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20.11.41 NMAC
"AUTHORITY-TO-CONSTRUCT"
AIR QUALITY PERMIT APPLICATION

Albuquerque, New Mexico

PREPARED FOR
ALBUQUERQUE ASPHALT, INC.

JULY 2019
REVISED OCTOBER 2019

Prepared by

Montrose Air Quality Services, LLC

MONTROSE
AIR QUALITY SERVICES

Introduction

With this 20.11.41.2.A.1 permit application, Albuquerque Asphalt, Inc. (AAI) is applying for a new 300 tons/hr portable aggregate/recycle plant.

AAI has retained Montrose Air Quality Services, LLC (Montrose) to assist with the permit application. The plant will be identified as AAI's 300 tons/hr portable aggregate/recycle plant and will have an initial project location in the lot east of 4560 Broadway Blvd SE, end of Prosperity Extension Ave SE, in Albuquerque, NM. The equipment UTM coordinate is 349,990 Easting; 3,875,290 Nothing, NAD 83, Zone 13. Expected time at the initial project location presented above is 3 to 5 months, depending on weather conditions.

For the facility's site, the operating hours for the portable aggregate/recycle plant is summarized in Table 1. The equipment hourly production is 300 tons per hour. AAI will take permit conditions on daily operating throughput of 3000 tons per day and annual operating throughput of 750,000 tons per year.

TABLE 1: Aggregate/Recycle Plant Daily Hours of Operation (MST)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	1	1	1	1	1	0.5	0	0	0
6:00 AM	0	0.5	1	1	1	1	1	1	1	1	0.5	0
7:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
8:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
9:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
10:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
11:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
12:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
1:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
2:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
3:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
4:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
5:00 PM	0.5	1	1	1	1	1	1	1	1	1	0	0
6:00 PM	0	0	0	1	1	1	1	1	0.5	0	0	0
7:00 PM	0	0	0	0	0	0.5	0.5	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	**10.5**	**11.5**	**12**	**14**	**14**	**14.5**	**14.5**	**14**	**13**	**12**	**10.5**	**10**

Additionally, requested permit conditions for facility operations will include:

- AAI will crush aggregate, recycled asphalt products (RAP), and concrete with the proposed portable aggregate/recycle plant. The plant will consist of three separate mobile track plants; jaw crusher, screen, and impact crusher.

- AAI is requesting options for any combination of equipment for the portable aggregate/recycle plant to allow for what is available from equipment rental providers at the time the project starts. This will allow them to operate their crushing operation with the most flexibility. The dispersion modeling analysis for this flexibility will require modeling the worst-case scenario using the maximum amount of equipment that will be required for the project. The table below presents the potential equipment options for each combination of plants.

Potential Jaw Crusher Plant	Potential Screen Plant	Potential Impact Crusher Plant
Screen Machine JXT	Screen Machine Spyder 512T	Screen Machine 4043T
Screen Machine JHT	Screen Machine Spyder 516T	Power Screen TrakPactor 320SR
Power Screen 400X	Power Screen Warrior 2100	KPI FT4250CC
Power Screen R400X	KPI GT205	Terex Finlay CRH1313R
KPI FT2650	Terex Finlay 684	-----
KPI FT3055	-----	-----
Terex Finlay J-1170	-----	-----

- There are three (3) potential engines to power the mobile track plants; jaw crusher plant, screen plant, and impact crusher plant. Based on engine information provided by the rental equipment providers for each of the plant options, the worst-case NO_X emissions will be based on EPA Tier III emission factors and highest Tier III engine horsepower; and the worst-case CO, SO_2, and PM will be based on EPA Tier 4F emission factors and the highest Tier 4F engine horsepower. Most engines are certified to meet EPA Tier 4F emission limits. The model parameters will be based on what will provide the worst-case model impacts for any engine selected. For the jaw crusher plant the highest Tier 4F horsepower rating will be 440 hp and the highest Tier III horsepower will be 300 hp. For screen plant the highest horsepower rating will be 131 hp. For the impact crusher plant the highest Tier 4F horsepower rating will be 450 hp and the highest Tier III horsepower will be 350 hp. The following tables presents the requested maximum horsepower and dispersion model input parameters for each plant engine.

Potential Jaw Crusher Plant	Horsepower	EPA Certified
Screen Machine JXT	300	Tier III
Screen Machine JHT	300	Tier III
Power Screen 400X	260	Tier III
Power Screen R400X	260	Tier III
KPI FT2650	300	Tier 4F
KPI FT3055	440	Tier 4F
Terex Finlay J-1170	400	Tier 4F
Potential Screen Plant	**Horsepower**	**EPA Certified**
Screen Machine Spyder 512T	84	Tier 4F
Screen Machine Spyder 516T	110	Tier III
Power Screen Warrior 2100	130	Tier III
KPI GT205	129	Tier III
Terex Finlay 684	131	Tier III
Potential Impact Crusher Plant	**Horsepower**	**EPA Certified**
Screen Machine 4043T	300	Tier III
Power Screen TrakPactor 320SR	350	Tier III
KPI FT4250CC	440	Tier 4F
Terex Finlay CRH1313R	450	Tier 4F

Parameter	Potential Jaw Crusher Plant	Potential Screen Plant	Potential Impact Crusher Plant
Horsepower	440 hp	131 hp	450 hp
Stack Height	10 feet	10 feet	10 feet
Stack Exit Diameter	4 inches	3 inches	4 inches
Stack Exhaust Temp.	850º F	850º F	850º F
Stack Exhaust Flowrate	1047 ft^3/min	589 ft^3/min	1047 ft^3/min
Stack Exhaust Velocity	200 ft/sec	200 ft/sec	200 ft/sec
Stack Exit Direction	Horizontal	Horizontal	Horizontal

The preliminary operational plan defining the measures to be taken to mitigate source emissions during malfunction, startup, or shutdown are as follows:

STARTUP AND SHUTDOWN PROCEDURES

Water Truck

Startup

Check water supply, inspect nozzles and open all associated valves before startup.

Shutdown

Inspect nozzles and close all associated valves after shutdown.

Processing Plant Water Spray Dust Suppression System

Startup

Daily visual inspection of water spray operation prior to material processing. All plant water sprays, required to maintain opacity limits to required levels, will be operational prior to material processing.

Shutdown

No additional requirements are proposed.

OPERATIONS PLAN

Water Truck Operation

A water truck to be operated, as needed, at plant site disturbed areas, storage piles, and haul truck traffic areas to prevent excess visible emissions. These activities include; unpaved haul roads, storage piles and active disturbed areas. Water spray application rate will be determined based on the occurrence of visible dust and may vary depending on existing road conditions, traffic, wind, temperature, and precipitation.

Processing Plant Water Spray Dust Suppression System

Water spray dust suppression will be operated at all times when pertinent equipment is operating to maintain equipment opacity limits.

MAINTENANCE PLAN

Water Truck Maintenance

A safety check and equipment check will be conducted daily. Normal vehicle maintenance will be performed regularly or as needed.

Processing Plant Water Spray Dust Suppression Maintenance

Visual inspections will be made monthly to verify proper functioning of control equipment. When emissions are suspected to approach compliance values, equipment will be checked for problems and repaired.

No startup/shutdown emission rates are expected to be greater than what is proposed for normal operations of the plant. All controls will be operating and functioning correctly prior to the start of production.

If you have any questions regarding this permit application please call Paul Wade of Montrose Air Quality Services at (505) 830-9680 x6 or Dan Fisher of AAI at (505) 831-7311.

The contents of this application packet include:

20.11.41 NMAC Permit Fee Review
20.11.41 NMAC Permit Checklist
20.11.41 NMAC Permit Application Forms
Attachment A: Figure A-1: Aggregate/Recycle Plant Process Flow
Figure A-2: Facility Site Plot Plan
Attachment B: Emission Calculations
Attachment C: Emission Calculations Support Documents
Attachment D: Figure E-1: USGS 7 ½“ Topographical Map
Attachment E: Facility Description
Attachment F: Regulatory Applicability Determinations
Attachment G: Dispersion Modeling Summary and Report
Attachment H: Public Notice Documents

City of Albuquerque

Environmental Health Department
Air Quality Program

Permit Application Checklist

Any person seeking a permit under 20.11.41 NMAC, Authority-to-Construct Permits, shall do so by filing a written application with the Department. Prior to ruling a submitted application complete each application submitted shall contain the required items listed below. **This checklist must be returned with the 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.

All applicants shall:

1. **X** Fill out and submit the *Pre-permit Application Meeting Request* form
   a. ☐ Attach a copy to this application

2. **X** Attend the pre-permit application meeting
   a. ☐ Attach a copy of the completed *Pre-permit Application Meeting Checklist* to this application

3. **X** Provide public notice to the appropriate parties
   a. **X** Attach a copy of the completed *Notice of Intent to Construct* form to this form
      i. Neighborhood Association(s):_____
      _____
      ii. Coalition(s): _____
   b. ☐ Attach a copy of the completed *Public Sign Notice Guideline* form

4. Fill out and submit the *Permit Application*. All applications shall:

   A. **X** be made on a form provided by the Department. Additional text, tables, calculations or clarifying information may also be attached to the form.

   B. **X** at the time of application, include documentary proof that all applicable permit application review fees have been paid as required by 20 NMAC 11.02. Please refer to the attached permit application worksheet.

   C. **X** contain the applicant's name, address, and the names and addresses of all other owners or operators of the emission sources.

   D. **X** contain the name, address, and phone number of a person to contact regarding questions about the facility.

E. **X** indicate the date the application was completed and submitted

F. **X** contain the company name, which identifies this particular site.

G. **X** contain a written description of the facility and/or modification including all operations affecting air emissions.

H. **X** contain the maximum and standard operating schedules for the source after completion of construction or modification in terms of hours per day, days per week, and weeks per year.

I. **X** provide sufficient information to describe the quantities and nature of any regulated air contaminant (including any amount of a hazardous air pollutant) that the source will emit during:

- Normal operation
- Maximum operation
- Abnormal emissions from malfunction, start-up and shutdown

J. **X** include anticipated operational needs to allow for reasonable operational scenarios to avoid delays from needing additional permitting in the future.

K. **X** contain a map, such as a 7.5-minute USGS topographic quadrangle, showing the exact location of the source; and include physical address of the proposed source.

L. **X** contain an aerial photograph showing the proposed location of each process equipment unit involved in the proposed construction, modification, relocation, or technical revision of the source except for federal agencies or departments involved in national defense or national security as confirmed and agreed to by the department in writing.

M. **X** contain the UTM zone and UTM coordinates.

N. **X** include the four digit Standard Industrialized Code (SIC) and the North American Industrial Classification System (NAICS).

O. **X** contain the types and **potential emission rate** amounts of any regulated air contaminants the new source or modification will emit. Complete appropriate sections of the application; attachments can be used to supplement the application, but not replace it.

P. **X** contain the types and **controlled** amounts of any regulated air contaminants the new source or modification will emit. Complete appropriate sections of the application; attachments can be used to supplement the application, but not replace it.

Q. **X** contain the basis or source for each emission rate (include the manufacturer's specification sheets, AP-42 Section sheets, test data, or other data when used as the source).

R. **X** contain all calculations used to estimate **potential emission rate** and **controlled** emissions.

S. **X** contain the basis for the estimated control efficiencies and sufficient engineering data for verification of the control equipment operation, including if necessary, design drawings, test reports, and factors which affect the normal operation (e.g. limits to normal operation).

T. **X** contain fuel data for each existing and/or proposed piece of fuel burning equipment.

U. **X** contain the anticipated maximum production capacity of the entire facility and the requested production capacity after construction and/or modification.

V. **X** contain the stack and exhaust gas parameters for all existing and proposed emission stacks.

W. **X** provide an ambient impact analysis using a atmospheric dispersion model approved by the US Environmental Protection Agency (EPA), and the Department to demonstrate compliance with the ambient air quality standards for the City of Albuquerque and Bernalillo County (See 20.11.01 NMAC). If you are modifying an existing source, the modeling must include the emissions of the entire source to demonstrate the impact the new or modified source(s) will have on existing plant emissions.

X. **X** contain a preliminary operational plan defining the measures to be taken to mitigate source emissions during malfunction, startup, or shutdown.

Y. **X** contain a process flow sheet, including a material balance, of all components of the facility that would be involved in routine operations. Indicate all emission points, including fugitive points.

Z. **X** contain a full description, including all calculations and the basis for all control efficiencies presented, of the equipment to be used for air pollution control. This shall include a process flow sheet or, if the Department so requires, layout and assembly drawings, design plans, test reports and factors which affect the normal equipment operation, including control and/or process equipment operating limitations.

AA. ☐ contain description of the equipment or methods proposed by the applicant to be used for emission measurement.

BB. **X** be signed under oath or affirmation by a corporate officer, authorized to bind the company into legal agreements, certifying to the best of his or her knowledge the truth of all information submitted.

City of Albuquerque

Environmental Health Department
Air Quality Program

Permit Application Review Fee Instructions

All source registration, authority-to-construct, and operating 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 modifications 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. be delivered in person to the Albuquerque Environmental Health Department, 3rd floor, Suite 3023 or Suite 3027, Albuquerque-Bernalillo County Government Center, south building, One Civic Plaza NW, Albuquerque, NM or,

2. mailed to Attn: Air Quality Program, Albuquerque Environmental Health Department, P.O. Box 1293, Albuquerque, NM 87103.

