	N/A	N/A
HAUL-3 – Truck Staging Area	-	-	-	-	-	-	-	-	1.46	2.58	0.15	0.26	N/A	N/A	N/A	N/A
Totals of Controlled Emissions	**23.43**	**93.03**	**26.83**	**115.40**	**1.27**	**5.21**	**0.30**	**1.21**	**18.38**	**71.86**	**5.97**	**24.75**	**N/A**	**N/A**		

NOTE: To add extra rows in Word, click anywhere in the second-to-last row. A plus (+) sign should appear on the bottom right corner of the row. Click the plus (+) sign to add a row. Repeat as needed.

1. Basis for Control Method % Efficiency (*e.g.*, Manufacturer's Data, Field Observation/Test, AP-42, etc.). **Manufacturer Guarantee**
   Submit information for each unit as an attachment.

Hazardous Air Pollutants (HAPs) Emissions Table

Report the Potential Emission Rate for each HAP from each source on the Regulated Emission Sources Table that emits a given HAP. Report individual HAPs with ≥ 1 ton/yr total emissions for the facility on this table. Otherwise, report total HAP emissions for each source that emits HAPs and report individual HAPs in the accompanying application package in association with emission calculations. If this application is for a Registration solely due to HAP emissions, report the largest HAP emissions on this table and the rest, if any, in the accompanying application package.

Unit Number	Total HAPs															
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Example 1.	6.3	18.2	3.2	8.5	2.3	7.7	0.5	1.0	0.3	1.0	N/A	N/A	N/A	N/A	N/A	N/A
N/A – There are no HAP emissions which are being modified as part of this application. HAP emissions are not listed out in Permit #0752-M4																
Totals of HAPs for all units:																

NOTE: To add extra rows in Word, click anywhere in the second-to-last row. A plus (+) sign should appear on the bottom right corner of the row. Click the plus (+) sign to add a row. Repeat as needed.

Use Instructions: Copy and paste the HAPs table here if need to list more individual HAPs.

Purchased Hazardous Air Pollutant Table*

Product Categories (Coatings, Solvents, Thinners, etc.)	Hazardous Air Pollutant (HAP), or Volatile Hazardous Air Pollutant (VHAP) Primary To The Representative As Purchased Product	Chemical Abstract Service (CAS) Number of HAP or VHAP from Representative As Purchased Product	HAP or VHAP Concentration of Representative As Purchased Product (pounds/gallon, or %)	Concentration Determination (CPDS, SDS, etc.)[1]	Total Product Purchases For Category	(-)	Quantity of Product Recovered & Disposed For Category	(=)	Total Product Usage For Category
N/A – There are no Purchased HAPs to report as part of this permit modification.									
Example 1. Surface Coatings	Xylene	1330207	4.0 lbs/gal	SDS	lb/yr 100 gal/yr	(-)	lb/yr 0 gal/yr	(=)	lb/yr 100 gal/yr
Example 2. Cleaning Solvents	Toluene	108883	70%	Product Label	lb/yr 200 gal/yr	(-)	lb/yr 50 gal/yr	(=)	lb/yr 150 gal/yr
1.					lb/yr gal/yr	(-)	lb/yr gal/yr	(=)	lb/yr gal/yr
2.					lb/yr gal/yr	(-)	lb/yr gal/yr	(=)	lb/yr gal/yr
3.					lb/yr gal/yr	(-)	lb/yr gal/yr	(=)	lb/yr gal/yr
4.					lb/yr gal/yr	(-)	lb/yr gal/yr	(=)	lb/yr gal/yr
5.					lb/yr gal/yr	(-)	lb/yr gal/yr	(=)	lb/yr gal/yr
6.					lb/yr gal/yr	(-)	lb/yr gal/yr	(=)	lb/yr gal/yr
7.					lb/yr gal/yr	(-)	lb/yr gal/yr	(=)	lb/yr gal/yr
8.					lb/yr gal/yr	(-)	lb/yr gal/yr	(=)	lb/yr gal/yr
9.					lb/yr gal/yr	(-)	lb/yr gal/yr	(=)	lb/yr gal/yr
.					lb/yr gal/yr	(-)	lb/yr gal/yr	(=)	lb/yr gal/yr
TOTALS					lb/yr gal/yr	(-)	lb/yr gal/yr	(=)	lb/yr gal/yr

NOTE: To add extra rows in Word, click anywhere in the second-to-last row. A plus (+) sign should appear on the bottom right corner of the row. Click the plus (+) sign to add a row. Repeat as needed.

NOTE: Product purchases, recovery/disposal and usage should be converted to the units listed in this table. If units cannot be converted please contact the Air Quality Program prior to making changes to this table.

1. Submit, as an attachment, information on one (1) product from each Category listed above which best represents the average of all the products purchased in that Category. CPDS = Certified Product Data Sheet; SDS = Safety Data Sheet

*** A Registration is required, at minimum, for any amount of HAP or VHAP emission.**
Emissions from purchased HAP usage should be accounted for on previous tables as appropriate.
A permit may be required for these emissions if the source meets the requirements of 20.11.41 NMAC.

Material and Fuel Storage Table

(*E.g.*, Tanks, barrels, silos, stockpiles, etc.)

Storage Equipment		Product Stored	Capacity (bbls, tons, gals, acres, etc.)	Above or Below Ground	Construction (Welded, riveted) & Color	Installation Date	Loading Rate[1]	Offloading Rate[1]	True Vapor Pressure	Control Method	Seal Type	% Eff.[2]
Ex. 1.	Tank	Diesel Fuel	5,000 gal.	Below	Welded/Brown	3/1993	3,000 gal/hr	500 gal/hr	N/A	N/A	N/A	N/A
Ex. 2.	Barrels	Solvent	55 gal. drum	Above	Welded/Green	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A – There are no proposed changes to material and fuel storage as part of this application.												

NOTE: To add extra rows in Word, click anywhere in the last row. A plus (+) sign should appear on the bottom right corner of the row. Click the plus (+) sign to add a row. Repeat as needed.

1. Basis for Loading/Offloading Rate (*e.g.*, Manufacturer's Data, Field Observation/Test, etc.). _____
   Submit information for each unit as an attachment.
2. Basis for Control Method % Efficiency (*e.g.*, Manufacturer's Data, Field Observation/Test, AP-42, etc.). _____
   Submit information for each unit as an attachment.

Stack Parameters Table

If any equipment from the Regulated Emission Sources Table is also listed in this Stack Table, use the same numbered line for the emission unit on both tables to show the association between the Process Equipment and its stack.

Unit Number and Description	Pollutant (CO, NOx, PM_{10}, etc.)	UTM Easting (m)	UTM Northing (m)	Stack Height (ft)	Stack Exit Temp. (°F)	Stack Velocity (fps)	Stack Flow Rate (acfm)	Stack Inside Diameter (ft)	Stack Type
1a. Kettle #1 (Combustion Stack)	**NO_X, CO, VOC, SO_2, PM_{10}, $PM_{2.5}$**	**354766.00**	**3893283.00**	**85.60**	**750**	**23.58**	**10,000**	**3.00**	**Vertical**
1b. Kettle #1 (Baghouse Stack)	**PM_{10}, $PM_{2.5}$**	**354768.00**	**3893286.00**	**82.20**	**320**	**46.91**	**12,000**	**2.33**	**Vertical**
2a. Kettle #2 (Combustion Stack)	**NO_X, CO, VOC, SO_2, PM_{10}, $PM_{2.5}$**	**354760.00**	**3893283.00**	**85.60**	**750**	**16.50**	**7,000**	**3.00**	**Vertical**
2b. Kettle #2 (Baghouse Stack)	**PM_{10}, $PM_{2.5}$**	**354761.00**	**3893285.00**	**82.20**	**320**	**46.21**	**6,000**	**1.66**	**Vertical**
3a. Kettle #3 (Combustion Stack)	**NO_X, CO, VOC, SO_2, PM_{10}, $PM_{2.5}$**	**354753.00**	**3893283.00**	**85.60**	**750**	**23.58**	**10,000**	**3.00**	**Vertical**
3b. Kettle #3 (Baghouse Stack)	**PM_{10}, $PM_{2.5}$**	**354754.00**	**3893285.00**	**82.20**	**320**	**46.21**	**6,000**	**1.66**	**Vertical**
4a. Kettle #4 (Combustion Stack)	**NO_X, CO, VOC, SO_2, PM_{10}, $PM_{2.5}$**	**354748.00**	**3893283.00**	**85.60**	**750**	**23.58**	**10,000**	**3.00**	**Vertical**
4b. Kettle #4 (Baghouse Stack)	**PM_{10}, $PM_{2.5}$**	**354754.00**	**3893289.00**	**82.20**	**320**	**46.91**	**12,000**	**2.33**	**Vertical**
6. Raymond Mill #1	**NO_X, CO, VOC, SO_2, PM_{10}, $PM_{2.5}$**	**354760.00**	**3893284.00**	**82.20**	**140**	**52.40**	**8,000**	**1.80**	**Vertical**
7. Raymond Mill #2	**NO_X, CO, VOC, SO_2, PM_{10}, $PM_{2.5}$**	**354751.00**	**3893294.00**	**82.20**	**140**	**52.40**	**8,000**	**1.80**	**Vertical**
101. Raymond Mill #3	**NO_X, CO, VOC, SO_2, PM_{10}, $PM_{2.5}$**	**354769.00**	**3893305.00**	**82.20**	**140**	**81.87**	**12,500**	**1.80**	**Vertical**
8. Misc. Mill Equipment	**PM_{10}, $PM_{2.5}$**	**354770.00**	**3893294.00**	**82.20**	**70**	**59.98**	**5,000**	**1.33**	**Vertical**
9. Rock Feeder and Hammermill Crusher	**PM_{10}, $PM_{2.5}$**	**354737.00**	**3893301.00**	**16.75**	**70**	**48.81**	**2,300**	**1.00**	**Vertical**
10. Bucket Elevator and Rock Tank	**PM_{10}, $PM_{2.5}$**	**354761.00**	**3893301.00**	**70.00**	**70**	**48.81**	**2,300**	**1.00**	**Vertical**
11. Stucco Silos and Equipment	**PM_{10}, $PM_{2.5}$**	**354795.00**	**3893286.00**	**82.20**	**70**	**48.89**	**3,600**	**1.25**	**Vertical**
14. Ball Mill Crushers (6 total)	**PM_{10}, $PM_{2.5}$**	**354769.00**	**3893318.00**	**37.20**	**120**	**92.41**	**3,000**	**0.83**	**Vertical**
15. Dryer	**NO_X, CO, VOC, SO_2, PM_{10}, $PM_{2.5}$**	**354827.00**	**3893193.00**	**85.60**	**220**	**50.08**	**59,000**	**5.00**	**Vertical**