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

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	Albuquerque Asphalt, Inc.	
Company Address	P.O. Box 66450, Albuquerque, New Mexico 87193	
Facility Name	300 ton/hr Portable Crushing and Screening Aggregate Plant	
Facility Address	167 Hill St. SW, Albuquerque, NM	
Contact Person	Dan Fisher	
Contact Person Phone Number	(505) 831-7311	
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 #**	
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	$562.00	2801
	AQN Technical Amendment	$307.00	2802
	AQN Transfer of a Prior Authorization	$307.00	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	$ 573.00	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	$ 1,146.00	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	$ 859.00	2302
X	Proposed Allowable Emission Rate Equal to or greater than 5 tpy and less than 25 tpy	$ 1,719.00	2303
	Proposed Allowable Emission Rate Equal to or greater than 25 tpy and less than 50 tpy	$ 3,438.00	2304
	Proposed Allowable Emission Rate Equal to or greater than 50 tpy and less than 75 tpy	$ 5,157.00	2305
	Proposed Allowable Emission Rate Equal to or greater than 75 tpy and less than 100 tpy	$ 6,876.00	2306
	Proposed Allowable Emission Rate Equal to or greater than 100 tpy	$8,594.00	2307
	Not Applicable	*See Section Above*	

Federal Program Review Fees (In addition to the Stationary Source Application Review Fees above)			
X	40 CFR 60 - "New Source Performance Standards" (NSPS)	$ 1,146.00	2308
	40 CFR 61 - "Emission Standards for Hazardous Air Pollutants (NESHAPs)	$ 1,146.00	2309
	40 CFR 63 - (NESHAPs) Promulgated Standards	$ 1,146.00	2310
	40 CFR 63 - (NESHAPs) Case-by-Case MACT Review	$ 11,459.00	2311
	20.11.61 NMAC, Prevention of Significant Deterioration (PSD) Permit	$ 5,730.00	2312
	20.11.60 NMAC, Non-Attainment Area Permit	$ 5,730.00	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	$ 1,146.00	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	$ 859.00	2322
	Proposed Allowable Emission Rate Equal to or greater than 5 tpy and less than 25 tpy	$ 1,719.00	2323
	Proposed Allowable Emission Rate Equal to or greater than 25 tpy and less than 50 tpy	$ 3,438.00	2324
	Proposed Allowable Emission Rate Equal to or greater than 50 tpy and less than 75 tpy	$ 5,157.00	2325
	Proposed Allowable Emission Rate Equal to or greater than 75 tpy and less than 100 tpy	$ 6,876.00	2326
	Proposed Allowable Emission Rate Equal to or greater than 100 tpy	$ 8,594.00	2327
	Not Applicable	*See Section Above*	
Major Modifications Review Fees (In addition to the Modification Application Review Fees above)			
	20.11.60 NMAC, Permitting in Non-Attainment Areas	$ 5,730.00	2333
	20.11.61 NMAC, Prevention of Significant Deterioration	$ 5,730.00	2334
	Not Applicable	*Not Applicable*	
Federal Program Review Fees (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)	$ 1,146.00	2328
	40 CFR 61 - "Emission Standards for Hazardous Air Pollutants (NESHAPs)	$ 1,146.00	2329
	40 CFR 63 - (NESHAPs) Promulgated Standards	$ 1,146.00	2330
	40 CFR 63 - (NESHAPs) Case-by-Case MACT Review	$11,459.00	2331
	20.11.61 NMAC, Prevention of Significant Deterioration (PSD) Permit	$ 5,730.00	2332
	20.11.60 NMAC, Non-Attainment Area Permit	$ 5,730.00	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 V*	

VI. Please submit a check or money order in the amount shown for the total application review fee.

Section Totals	Review Fee Amount
Section II Total	$ 2,865.00
Section III Total	$
Section IV Total	$
Section V Total	$
Total Application Review Fee	**$ 2,865.00**

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 9th **day of** July **20** 19

Robert B. Wood — **Print Name**

President — **Print Title**

R B. Wood

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.

Albuquerque Environmental Health Department - Air Quality Program
Please mail this application to **P.O. Box 1293, Albuquerque, NM 87103**
or hand deliver between 8:00am - 5:00pm Monday - Friday to:
3rd Floor, Suite 3023 - One Civic Plaza NW, Albuquerque, New Mexico 87103
(505) 768 – 1972 aqd@cabq.gov (505) 768 - 1977 (Fax)

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

Clearly handwrite or type **Corporate Information** **ReSubmittal Date:** 08/27/2019

1. Company Name Albuquerque Asphalt Inc.
2. Street Address 202 94th St SW Zip 87121
3. Company City Albuquerque 4. Company State NM 5. Company Phone (505) 831-7311 6. Company Fax (505) 831-0811
7. Company Mailing Address: P.O. BOX 66450 Zip 87193
8. Company Contact and Title Dan Fisher - Vice President of Engineering 9. Phone (505) 831-7311
10. E-mail Dan@alb-asphalt.com

Stationary Source (Facility) Information: **[Provide a plot plan (legal description/drawing of facility property) with overlay sketch of facility processes; Location of emission points; Pollutant type and distances to property boundaries]**

1. Facility Name AAI Broadway Recycle Crusher 2. Street Address Lot east of 4560 Broadway Blvd SE, End of Prosperity Extension Ave SE
3. City Albuquerque 4. State NM 5. Facility Phone (505) 831-7311 6. Facility Fax (505) 831-0811
7. Facility Mailing Address (Local) P.O. BOX 66450 Zip 87193
8. Latitude - Longitude or UTM Coordinates of Facility 349,990E; 3,875,290N NAD 83, Zone 13
9. Facility Contact and Title Dan Fisher - Vice President of Engineering 10. Phone (505) 831-7311 11. E-mail Dan@alb-asphalt.com

General Operation Information (if any further information request does not pertain to your facility, write N/A on the line or in the box)

1. Facility Type (description of your facility operations): 300 tons/hr portable aggregate/recycle plant
2. Standard Industrial Classification (SIC 4 digit #): 1442
3. North American Industry Classification System (NAICS Code #): 212321
4. Is facility currently operating in Bernalillo County. No If yes, date of original construction____/____/_____
   If no, planned startup is 11/01/2019
5. Is facility permanent No If no, give dates for requested temporary operation - from 11/01/2019 through 02/01/2020
6. Is facility process equipment new Yes If no, give actual or estimated manufacture or installation dates in the Process Equipment Table.
7. Is application for a modification, expansion, or reconstruction (altering process, or adding, or replacing process equipment, etc.) to an existing facility which will result in a change in emissions No. If yes, give the manufacture date of modified, added, or replacement equipment in the Process Equipment Table modification date column, or the operation changes to existing process/equipment which cause an emission increase.
8. Is facility operation (circle one) [Continuous **Intermittent** Batch]

9. Estimated % of production Jan-Mar 25% Apr-Jun 25% Jul-Sep 25% Oct-Dec 25%

10. Current or requested operating times of facility daylight hrs/day 7 days/wk 52 wks/yr 12 mos/yr

11. Production Limit of 300 tons per hour and 750,000 tons per year.

12. Business hrs Daylight Hours

13. Will there be special or seasonal operating times other than shown above No If yes, explain

14. Raw materials processed: Aggregate, Sand, RAP, Concrete

15. Saleable item(s) produced: Aggregate, Sand, and Recycled Material

15. Permitting Action Being Requested

X New Permit ☐ Permit Modification ☐ Technical Permit Revision ☐ Administrative Permit Revision
Current Permit #: _____ Current Permit #: _____ Current Permit #: _____

PROCESS EQUIPMENT TABLE

(Generator-Crusher-Screen-Conveyor-Boiler-Mixer-Spray Guns-Saws-Sander-Oven-Dryer-Furnace-Incinerator, etc.) Match the Process Equipment Units listed on this Table to the same numbered line if also listed on Emissions & Stack Table (page 6).

Process Equipment Unit	Manufacturer	Model #	Serial #	Manufacture Date	Installation Date	Modification Date	Size or Process Rate (Hp;kW;Btu;ft^3;lbs; tons;yd^3;etc.)	Fuel Type
RAW: Raw Material Source	NA	NA	NA	NA	TBD	NA	300 ton/hr. 750,000 ton/yr	NA
1. Crusher Plant Feeder	Jaw Crusher Plant Screen Machine Power Screen KPI Terex Finlay	Screen Machine JXT or JHT Power Screen PremierTrax 400X/R400X KPI FT2650 or FT3055 Terex Finlay J-1170	Screen Machine TBD Power Screen TBD KPI TBD Terex Finlay TBD	Screen Machine TBD Power Screen TBD KPI TBD Terex Finlay TBD	Screen Machine TBD Power Screen TBD KPI TBD Terex Finlay TBD	Screen Machine TBD Power Screen TBD KPI TBD Terex Finlay TBD	300 ton/hr. 750,000 ton/yr	NA
2. Crusher Plant Primary Crusher							300 ton/hr. 750,000 ton/yr	NA
3. Crusher Plant Crusher Conveyor							300 ton/hr. 750,000 ton/yr	NA
EG1. Crusher Plant Engine/Generator	Various	Tier III/4F	TBD	TBD	TBD	TBD	Max Rating 440 hp	Low Sulfur Diesel
4. Screen Plant Feeder	Screen Plant Screen Machine Power Screen KPI Terex Finlay	Screen Machine Spyder 512T or 516T Power Screen Warrior 2100 KPI GT205 Terex Finlay 684	Screen Machine TBD Power Screen TBD KPI TBD Terex Finlay TBD	Screen Machine TBD Power Screen TBD KPI TBD Terex Finlay TBD	Screen Machine TBD Power Screen TBD KPI TBD Terex Finlay TBD	Screen Machine TBD Power Screen TBD KPI TBD Terex Finlay TBD	480 ton/hr. 1,200,000 ton/yr	NA
5. Screen Plant Screen							480 ton/hr. 1,200,000 ton/yr	NA
6. Screen Plant Screen Conveyor							150 ton/hr. 375,000 ton/yr	NA
7. Additional Stacker Conveyor							150 ton/hr. 375,000 ton/yr	NA
8. Screen Plant Screen Conveyor							150 ton/hr. 375,000 ton/yr	NA
9. Additional Stacker Conveyor							150 ton/hr. 375,000 ton/yr	NA
10. Screen Plant Screen Conveyor							180 ton/hr. 450,000 ton/yr	NA
EG2. Screen Plant Engine/Generator	Various	Tier III/4F	TBD	TBD	TBD	TBD	Max Rating 131 hp	Low Sulfur Diesel

1. Basis for Equipment Size or Process Rate (Manufacturers data, Field Observation/Test, etc.)_____
Submit information for each unit as an attachment

NOTE: Copy this table if additional space is needed (begin numbering with 16., 17., etc.)

PROCESS EQUIPMENT TABLE

(Generator-Crusher-Screen-Conveyor-Boiler-Mixer-Spray Guns-Saws-Sander-Oven-Dryer-Furnace-Incinerator, etc.) Match the Process Equipment Units listed on this Table to the same numbered line if also listed on Emissions & Stack Table (page 6).

Process Equipment Unit	Manufacturer	Model #	Serial #	Manufacture Date	Installation Date	Modification Date	Size or Process Rate (Hp;kW;Btu;ft^3;lbs; tons;yd^3;etc.)	Fuel Type
11. Impact Crusher Plant Feeder	Impact Crusher Plant Screen Machine Power Screen KPI Terex Finlay	Screen Machine 4043T Power Screen TrakPactor 320SR KPI FT4250CC Terex Finlay CRH1313R	Screen Machine TBD Power Screen TBD KPI TBD Terex Finlay TBD	Screen Machine TBD Power Screen TBD KPI TBD Terex Finlay TBD	Screen Machine TBD Power Screen TBD KPI TBD Terex Finlay TBD	Screen Machine TBD Power Screen TBD KPI TBD Terex Finlay TBD	180 ton/hr. 450,000 ton/yr	NA
12. Impact Crusher Plant Crusher							180 ton/hr. 450,000 ton/yr	NA
13. Impact Crusher Plant Conveyor							180 ton/hr. 450,000 ton/yr	NA
14. Impact Crusher Plant Conveyor							180 ton/hr. 450,000 ton/yr	NA
15. Impact Crusher Plant Conveyor							180 ton/hr. 450,000 ton/yr	NA
16. Impact Crusher Plant Conveyor							180 ton/hr. 450,000 ton/yr	NA
EG3. Impact Crusher Plant Engine/Generator	Various	Tier III/4F	TBD	TBD	TBD	TBD	Max Rating 450 hp	Low Sulfur Diesel
STACKER. Material Drop from Stacker Conveyors to Storage Pile	NA	NA	NA	NA	TBD	NA	300 ton/hr. 750,000 ton/yr	NA
FINISH. Material Transfer to Finish Storage Pile	NA	NA	NA	NA	TBD	NA	300 ton/hr. 750,000 ton/yr	NA
PRODUCT. Load Product Trucks	NA	NA	NA	NA	TBD	NA	300 ton/hr. 750,000 ton/yr	NA
ROAD. Unpaved Haul Road Traffic	NA	NA	NA	NA	TBD	NA	13 trucks/hr. 32,609 trucks/yr	NA

1. Basis for Equipment Size or Process Rate (Manufacturers data, Field Observation/Test, etc.)_____
Submit information for each unit as an attachment

NOTE: Copy this table if additional space is needed (begin numbering with 16., 17., etc.)

TABLE EXEMPTED SOURCES AND EXEMPTED ACTIVITIES

(Generator-Crusher-Screen-Conveyor-Boiler-Mixer-Spray Guns-Saws-Sander-Oven-Dryer-Furnace-Incinerator, etc.) Match the Process Equipment Units listed on this Table to the same numbered line if also listed on Emissions & Stack Table (page 6).

Process Equipment Unit	Manufacturer	Model #	Serial #	Manufacture Date	Installation Date	Modification Date	Size or Process Rate (Hp;kW;Btu;ft^3;lbs; tons;yd^3;etc.)	Fuel Type
1. NA							HR. YR.	
2.							HR. YR.	
3.							HR. YR.	
4.							HR. YR.	
5.							HR. YR.	
6.							HR. YR.	
7.							HR. YR.	
8.							HR. YR.	
9.							HR. YR.	
10.							HR. YR.	
11.							HR. YR.	
12.							HR. YR.	
13.							HR. YR.	
14.							HR. YR.	
15.							HR. YR.	

1. Basis for Equipment Size or Process Rate (Manufacturers data, Field Observation/Test, etc.) _____
Submit information for each unit as an attachment

NOTE: Copy this table if additional space is needed (begin numbering with 16., 17., etc.)

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

UNCONTROLLED EMISSIONS OF INDIVIDUAL AND COMBINED PROCESSES

(Process potential under physical/operational limitations during a 24 hr/day and 365 day/year = 8,760 hrs)

Process Equipment Unit*	Carbon Monoxide (CO)	Oxides of Nitrogen (NOx)	Nonmethane Hydrocarbons NMHC (VOCs)	Oxides of Sulfur (SOx)	Total Suspended Particulate Matter (TSP)	Method(s) used for Determination of Emissions (AP-42, Material balance, field tests, manufacturers data, etc.)
RAW	RAW. lbs/hr	lbs/hr	lbs/hr	lbs/hr	1.42 lbs/hr	AP-42 Section 13.2.4 "Aggregate Handling" 2% moisture content and 8.5 MPH wind speed
	RAWa. tons/yr	tons/yr	tons/yr	tons/yr	6.20 tons/yr	
1. Jaw Crusher Plant Feeder	1. lbs/hr	lbs/hr	lbs/hr	lbs/hr	1.42 lbs/hr	AP-42 Section 13.2.4 "Aggregate Handling" 2% moisture content and 8.5 MPH wind speed
	1a. tons/yr	tons/yr	tons/yr	tons/yr	6.20 tons/yr	
2. Jaw Crusher	2. lbs/hr	lbs/hr	lbs/hr	lbs/hr	1.62 lbs/hr	AP-42 Table 11.19.2-2 "Tertiary Crushing Uncontrolled"
	2a. tons/yr	tons/yr	tons/yr	tons/yr	7.10 tons/yr	
3. Jaw Crusher Conveyor	3. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.90 lbs/hr	AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"
	3a. tons/yr	tons/yr	tons/yr	tons/yr	3.94 tons/yr	
4. Screening Plant Feeder	4. lbs/hr	lbs/hr	lbs/hr	lbs/hr	2.27 lbs/hr	AP-42 Section 13.2.4 "Aggregate Handling" 2% moisture content and 8.5 MPH wind speed
	4a. tons/yr	tons/yr	tons/yr	tons/yr	9.92 tons/yr	
5. Screen	5. lbs/hr	lbs/hr	lbs/hr	lbs/hr	12.00 lbs/hr	AP-42 Table 11.19.2-2 "Screening Uncontrolled"
	5a. tons/yr	tons/yr	tons/yr	tons/yr	52.56 tons/yr	
6. Screen Plant Conveyor	6. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.45 lbs/hr	AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"
	6a. tons/yr	tons/yr	tons/yr	tons/yr	1.97 tons/yr	
7. Conveyor	7. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.45 lbs/hr	AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"
	7a. tons/yr	tons/yr	tons/yr	tons/yr	1.97 tons/yr	
8. Screen Plant Conveyor	8. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.45 lbs/hr	AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"
	8a. tons/yr	tons/yr	tons/yr	tons/yr	1.97 tons/yr	
9. Conveyor	9. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.45 lbs/hr	AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"
	9a. tons/yr	tons/yr	tons/yr	tons/yr	1.97 tons/yr	
10. Screen Plant Conveyor	10. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.54 lbs/hr	AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"
	10a. tons/yr	tons/yr	tons/yr	tons/yr	2.37 tons/yr	
11. Impact Crusher Plant Feeder	11. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.85 lbs/hr	AP-42 Section 13.2.4 "Aggregate Handling" 2% moisture content and 8.5 MPH wind speed
	11a. tons/yr	tons/yr	tons/yr	tons/yr	3.72 tons/yr	
Totals of Uncontrolled Emissions (RAW - 11)	**lbs/hr**	**lbs/hr**	**lbs/hr**	**lbs/hr**	**22.81 lbs/hr**	
	tons/yr	**tons/yr**	**tons/yr**	**tons/yr**	**99.90 tons/yr**	

*** If any one (1) of these process units, <u>or</u> combination of units, has an uncontrolled emission greater than (>) 10 lbs/hr or 25 tons/yr for any of the above pollutants (based on 8760 hrs of operation), then a permit will be required. Complete this application along with additional checklist information requested on accompanying instruction sheet. <u>Copy this Table if additional space is needed (begin numbering with 11., 12., etc.)</u>**

*** If all of these process units, individually <u>and</u> in combination, have an uncontrolled emission less than or equal to (<u>≤</u>) 10 lbs/hr or 25 tons/yr for all of the above pollutants (based on 8760 hrs of operation), but > 1 ton/yr for any of the above pollutants - then a source registration is required.**

<u>If your facility does not require a registration or permit, based on above emissions, complete the remainder of this application to determine if a registration or permit would be required for Toxic or Hazardous air pollutants used at your facility.</u>

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

UNCONTROLLED EMISSIONS OF INDIVIDUAL AND COMBINED PROCESSES

(Process potential under physical/operational limitations during a 24 hr/day and 365 day/year = 8,760 hrs)

Process Equipment Unit*	Carbon Monoxide (CO)	Oxides of Nitrogen (NOx)	Nonmethane Hydrocarbons NMHC (VOCs)	Oxides of Sulfur (SOx)	Total Suspended Particulate Matter (TSP)	Method(s) used for Determination of Emissions (AP-42, Material balance, field tests, manufacturers data, etc.)
12. Impact Crusher	12. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.97 lbs/hr	AP-42 Table 11.19.2-2 "Tertiary Crushing Uncontrolled"
	12a. tons/yr	tons/yr	tons/yr	tons/yr	4.26 tons/yr	
13. Impact Crusher Conveyor	13. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.54 lbs/hr	AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"
	13a. tons/yr	tons/yr	tons/yr	tons/yr	2.37 tons/yr	
14. Conveyor	14. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.54 lbs/hr	AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"
	14a. tons/yr	tons/yr	tons/yr	tons/yr	2.37 tons/yr	
15. Conveyor	15. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.54 lbs/hr	AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"
	15a. tons/yr	tons/yr	tons/yr	tons/yr	2.37 tons/yr	
16. Conveyor	16. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.54 lbs/hr	AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"
	16a. tons/yr	tons/yr	tons/yr	tons/yr	2.37 tons/yr	
STACKER. Stacker Conveyor Drop to Pile	STACKER. lbs/hr	lbs/hr	lbs/hr	lbs/hr	1.42 lbs/hr	AP-42 Section 13.2.4 "Aggregate Handling" 2% moisture content and 8.5 MPH wind speed
	STACKERa. tons/yr	tons/yr	tons/yr	tons/yr	6.20 tons/yr	
FINISH. Finish Product Storage Pile	FINISH. lbs/hr	lbs/hr	lbs/hr	lbs/hr	1.42 lbs/hr	AP-42 Section 13.2.4 "Aggregate Handling" 2% moisture content and 8.5 MPH wind speed
	FINISHa. tons/yr	tons/yr	tons/yr	tons/yr	6.20 tons/yr	
PRODUCT. Product Truck Loading - Finish Pile	PRODUCT. lbs/hr	lbs/hr	lbs/hr	lbs/hr	1.42 lbs/hr	AP-42 Section 13.2.4 "Aggregate Handling" 2% moisture content and 8.5 MPH wind speed
	PRODUCTa. tons/yr	tons/yr	tons/yr	tons/yr	6.20 tons/yr	
EG1. Jaw Crusher Plant Engine	EG1. 2.53 lbs/hr	1.97 lbs/hr	0.29 lbs/hr	0.16 lbs/hr	0.14 lbs/hr	Tier III/IVF Emission Factors
	EG1a. 11.09 tons/yr	8.64 tons/yr	1.27 tons/yr	0.69 tons/yr	0.63 tons/yr	
EG2. Screen Plant Engine	EG2. 1.08 lbs/hr	0.86 lbs/hr	0.086 lbs/hr	0.046 lbs/hr	0.065 lbs/hr	Tier III Emission Factors
	EG2a. 4.72 tons/yr	3.77 tons/yr	0.38 tons/yr	0.20 tons/yr	0.28 tons/yr	
EG3. Impact Crusher Engine	EG3. 2.59 lbs/hr	2.30 lbs/hr	0.30 lbs/hr	0.16 lbs/hr	0.15 lbs/hr	Tier III/IVF Emission Factors
	EG3a. 11.34 tons/yr	10.08 tons/yr	1.30 tons/yr	0.69 tons/yr	0.65 tons/yr	
ROAD. Unpaved Haul Road Traffic	ROAD. lbs/hr	lbs/hr	lbs/hr	lbs/hr	36.74 lbs/hr	AP-42 13.2 (ver 11/06) "Unpaved Road"
	ROADa. tons/yr	tons/yr	tons/yr	tons/yr	134.48 tons/yr	
Totals of Uncontrolled Emissions (12 – ROAD)	**6.20 lbs/hr**	**5.14 lbs/hr**	**0.67 lbs/hr**	**0.36 lbs/hr**	**44.48 lbs/hr**	
	27.15 tons/yr	**22.49 tons/yr**	**2.94 tons/yr**	**1.58 tons/yr**	**168.37 tons/yr**	
Totals of Uncontrolled Emissions (RAW – ROAD)	**6.20 lbs/hr**	**5.14 lbs/hr**	**0.67 lbs/hr**	**0.36 lbs/hr**	**67.29 lbs/hr**	
	27.15 tons/yr	**22.49 tons/yr**	**2.94 tons/yr**	**1.58 tons/yr**	**268.26 tons/yr**	

*** If any one (1) of these process units, or combination of units, has an uncontrolled emission greater than (>) 10 lbs/hr or 25 tons/yr for any of the above pollutants (based on 8760 hrs of operation), then a permit will be required. Complete this application along with additional checklist information requested on accompanying instruction sheet. Copy this Table if additional space is needed (begin numbering with 11., 12., etc.)**

*** If all of these process units, individually and in combination, have an uncontrolled emission less than or equal to (≤) 10 lbs/hr or 25 tons/yr for all of the above pollutants (based on 8760 hrs of operation), but > 1 ton/yr for any of the above pollutants - then a source registration is required.**

CONTROLLED EMISSIONS OF INDIVIDUAL AND COMBINED PROCESSES

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

Process Equipment Units listed on this Table should match up to the same numbered line and Unit as listed on Uncontrolled Table (pg. 3)

Process Equipment Unit	Carbon Monoxide (CO)	Oxides of Nitrogen (NOx)	Nonmethane Hydrocarbons NMHC (VOCs)	Oxides of Sulfur (SOx)	Total Suspended Particulate Matter (TSP)	Control Method	% Efficiency
RAW	RAW. lbs/hr	lbs/hr	lbs/hr	lbs/hr	1.42 lbs/hr	None	NA
	RAWa. tons/yr	tons/yr	tons/yr	tons/yr	1.77 tons/yr		
1. Jaw Crusher Plant Feeder	1. lbs/hr	lbs/hr	lbs/hr	lbs/hr	1.42 lbs/hr	None	NA
	1a. tons/yr	tons/yr	tons/yr	tons/yr	1.77 tons/yr		
2. Jaw Crusher	2. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.36 lbs/hr	Water spray or Moisture Content	88.33%
	2a. tons/yr	tons/yr	tons/yr	tons/yr	0.45 tons/yr		
3. Jaw Crusher Conveyor	3. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.042 lbs/hr	Water spray or Moisture Content	95.33%
	3a. tons/yr	tons/yr	tons/yr	tons/yr	0.053 tons/yr		
4. Screening Plant Feeder	4. lbs/hr	lbs/hr	lbs/hr	lbs/hr	1.36 lbs/hr	Water spray or Moisture Content	40%
	4a. tons/yr	tons/yr	tons/yr	tons/yr	1.70 tons/yr		
5. Screen	5. lbs/hr	lbs/hr	lbs/hr	lbs/hr	1.06 lbs/hr	Water spray or Moisture Content	91.20%
	5a. tons/yr	tons/yr	tons/yr	tons/yr	1.32 tons/yr		
6. Screen Plant Conveyor	6. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.021 lbs/hr	Water spray or Moisture Content	95.33%
	6a. tons/yr	tons/yr	tons/yr	tons/yr	0.026 tons/yr		
7. Conveyor	7. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.021 lbs/hr	Water spray or Moisture Content	95.33%
	7a. tons/yr	tons/yr	tons/yr	tons/yr	0.026 tons/yr		
8. Screen Plant Conveyor	8. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.021 lbs/hr	Water spray or Moisture Content	95.33%
	8a. tons/yr	tons/yr	tons/yr	tons/yr	0.026 tons/yr		
9. Conveyor	9. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.021 lbs/hr	Water spray or Moisture Content	95.33%
	9a. tons/yr	tons/yr	tons/yr	tons/yr	0.026 tons/yr		
10. Screen Plant Conveyor	10. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.025 lbs/hr	Water spray or Moisture Content	95.33%
	10a. tons/yr	tons/yr	tons/yr	tons/yr	0.032 tons/yr		
11. Impact Crusher Plant Feeder	11. lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.51 lbs/hr	Water spray or Moisture Content	40%
	11a. tons/yr	tons/yr	tons/yr	tons/yr	0.64 tons/yr		
Totals of Controlled Emissions (RAW - 11)	**lbs/hr**	**lbs/hr**	**lbs/hr**	**lbs/hr**	**6.27 lbs/hr**		
	tons/yr	**tons/yr**	**tons/yr**	**tons/yr**	**7.84 tons/yr**		

1. Basis for Control Equipment % Efficiency (Manufacturers data, Field Observation/Test, AP-42, etc.) AP-42
Submit information for each unit as an attachment

2. Explain and give estimated amounts of any Fugitive Emission associated with facility processes
_____

NOTE: Copy this table if additional space is needed (begin numbering with 16., 17., etc.)