16. Dryer Wet End Seal	**NO_X, CO, VOC, SO_2, PM_{10}, $PM_{2.5}$**	**354825.00**	**3893053.00**	**85.60**	**100**	**82.97**	**11,300**	**1.70**	**Vertical**
17. Final Trim	**PM_{10}, $PM_{2.5}$**	**354768.00**	**3893249.00**	**37.20**	**120**	**50.47**	**5,000**	**1.45**	**Vertical**
18. Reclaimed Wallboard Recycling System	**PM_{10}, $PM_{2.5}$**	**354712.00**	**3893320.00**	**56.00**	**120**	**74.27**	**14,000**	**2.00**	**Vertical**
DC-01 – Unloading Baghouse	**PM_{10}, $PM_{2.5}$**	**354737.00**	**3893275.00**	**10.00**	**120**	**61.30**	**6,500**	**1.50**	**Vertical**
DC-02 – Mill Feed Baghouse	**PM_{10}, $PM_{2.5}$**	**354761.00**	**3893269.00**	**19.00**	**120**	**56.59**	**6,000**	**1.50**	**Vertical**
DC-03 – Rock Storage Baghouse	**PM_{10}, $PM_{2.5}$**	**354755.00**	**3893261.00**	**74.00**	**120**	**62.36**	**4,000**	**1.17**	**Vertical**
DC-11a – Stucco Silos and Equipment	**PM_{10}, $PM_{2.5}$**	**354795.00**	**3893286.00**	**82.20**	**70**	**70.96**	**5,225**	**1.25**	**Vertical**
DC-11 – Mill Baghouse	**NO_X, CO, VOC, SO_2, PM_{10}, $PM_{2.5}$**	**354755.00**	**3893242.00**	**100.00**	**327**	**66.31**	**50,000**	**4.00**	**Vertical**
DC-12 – Conditioning Baghouse System	**PM_{10}, $PM_{2.5}$**	**354760.00**	**3893244.00**	**10.00**	**327**	**58.47**	**6,200**	**1.50**	**Vertical**
DC-13 – Start-up Baghouse	**PM_{10}, $PM_{2.5}$**	**354771.00**	**3893274.00**	**40.00**	**327**	**42.44**	**2,000**	**1.00**	**Vertical**
Unit Number and Description	Pollutant (CO, NOx, PM_{10}, etc.)	UTM Easting (m)	UTM Northing (m)	Stack Height (ft)	Stack Exit Temp. (°F)	Stack Velocity (fps)	Stack Flow Rate (acfm)	Stack Inside Diameter (ft)	Stack Type

NOTE: To add extra rows in Word, click anywhere in the last row. A plus (+) sign should appear on the bottom right corner of the row. Click the plus (+) sign to add a row. Repeat as needed.

Application for Air Pollutant Sources in Bernalillo County
Source Registration (20.11.40 NMAC) and Construction Permits (20.11.41 NMAC)

Certification

NOTICE REGARDING SCOPE OF A PERMIT: The Environmental Health Department's issuance of an air quality permit only authorizes the use of the specified equipment pursuant to the air quality control laws, regulations and conditions. Permits relate to air quality control only and are issued for the sole purpose of regulating the emission of air contaminants from said equipment. Air quality permits are not a general authorization for the location, construction and/or operation of a facility, nor does a permit authorize any particular land use or other form of land entitlement. It is the applicant's/permittee's responsibility to obtain all other necessary permits from the appropriate agencies, such as the City of Albuquerque Planning Department or Bernalillo County Department of Planning and Development Services, including but not limited to site plan approvals, building permits, fire department approvals and the like, as may be required by law for the location, construction and/or operation of a facility. For more information, please visit the City of Albuquerque Planning Department website at https://www.cabq.gov/planning and the Bernalillo County Department of Planning and Development Services website at https://www.bernco.gov/planning.

NOTICE REGARDING ACCURACY OF INFORMATION AND DATA SUBMITTED: Any misrepresentation of a material fact in this application and its attachments is cause for denial of a permit or revocation of part or all of the resulting registration or permit, and revocation of a permit for cause may limit the permitee's ability to obtain any subsequent air quality permit for ten (10) years. Any person who knowingly makes any false statement, representation, or certification in any application, record, report, plan or other document filed or required to be maintained under the Air Quality Control Act, NMSA 1978 §§ 74-2-1 to 74-2-17, is guilty of a misdemeanor and shall, upon conviction, be punished by a fine of not more than ten thousand dollars ($10,000) per day per violation or by imprisonment for not more than twelve months, or by both.

I, the undersigned, hereby certify that I have knowledge of the information and data represented and submitted in this application and that the same is true and accurate, including the information and date in any and all attachments, including without limitation associated forms, materials, drawings, specifications, and other data. I also certify that the information represented gives a true and complete portrayal of the existing, modified existing, or planned new stationary source with respect to air pollution sources and control equipment. I understand that there may be significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations. I also understand that the person who has applied for or has been issued an air quality permit by the Department is an obligatory party to a permit appeal filed pursuant to 20.11.81 NMAC. Further, I certify that I am qualified and authorized to file this application, to certify the truth and accuracy of the information herein, and bind the source. Moreover, I covenant and agree to comply with any requests by the Department for additional information necessary for the Department to evaluate or make a final decision regarding the application.

Signed this 30TH day of AUGUST, 20 24

CAREY W SLATER
Print Name

PLANT MANAGER
Print Title

Signature

Role: ☐ Owner ☐ Operator
☑ Other Authorized Representative

City of Albuquerque
Environmental Health Department
Air Quality Program

Permit Application Review Fee Instructions

All source registration and construction permit applications for stationary or portable sources shall be charged an application review fee according to the fee schedule in 20.11.2 NMAC. These filing fees are required for both new construction, reconstruction, and permit modification applications. Qualified small businesses as defined in 20.11.2 NMAC may be eligible to pay one-half of the application review fees and 100% of all applicable federal program review fees.

Please fill out the permit application review fee checklist and submit with a check or money order payable to the "City of Albuquerque Fund 242" and either:

1. deliver it in person to the Albuquerque Environmental Health Department, 3rd floor, Suite 3023, Albuquerque-Bernalillo County Government Center, south building, One Civic Plaza NW, Albuquerque, NM or,

2. mail it to Albuquerque Environmental Health Department, Air Quality Program, Permitting Division, P.O. Box 1293, Albuquerque, NM 87103.

3. online fee payments are now accepted as well. Application must be submitted first, then Department will provide invoice for online payment.

The Department will provide a receipt of payment to the applicant. The person delivering or filing a submittal shall attach a copy of the receipt of payment to the submittal as proof of payment. Application review fees shall not be refunded without the written approval of the manager. If a refund is requested, a reasonable professional service fee to cover the costs of staff time involved in processing such requests shall be assessed. Please refer to 20.11.2 NMAC (effective January 10, 2011) for more detail concerning the "Fees" regulation as this checklist does not relieve the applicant from any applicable requirement of the regulation.

City of Albuquerque
Environmental Health Department
Air Quality Program

Permit Application Review Fee Checklist Effective January 1, 2024 – December 31, 2024

Please completely fill out the information in each section. Incompleteness of this checklist may result in the Albuquerque Environmental Health Department not accepting the application review fees. If you should have any questions concerning this checklist, please call 768-1972.

I. COMPANY INFORMATION:

Company Name	American Gypsum Company, LLC	
Company Address	4600 Paseo Del Norte	
Facility Name	Albuquerque Plant	
Facility Address	4600 Paseo Del Norte	
Contact Person	Carey Slater	
Contact Person Phone Number	505-346-2142	
Are these application review fees for an existing permitted source located within the City of Albuquerque or Bernalillo County?	**Yes** ☒	**No** ☐
If yes, what is the permit number associated with this modification?	**Permit #** 0752-M4	
Is this application review fee for a Qualified Small Business as defined in 20.11.2 NMAC? (See Definition of Qualified Small Business on Page 4)	**Yes** ☐	**No** ☒

II. STATIONARY SOURCE APPLICATION REVIEW FEES:

If the application is for a new stationary source facility, please check all that apply. If this application is for a modification to an existing permit please see Section III.

Check All That Apply	Stationary Sources	Review Fee	Program Element
	Air Quality Notifications		
☐	AQN New Application	$680.00	2801
☐	AQN Technical Amendment	$371.00	2802
☐	AQN Transfer of a Prior Authorization	$371.00	2803
☒	*Not Applicable*	*See Sections Below*	
	Stationary Source Review Fees (Not Based on Proposed Allowable Emission Rate)		
☐	Source Registration required by 20.11.40 NMAC	$693.00	2401
☐	A Stationary Source that requires a permit pursuant to 20.11.41 NMAC or other board regulations and are not subject to the below proposed allowable emission rates	$1,385.00	2301
☒	*Not Applicable*	*See Sections Below*	
	Stationary Source Review Fees (Based on the Proposed Allowable Emission Rate for the single highest fee pollutant)		
☐	Proposed Allowable Emission Rate Equal to or greater than 1 tpy and less than 5 tpy	$1,039.00	2302
☐	Proposed Allowable Emission Rate Equal to or greater than 5 tpy and less than 25 tpy	$2,078.00	2303
☐	Proposed Allowable Emission Rate Equal to or greater than 25 tpy and less than 50 tpy	$4,156.00	2304
☐	Proposed Allowable Emission Rate Equal to or greater than 50 tpy and less than 75 tpy	$6,324.00	2305
☐	Proposed Allowable Emission Rate Equal to or greater than 75 tpy and less than 100 tpy	$8,312.00	2306
☐	Proposed Allowable Emission Rate Equal to or greater than 100 tpy	$10,390.00	2307
☒	*Not Applicable*	*See Sections Below*	

Federal Program Review Fees for each subpart (In addition to the Stationary Source Application Review Fees above)			
☐	40 CFR 60 – "New Source Performance Standards" (NSPS)	$1,385.00	2308
☐	40 CFR 61 – "Emission Standards for Hazardous Air Pollutants (NESHAPs)	$1,385.00	2309
☐	40 CFR 63 – (NESHAPs) Promulgated Standards	$1,385.00	2310
☐	40 CFR 63 – (NESHAPs) Case-by-Case MACT Review	$13,854.00	2311
☐	20.11.61 NMAC – Prevention of Significant Deterioration (PSD) Permit	$6,927.00	2312
☐	20.11.60 NMAC – Non-Attainment Area Permit	$6,927.00	2313
☐	*Not Applicable*	*Not Applicable*	

III. MODIFICATION TO EXISTING PERMIT APPLICATION REVIEW FEES:

If the permit application is for a modification to an existing permit, please check all that apply. If this application is for a new stationary source facility, please see Section II.