CONTROLLED EMISSIONS OF INDIVIDUAL AND COMBINED PROCESSES

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

Process Equipment Units listed on this Table should match up to the same numbered line and Unit as listed on Uncontrolled Table (pg. 3)

Process Equipment Unit		Carbon Monoxide (CO)	Oxides of Nitrogen (NOx)	Nonmethane Hydrocarbons NMHC (VOCs)	Oxides of Sulfur (SOx)	Total Suspended Particulate Matter (TSP)	Control Method	% Efficiency
12. Impact Crusher	12.	lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.22 lbs/hr	Water spray or Moisture Content	88.33%
	12a.	tons/yr	tons/yr	tons/yr	tons/yr	0.27 tons/yr		
13. Impact Crusher Conveyor	13.	lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.025 lbs/hr	Water spray or Moisture Content	95.33%
	13a.	tons/yr	tons/yr	tons/yr	tons/yr	0.032 tons/yr		
14. Conveyor	14.	lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.025 lbs/hr	Water spray or Moisture Content	95.33%
	14a.	tons/yr	tons/yr	tons/yr	tons/yr	0.032 tons/yr		
15. Conveyor	15.	lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.025 lbs/hr	Water spray or Moisture Content	95.33%
	15a.	tons/yr	tons/yr	tons/yr	tons/yr	0.032 tons/yr		
16. Conveyor	16.	lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.025 lbs/hr	Water spray or Moisture Content	95.33%
	16a.	tons/yr	tons/yr	tons/yr	tons/yr	0.032 tons/yr		
STACKER. Stacker Conveyor Drop to Pile	STACKER.	lbs/hr	lbs/hr	lbs/hr	lbs/hr	0.85 lbs/hr	Water spray or Moisture Content	40%
	STACKERa.	tons/yr	tons/yr	tons/yr	tons/yr	1.06 tons/yr		
FINISH. Finish Product Storage Pile	FINISH.	lbs/hr	lbs/hr	lbs/hr	lbs/hr	1.42 lbs/hr	None	NA
	FINISHa.	tons/yr	tons/yr	tons/yr	tons/yr	1.77 tons/yr		
PRODUCT. Product Truck Loading - Finish Pile	PRODUCT.	lbs/hr	lbs/hr	lbs/hr	lbs/hr	1.42 lbs/hr	None	NA
	PRODUCTa.	tons/yr	tons/yr	tons/yr	tons/yr	1.77 tons/yr		
EG1. Jaw Crusher Plant Engine	EG1.	2.53 lbs/hr	1.97 lbs/hr	0.29 lbs/hr	0.16 lbs/hr	0.14 lbs/hr	None	NA
	EG1a.	5.80 tons/yr	4.52 tons/yr	0.66 tons/yr	0.36 tons/yr	0.33 tons/yr		
EG2. Screen Plant Engine	EG2.	1.08 lbs/hr	0.86 lbs/hr	0.086 lbs/hr	0.046 lbs/hr	0.065 lbs/hr	None	NA
	EG2a.	2.47 tons/yr	1.97 tons/yr	0.20 tons/yr	0.11 tons/yr	0.15 tons/yr		
EG3. Impact Crusher Engine	EG3.	2.59 lbs/hr	2.30 lbs/hr	0.30 lbs/hr	0.16 lbs/hr	0.15 lbs/hr	None	NA
	EG3a.	5.93 tons/yr	5.27 tons/yr	0.68 tons/yr	0.36 tons/yr	0.34 tons/yr		
ROAD. Unpaved Haul Road Traffic	ROAD.	lbs/hr	lbs/hr	lbs/hr	lbs/hr	7.35 lbs/hr	Unpaved Roads-Watering and Base Course	Unpaved - 80%
	ROADa.	tons/yr	tons/yr	tons/yr	tons/yr	7.68 tons/yr		
Totals of Controlled Emissions (12 - ROAD)		**6.20 lbs/hr**	**5.14 lbs/hr**	**0.67 lbs/hr**	**0.36 lbs/hr**	**11.70 lbs/hr**		
		14.19 tons/yr	**11.76 tons/yr**	**1.54 tons/yr**	**0.82 tons/yr**	**13.50 tons/yr**		
Totals of Controlled Emissions (RAW - ROAD)		**6.20 lbs/hr**	**5.14 lbs/hr**	**0.67 lbs/hr**	**0.36 lbs/hr**	**17.97 lbs/hr**		
		21.01 tons/yr	**17.41 tons/yr**	**2.28 tons/yr**	**1.22 tons/yr**	**21.33 tons/yr**		

1. Basis for Control Equipment % Efficiency (Manufacturers data, Field Observation/Test, AP-42, etc.) AP-42, Tier III/4F for EG1, EG2, and EG3

Submit information for each unit as an attachment

2. Explain and give estimated amounts of any Fugitive Emission associated with facility processes

**TOXIC EMISSIONS

VOLATILE, HAZARDOUS, & VOLATILE HAZARDOUS AIR POLLUTANT EMISSION TABLE

Product Categories (Coatings, Solvents, Thinners, etc.)	Volatile Organic Compound (VOC), Hazardous Air Pollutant (HAP), or Volatile Hazardous Air Pollutant (VHAP) Primary To The Representative As Purchased Product	Chemical Abstract Service Number (CAS) Of VOC, HAP, Or VHAP From Representative As Purchased Product	VOC, HAP, Or VHAP Concentration Of Representative As Purchased Product (pounds/gallon, or %)	1. How were Concentrations Determined (CPDS, MSDS, etc.)	Total Product Purchases For Category	(-)	Quantity Of Product Recovered & Disposed For Category	(=)	Total Product Usage For Category
I. NA					lbs/yr gal/yr	(-)	lbs/yr gal/yr	(=)	lbs/yr gal/yr
II.					lbs/yr gal/yr	(-)	lbs/yr gal/yr	(=)	lbs/yr gal/yr
III.					lbs/yr gal/yr	(-)	lbs/yr gal/yr	(=)	lbs/yr gal/yr
IV.					lbs/yr gal/yr	(-)	lbs/yr gal/yr	(=)	lbs/yr gal/yr
V.					lbs/yr gal/yr	(-)	lbs/yr gal/yr	(=)	lbs/yr gal/yr
VI.					lbs/yr gal/yr	(-)	lbs/yr gal/yr	(=)	lbs/yr gal/yr
VII.					lbs/yr gal/yr	(-)	lbs/yr gal/yr	(=)	lbs/yr gal/yr
VIII.					lbs/yr gal/yr	(-)	lbs/yr gal/yr	(=)	lbs/yr gal/yr
IX.					lbs/yr gal/yr	(-)	lbs/yr gal/yr	(=)	lbs/yr gal/yr
X.					lbs/yr gal/yr	(-)	lbs/yr gal/yr	(=)	lbs/yr gal/yr
TOTAL >>>>>>>					lbs/yr gal/yr	(-)	lbs/yr gal/yr	(=)	lbs/yr gal/yr

1. Basis for percent (%) determinations (Certified Product Data Sheets, Material Safety Data Sheets, etc.). 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. Copy this Table if additional space is needed (begin numbering with XI., XII., etc.)

****NOTE: A REGISTRATION IS REQUIRED, AT MINIMUM, FOR ANY AMOUNT OF HAP OR VHAP EMISSION. A PERMIT MAY BE REQUIRED FOR THESE EMISSIONS, DETERMINED ON A CASE-BY-CASE EVALUATION.**

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

MATERIAL AND FUEL STORAGE TABLE

(Tanks, barrels, silos, stockpiles, etc.) Copy this table if additional space is needed (begin numbering with 6., 7., etc.)

Storage Equipment	Product Stored	Capacity (bbls - tons gal - acres,etc)	Above or Below Ground	Construction (welded, riveted) & Color	Install Date	Loading Rate	Offloading Rate	True Vapor Pressure	Control Equipment	Seal Type	% Eff.
RAW	Aggregate, Recycle Material	1 Acre	Above	NA	TBD	300 ton/hr. 750,000 ton/yr	300 ton/hr. 750,000 ton/yr	NA	None	NA	0.0
FINISH	Aggregate, Recycle Material	1/2 Acre	Above	NA	TBD	300 ton/hr. 750,000 ton/yr	300 ton/hr. 750,000 ton/yr	NA	None	NA	0.0

1. Basis for Loading/Offloading Rate (Manufacturers data, Field Observation/Test, etc.) Submit information for each unit as an attachment
Field Observation – RAW, FINISH

2. Basis for Control Equipment % Efficiency (Manufacturers data, Field Observation/Test, AP-42, etc.) Submit information for each unit as an attachment
_____

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

STACK AND EMISSION MEASUREMENT TABLE

If any equipment from the Process Equipment Table (Page 2) is also listed in this Stack Table, use the same numbered line for the Process Equipment unit on both Tables to show the association between the Process Equipment and its Stack. Copy this table if additional space is needed (begin numbering with 6., 7., etc.).

Process Equipment	Pollutant (CO,NOx,TSP, Toluene,etc)	Control Equipment	Control Efficiency	Stack Height & Diameter in feet	Stack Temp.	Stack Velocity & Exit Direction	Emission Measurement Equipment Type	Range-Sensitivity-Accuracy-
EG1. Crusher Plant Engine/Generator	PM, CO, NOx, VOC, SO2	None	0.0	Height – 10 feet Diameter – 0.33 feet	850.0º F	Velocity – 200 ft/sec Direction - Horizontal	None	None
EG2. Screen Plant Engine/Generator	PM, CO, NOx, VOC, SO2	None	0.0	Height – 10 feet Diameter – 0.25 feet	850.0º F	Velocity – 200 ft/sec Direction - Horizontal	None	None
EG3. Impact Crusher Plant Engine/Generator	PM, CO, NOx, VOC, SO2	None	0.0	Height – 10 feet Diameter – 0.33 feet	850.0º F	Velocity – 200 ft/sec Direction - Horizontal	None	None

1. Basis for Control Equipment % Efficiency (Manufacturers data, Field Observation/Test, AP-42, etc.) Submit information for each unit as an attachment
None

I, the undersigned, a responsible officer of the applicant company, certify that to the best of my knowledge, the information stated on this application, together with associated drawings, specifications, and other data, give a true and complete representation of the existing, modified existing, or planned new stationary source with respect to air pollution sources and control equipment. I also understand that any significant omissions, errors, or misrepresentations in these data will be cause for revocation of part or all of the resulting registration or permit.

Signed this_____ day of_____, 20_____

_____ _____

Print Name Print Title

_____

Signature

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

STACK AND EMISSION MEASUREMENT TABLE

If any equipment from the Process Equipment Table (Page 2) is also listed in this Stack Table, use the same numbered line for the Process Equipment unit on both Tables to show the association between the Process Equipment and its Stack. Copy this table if additional space is needed (begin numbering with 6., 7., etc.).

Process Equipment	Pollutant (CO,NOx,TSP, Toluene,etc)	Control Equipment	Control Efficiency	Stack Height & Diameter in feet	Stack Temp.	Stack Velocity & Exit Direction	Emission Measurement Equipment Type	Range-Sensitivity-Accuracy-
EG1. Crusher Plant Engine/Generator	PM, CO, NOx, VOC, SO2	None	0.0	Height – 8 feet Diameter – 0.33 feet	800.0° F	Velocity – 150 ft/sec Direction - Horizontal	None	None
EG2. Screen Plant Engine/Generator	PM, CO, NOx, VOC, SO2	None	0.0	Height – 8 feet Diameter – 0.25 feet	800.0° F	Velocity – 150 ft/sec Direction - Horizontal	None	None
EG3. Impact Crusher Plant Engine/Generator	PM, CO, NOx, VOC, SO2	None	0.0	Height – 8 feet Diameter – 0.33 feet	800.0° F	Velocity – 150 ft/sec Direction - Horizontal	None	None

1. Basis for Control Equipment % Efficiency (Manufacturers data, Field Observation/Test,AP-42, etc.) Submit information for each unit as an attachment
None

I, the undersigned, a responsible officer of the applicant company, certify that to the best of my knowledge, the information stated on this application, together with associated drawings, specifications, and other data, give a true and complete representation of the existing, modified existing, or planned new stationary source with respect to air pollution sources and control equipment. I also understand that any significant omissions, errors, or misrepresentations in these data will be cause for revocation of part or all of the resulting registration or permit.

Signed this 9th day of July, 20 19

Robert B. Wood
Print Name

President
Print Title

Signature

Attachment A
Facility Process Flow Diagrams and Plot Plan

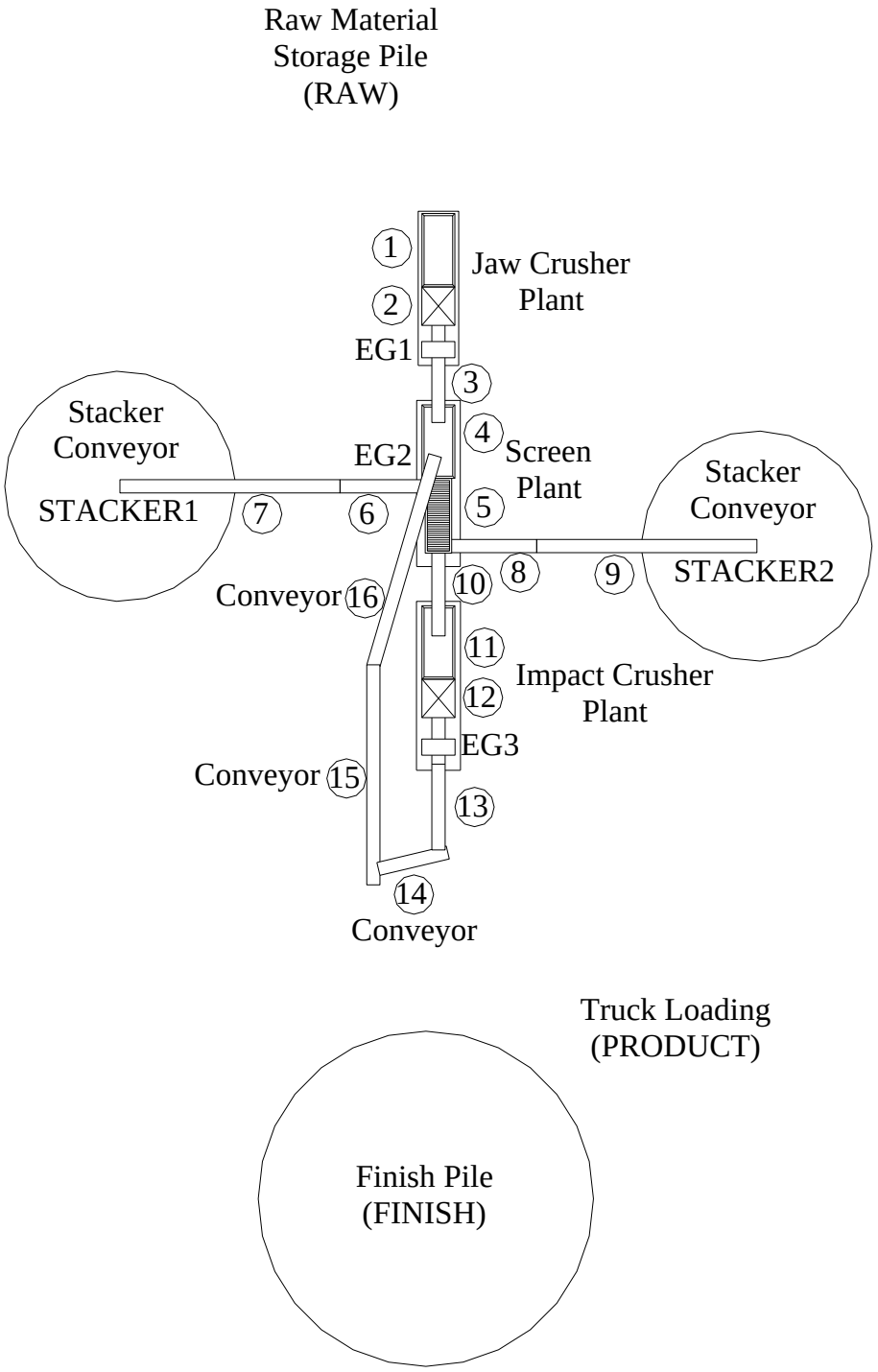

FIGURE A-1: Equipment Process Flow Diagram

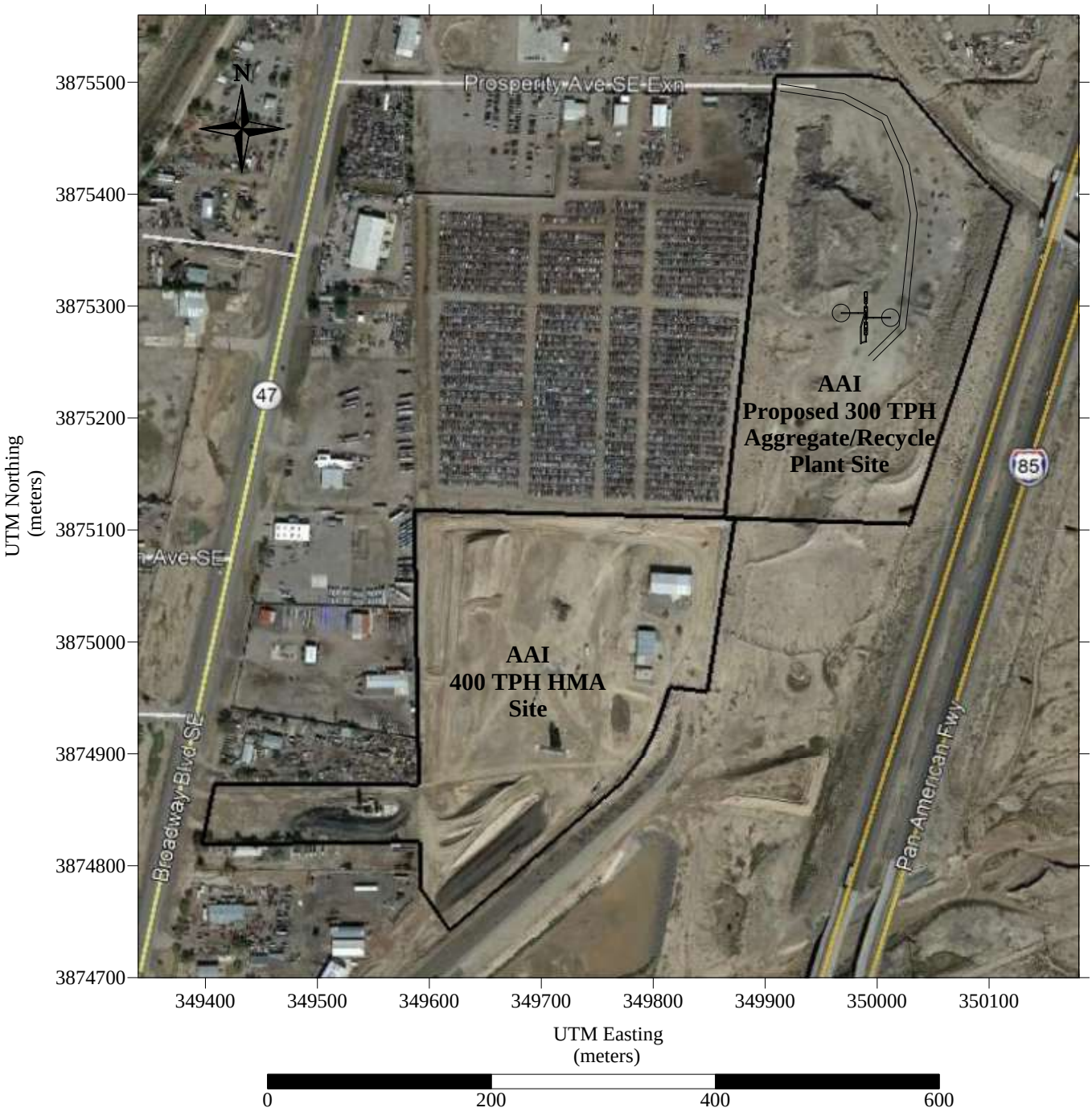

FIGURE A-2: AAI Aggregate/Recycle Plant Layout Overview

Attachment B
Emissions Calculations

Pre-Control Particulate Emission Rates

MATERIAL HANDLING ($PM_{2.5}$, PM_{10}, AND TSP)

To estimate material handling pre-control particulate emissions rates for crushing, screening, and conveyor transfer operations, emission factors were obtained from EPA's Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Aug. 2004, Section 11.19.2, Table 11.19.2-2. To determine missing $PM_{2.5}$ emission factors the ratio of 0.35/0.053 from $PM_{10}/PM_{2.5}$ *k* factors found in AP-42 Section 13.2.4 (11/2006) were used.

To estimate material handling pre-control particulate emission rates for aggregate handling operations (aggregate piles/loading feed bins/stacker conveyor to pile loading), an emission equation was obtained from EPA's Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, Section 13.2.4 (11/2004), where the k (TSP = 0.74, PM_{10} = 0.35, $PM_{2.5}$ = 0.053), wind speed for determining the maximum hourly and annual emission rate emission rate are based on the average wind speed for Albuquerque for the years of 1996 through 2006 of 8.5 mph, and the NMED default moisture content of 2 percent.

Maximum hourly production is 300 tons per hour. Uncontrolled annual emission rates are based on 8760 hours per year.

Aggregate Storage Piles and Feed Bin Loading Emission Equation:

Maximum Hour Emission Factor

E (lbs/ton) = k x 0.0032 x $(U/5)^{1.3}$ / $(M/2)^{1.4}$

E_{TSP} (lbs/ton) = 0.74 x 0.0032 x $(8.5/5)^{1.3}$ / $(2/2)^{1.4}$

E_{PM10} (lbs/ton) = 0.35 x 0.0032 x $(8.5/5)^{1.3}$ / $(2/2)^{1.4}$

$E_{PM2.5}$ (lbs/ton) = 0.053 x 0.0032 x $(8.5/5)^{1.3}$ / $(2/2)^{1.4}$

E_{TSP} (lbs/ton) = 0.00472 lbs/ton;

E_{PM10} (lbs/ton) = 0.00223 lbs/ton

$E_{PM2.5}$ (lbs/ton) = 0.00034 lbs/ton

AP-42 Emission Factors:

All Bin Unloading and Conveyor Transfers = Uncontrolled Conveyor Transfer Point Emission Factor
Crushing = Uncontrolled Tertiary Crushing Emission Factor
Screening = Uncontrolled Screening Emission Factor

Material Handling Emission Factors:

Process Unit	TSP Emission Factor (lbs/ton)	PM_{10} Emission Factor (lbs/ton)	$PM_{2.5}$ Emission Factor (lbs/ton)
Uncontrolled Crushing	0.00540	0.00240	0.00036
Uncontrolled Screening	0.02500	0.00870	0.00132
Uncontrolled Screen Unloading, Feed Bin Unloading, and Conveyor Transfers	0.00300	0.00110	0.00017
Uncontrolled Aggregate Storage Piles, Aggregate Feeder Loading, Stacker Conveyor Unloading	0.00472	0.00223	0.00034

The following equation was used to calculate the hourly emission rate for each process unit:

Emission Rate (lbs/hour) = Process Rate (tons/hour) * Emission Factor (lbs/ton)

The following equation was used to calculate the annual emission rate for each process unit:

$$\text{Emission Rate (tons/year)} = \frac{\text{Emission Rate (lbs/hour)} * \text{Annual Hours (hours/year)}}{\text{2000 lbs/ton}}$$

Table B-1 Pre-Controlled Material Handling Emission Rates

Unit #	Process Unit Description	Process Rate (tph)	TSP Emission Rate (lbs/hr)	TSP Emission Rate (tons/yr)	PM_{10} Emission Rate (lbs/hr)	PM_{10} Emission Rate (tons/yr)	$PM_{2.5}$ Emission Rate (lbs/hr)	$PM_{2.5}$ Emission Rate (tons/yr)
RAW	Raw Material Source	300	1.42	6.20	0.67	2.93	0.10	0.44
1	Jaw Crusher Plant Feeder	300	1.42	6.20	0.67	2.93	0.10	0.44
2	Jaw Crusher	300	1.62	7.10	0.72	3.15	0.13	0.58
3	Jaw Crusher Conveyor	300	0.90	3.94	0.33	1.45	0.10	0.43
4	Screening Plant Feeder	480	2.27	9.92	1.07	4.69	0.16	0.71
5	Screen	480	12.00	52.56	4.18	18.29	0.28	1.24
6	Screen Plant Conveyor	150	0.45	1.97	0.17	0.72	0.049	0.21
7	Conveyor	150	0.45	1.97	0.17	0.72	0.049	0.21
8	Screen Plant Conveyor	150	0.45	1.97	0.17	0.72	0.049	0.21
9	Conveyor	150	0.45	1.97	0.17	0.72	0.049	0.21
10	Screen Plant Conveyor	180	0.54	2.37	0.20	0.87	0.059	0.26
11	Impact Crusher Plant Feeder	180	0.85	3.72	0.40	1.76	0.061	0.27
12	Impact Crusher	180	0.97	4.26	0.43	1.89	0.080	0.35
13	Impact Crusher Conveyor	180	0.54	2.37	0.20	0.87	0.059	0.26
14	Conveyor	180	0.54	2.37	0.43	0.87	0.080	0.26
15	Conveyor	180	0.54	2.37	0.20	0.87	0.059	0.26
16	Conveyor	180	0.54	2.37	0.20	0.87	0.059	0.26
STACKER	Stacker Conveyor Drop to Pile	300	1.42	6.20	0.67	2.93	0.10	0.44
FINISH	Finish Product Storage Pile	300	1.42	6.20	0.67	2.93	0.10	0.44
PRODUCT	Product Truck Loading - Finish Pile	300	1.42	6.20	0.67	2.93	0.10	0.44
TOTALS			30.19	132.22	12.36	53.13	1.83	7.93

HAUL TRUCK TRAVEL

Haul truck travel emissions were estimated using AP-42, Section 13.2.2 (ver.11/06) "Unpaved Roads" emission equation. The haul in and out of the plant from the end of Prosperity Ave SE Extension will be unpaved but controlled with base course and/or millings and watering. Haul trucks will be used to remove aggregate recycled products. Table B-2 summarizes the emission rate for haul truck traffic.