Check All That Apply	Modifications	Review Fee	Program Element
Modification Application Review Fees (Not Based on Proposed Allowable Emission Rate)			
☐	Proposed modification to an existing stationary source that requires a permit pursuant to 20.11.41 NMAC or other board regulations and are not subject to the below proposed allowable emission rates	$1,385	2321
☒	*Not Applicable*	*See Sections Below*	
Modification Application Review Fees (Based on the Proposed Allowable Emission Rate for the single highest fee pollutant)			
☐	Proposed Allowable Emission Rate Equal to or greater than 1 tpy and less than 5 tpy	$1,039.00	2322
☐	Proposed Allowable Emission Rate Equal to or greater than 5 tpy and less than 25 tpy	$2,078.00	2323
☐	Proposed Allowable Emission Rate Equal to or greater than 25 tpy and less than 50 tpy	$4,156.00	2324
☐	Proposed Allowable Emission Rate Equal to or greater than 50 tpy and less than 75 tpy	$6,234.00	2325
☐	Proposed Allowable Emission Rate Equal to or greater than 75 tpy and less than 100 tpy	$8,312.00	2326
☒	Proposed Allowable Emission Rate Equal to or greater than 100 tpy	$10,390.00	2327
☐	*Not Applicable*	*See Sections Below*	
Major Modifications Review Fees (In addition to the Modification Application Review Fees above)			
☐	20.11.60 NMAC – Permitting in Non-Attainment Areas	$6,927.00	2333
☐	20.11.61 NMAC – Prevention of Significant Deterioration	$6,927.00	2334
☒	*Not Applicable*	*Not Applicable*	
Federal Program Review Fees for each subpart (This section applies only if a Federal Program Review is triggered by the proposed modification) (These fees are in addition to the Modification and Major Modification Application Review Fees above)			
☐	40 CFR 60 – "New Source Performance Standards" (NSPS)	$1,385.00	2328
☐	40 CFR 61 – "Emission Standards for Hazardous Air Pollutants (NESHAPs)	$1,385.00	2329
☐	40 CFR 63 – (NESHAPs) Promulgated Standards	$1,385.00	2330
☐	40 CFR 63 – (NESHAPs) Case-by-Case MACT Review	$13,854.00	2331
☐	20.11.61 NMAC – Prevention of Significant Deterioration (PSD) Permit	$6,927.00	2332
☐	20.11.60 NMAC – Non-Attainment Area Permit	$6,927.00	2333
☒	*Not Applicable*	*Not Applicable*	

IV. ADMINISTRATIVE AND TECHNICAL REVISION APPLICATION REVIEW FEES:

If the permit application is for an administrative or technical revision of an existing permit issued pursuant to 20.11.41 NMAC, please check one that applies.

Check One	Revision Type	Review Fee	Program Element
☐	Administrative Revisions	$250.00	2340
☐	Technical Revisions	$500.00	2341
☒	*Not Applicable*	*See Sections II, III or V*	

V. PORTABLE STATIONARY SOURCE RELOCATION FEES:

If the permit application is for a portable stationary source relocation of an existing permit, please check one that applies.

Check One	Portable Stationary Source Relocation Type	Review Fee	Program Element
☐	No New Air Dispersion Modeling Required	$500.00	2501
☐	New Air Dispersion Modeling Required	$750.00	2502
☒	*Not Applicable*	*See Sections II, III or IV*	

VI. Please submit payment in the amount shown for the total application review fee.

Section Totals	Review Fee Amount
Section II Total	$0.00
Section III Total	$10,390.00
Section IV Total	$0.00
Section V Total	$0.00
Total Application Review Fee	**$10,390.00**

I, the undersigned, a responsible official of the applicant company, certify that to the best of my knowledge, the information stated on this checklist, give a true and complete representation of the permit application review fees which are being submitted. I also understand that an incorrect submittal of permit application reviews may cause an incompleteness determination of the submitted permit application and that the balance of the appropriate permit application review fees shall be paid in full prior to further processing of the application.

Signed this 30TH day of AUGUST, 20 24

CAREY W SLATER
Print Name

PLANT MANAGER
Print Title

Signature

Definition of Qualified Small Business as defined in 20.11.2 NMAC:
"Qualified small business" means a business that meets all of the following requirements:

(1) a business that has 100 or fewer employees;
(2) a small business concern as defined by the federal Small Business Act;
(3) a source that emits less than 50 tons per year of any individual regulated air pollutant, or less than 75 tons per year of all regulated air pollutants combined; and
(4) a source that is not a major source or major stationary source.

Note: Beginning January 1, 2011, and every January 1 thereafter, an increase based on the consumer price index shall be added to the application review fees. The application review fees established in Subsection A through D of 20.11.2.18 NMAC shall be adjusted by an amount equal to the increase in the consumer price index for the immediately-preceding year. Application review fee adjustments equal to or greater than fifty cents ($0.50) shall be rounded up to the next highest whole dollar. Application review fee adjustments totaling less than fifty cents ($0.50) shall be rounded down to the next lowest whole dollar. The department shall post the application review fees on the city of Albuquerque environmental health department air quality program website.

City of Albuquerque
Environmental Health Department
Air Quality Program

Air Quality
Compliance History Disclosure Form

The Albuquerque-Bernalillo County Joint Air Quality Program ("Program") administers and enforces local air quality laws for the City of Albuquerque ("City") and Bernalillo County ("County") on behalf of the City Environmental Health Department, including the New Mexico Air Quality Control Act ("AQCA"), NMSA 1978, Sections 74-2-1 to -17. In accordance with Sections 74-2-7(P) and (S) of the AQCA, the Program may deny any permit application or revoke any permit issued pursuant to the AQCA if, within ten years immediately preceding the date of submission of the permit application, the applicant or permittee meets any one of the criteria outlined in the AQCA. The Program requires applicants to file this Compliance History Disclosure Form in order for the Program to deem an air permit application administratively complete, or issue an air permit for those permits without an initial administrative completeness determination process. Additionally, an existing permit holder (permits issued prior to the Effective Date of this Form) shall provide this Compliance History Disclosure Form to the Program upon the Program's request. Note: Program Staff can answer basic questions about this Compliance History Disclosure Form but cannot provide specific guidance or legal advice.

Instructions

1. Applications filed pursuant to the following regulations shall include this Compliance History Disclosure Form, in accordance with Section 74-2-7(S) of the AQCA: *Construction Permits* (20.11.41 NMAC); *Operating Permits* (20.11.42 NMAC); *Nonattainment Areas* (20.11.60 NMAC); *Prevention of Significant Deterioration* (20.11.61 NMAC); *Acid Rain* (20.11.62 NMAC); and *Fugitive Dust* (20.11.20 NMAC) except this Form shall not be required for asbestos notifications under 20.11.20.22 NMAC.
2. This Compliance History Disclosure Form is not site specific: responses shall be based on the applicant/permittee as an entity and not be limited to the application, site, facility or source.
3. The permittee identified on this Compliance History Disclosure Form shall match the permittee in the existing permit or new application. If the information in an existing permit needs to be changed, please contact the Program about revisions and ownership transfers.
4. Answer every question completely and truthfully, and do not leave any blank spaces. If there is nothing to disclose in answer to a particular question, check the box labeled "No" except for Question 5b. Failure to provide any of the information requested in this Compliance History Disclosure Form may constitute grounds for an incompleteness determination, application denial, or permit revocation.
5. Be especially careful not to leave out information in a way that might create an impression that you are trying to hide it. Omitting information, even unintentionally, may result in application denial or permit revocation.
6. For any required explanations, be sure to identify the question to which the explanation is responsive. If you submit any document in connection with your answer to any question, refer to it as, "Exhibit No.__", and attach it after the explanation(s) at the end of the Compliance History Disclosure Form, consecutively numbering each additional page at the top right corner.
7. The Program may require additional information to make a thorough review of an application. At all times before the Program has made a final decision regarding the application, an applicant has a duty to promptly supplement and correct information the applicant has submitted in an application to the Program. The applicant's duty to supplement and correct the application includes, but is not limited to, relevant information acquired after the applicant has submitted the application and additional information the applicant otherwise determines is relevant to the application and the Program's review and decision. While the Program is processing an application, regardless of whether the Program has determined the application is administratively complete, if the Program determines that additional information is necessary to evaluate or make a final decision regarding the application, the Program may request additional information and the applicant shall provide the requested additional information.
8. Supplementary information required by the Program may include responses to public comment received by the Program during the application review process.
9. Any fees submitted for processing an application that has been denied will not be refunded. If the Program denies an application, a person may submit a new application and the fee required for a new application. The applicant has the burden of demonstrating that a permit should be issued.

COMPLIANCE HISTORY		
A. Applicant/Permittee Name: **American GypsumCompany, LLC**		*Check Applicable Box*: ☒ Applicant ☐ Permittee
B. Time Period of Compliance Reporting (10 Years): [Click to Insert Date] to [Click to Insert Date] *Instructions: For applicants, answer the following questions with information from within the 10 years preceding the current application. For existing permit holders requested to submit this form by the Program outside of an application, answer the following questions with information from within the 10 years preceding the Program's issuance of each permit.*		
C. Questions		
1	Knowingly misrepresented a material fact in an application for a permit?	☐ Yes ☒ No
2	Refused to disclose information required by the provisions of the New Mexico Air Quality Control Act?	☐ Yes ☒ No
3	Been convicted in any court of any state or the United States of a felony related to environmental crime?	☐ Yes ☒ No
4	Been convicted in any court of any state or the United States of a crime defined by state or federal statute as involving or being in restraint of trade, price fixing, bribery, or fraud?	☐ Yes ☒ No
5a	Constructed or operated any facility for which a permit was sought, including the current application, without the required air quality permit(s) under 20.11.41 NMAC, 20.11.42 NMAC, 20.11.60 NMAC, 20.11.61 NMAC, or 20.11.62 NMAC?	☐ Yes ☒ No
5b	If "No" to question 5a, mark N/A and go to question 6. If "Yes" to question 5a, state whether each facility that was constructed or operated without the required air quality permit met at least one of the following exceptions: i. The unpermitted facility was discovered after acquisition during a timely environmental audit that was authorized by the Program or the New Mexico Environment Department; or ii. The operator of the facility, using good engineering practices and established approved calculation methodologies, estimated that the facility's emissions would not require an air permit, **and** the operator applied for an air permit within 30 calendar days of discovering that an air permit was required for the facility.	☐ Yes ☐ No ☒ N/A
6	Had any permit revoked or permanently suspended for cause under the environmental laws of any state or the United States?	☐ Yes ☒ No
7	For each "yes" answer, or "no" to 5b, please attach an explanation and supporting documentation.	

I, the undersigned, hereby certify under penalty of law that this Compliance History Disclosure Form (Form) and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. I have knowledge of the information in this Form and it is, to the best of my knowledge and belief, true, accurate, and complete. I understand that there are significant penalties for submitting false information, including denial of the application or revocation of a permit, as well as fines and imprisonment for knowing violations. If I filed an application, I covenant and agree to promptly supplement and correct information in this Form until the Program makes a final decision regarding the application. Further, I certify that I am qualified and authorized to file this Form, to certify to the truth and accuracy of the information herein, and bind the permittee and source.

Signed on [Click to Insert Date]

CAREY W SLATER
Print Name

PLANT MANAGER
Print Title

Signature

AMERICAN GYPSUM COMPANY
Company Name

APPENDIX B. PRE-PERMIT APPLICATION MEETING

Pre-Permit Application Meeting Request Form

Pre-Permit Application Meeting Checklist

City of Albuquerque
Environmental Health Department
Air Quality Program

Pre-Permit Application Meeting Request Form

Please complete appropriate boxes and email to aqd@cabq.gov or mail to:

Environmental Health Department
Air Quality Program
Permitting Division
P.O. Box 1293
Albuquerque, NM 87103

A copy of this form must be included as part of the application package.

Company/Organization: Current Permit #:	**American Gypsum Company** 0752-M4
Point of Contact: (phone number and email): Preferred form of contact (check one): ☐ Phone ☒ E-mail	Name: **Carey Slater** Phone: **(505) 346-2142** Email: Carey.Slater@americangypsum.com Name: Joseph Marini Phone**: (214) 432-2017** Email: jmarini@eaglematerials.com Name: **Adam Erenstein** Phone: **(505) 266-6611** Email: aerenstein@trinityconsultants.com
Preferred meeting date/times: Preferred meeting type (Zoom/In Person):	As soon as practicable for the department. **In Person**

City of Albuquerque
Environmental Health Department
Air Quality Program

Description of Project:	**American Gypsum Company is requesting to modify their existing air permit (#0752-M4) to true-up emissions associated with the new vertical roller mill's hot gas generator and baghouse (unit DC-11).**

City of Albuquerque
Environmental Health Department
Air Quality Program

Construction Permit (20.11.41 NMAC)
Pre-Permit Application Meeting Agenda Checklist & Public Notice Sign Guidelines Checklist

This entire document, including both completed checklists, must be included as part of the application package.

Any person seeking a new permit, a permit modification, or an emergency permit under 20.11.41 NMAC (Construction Permits) shall do so by filing a written application with the Albuquerque-Bernalillo County Joint Air Quality Program, which administers and enforces local air quality laws for the City of Albuquerque ("City") and Bernalillo County ("County"), on behalf of the City Environmental Health Department ("Department").

Prior to submitting an application, per 20.11.41.13(A) NMAC, the applicant (or their consultant) shall contact the Department in writing and submit a Pre-Permit Application Meeting Request Form to request a pre-application meeting. The Pre-Permit Application Meeting Request Form is available at https://www.cabq.gov/airquality/air-quality-permits/air-quality-application-forms. The purpose of the pre-application meeting is for the Department to provide the applicant with information regarding the contents of the application and the application process.

This pre-application meeting agenda checklist is provided to aid the Department and applicant in ensuring that in the pre-permit application meeting all information regarding the contents of the application and the application process are communicated to the applicant. This is because applications that are ruled incomplete because of missing information will delay any determination or the issuance of the permit. The Department reserves the right to request additional relevant information prior to ruling the application complete in accordance with 20.11.41 NMAC.

Also included in this document is the Public Notice Sign Guidelines Checklist, which contains requirements for how the applicant must display the required weather-proof sign.

The applicant should fill out and have this agenda checklist available at the pre-application meeting to be sure all items are covered. Check the boxes to acknowledge that each item from the agenda was discussed and that requirements for the weather-proof sign were followed.

Pre-Permit Application Meeting Agenda Checklist

Applicant Company Name: **American Gypsum Company, LLC**
Facility Name: **Albuquerque Plant**

☒ Fill out and submit a Pre-Permit Application Meeting Request form
Available online at https://www.cabq.gov/airquality/air-quality-permits/air-quality-application-forms/air-quality-application-forms

I. ☒ Discuss Project:
   a. Facility Location
   b. Facility Description
   c. Main Processes
   d. Equipment
   e. Proposed Schedule

II. ☒ Discuss the requirement for a zoning certification or verifications for new permits and permit modifications. The Zoning Requirement Cover Page form is a required component of this part of the submittal:
   a. For projects on property subject to City or County zoning laws (*i.e.*, **not** located on federal land, **not** located on State of New Mexico land, **not** located on Tribal land), a zoning certification from the appropriate planning department is required.
      i. City Planning Form: https://www.cabq.gov/planning/code-enforcement-zoning
      ii. County Planning Form: https://www.bernco.gov/planning/planning-and-land-use/applications-forms/
   b. If the project's property is not subject to City or County zoning jurisdiction, a zoning verification from both planning departments is required.
      i. City Planning Form: https://www.cabq.gov/planning/code-enforcement-zoning
      ii. County Planning Form: https://www.bernco.gov/planning/planning-and-land-use/applications-forms/
   c. The zoning certification or verifications **must** be obtained from the appropriate Planning Department, either City of Albuquerque or Bernalillo County. For more information, please visit the City's Planning Department website at https://www.cabq.gov/planning or Bernalillo County's Planning Department website at the https://www.bernco.gov/planning/.

III. ☒ Discuss the requirement for a Compliance History Disclosure Form as of Nov. 6, 2023 for permit application submittals except for Administrative Revisions that are not transfers of ownership.

IV. ☒ If permit modification or revision, review current permit:
   a. Review Process Equipment Table and Emissions Table and discuss changes
   b. Request information about the replacement or new equipment (for example, if it is an engine, we need to know if it is new, what year, fuel type, etc…) to give them an idea of the changes that will be needed
   c. Discuss possible changes in permit conditions

V. ☒ Air Dispersion modeling process, procedures and options:
   a. When modeling is required and possibility of waivers
   b. Protocol process, purpose, and time frame
   c. Preliminary review, purpose, and time frame
   d. Full review and time frame
   e. Peer reviews
   f. Assumptions in the modeling become permit conditions
   g. NED data should be used instead of DEM data for assigning elevations to receptors, sources, buildings, etc.

VI. ☒ Applicant's public notice requirements

a. During the same month application package will be submitted, ask Department for memo of neighborhood associations/coalitions within ½ mile of facility
b. Fill out and send Notice of Intent to Construct form as attachment, with Applicant Notice Cover Letter as email body, to neighborhood associations/coalitions listed in memo: https://www.cabq.gov/airquality/air-quality-permits/air-quality-application-forms
c. Post and maintain a weather-proof sign. Signs are available in the downtown Program office. The Public Notice Sign Guidelines Checklist can be found on the next page of this document.

VII. ☒ Regulatory timelines

a. 30 days to rule application complete
b. 90 days after ruled complete for permitting decision
c. 30-day public comment period after application deemed complete
d. If public interest in application:
    i. 30-day review of technical analysis
    ii. 90-day extension for permitting decision
e. Request for Public Information Hearing - 90-day extension for permitting decision
f. Complex technical issues in application - 90-day extension for permitting decision
g. If application ruled incomplete it stops timeline and restarts at beginning with updated submittal

VIII. ☒ Department Policies

a. One original hard copy must be submitted along with a duplicate copy. The duplicate copy should be a high-quality electronic duplicate submitted on thumb drive as one complete PDF with all application contents found in the hardcopy, including pages with signatures. However, do not include financial information, such as a copy of a check, in the electronic PDF. The electronic submittal should also include emission calculations Excel-compatible file(s) and modeling files, if applicable.
b. Applications will be ruled incomplete if any parts from Permit Application Checklist are missing
c. Review fees paid in full are part of the application package (Except as noted above)
d. Discuss payment format (by check, credit card or online)
e. Use the most recent Permit Application Checklist, found under Part 41 Implementation on this page: https://www.cabq.gov/airquality/air-quality-permits/air-quality-application-forms
f. After three tries, permit application denied and application must start over including repayment of fees

IX. ☐ Additional Questions?

City of Albuquerque
Environmental Health Department
Air Quality Program

Public Notice Sign Guidelines

Any person seeking a permit under 20.11.41 NMAC, Construction Permits, shall do so by filing a written application with the Department. *Prior to submitting an application, the applicant shall post and maintain a weather-proof sign provided by the department. The applicant shall keep the sign posted until the department takes final action on the permit application; if an applicant can establish to the department's satisfaction that the applicant is prohibited by law from posting, at either location required, the department may waive the posting requirement and may impose different notification requirements.* **A copy of this form must be submitted with your application.**

Applications that are ruled incomplete because of missing information will delay any determination or the issuance of the permit. The Department reserves the right to request additional relevant information prior to ruling the application complete in accordance with 20.11.41 NMAC.

Applicant Company Name: **American Gypsum Company, LLC**
Facility Name: **Albuquerque Plant**

☒ The sign must be posted at the more visible of either the proposed or existing facility entrance (or, if approved in advance and in writing by the department, at another location on the property that is accessible to the public)

- ☒ The sign shall be installed and maintained in a condition such that members of the public can easily view, access, and read the sign at all times.
- ☒ The lower edge of the sign board should be mounted a minimum of 2 feet above the existing ground surface to facilitate ease of viewing

☒ Include at least two pictures of the completed, properly posted sign in the application package immediately following this document. One picture should show the location of the posted sign and the other should be close enough to the sign for the posted information to be legible in the picture.

☐ **Check here if the department has waived the sign posting requirement.**
Alternative public notice details:

APPENDIX C. PUBLIC NOTICE REQUIREMENTS

Notice of Intent to Construct

Email Documentation of Intent to Neighborhood Associations and Coalitions

Pictures of Posted Public Notice Sign

NOTICE FROM THE APPLICANT

Notice of Intent to Apply for Air Quality Construction Permit

You are receiving this notice because the New Mexico Air Quality Control Act (20.11.41.13B NMAC) requires any owner/operator proposing to construct or modify a facility subject to air quality regulations to provide public notice by certified mail or electronic mail to designated representatives of recognized neighborhood associations and coalitions within 0.5-mile of the property on which the source is or is proposed to be located.