Unpaved Roads

AP-42, Section 13.2.2 (ver.11/06) "Unpaved Roads"

$$E = k * (s/12)^a * (W/3)^b * [(365 - p)/365] * VMT$$

Where k = constant PM2.5 = 0.15
PM10 = 1.5
TSP = 4.9

s = % silt content (Table 13.2.2-1, "Sand and Gravel" 4.8%)

W = mean vehicle weight (26.5 tons)

p = number of days with at least 0.01 in of precip. (60 days)

a = Constant PM2.5 = 0.9
PM10 = 0.9
TSP = 0.7

b = Constant PM2.5 = 0.45
PM10 = 0.45
TSP = 0.45

Trucks per Hour
Total Trucks Entrance = 13.0 trucks per hour average

VMT =Vehicle Miles Traveled
Unpaved – 0.40962 miles per vehicle

Reduction in emissions due to precipitation was only accounted for in the annual emission rate. Particulate emission rate per vehicle mile traveled for each particle size category is:

Hourly Emission Rate Factor
TSP = 6.8769 lbs/VMT
PM10 = 1.7527 lbs/VMT
PM2.5 = 0.1753 lbs/VMT

Annual Emission Rate Factor
TSP = 5.7465 lbs/VMT
PM10 = 1.4646 lbs/VMT
PM2.5 = 0.1465 lbs/VMT

Table B-2: Pre-Controlled Haul Road Fugitive Dust Emission Rates

Process Unit Description	Process Rate	TSP Emission Rate (lbs/hr)	TSP Emission Rate (tons/yr)	PM_{10} Emission Rate (lbs/hr)	PM_{10} Emission Rate (tons/yr)	$PM_{2.5}$ Emission Rate (lbs/hr)	$PM_{2.5}$ Emission Rate (tons/yr)
Total Haul Truck Traffic	5.34 miles/hr; 46,804 miles/yr	36.74	134.48	9.36	34.27	0.94	3.43

CONTROLLED PARTICULATE EMISSION RATES

No fugitive dust controls or emission reductions are proposed for the aggregate/RAP/Concrete storage piles (Units RAW, Finish, Product) or loading into the plant jaw crusher feeder (Unit 1) with the exception of limiting annual production rates.

Fugitive dust control for plant transfer conveyors (Units 3, 6, 7, 8, 9, 10, 13, 14, 15, 16) will be controlled with material moisture content and/or enclosure. It is estimated that these methods will control to an efficiency of 95.3 percent per AP42 Section 11.19.2, Table 11.19.2-2. Additional emission reductions include limiting annual production rates.

Fugitive dust control for the plant crushers (Units 2 and 12) will be controlled, as needed, with enclosures and/or water sprays. It is estimated that these methods will control to an efficiency of 77.8 percent for crushing operations per AP42 Section 11.19.2, Table 11.19.2-2. Additional emission reductions include limiting annual production rates.

Fugitive dust control for the plant screen (Unit 5) will be controlled, as needed, with enclosures and/or water sprays. It is estimated that these methods will control to an efficiency of 91.2 percent for screening operations per AP42 Section 11.19.2, Table 11.19.2-2. Additional emission reductions include limiting annual production rates.

Fugitive dust control for the stacker conveyor transfer to storage piles (Unit STACKER), screening plant feeder (Unit 4), and impact plant feeder (Unit 11) will be controlled with material moisture content and/or enclosure. It is estimated that the additional moisture during processing will increase the moisture content from the default of 2% to the high moisture content value found in footnote b of AP-42 Table 11.19.2-2 of 2.88%. This will control fugitive emissions to an efficiency of 60 percent. Additional emission reductions include limiting annual production rates.

To estimate material handling control particulate emissions rates for crushing, screening, pug mill and conveyor transfer operations, emission factors were obtained from EPA's Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Aug. 2004, Section 11.19.2, Table 11.19.2-2.

To estimate material handling pre-control particulate emission rates for aggregate handling operations (aggregate/RAP/concrete/ loading feed bins), an emission equation was obtained from EPA's Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, Section 13.2.4 (11/2004), where the k (TSP = 0.74, PM_{10} = 0.35, $PM_{2.5}$ = 0.053), wind speed for determining the maximum hourly and annual emission rate emission rate are based on the average wind speed for Albuquerque for the years of 1996 through 2006 of 8.5 mph, and the NMED default moisture content of 2 percent.

To estimate material handling control particulate emission rates for RAP/Concrete plant stacker conveyor to storage pile (Unit 37), an emission equation was obtained from EPA's Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, Section 13.2.4 (11/2004), where the k (TSP = 0.74, PM_{10} = 0.35, $PM_{2.5}$ = 0.053), wind speed for determining the maximum hourly and annual emission rate emission rate are based on the average wind speed for Albuquerque for the years of 1996 through 2006 of 8.5 mph, and the footnote b of AP-42 Table 11.19.2-2 high moisture content of 2.88 percent.

The maximum throughput at the jaw crusher plant feeder is 300 tons per hour and 750,000 tons per year.

Aggregate/Recycle Plant Storage Piles and Feed Bin Loading Emission Equation:

Maximum Hour Emission Factor

E (lbs/ton) = k x 0.0032 x $(U/5)^{1.3}$ / $(M/2)^{1.4}$

E_{TSP} (lbs/ton) = 0.74 x 0.0032 x $(8.5/5)^{1.3}$ / $(2/2)^{1.4}$

E_{PM10} (lbs/ton) = 0.35 x 0.0032 x $(8.5/5)^{1.3}$ / $(2/2)^{1.4}$

$E_{PM2.5}$ (lbs/ton) = 0.053 x 0.0032 x $(8.5/5)^{1.3}$ / $(2/2)^{1.4}$

E_{TSP} (lbs/ton) = 0.00472 lbs/ton;

E_{PM10} (lbs/ton) = 0.00223 lbs/ton

$E_{PM2.5}$ (lbs/ton) = 0.00034 lbs/ton

Aggregate/Recycle Plant Storage Pile Loading from Stacker Conveyor Emission Equation:

Maximum Hour Emission Factor

E (lbs/ton) = k x 0.0032 x $(U/5)^{1.3}$ / $(M/2)^{1.4}$

E_{TSP} (lbs/ton) = 0.74 x 0.0032 x $(8.5/5)^{1.3}$ / $(2.88/2)^{1.4}$

E_{PM10} (lbs/ton) = 0.35 x 0.0032 x $(8.5/5)^{1.3}$ / $(2.88/2)^{1.4}$

$E_{PM2.5}$ (lbs/ton) = 0.053 x 0.0032 x $(8.5/5)^{1.3}$ / $(2.88/2)^{1.4}$

E_{TSP} (lbs/ton) = 0.00283 lbs/ton;

E_{PM10} (lbs/ton) = 0.00134 lbs/ton

$E_{PM2.5}$ (lbs/ton) = 0.00020 lbs/ton

AP-42 Emission Factors:

Feed Bin Unloading = Controlled Conveyor Transfer Point Emission Factor
Crusher = Controlled Tertiary Crusher Emission Factor
Screen = Controlled Screening Emission Factor
Transfer Conveyor = Controlled Conveyor Transfer Point Emission Factor

Material Handling Emission Factors:

Process Unit	TSP Emission Factor (lbs/ton)	PM_{10} Emission Factor (lbs/ton)	$PM_{2.5}$ Emission Factor (lbs/ton)
Feed Bin Unloading	0.00014	0.00005	0.000013
Controlled Crushing	0.00120	0.00054	0.00010
Controlled Screening	0.00220	0.00074	0.00005
Transfer Conveyor	0.00014	0.00005	0.000013
Controlled Screen and Crusher Unloading	0.00014	0.00005	0.000013
Aggregate/Recycle Storage Piles, Jaw Crusher Feeder Loading	0.00472	0.00223	0.00034
Aggregate/Recycle Stacker Conveyor to Pile, Screen Plant Feeder, Impact Crusher Feeder	0.00283	0.00134	0.00020

The following equation was used to calculate the hourly emission rate for each process unit:

Emission Rate (lbs/hour) = Process Rate (tons/hour) * Emission Factor (lbs/ton)

The following equation was used to calculate the annual emission rate for each process unit:

$$\text{Emission Rate (tons/year)} = \frac{\text{Emission Factor (lbs/ton)} * \text{Process Rate (tons/year)}}{\text{2000 lbs/ton}}$$

Table B-4 Controlled Material Handling Emission Rates

Unit #	Process Unit Description	Process Rate (tph)	TSP Emission Rate (lbs/hr)	TSP Emission Rate (tons/yr)	PM_{10} Emission Rate (lbs/hr)	PM_{10} Emission Rate (tons/yr)	$PM_{2.5}$ Emission Rate (lbs/hr)	$PM_{2.5}$ Emission Rate (tons/yr)
RAW	Raw Material Source	300	1.42	1.77	0.67	0.84	0.10	0.13
1	Jaw Crusher Plant Feeder	300	1.42	1.77	0.67	0.84	0.10	0.13
2	Jaw Crusher	300	0.36	0.45	0.16	0.20	0.030	0.038
3	Jaw Crusher Conveyor	300	0.042	0.053	0.014	0.017	0.0039	0.0049
4	Screening Plant Feeder	480	1.36	1.70	0.64	0.80	0.10	0.12
5	Screen	480	1.06	1.32	0.36	0.44	0.024	0.030
6	Screen Plant Conveyor	150	0.021	0.026	0.0069	0.009	0.0020	0.0024
7	Conveyor	150	0.021	0.026	0.0069	0.009	0.0020	0.0024
8	Screen Plant Conveyor	150	0.021	0.026	0.0069	0.009	0.0020	0.0024
9	Conveyor	150	0.021	0.026	0.0069	0.009	0.0020	0.0024
10	Screen Plant Conveyor	180	0.025	0.032	0.0083	0.010	0.0023	0.0029
11	Impact Crusher Plant Feeder	180	0.51	0.64	0.24	0.30	0.037	0.046
12	Impact Crusher	180	0.22	0.27	0.10	0.12	0.018	0.023
13	Impact Crusher Conveyor	180	0.025	0.032	0.0083	0.010	0.0023	0.0029
14	Conveyor	180	0.025	0.032	0.0083	0.010	0.0023	0.0029
15	Conveyor	180	0.025	0.032	0.0083	0.010	0.0023	0.0029
16	Conveyor	180	0.025	0.032	0.0083	0.010	0.0023	0.0029
STACKER	Stacker Conveyor Drop to Pile	300	0.85	1.06	0.40	0.50	0.061	0.08
FINISH	Finish Product Storage Pile	300	1.42	1.77	0.67	0.84	0.10	0.13
PRODUCT	Product Truck Loading - Finish Pile	300	1.42	1.77	0.67	0.84	0.10	0.13
	TOTALS		**10.27**	**12.84**	**4.66**	**5.83**	**0.70**	**0.87**

Controlled Haul Truck Travel

Haul truck travel emissions were estimated using AP-42, Section 13.2.2 (ver.11/06) "Unpaved Roads" emission equation. The haul in and out of the plant from the end of Prosperity Ave SE Extension will be unpaved. Haul trucks will be used to remove aggregate recycled products. The haul road will be unpaved but will be controlled with base course and/or millings, and watering. Haul road traffic emission rates controlled by base course and/or millings, and watering have applied a control efficiency of 80%. Table B-5 summarizes the emission rate for haul truck traffic.