This notice indicates that the owner/operator intends to apply for an Air Quality Construction Permit from the Albuquerque – Bernalillo County Joint Air Quality Program. Currently, no application for this proposed project has been submitted to the Air Quality Program. Applicants are required to include a copy of this form and documentation of mailed notices with their Air Quality Construction Permit Application.

Proposed Project Information

Applicant's name and address:
Nombre y domicilio del solicitante: American Gypsum Company, 4600 Paseo Del Norte, Albuquerque, NM 87109

Owner / operator's name and address:
Nombre y domicilio del propietario u operador: Carey Slater, 4600 Paseo Del Norte, Albuquerque, NM 87109

Contact for comments and inquires:
Datos actuales para comentarios y preguntas:

Name *(Nombre)*: Carey Slater
Address *(Domicilio)*: 4600 Paseo Del Norte, Albuquerque, NM 87109
Phone Number *(Número Telefónico)*: (505) 346-2142
E-mail Address *(Correo Electrónico)*: carey.slater@americangypsum.com

Actual or estimated date the application will be submitted to the department:
Fecha actual o estimada en que se entregará la solicitud al departamento: August 2024

Description of the source:
Descripción de la fuente: Manufacturer of wallboard from gypsum

Exact location of the source or proposed source:
Ubicación exacta de la fuente o fuente propuesta: 354,737 m E, 3,893,360 m N

Nature of business:
Tipo de negocio: Gypsum Wallboard Manufacturing

Process or change for which the permit is requested:
Proceso o cambio para el cuál de solicita el permiso: In this permit modification, AMG is seeking a modification to their existing permit (#0752-M4) associated with the facility. The modification is a true-up for the proposed emissions on existing Unit DC-11 solely for the emissions rate of Carbon Monoxide (CO) and will be increased from 9.28 tpy to 70.95 tpy. All other sources will remain unchanged. Emissions from all other units are provided with this application to accurately capture total emissions at the facility.

Maximum operating schedule:
Horario máximo de operaciones: 8,760 hours per year

Normal operating schedule:
Horario normal de operaciones: 8,760 hours per year

Preliminary estimate of the maximum quantities of each regulated air contaminant the source will emit:
Estimación preliminar de las cantidades máximas de cada contaminante de aire regulado que la fuente va a emitir:

Air Contaminant *Contaminante de aire*	**Proposed Construction Permit** *Permiso de Construcción Propuesto*		**Net Changes (for permit modification or technical revision)** *Cambio Neto de Emisiones (para modificación de permiso o revisión técnica)*	
	pounds per hour *libras por hora*	tons per year *toneladas por año*	pounds per hour *libras por hora*	tons per year *toneladas por año*
NO_x	23.43	93.05	N/A	N/A
CO	26.83	115.40	+14.08	+61.67
VOC	1.27	5.22	N/A	N/A
SO_2	0.30	1.21	N/A	N/A
PM_{10}	18.37	71.86	N/A	N/A
$PM_{2.5}$	5.97	24.76	N/A	N/A
HAP	N/A	N/A	N/A	N/A

NOTE: To add extra rows for H_2S or Pb in Word, click in a box in the last row. Click the plus (+) sign that appears on the right of the row to add a row.

Questions or comments regarding this Notice of Intent should be directed to the Applicant. Contact information is provided with the Proposed Project Information on the first page of this notice. To check the status of an Air Quality Construction Permit application, call 311 and provide the Applicant's information, or visit www.cabq.gov/airquality/air-quality-permits.

The Air Quality Program will issue a Public Notice announcing a 30-day public comment period on the permit application for the proposed project when the application is deemed complete. The Air Quality Program does not process or issue notices on applications that are deemed incomplete. More information about the air quality permitting process is attached to this notice.

Air Quality Construction Permitting Overview

This is the typical process to obtain an Air Quality Construction Permit for Synthetic Minor and Minor sources of air pollution from the Albuquerque – Bernalillo County Joint Air Quality Program.

Step 1: Pre-application Meeting: The Applicant and their consultant must request a meeting with the Air Quality Program to discuss the proposed action. If air dispersion modeling is required, Air Quality Program staff discuss the modeling protocol with the Applicant to ensure that all proposed emissions are considered.

> **Notice of Intent from the Applicant:** Before submitting their application, the Applicant is required to notify all nearby neighborhood associations and interested parties that they intend to apply for an air quality permit or modify an existing permit. The Applicant is also required to post a notice sign at the facility location.

Step 2: Administrative Completeness Review and Preliminary Technical Review: The Air Quality Program has 30 days from the day the permit is received to review the permit application to be sure that it is administratively complete. This means that all application forms must be signed and filled out properly, and that all relevant technical information needed to evaluate any proposed impacts is included. If the application is not complete, the permit reviewer will return the application and request more information from the Applicant. Applicants have three opportunities to submit an administratively complete application with all relevant technical information.

> **Public Notice from the Department:** When the application is deemed complete, the Department will issue a Public Notice announcing a 30-day public comment period on the permit application. This notice is distributed to the same nearby neighborhood associations and interested parties that the Applicant sent notices to, and published on the Air Quality Program's website.
>
> During this 30-day comment period, individuals have the opportunity to submit written comments expressing their concerns or support for the proposed project, and/or to request a Public Information Hearing. If approved by the Environmental Health Department Director, Public Information Hearings are held after the technical analysis is complete and the permit has been drafted.

Step 3: Technical Analysis and Draft Permit: Air Quality Program staff review all elements of the proposed operation related to air quality, and review outputs from advanced air dispersion modeling software that considers existing emission levels in the area surrounding the proposed project, emission levels from the proposed project, and meteorological data. The total calculated level of emissions is compared to state and federal air quality standards and informs the decision on whether to approve or deny the Applicant's permit.

Draft Permit: The permit will establish emission limits, standards, monitoring, recordkeeping, and reporting requirements. The draft permit undergoes an internal peer review process to determine if the emissions were properly evaluated, permit limits are appropriate and enforceable, and the permit is clear, concise, and consistent.

> **Public Notice from the Department:** When the technical analysis is complete and the permit has been drafted, the Department will issue a second Public Notice announcing a 30-day public comment period on the technical analysis and draft permit. This second Public Notice, along with the technical analysis documentation and draft permit, will be published on the Air Quality Program's website, and the public notice for availability of the technical analysis and draft permit will only be directly sent to those who requested further information during the first comment period.

During this second 30-day comment period, residents have another opportunity to submit written comments expressing their concerns or support for the proposed project, and/or to request a Public Information Hearing.

Possible Public Information Hearing: The Environmental Health Department Director may decide to hold a Public Information Hearing for a permit application if there is significant public interest and a significant air quality issue. If a Public Information Hearing is held, it will occur after the technical analysis is complete and the permit has been drafted.

Step 4: Public Comment Evaluation and Response: The Air Quality Program evaluates all public comments received during the two 30-day public comment periods and Public Information Hearing, if held, and updates the technical analysis and draft permit as appropriate. The Air Quality Program prepares a response document to address the public comments received, and when a final decision is made on the permit application, the comment response document is published on the Air Quality Program's website and distributed to the individuals who participated in the permit process. If no comments are received, a response document is not prepared.

Step 5: Final Decision on the Application: After public comments are addressed and the final technical review is completed, the Environmental Health Department makes a final decision on the application. If the permit application meets all applicable requirements set forth by the New Mexico Air Quality Control Act and the federal Clean Air Act, the permit is approved. If the permit application does not meet all applicable requirements, it is denied.

Notifications of the final decision on the permit application and the availability of the comment response document is published on the Air Quality Program's website and distributed to the individuals who participated in the permit process.

The Department must approve a permit application if the proposed action will meet all applicable requirements and if it demonstrates that it will not result in an exceedance of ambient air quality standards. Permit writers are very careful to ensure that estimated emissions have been appropriately identified or quantified and that the emission data used are acceptable.

The Department must deny a permit application if it is deemed incomplete three times, if the proposed action will not meet applicable requirements, if estimated emissions have not been appropriately identified or quantified, or if the emission data are not acceptable for technical reasons.

For more information about air quality permitting, visit www.cabq.gov/airquality/air-quality-permits

Timothy M. Keller,
Mayor

Public Participation

List of Neighborhood Associations and Neighborhood Coalitions
MEMORANDUM

To: Ryan Ahlberg
From: Michael McKinstry, Interim, Environmental Health-Air Quality Permitting Manager
Subject: Determination of Neighborhood Associations and Coalitions within 0.5 mile of 4600 Paseo del Norte NE, Bernalillo County, NM.
Date: August 20, 2024

DETERMINATION:

On August 20, 2024, I used the City of Albuquerque Zoning Advanced Map Viewer (http://coagisweb.cabq.gov/) to verify which City of Albuquerque Neighborhood Associations (NA), Homeowner Associations (HOA) and Neighborhood Coalitions (NC) are located within 0.5 mile of 4600 Paseo del Norte NE in Bernalillo County, NM.

I then used the City of Albuquerque Office (COA) of Neighborhood Coordination's Monthly Master NA List dated August 2024 and the Bernalillo County (BC) Monthly Neighborhood Association August 2024 Excel file to determine the contact information for each NA and NC located within 0.5 mile of 4600 Paseo del Norte NE in Bernalillo County, NM.

The table below contains the contact information, which will be used in the City of Albuquerque Environmental Health Department's public notice. Duplicates have been deleted.

COA/BC Association or Coalition	Name	Email or Mailing Address*
D4C	Mildred Griffee Ellen Dueweke	mgriffee@noreste.org edueweke@juno.com sec.dist4@gmail.com
North Valley Coalition (NVC)	Peggy Norton James Salazar	peggynorton@yahoo.com jasalazarnm@gmail.com nvcabq@gmail.com
Vista Del Norte (VDN)	Janelle Johnson James Souter	tuscanylandscape@me.com jamessouter@msn.com vistadelnorte@me.com

Timothy M. Keller,
Mayor

Public Participation

List of Neighborhood Associations
and Neighborhood Coalitions
MEMORANDUM

If email address is not listed, provide public notice via certified mail and include a copy of each mail receipt with the application submittal.

SUBJECT: Public Notice of Proposed Air Quality Construction Permit Application American Gypsum Company, LLC-Albuquerque Plant

Ryan Ahlberg <Ryan.Ahlberg@trinityconsultants.com>

Fri 8/23/2024 1:05 PM

To:mgriffee@noreste.org <mgriffee@noreste.org>;edueweke@juno.com <edueweke@juno.com>;sec.dist4@gmail.com <sec.dist4@gmail.com>;peggynorton@yahoo.com <peggynorton@yahoo.com>;jasalazarnm@gmail.com <jasalazarnm@gmail.com>; nvcabq@gmail.com <nvcabq@gmail.com>;tuscanylandscape@me.com <tuscanylandscape@me.com>;jamessouter@msn.com <jamessouter@msn.com>;vistadelnorte@me.com <vistadelnorte@me.com>;carey.slater@americangypsum.com <carey.slater@americangypsum.com>;Adam Erenstein <AErenstein@trinityconsultants.com>;McKinstry, Michael W. <mmckinstry@cabq.gov>;aqd@cabq.gov <aqd@cabq.gov>

1 attachments (258 KB)

AQP_Notice_of_Intent_Neighborhood Associations Coalitions_2023-11_v1.0_2024_0801.pdf;

Dear Neighborhood Association/Coalition Representative(s),

Why did I receive this public notice?

You are receiving this notice in accordance with New Mexico Administrative Code (NMAC) 20.11.41.13.B(1) which requires any applicant seeking an Air Quality Construction Permit pursuant to 20.11.41 NMAC to provide public notice by certified mail or electronic mail to the designated representative(s) of the recognized neighborhood associations and recognized coalitions that are within one-half mile of the exterior boundaries of the property on which the source is or is proposed to be located.

What is the Air Quality Permit application review process?

The City of Albuquerque, Environmental Health Department, Air Quality Program (Program) is responsible for the review and issuance of Air Quality Permits for any stationary source of air contaminants within Bernalillo County. Once the application is received, the Program reviews each application and rules it either complete or incomplete. Complete applications will then go through a 30-day public comment period. Within 90 days after the Program has ruled the application complete, the Program shall issue the permit, issue the permit subject to conditions, or deny the requested permit or permit modification. The Program shall hold a Public Information Hearing pursuant to 20.11.41.15 NMAC if the Director determines there is significant public interest and a significant air quality issue is involved.

What do I need to know about this proposed application?

Applicant Name	American Gypsum Company, LLC
Site or Facility Name	Albuquerque Plant
Site or Facility Address	4600 Paseo Del Norte, Albuquerque, NM 87109
New or Existing Source	Existing
Anticipated Date of Application Submittal	August 2024
Summary of Proposed Source to Be Permitted	In this permit modification, AMG is seeking a modification to their existing permit (#0752-M4) associated with the facility. The modification is a true-up for the proposed emissions on existing Unit DC-11 solely for the emissions rate of Carbon Monoxide (CO) and will be increased from 9.28 tpy to 70.95 tpy. All other sources will remain unchanged. Emissions from all other units are provided with this application to accurately capture total emissions at the facility.

What emission limits and operating schedule are being requested?

See attached Notice of Intent to Construct form for this information.

How do I get additional information regarding this proposed application?

For inquiries regarding the proposed source, contact:

- Carey Slater
- Carey.Slater@americangypsum.com
- (505) 346-2142

For inquiries regarding the air quality permitting process, contact:

- City of Albuquerque Environmental Health Department Air Quality Program
- aqd@cabq.gov
- (505) 768-1972

Ryan Ahlberg
Associate Consultant

P 505.266.6611 M 815.341.2524
Email: mailto:ryan.ahlberg@trinityconsultants.com
9400 Holly Ave NE, Bldg 3, Ste B Albuquerque, NM 87122


NOTICE
OFFICE HOURS: 7-3
DURING OFFICE HOURS
ALL VISITORS AND FOOD DELIVERIES MUST CHECK IN WITH GUARD
AFTER OFFICE HOURS
NO VISITORS OR FOOD DELIVERIES BEYOND THIS POINT


Proposed Air Quality Construction Permit
Permiso de Construcción de Calidad del Aire Propuesto
1. Applicant's Name:
American Gypsum Company
Owner or Operator's Name:
Corky Slater
2. Actual or Estimated Date the Application will be Submitted to the Department:
August 2024
3. Exact Location of the Source or Proposed Source:
354,732 mE, 3892,360 m N
4. Description of the Source:
Manufacture of Wallboard from Gypsum
Nature of Business:
Gypsum Wallboard Manufacturing
Process or change for which a permit is requested:
ATC
Preliminary estimate of the maximum quantities of each regulated air contaminant the source will emit:
Air Contaminant
Proposed Construction Permit
Net Change Limitations
NO2
28.48
93.03
0.00
0.00
CO
26.33
115.40
+14.09
+61.67
VOC
1.92
8.21
0.00
0.00
SO2
0.20
1.01
0.00
0.00
PM10
15.38
71.86
0.00
0.00
PM2.5
5.97
24.76
0.00
0.00
HAP
0.00
0.00
0.00
0.00
5. Maximum Operating Schedule:
8,760 hours per year
Normal Operation Schedule:
8,760 hours per year
6. Current Contact Information for Comments and Inquiries:
Name:
Corky Slater
Address:
4600 Paseo Del Norte, Albuquerque, NM 87109
Phone Number:
(505) 396-2892
Email Address:
City of Albuquerque, Environmental Health Department, Air Quality Program – Stationary Source Permitting
American Gypsum is perm
stormwater discharges un
General Permit (MSGP)
NPDES ID: NMR053164 for
Contact: 505-771-4721
SWPPP: ray.dabria@america
To report observed indicato
contact EPA at: 214-665-752

APPENDIX D. FACILITY LOCATION AND AERIAL PHOTOGRAPH

Appendix Figure D-2: Facility Location

Appendix Figure D-3 through D-7: Aerial Photographs of Process Locations


Alameda Blvd NW
528
Alameda Blvd NE
Corona Ave NE
Paseo Del Norte Blvd NE
El Pueblo Rd NE
423
North Valley
Las Lomitas Dr NE
American Gypsum Albuquerque Plant
Tiburon St NE
San Antonio Dr NE
25
47
Edith Blvd NE
Chappell Rd NE
McKinney Dr NE
Burlison Dr NE
Montano Rd NE
Alexander Blvd NE
Montgomery
Ruler
Line
Path
Polygon
Circle
3D path
3D polygon
Measure the circumference or area of a circle on the ground
Radius:
3.00
Kilometers
Area:
28,386,332.00
Square Meters
Circumference:
18.89 Kilometers
Mouse Navigation
Save
Clear

Point Sources 1

Location of point source stacks

Point Sources 2

Location of point source stacks

Stockpile (12a)

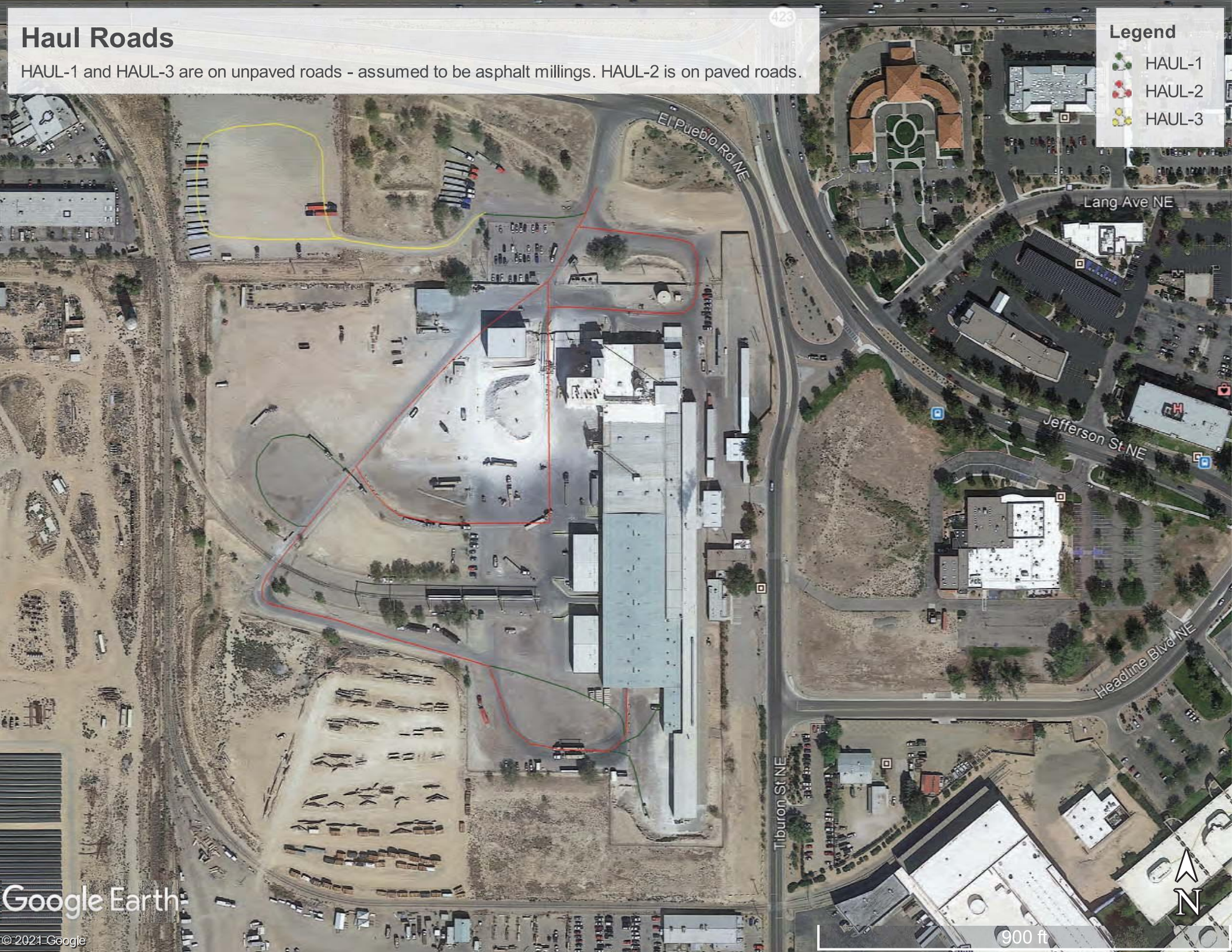
Proposed stockpile actual size vs. area of stockpile disturbed in 1 hour (to be included in model as area source)

Volume Sources

Location of volume sources

Haul Roads

HAUL-1 and HAUL-3 are on unpaved roads - assumed to be asphalt millings. HAUL-2 is on paved roads.



APPENDIX E. ZONING REQUIREMENTS

Zoning Verification Provided by the EHD

City of Albuquerque
Environmental Health Department
Air Quality Program

Construction Permit (20.11.41 NMAC)
Zoning Requirement Cover Letter

This Cover Letter Must Be Returned With The Application Along With All Required Attachments

The Albuquerque-Bernalillo County Joint Air Quality Program, which administers and enforces local air quality laws for the City of Albuquerque ("City") and Bernalillo County ("County"), on behalf of the City Environmental Health Department ("Department").