Unpaved Roads
AP-42, Section 13.2.2 (ver.11/06) "Unpaved Roads"

$$E = k * (s/12)^a * (W/3)^b * [(365 - p)/365] * VMT$$

Where k = constant PM2.5 = 0.15
PM10 = 1.5
TSP = 4.9
s = % silt content (Table 13.2.2-1, "Sand and Gravel" 4.8%)
W = mean vehicle weight (26.5 tons)
p = number of days with at least 0.01 in of precip. (60 days)
a = Constant PM2.5 = 0.9
PM10 = 0.9
TSP = 0.7
b = Constant PM2.5 = 0.45
PM10 = 0.45
TSP = 0.45
Trucks per Hour
Total Trucks Entrance = 13.0 trucks per hour average

VMT =Vehicle Miles Traveled
Unpaved – 0.40962 miles per vehicle

Reduction in emissions due to precipitation was only accounted for in the annual emission rate. Unpaved road control will be 80%. Particulate emission rate per vehicle mile traveled for each particle size category is:

Hourly Emission Rate Factor with 80% CE
TSP = 1.3754 lbs/VMT
PM10 = 0.3505 lbs/VMT
PM2.5 = 0.0351 lbs/VMT

Annual Emission Rate Factor with 80% CE
TSP = 1.1493 lbs/VMT
PM10 = 0.2929 lbs/VMT
PM2.5 = 0.0293 lbs/VMT

Table B-5: Controlled Haul Road Fugitive Dust Emission Rates

Process Unit Description	Process Rate	TSP Emission Rate (lbs/hr)	TSP Emission Rate (tons/yr)	PM_{10} Emission Rate (lbs/hr)	PM_{10} Emission Rate (tons/yr)	$PM_{2.5}$ Emission Rate (lbs/hr)	$PM_{2.5}$ Emission Rate (tons/yr)
Total Haul Truck Traffic	5.34 miles/hr; 13,357 miles/yr	7.35	7.68	1.87	1.96	0.19	0.20

Estimates for Plant Diesel-Fired Engines (NO_X, CO, SO_2, VOC and PM)

Three diesel-fired engines, provides power to the Aggregate/Recycle plant. Nitrogen oxides (NO_X), carbon monoxides (CO), hydrocarbons (VOC), and particulate (PM) emissions were obtained from EPA Tier III and Tier 4F emission rates Sulfur dioxide (SO_2) emissions are estimated based on sulfur content of diesel fuel, not to exceed 0.05% fuel content. Uncontrolled annual emissions in tons per year (tpy) were calculated assuming operation of 8760 hours per year. Controlled annual emissions in tons per year (tpy) were calculated assuming operation of 4579 hours per year. ($PM=TSP=PM_{10}=PM_{2.5}$)

EPA Tier III Emission Rate:

Pollutant	Emission Factor (g/kW-hr)
Nitrogen Oxide (EG1, EG2, EG3)	4.00
Carbon Monoxide (EG2)	5.00
Hydrocarbons (EG2)	0.40
Particulate (EG2)	0.30

EPA Tier 4F Emission Rate:

Pollutant	Emission Factor (g/kW-hr)
Carbon Monoxide (EG1, EG3)	3.50
Hydrocarbons (EG1, EG3)	0.40
Particulate (EG1, EG3)	0.20

Sulfur dioxide emission rate was calculated using the fuel consumption rate, a fuel density of 7.0 pounds per gallon, a fuel sulfur content of 0.05%, and a sulfur to sulfur dioxide conversion factor of two (2). The following equation calculates the emission rate for sulfur dioxide (SO_2).

Emission Rate (lbs/hr) = Fuel (gal/hr) * Density lbs/gal * % Sulfur Content * Factor

Unit EG1

$$\text{Emission Rate (lbs/hr)} = \frac{22.4 \text{ gallons}}{\text{hr}} \left| \frac{7.0 \text{ lbs}}{\text{gallon}} \right| \frac{0.0005 \text{ lbs Sulfur}}{\text{lbs of fuel}} \left| \frac{2 \text{ lbs Sulfur Dioxide}}{1 \text{ lb Sulfur}} \right.$$

Emission Rate (lbs/hr) = 0.16 lbs/hr

Unit EG2

$$\text{Emission Rate (lbs/hr)} = \frac{6.6 \text{ gallons}}{\text{hr}} \left| \frac{7.0 \text{ lbs}}{\text{gallon}} \right| \frac{0.0005 \text{ lbs Sulfur}}{\text{lbs of fuel}} \left| \frac{2 \text{ lbs Sulfur Dioxide}}{1 \text{ lb Sulfur}} \right.$$

Emission Rate (lbs/hr) = 0.046 lbs/hr

Unit EG3

$$\text{Emission Rate (lbs/hr)} = \frac{22.4 \text{ gallons}}{\text{hr}} \left| \frac{7.0 \text{ lbs}}{\text{gallon}} \right| \frac{0.0005 \text{ lbs Sulfur}}{\text{lbs of fuel}} \left| \frac{2 \text{ lbs Sulfur Dioxide}}{1 \text{ lb Sulfur}} \right.$$

Emission Rate (lbs/hr) = 0.16 lbs/hr

Table B-7: Pre-Controlled Combustion Emission Rates – Unit EG1

Process Unit Number	Pollutant	Generator Rating (kW)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
EG1	NO_X	224	1.97	8.64
	CO	328	2.53	11.09
	SO_2	328	0.16	0.69
	VOC	328	0.29	1.27
	PM	328	0.14	0.63

Table B-8: Controlled Combustion Emission Rates – Unit EG1

Process Unit Number	Pollutant	Generator Rating (kW)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
EG1	NO_X	224	1.97	4.52
	CO	328	2.53	5.80
	SO_2	328	0.16	0.36
	VOC	328	0.29	0.66
	PM	328	0.14	0.33

Table B-9: Pre-Controlled Combustion Emission Rates – Unit EG2

Process Unit Number	Pollutant	Generator Rating (kW)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
EG2	NO_X	98	0.86	3.77
	CO	98	1.08	4.72
	SO_2	98	0.046	0.20
	VOC	98	0.086	0.38
	PM	98	0.065	0.28

Table B-10: Controlled Combustion Emission Rates – Unit EG2

Process Unit Number	Pollutant	Generator Rating (kW)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
EG2	NO_X	98	0.86	1.97
	CO	98	1.08	2.47
	SO_2	98	0.046	0.11
	VOC	98	0.086	0.20
	PM	98	0.065	0.15

Table B-11: Pre-Controlled Combustion Emission Rates – Unit EG3

Process Unit Number	Pollutant	Generator Rating (kW)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
EG3	NO_X	261	2.30	10.08
	CO	336	2.59	11.34
	SO_2	336	0.16	0.69
	VOC	336	0.30	1.30
	PM	336	0.15	0.65

Table B-12: Controlled Combustion Emission Rates – Unit EG3

Process Unit Number	Pollutant	Generator Rating (kW)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
EG3	NO_X	261	2.30	5.27
	CO	336	2.59	5.93
	SO_2	336	0.16	0.36
	VOC	336	0.30	0.68
	PM	336	0.15	0.34

Table B-13 Summary of Uncontrolled NOx, CO, SO2, and PM Emission Rates

Uncontrolled Emission Totals															
		NOx		CO		SO_2		VOC		TSP		PM_{10}		$PM_{2.5}$	
Unit #	Description	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
RAW	Raw Material Source									1.42	6.20	0.67	2.93	0.10	0.44
1	Jaw Crusher Plant Feeder									1.42	6.20	0.67	2.93	0.10	0.44
2	Jaw Crusher									1.62	7.10	0.72	3.15	0.13	0.58
3	Jaw Crusher Conveyor									0.90	3.94	0.33	1.45	0.10	0.43
4	Screening Plant Feeder									2.27	9.92	1.07	4.69	0.16	0.71
5	Screen									12.00	52.56	4.18	18.29	0.28	1.24
6	Screen Plant Conveyor									0.45	1.97	0.17	0.72	0.049	0.21
7	Conveyor									0.45	1.97	0.17	0.72	0.049	0.21
8	Screen Plant Conveyor									0.45	1.97	0.17	0.72	0.049	0.21
9	Conveyor									0.45	1.97	0.17	0.72	0.049	0.21
10	Screen Plant Conveyor									0.54	2.37	0.20	0.87	0.059	0.26
11	Impact Crusher Plant Feeder									0.85	3.72	0.40	1.76	0.061	0.27
12	Impact Crusher									0.97	4.26	0.43	1.89	0.080	0.35
13	Impact Crusher Conveyor									0.54	2.37	0.20	0.87	0.059	0.26
14	Conveyor									0.54	2.37	0.43	0.87	0.080	0.26
15	Conveyor									0.54	2.37	0.20	0.87	0.059	0.26
16	Conveyor									0.54	2.37	0.20	0.87	0.059	0.26
STACKER	Stacker Conveyor Drop to Pile									1.42	6.20	0.67	2.93	0.10	0.44
FINISH	Finish Product Storage Pile									1.42	6.20	0.67	2.93	0.10	0.44
PRODUCT	Product Truck Loading - Finish Pile									1.42	6.20	0.67	2.93	0.10	0.44
ROAD	Unpaved Haul Road Traffic									36.74	134.48	9.36	34.27	0.94	3.43
EG1	Jaw Crusher Plant Engine	1.97	8.64	2.53	11.09	0.16	0.69	0.29	1.27	0.14	0.63	0.14	0.63	0.14	0.63
EG2	Screen Plant Engine	0.86	3.77	1.08	4.72	0.046	0.20	0.086	0.38	0.065	0.28	0.065	0.28	0.065	0.28
EG3	Impact Crusher Engine	2.30	10.08	2.59	11.34	0.16	0.69	0.30	1.30	0.15	0.65	0.15	0.65	0.15	0.65
	Total	**5.14**	**22.49**	**6.20**	**27.15**	**0.36**	**1.58**	**0.67**	**2.94**	**67.29**	**268.26**	**22.09**	**88.97**	**3.13**	**12.92**

Table B-14 Summary of Controlled NOx, CO, SO2, and PM Emission Rates

Controlled Emission Totals															
		NOx		CO		SO_2		VOC		TSP		PM_{10}		$PM_{2.5}$	
Unit #	Description	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
RAW	Raw Material Source									1.42	1.77	0.67	0.84	0.10	0.13
1	Jaw Crusher Plant Feeder									1.42	1.77	0.67	0.84	0.10	0.13
2	Jaw Crusher									0.36	0.45	0.16	0.20	0.030	0.038
3	Jaw Crusher Conveyor									0.042	0.053	0.014	0.017	0.0039	0.0049
4	Screening Plant Feeder									1.36	1.70	0.64	0.80	0.10	0.12
5	Screen									1.06	1.32	0.36	0.44	0.024	0.030
6	Screen Plant Conveyor									0.021	0.026	0.0069	0.009	0.0020	0.0024
7	Conveyor									0.021	0.026	0.0069	0.009	0.0020	0.0024
8	Screen Plant Conveyor									0.021	0.026	0.0069	0.009	0.0020	0.0024
9	Conveyor									0.021	0.026	0.0069	0.009	0.0020	0.0024
10	Screen Plant Conveyor									0.025	0.032	0.0083	0.010	0.0023	0.0029
11	Impact Crusher Plant Feeder									0.51	0.64	0.24	0.30	0.037	0.046
12	Impact Crusher									0.22	0.27	0.10	0.12	0.018	0.023
13	Impact Crusher Conveyor									0.025	0.032	0.0083	0.010	0.0023	0.0029
14	Conveyor									0.025	0.032	0.0083	0.010	0.0023	0.0029
15	Conveyor									0.025	0.032	0.0083	0.010	0.0023	0.0029
16	Conveyor									0.025	0.032	0.0083	0.010	0.0023	0.0029
STACKER	Stacker Conveyor Drop to Pile									0.85	1.06	0.40	0.50	0.061	0.08
FINISH	Finish Product Storage Pile									1.42	1.77	0.67	0.84	0.10	0.13
PRODUCT	Product Truck Loading - Finish Pile									1.42	1.77	0.67	0.84	0.10	0.13
ROAD	Unpaved Haul Road Traffic									7.35	7.68	1.87	1.96	0.19	0.20
EG1	Jaw Crusher Plant Engine	1.97	4.52	2.53	5.80	0.16	0.36	0.29	0.66	0.14	0.33	0.14	0.33	0.14	0.33
EG2	Screen Plant Engine	0.86	1.97	1.08	2.47	0.046	0.11	0.086	0.20	0.065	0.15	0.065	0.15	0.065	0.15
EG3	Impact Crusher Engine	2.30	5.27	2.59	5.93	0.16	0.36	0.30	0.68	0.15	0.34	0.15	0.34	0.15	0.34
	Total	**5.14**	**11.76**	**6.20**	**14.19**	**0.36**	**0.82**	**0.67**	**1.54**	**17.97**	**21.33**	**6.89**	**8.60**	**1.24**	**1.88**

Attachment C
Emission Calculations Supporting Documents

AAI
Aggregate/Screening Plant
Uncontrolled Emissions

Main Plant Throughput	300	tph	2628000	tons per year
Uncontrolled Hours Operation	8760	hours/yr		

AP-42 Section 13.2.4 "Aggregate Handling" (ver 11/2006)
E = k x (0.0032) x (U/5)^1.3 / (M/2)^1.4 lbs/ton

k(pm)	0.74		
k(pm10)	0.35		
k(pm2.5)	0.053		
U Ave Hour	8.5	MPH	Albuquerque Airport Annual Average 1996-2006
M	2.00	%	NMED Default