Any person seeking a new air quality permit or a permit modification under 20.11.41 NMAC (Construction Permits) shall provide documentary proof that the proposed air quality permitted use of the facility's subject property is allowed by the zoning designation of the City or County zoning laws, as applicable. Sufficient documentation may include (i) a zoning certification from the City Planning Department or County Department of Planning and Development Services, as applicable, if the applicant is subject to City or County zoning jurisdiction; or (ii) a zoning verification from both planning departments if the applicant is not subject to City or County zoning jurisdiction. A zone atlas map shall not be sufficient. At this time, applicants are not required to submit documentation for the subject property's zoning designation when applying for a relocation of a portable stationary source, or a technical or administrative revision to an existing permit.

The Department will rule an application administratively incomplete if it is missing or has incorrect information. If the Department has ruled an application administratively incomplete three (3) times, the Department will deny the permit application. Any fees submitted for processing an application that has been denied will not be refunded. If the Department denies an application, a person may submit a new application and the fee required for a new application. The applicant has the burden of demonstrating that a permit should be issued.

The Department may require additional information that is necessary to make a thorough review of an application. At all times before the Department has made a final decision regarding the application, an applicant has a duty to promptly supplement and correct information the applicant has submitted in an application to the Department. The applicant's duty to supplement and correct the application includes, but is not limited to, relevant information acquired after the applicant has submitted the application and additional information the applicant otherwise determines is relevant to the application and the Department's review and decision. While the Department is processing an application, regardless of whether the Department has determined the application is administratively complete, if the Department determines that additional information is necessary to evaluate or make a final decision regarding the application, the Department may request additional information and the applicant shall provide the requested additional information.

NOTICE REGARDING SCOPE OF A PERMIT: The Department's issuance of an air quality permit only authorizes the use of the specified equipment pursuant to the air quality control laws, regulations and conditions. Permits relate to air quality control only and are issued for the sole purpose of regulating the emission of air contaminants from said equipment. Air quality permits are not a general authorization for the location, construction and/or operation of a facility, nor does a permit authorize any particular land use or other form of land entitlement. It is the applicant's/permittee's responsibility to obtain all other necessary permits from the appropriate agencies, such as the City Planning Department or County Department of Planning and Development Services, including but not limited to site plan approvals, building permits, fire department approvals and the like, as may be required by law for the location, construction and/or operation of a facility. For more information, please visit the City Planning Department website at https://www.cabq.gov/planning and the County Department of Planning and Development Services website at https://www.bernco.gov/planning.

Corporate and Facility Information: This information shall match the information in the permit application**.**

Air Quality Permit Applicant Company Name: **American Gypsum Company LLC**			
Facility Name: Albuquerque Plant			
Facility Physical Address: **4600 Paseo Del Norte**	City: **Albuquerque**	State: **NM**	Zip: **87109**
Facility Legal Description: **TR OF LAND IN E1/2 NW1/4 & W1/2 NE1/4 SEC 23 T11N R3E (EXCLPORT OUT TO R/W) CONT 43.3900**			

General Operation Information: This information shall match the information in the permit application.

Permitting action being requested (please refer to the definitions in 20.11.41 NMAC):
☐ New Permit ☒ Permit Modification, Current Permit #: **#0752-M4**

Attachment Information: The location information provided to the City Planning Department or County Department of Planning and Development Services, as applicable, and reflected in the zoning certification or verifications, as applicable, shall be the same as the Facility location information provided to the Department in the air quality construction permit application.

☒ Zoning Certification Provided by: Choose an item. *This is a use-specific certification.* **City Planning Form**: https://www.cabq.gov/planning/code-enforcement-zoning **County Planning Form**: https://www.bernco.gov/planning/planning-and-land-use/applications-forms/	☐ City Zoning Verification ☐ County Zoning Verification **City Planning Form**: https://www.cabq.gov/planning/code-enforcement-zoning **County Planning Form**: https://www.bernco.gov/planning/planning-and-land-use/applications-forms/

CITY OF ALBUQUERQUE

CODE ENFORCEMENT
Plaza Del Sol Building, Suite 500
600 2nd Street NW
Albuquerque, NM 87102
Tel: (505) 924-3850 Fax: (505) 924-3847

Date: June 5, 2023

VIA Email, carey.slater@americangypsum.com
Carey Slater
4600 Paseo Del Norte NE
Albuquerque, NM 87109

RE: 4600 Paseo Del Norte NE, Albuquerque, NM 87109 the "property".
UPC: 101706325338020199

To Whom It May Concern:

This letter will certify that according to the map on file in this office on June 5, 2023, the referenced property, legally described as: TR OF LAND IN E1/2 NW1/4 & W1/2 NE1/4 SEC 23 T11N R3E (EXCLPORT OUT TO R/W) CONT 43.3900 located in Albuquerque, Bernalillo County, New Mexico, is Zoned: Non-Residential General Manufacturing (NR-GM)

The current use of the property is for Heavy Manufacturing, a permissive use in this zone.

This property has been inspected and it was found to be in compliance with the applicable provisions of the Integrated Development Ordinance. This property is controlled by an approved site development plan reference project # 1003477. There are no special exceptions or overlays associated with this site.

If you have any questions regarding this matter please contact me at (505) 924-3301 or by email at ametzgar@cabq.gov.

Sincerely:

Angelo Metzgar,
Code Compliance Manager, Code Enforcement, Planning Department

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

NON-RESIDENTIAL – GENERAL MANUFACTURING ZONE DISTRICT (NR-GM)

Purpose: The purpose of the NR-GM zone district is to accommodate a wide variety of industrial, manufacturing, and heavy commercial uses, particularly those with noise, glare, or heavy traffic impacts, in areas separated from Residential and Mixed-use areas and less intense, lighter impact businesses.

This document provides a summary about development in the NR-GM zone district. It includes links to Frequently Asked Questions (FAQs) about allowable uses, use-standards, development standards, and the approval process.

The document also includes a summary of the development standards and a summary of the allowable uses in this zone. To see the full Integrated Development Ordinance (IDO), click the link below.

https://ido.abc-zone.com/

Notes:

1. Check the project website for links to the Integrated Development Ordinance, the Allowable Uses Table, and excerpts from the Allowable Uses Table for each zone district.
   https://abc-zone.com/node/919
2. Check the IDO to see if there are any Use-specific Standards or an Airport Protection Overlay zone that may change the allowable uses on your property. (See IDO Part 4 and Subsection 3-3, respectively). For more information, see these FAQs:
   https://abc-zone.com/node/915
   https://abc-zone.com/node/931
3. Check the IDO to find development standards for your zone district and any context-specific standards that apply to your property. (See IDO Parts 2 and 5.) For more information, see this FAQ:
   https://abc-zone.com/node/930
4. Check the IDO to find review and approval processes that may apply to a zone district, your project, or your property. (See IDO Part 6.) For more information, see this FAQ:
   https://abc-zone.com/node/933

If you have other questions, email devhelp@cabq.gov or request a Pre-application Review Team Meeting (PRT) here:

https://www.cabq.gov/planning/urban-design-development/pre-application-review-team-meetings

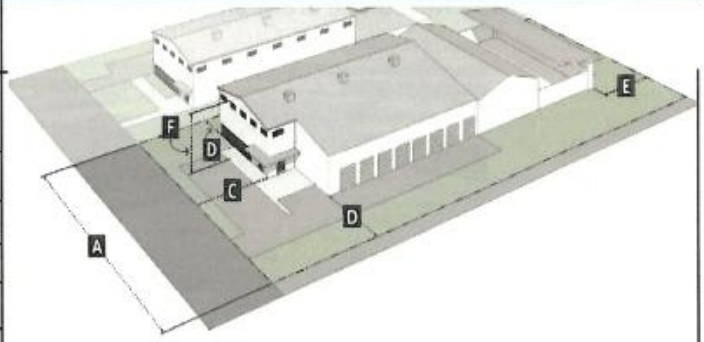
Development Standards Summary

Table 2-5-7: NR-GM Zone District Dimensional Standards

UC-MS-PT = Urban Centers, Main Street areas, and Premium Transit areas BR = bedroom DU = dwelling units

Note: Any different dimensional standards in Part 14-16-3 (Overlay Zones) and Section 14-16-5-9 (Neighborhood Edges) applicable to the property shall prevail over the standards in this table.

Development Location		General	UC-MS-PT
Site Standards*			
Lot width, minimum	A	N/A	
Building coverage,maximum	B	N/A	
Setback Standards			
Front, minimum	C	5 ft. / N/A	
Side, minimum	D	0 ft. / N/A	
Rear, minimum	E	0 ft.	
Building Height			
Building height, maximum	F	65 ft. >100 ft. from front lot lines: N/A	



[1] Residential development that qualifies for funding through Article 14-17 of ROA 1994 (Family Housing Developments) may be eligible for development incentives specified in that Article.

*See IDO Subsection 14-16-5-1(C)(2) Contextual Residential Development in Areas of Consistency, if applicable, for additional standards that modify these general dimensional standards.

Table 2-5-8: Other Applicable IDO Sections

Overlay Zones	Part 14-16-3	Landscaping, Buffering, and Screening	14-16-5-6
Allowable Uses	14-16-4-2	Walls and Fences	14-16-5-7
Use-specific Standards	14-16-4-3	Outdoor Lighting	14-16-5-8
Dimensional Standards	14-16-5-1	Neighborhood Edges	14-16-5-9
Site Design and Sensitive Lands	14-16-5-2	Solar Access	14-16-5-10
Access and Connectivity	14-16-5-3	Building Design	14-16-5-11
Subdivision of Land	14-16-5-4	Signs	14-16-5-12
Parking and Loading	14-16-5-5	Operations and Maintenance	14-16-5-13

Use Table Summary

The following excerpt from Table 4-2-1 shows the allowable uses for the **NR-GM zone district only** (highlighted). See the Integrated Development Ordinance (IDO) for the complete list of uses allowed in all zone districts and use definitions (Table 4-2-1 and Section 14-16-7-1, respectively).

- ⇨ Permissive uses (P) are allowed in this zone by right, without any other approvals
- ⇨ Conditional uses (C) require approval at a public hearing (see Subsection 14-16-6-6(A) for more info)
- ⇨ Accessory uses (A) must be in addition to an allowed primary use (either P or C)

The column on the far right (also highlighted), provides IDO section references for Use-specific Standards that may apply to a use. These Use-specific Standards may change the allowable uses depending on the context of the site or may impose requirements on the development.

Table 4-2-1: Allowable Uses

P = Permissive Primary C = Conditional Primary A = Permissive Accessory CA = Conditional Accessory
CV = Conditional if Structure Vacant for 5 years or more T = Temporary CT = Conditional Temporary
Blank Cell = Not Allowed

Zone District >> / Land Uses	Residential						Mixed-use				Non-residential								Use-specific Standards
	R-A	R-1	R-MC	R-T	R-ML	R-MH	MX-T	MX-L	MX-M	MX-H	NR-C	NR-BP	NR-LM	NR-GM	NR-SU	NR-PO A	NR-PO B	NR-PO C	
PRIMARY USES THAT MAY BE ACCESSORY IN SOME ZONE DISTRICTS																			
RESIDENTIAL USES																			
Household Living																			
Group Living																			
CIVIC AND INSTITUTIONAL USES																			
Adult or child day care facility			C	C	C	P	P	P	P	P	P	P	A	A					
Community center or library	C	P		P	P	P	P	P	P	P	C	C	C	C		P		C	4-3(C)(1)
Museum				CV	CV	C	P	P	P	P	P	P	P	P		P	A		4-3(C)(5)
Overnight shelter										C	C	C	C	C					4-3(C)(6)
Parks and open space	P	P		P	P	P	P	P	P	P	P	P	C	C	A	P	P	P	4-3(C)(7)
Religious institution	P	P		P	P	P	P	P	P	P	P	P	CV	CV					4-3(C)(8)
Sports field							CV	C	P	P	P	P	P	C		P		C	
University or college						CV	CV	C	P	P	P	P	CV	CV					
Vocational school						CV	P	P	P	P	P	P	P	P					
COMMERCIAL USES																			
Agriculture and Animal-related																			
Community garden	P	P	P	P	P	P	P	P	P	P	P	P	C	C		A	A	A	4-3(D)(1)
General agriculture	P											C	P	P			P	A	4-3(D)(3)
Kennel	C							C	C		P	P	P	P					4-3(D)(4)
Nursery	P								A		P	P	P	P		A	A		
Veterinary hospital	C						C	P	P	P	P	P	P	P					4-3(D)(5)
Other pet services	C						C	P	P	P	P	P	P	P					

Table 4-2-1: Allowable Uses

P = Permissive Primary C = Conditional Primary A = Permissive Accessory CA = Conditional Accessory

CV = Conditional if Structure Vacant for 5 years or more T = Temporary CT = Conditional Temporary

Blank Cell = Not Allowed

Zone District >>	Residential						Mixed-use				Non-residential								Use-specific Standards
	-A	-1	MC	-T	ML	MH	X-T	X-L	X-M	X-H	R-C	R-BP	-LM	-GM	-SU	NR-PO			
Food, Beverage, and Indoor Entertainment																			
Adult entertainment												P	P	P					4-3(D)(6)
Auditorium or theater						A	A	A	P	P	P	P	P	P					4-3(D)(7)
Bar							C	C	P	P	P	P	P	P					4-3(D)(8)
Catering service									P	P	P	P	P	P					
Health club or gym			A		A	A	P	P	P	P	P	P	P	A					4-3(D)(9)
Mobile food truck court							C	P	P	P	P	P	P	C					4-3(D)(10)
Restaurant							C	P	P	P	P	P	P	P					4-3(D)(8)
Tap room or tasting room							C	C	P	P	P	P	P	P					4-3(D)(8)
Other indoor entertainment							C	P	P	P	P	P	P	P		P		C	4-3(D)(12)
Lodging																			
Hotel or motel							P	P	P	P	P	P	P	P					4-3(D)(15)
Motor Vehicle-related																			
Car wash								P	P	P	P	P	P	P					4-3(D)(16)
Heavy vehicle and equipment sales, rental, fueling, and repair											P	C	P	P					4-3(D)(17)
Light vehicle fueling station								C	P	P	P	P	P	P					4-3(D)(18)
Light vehicle repair								P	P	P	P	P	P	P					4-3(D)(19)
Light vehicle sales and rental								C	P	P	P	P	P	P					4-3(D)(20)
Outdoor vehicle storage											C	C	P	P			A		4-3(D)(21)
Paid parking lot			A		A	A	C	P	P	A	P	P	P	P	A	A	A		4-3(D)(22)
Parking structure			A		A	A	CA	P	P	P	P	P	P	P	A				4-3(D)(22)

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Zone District >>	Residential						Mixed-use				Non-residential								Use-specific Standards
	-A	-1	MC	-T	ML	MH	X-T	X-L	X-M	X-H	R-C	R-BP	-LM	-GM	R-SU	NR-PO			
Offices and Services																			
Bank							P	P	P	P	P	P	P	CV					4-3(D)(23)
Blood services facility									C	C	C	P	P	P					
Club or event facility							C	P	P	P	P	P	P	CV		P	P	C	4-3(D)(24)
Commercial services								P	P	P	P	P	P	P					
Construction contractor facility and yard										C	P	P	P	P					4-3(D)(25)
Medical or dental clinic							P	P	P	P	P	P	P	P					4-3(D)(26)
Office							P	P	P	P	P	P	P	P					
Personal and business services, small							P	P	P	P	P	P	P	P					4-3(D)(27)
Personal and business services, large									P	P	P	P	P	P					4-3(D)(27)
Research or testing facility							P	P	P	P	P	P	P	P					4-3(D)(28)
Self-storage								C	C	P	P	P	P	P			A		4-3(D)(29)
Outdoor Recreation and Entertainment																			
Amphitheater										C	C	C	C	C	A	P	A	C	
Other outdoor entertainment	CA	CA	CA	CA	CA	CA	A	A	A	A	P	P	P	A		P		P	4-3(D)(32)
Retail Sales																			
Adult retail										P		P	P	P					4-3(D)(6)
Art gallery	CV	CV	C	P	P	P	P	P	P	P	P		P	A					4-3(D)(33)
Bakery goods or confectionery shop							C	P	P	P	P	P	P	P					
Building and home improvement materials store									C	C	P	P	P	C					4-3(D)(34)
Cannabis retail							P	P	P	P	P	P	A	A					4-3(D)(35)
Farmers' market	T		T	T	T	T	T	P	P	P	P	P	CV	CV		P	A	CA	4-3(D)(36)
General retail, small			A			A	P	P	P	P	P	P	P	P					4-3(D)(37)
Grocery store								P	P	P	P		P	P					4-3(D)(38)
Liquor retail							C	A	C	C	C	C	C	C					4-3(D)(39)
Nicotine retail							CA	A	C	C	C	C	C	C					4-3(D)(40)
Pawn shop								C	P	P	P	P	P	P					4-3(D)(41)

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Transportation																			
Freight terminal or dispatch center												C	P	P					4-3(D)(43)
Helipad									CA	CA	A	P	P	P	A				4-3(D)(44)
Park-and-ride lot						C	C	C	P	C	C	P	C	C	A	A			4-3(D)(45)
Railroad yard												C	P	P					4-3(D)(46)
Transit facility						C	C	C	P	P	P	P	P	P					4-3(D)(47)
INDUSTRIAL USES																			
Manufacturing, Fabrication, and Assembly																			
Artisan manufacturing							C	P	P	P	P	P	P	P					4-3(E)(1)
Cannabis cultivation							C	P	P	P	P	P	P	P					4-3(E)(2)
Cannabis-derived products manufacturing							C	P	P	P	P	P	P	P					4-3(E)(3)
Light manufacturing										A	P	P	P	P					4-3(E)(4)
Heavy manufacturing														P					4-3(E)(5)
Special manufacturing														C					4-3(E)(7)
Telecommunications, Towers, and Utilities																			
Drainage facility	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	A	A	C	
Electric utility	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	A	A	A	4-3(E)(8)
Geothermal energy generation	A	A	A	A	A	A	A	A	A	A	A	P	P	P		A	A		4-3(E)(9)
Major utility, other	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	A	A	A	
Solar energy generation	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	4-3(E)(10)
Wind energy generation							A	A	A	A	A	A	A	C	A	A	A		4-3(E)(11)
Wireless Telecommunications Facility (WTF)																			4-3(E)(12)
Architecturally integrated	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
Non-commercial or broadcasting antenna	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
Collocation	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
Freestanding							P	P	P	P	P	P	P	P	A				
Public utility collocation	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
Roof-mounted			A		A	A	A	A	A	A	A	A	A	A	A				
Small cell	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	

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Waste and Recycling																			
Recycling drop-off bin facility						A	A	A	A	A	P	P	P	P					4-3(E)(13)
Salvage yard												C	C	P					4-3(E)(15)
Wholesaling and Storage																			
Above-ground storage of fuels or feed													C	P					
Outdoor storage								CA	C	C	C	A	P	P					4-3(E)(17)
Warehousing									C	C	P	P	P	P					4-3(E)(18)
Wholesaling and distribution center									C	C	P	P	P	P					4-3(E)(19)
ACCESSORY AND TEMPORARY USES																			
ACCESSORY USES																			4-3(F)(1)
Agriculture sales stand	A	A	A	A	A	A	A	A	A	A	A	A	CA	CA			A		4-3(F)(2)
Animal keeping	A	A	A	A	A	A	A	A	A	A	A	A	A	A				CA	4-3(F)(3)
Automated Teller Machine (ATM)			A		A	A	A	A	A	A	A	A	A	A		T	T		
Dwelling unit, accessory with kitchen		A		A	A	A	A	A	A		A	A	A	A	A		A		4-3(F)(5)
Dwelling unit, accessory without kitchen	CA	A		A	A	A	A	A	A		A	A	A	A	A		A		4-3(F)(5)
Mobile food truck	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			4-3(F)(11)
Mobile vending cart							A	A	A	A	A	A	A	A		A		A	4-3(F)(12)
Outdoor animal run	A							CA	CA		CA		A	A					4-3(F)(13)
Outdoor dining area							CA	A	A	A	A	A	A	A	A				4-3(F)(14)
Other use accessory to non-residential primary use							A	A	A	A	A	A	A	A	A			A	4-3(F)(16)

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TEMPORARY USES																		
Temporary Uses That Require A Permit																		
Construction staging area, trailer, or office	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	4-3(G)(2)
Dwelling, temporary	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	4-3(G)(3)
Park-and-ride facility, temporary						T	T	T	T	T	T	T	T	T	T		T	4-3(G)(6)
Real estate office or model home	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T			4-3(G)(7)
Safe outdoor space							CT	CT	CT	CT	T	T	T	T				4-3(G)(8)
Seasonal outdoor sales							T	T	T	T	T	T	T	T				4-3(G)(9)
Temporary use not listed			T			T	T	T	T	T	T	T	T	T	T		T	4-3(G)(10)
Temporary Uses That Do Not Require A Permit																		
Hot air balloon takeoff/landing	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	4-3(G)(12)