E(PM) Max Hour =	0.00472	lbs/ton
E(PM10) Max Hour =	0.00223	lbs/ton
E(PM2.5) Max Hour =	0.00034	lbs/ton

Uncontrolled Emission Factors	PM		PM10		PM2.5		
Crusher	0.00540	lbs/ton	0.00240	lbs/ton	0.000444	lbs/ton	AP-42 Table 11.19.2-2 "Tertiary Crushing Uncontrolled"
Screen	0.02500	lbs/ton	0.00870	lbs/ton	0.000588	lbs/ton	AP-42 Table 11.19.2-2 "Screening Uncontrolled"
Conveyor	0.00300	lbs/ton	0.00110	lbs/ton	0.000325	lbs/ton	AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"
Material Handling	0.00472	lbs/ton	0.00223	lbs/ton	0.000338	lbs/ton	AP-42 Section 13.2.4 "Aggregate Handling" w=8.5 MPH;M=2%

PTE

Emission Point #	Process Unit Description	% of Throughput	Process Rate	PM lbs/hr	PM ton/yr	PM10 lbs/hr	PM10 ton/yr	PM2.5 lbs/hr	PM2.5 ton/yr
RAW	Raw Material Source	100.00	300	1.42	6.20	0.67	2.93	0.10	0.44
1	Jaw Crusher Plant Feeder	100.00	300	1.42	6.20	0.67	2.93	0.10	0.44
2	Jaw Crusher	100.00	300	1.62	7.10	0.72	3.15	0.13	0.58
3	Jaw Crusher Conveyor	100.00	300	0.90	3.94	0.33	1.45	0.10	0.43
4	Screening Plant Feeder	160.00	480	2.27	9.92	1.07	4.69	0.16	0.71
5	Screen	160.00	480	12.00	52.56	4.18	18.29	0.28	1.24
6	Screen Plant Conveyor	50.00	150	0.45	1.97	0.17	0.72	0.049	0.21
7	Conveyor	50.00	150	0.45	1.97	0.17	0.72	0.049	0.21
8	Screen Plant Conveyor	50.00	150	0.45	1.97	0.17	0.72	0.049	0.21
9	Conveyor	50.00	150	0.45	1.97	0.17	0.72	0.049	0.21
10	Screen Plant Conveyor	60.00	180	0.54	2.37	0.20	0.87	0.059	0.26
11	Impact Crusher Plant Feeder	60.00	180	0.85	3.72	0.40	1.76	0.061	0.27
12	Impact Crusher	60.00	180	0.97	4.26	0.43	1.89	0.080	0.35
13	Impact Crusher Conveyor	60.00	180	0.54	2.37	0.20	0.87	0.059	0.26
14	Conveyor	60.00	180	0.54	2.37	0.43	0.87	0.080	0.26
15	Conveyor	60.00	180	0.54	2.37	0.20	0.87	0.059	0.26
16	Conveyor	60.00	180	0.54	2.37	0.20	0.87	0.059	0.26
STACKER	Stacker Conveyor Drop to Pile	100.00	300	1.42	6.20	0.67	2.93	0.10	0.44
FINISH	Finish Product Storage Pile	100.00	300	1.42	6.20	0.67	2.93	0.10	0.44
PRODUCT	Product Truck Loading - Finish Pile	100.00	300	1.42	6.20	0.67	2.93	0.10	0.44
ROAD	Haul Road Traffic			36.74	134.48	9.36	34.27	0.94	3.43
			Total PM Engine	0.36	1.56	0.36	1.56	0.36	1.56
			Total PM Crushing Equipment	30.19	132.22	12.36	53.13	1.83	7.93
			Total Haul Roads	36.74	134.48	9.36	34.27	0.94	3.43
			Total PM	67.29	268.26	22.09	88.97	3.13	12.92

AAI
Aggregate/Screening Plant
Uncontrolled Emissions

EG1	Process Unit Number	Emitted Pollutants	Emission Factor g/kW-hr	Emission Rate lbs/hr	Hour	kW	Horsepower	lbs/hr	ton/yr
	Jaw Crusher Plant Engine - Tier III	NOX	4.00	1.97	8760	224	300	1.97	8.64
	Jaw Crusher Plant Engine - Tier 4F	CO	3.50	2.53	8760	328	440	2.53	11.09
SO2 emissions based on 22.4 gallon fuel/hr times 7 lbs/gal times fuel % sulfur content times a factor of 2.	Sulfur Content - 0.05%	SO2		0.16	8760	328	440	0.16	0.69
	Jaw Crusher Plant Engine - Tier 4F	VOC	0.40	0.29	8760	328	440	0.29	1.27
	Jaw Crusher Plant Engine - Tier 4F	PM	0.20	0.14	8760	328	440	0.14	0.63
	AP-42 Emission Factor lbs/hp-hr	CO2	1.08	475.20	8760	328	440	475	2081

EG2	Process Unit Number	Emitted Pollutants	Emission Factor g/kW-hr	Emission Rate lbs/hr	Hour	kW	Horsepower	lbs/hr	ton/yr
	Screen Plant Engine - Tier III	NOX	4.00	0.86	8760	98	131	0.86	3.77
	Screen Plant Engine - Tier III	CO	5.00	1.08	8760	98	131	1.08	4.72
SO2 emissions based on 6.6 gallon fuel/hr times 7 lbs/gal times fuel % sulfur content times a factor of 2.	Sulfur Content - 0.05%	SO2		0.046	8760	98	131	0.046	0.20
	Screen Plant Engine - Tier III	VOC	0.40	0.086	8760	98	131	0.086	0.38
	Screen Plant Engine - Tier III	PM	0.30	0.065	8760	98	131	0.065	0.28
	AP-42 Emission Factor lbs/hp-hr	CO2	1.08	141.48	8760	98	131	141	620

EG3	Process Unit Number	Emitted Pollutants	Emission Factor g/kW-hr	Emission Rate lbs/hr	Hour	kW	Horsepower	lbs/hr	ton/yr
	Impact Crusher Engine - Tier III	NOX	4.00	2.30	8760	261	350	2.30	10.08
	Impact Crusher Engine - Tier 4F	CO	3.50	2.59	8760	336	450	2.59	11.34
SO2 emissions based on 22.4 gallon fuel/hr times 7 lbs/gal times fuel % sulfur content times a factor of 2.	Sulfur Content - 0.05%	SO2		0.16	8760	336	450	0.16	0.69
	Impact Crusher Engine - Tier 4F	VOC	0.40	0.30	8760	336	450	0.30	1.30
	Impact Crusher Engine - Tier 4F	PM	0.20	0.15	8760	336	450	0.15	0.65
	AP-42 Emission Factor lbs/hp-hr	CO2	1.08	486.00	8760	336	450	486	2129

NOx Total	5.14	lbs/hr	22.49	tons/yr
CO Total	6.20	lbs/hr	27.15	tons/yr
SO2 Total	0.36	lbs/hr	1.58	tons/yr
VOC Total	0.67	lbs/hr	2.94	tons/yr
PM Total	67.29	lbs/hr	268.26	tons/yr
PM10 Total	22.09	lbs/hr	88.97	tons/yr
PM2.5 Total	3.13	lbs/hr	12.92	tons/yr

AAI
Aggregate/Screening Plant
Uncontrolled Emissions

Haul Road Traffic
AP-42 13.2 (ver 11/06) "Unpaved Road"
Sand and Gravel Conditions - NMED Equation
Equation:
E = k(s/12)^a*(W/3)^b*[(365-p)/365]

k PM	4.9			
k PM10	1.5			
k PM2.5	0.15			
a PM	0.7			
a PM10	0.9			
a PM2.5	0.9			
b PM	0.45			
b PM10	0.45			
b PM2.5	0.45			
% Silt Content = s	4.8	%	Sand and Gravel (AP-42 13.2.2-1)	
precipitation days/yr	60	days	AP-42 Figure 13.2.2-1	
Hours per year	8760	hrs		

Vehicle control	0	%		
Aggregate Truck VMT	329.54	meters round trip		
	0.409621237	miles/vehicle		
Max. Aggregate Truck/hr	13.04347826	truck/hr	23	tons/load
	114260.8696	truck/yr	300	tons/hr
Aggregate Truck VMT	5.34	miles/hr		
	46803.68	miles/yr		
Aggregate Truck weight	26.5	tons		

		PM Controlled			
Max. Aggregate Truck Emissions	Base Course and Water	36.74	lbs/hr	134.48	tons/yr

		PM10Controlled			
Max. Aggregate Truck Emissions	Base Course and Water	9.36	lbs/hr	34.27	tons/yr

		PM2.5 Controlled			
Max. Aggregate Truck Emissions	Base Course and Water	0.94	lbs/hr	3.43	tons/yr

AAI
Aggregate/Screening Plant
Requested Regulated Emissions

Main Plant Throughput	300	tph	750000 tons per year
Processing Equipment Hours Operation	3650	hours/yr	
Engine Hours of Operation	4579	hours/yr	

Quarry, Raw Ore Pile, Feeder Loading, Finish Pile

AP-42 Section 13.2.4 "Aggregate Handling" (ver 11/2006)

E = k x (0.0032) x (U/5)^1.3 / (M/2)^1.4 lbs/ton

k(pm)	0.74			
k(pm10)	0.35			
k(pm2.5)	0.053			
U Ave Hour	8.5	MPH	Albuquerque Airport 1996-2006	
M	2.00	%	NMED Default	

E(TSP) Hour =	0.00472	lbs/ton
E(PM10) Hour =	0.00223	lbs/ton
E(PM2.5) Hour =	0.00034	lbs/ton

Stacker to Storage Pile Loading

AP-42 Section 13.2.4 "Aggregate Handling" (ver 11/2006)

E = k x (0.0032) x (U/5)^1.3 / (M/2)^1.4 lbs/ton

k(pm)	0.74			
k(pm10)	0.35			
k(pm2.5)	0.053			
U Annual Hour	8.5	MPH	Albuquerque Airport 1996-2006	
M	2.88	%	NMED Default	

E(TSP) Hour =	0.00283	lbs/ton
E(PM10) Hour =	0.00134	lbs/ton
E(PM2.5) Hour =	0.00020	lbs/ton

Controlled Emission Factors	PM		PM10		PM2.5		
Crusher	0.00120	lbs/ton	0.00054	lbs/ton	0.00010	lbs/ton	AP-42 Table 11.19.2-2 "Tertiary Crushing Controlled"
Screen	0.00220	lbs/ton	0.00074	lbs/ton	0.00005	lbs/ton	AP-42 Table 11.19.2-2 "Screening Controlled"
Uncontrolled Conveyor	0.00300	lbs/ton	0.00110	lbs/ton	0.00033	lbs/ton	AP-42 Table 11.19.2-2 "Conveyor Transfer Point Uncontrolled"
Controlled Conveyor	0.00014	lbs/ton	0.00005	lbs/ton	0.000013	lbs/ton	AP-42 Table 11.19.2-2 "Conveyor Transfer Point Controlled"
Stacker Hour	0.00283	lbs/ton	0.00134	lbs/ton	0.00020	lbs/ton	AP-42 Section 13.2.4 "Aggregate Handling" w=8.5 MPH;M=2.88%
Feeder Hour	0.00472	lbs/ton	0.00223	lbs/ton	0.00034	lbs/ton	AP-42 Section 13.2.4 "Aggregate Handling" w=8.5 MPH;M=2%
Storage Pile Hour	0.00472	lbs/ton	0.00223	lbs/ton	0.00034	lbs/ton	AP-42 Section 13.2.4 "Aggregate Handling" w=8.5 MPH;M=2%
Raw Material Hour	0.00472	lbs/ton	0.00223	lbs/ton	0.00034	lbs/ton	AP-42 Section 13.2.4 "Aggregate Handling" w=8.5 MPH;M=2%
Product Piles hour	0.00472	lbs/ton	0.00223	lbs/ton	0.00034	lbs/ton	AP-42 Section 13.2.4 "Aggregate Handling" w=8.5 MPH;M=2%

PTE

Emission Point #	Process Unit Description	% of Throughput	Process Rate	PM lbs/hr	PM ton/yr	PM10 lbs/hr	PM10 ton/yr	PM2.5 lbs/hr	PM2.5 ton/yr
RAW	Raw Material Source	100.00	300	1.42	1.77	0.67	0.84	0.10	0.13
1	Jaw Crusher Plant Feeder	100.00	300	1.42	1.77	0.67	0.84	0.10	0.13
2	Jaw Crusher	100.00	300	0.36	0.45	0.16	0.20	0.030	0.038
3	Jaw Crusher Conveyor	100.00	300	0.042	0.053	0.014	0.017	0.0039	0.0049
4	Screening Plant Feeder	160.00	480	1.36	1.70	0.64	0.80	0.10	0.12
5	Screen	160.00	480	1.06	1.32	0.36	0.44	0.024	0.030
6	Screen Plant Conveyor	50.00	150	0.021	0.026	0.0069	0.009	0.0020	0.0024
7	Conveyor	50.00	150	0.021	0.026	0.0069	0.009	0.0020	0.0024
8	Screen Plant Conveyor	50.00	150	0.021	0.026	0.0069	0.009	0.0020	0.0024
9	Conveyor	50.00	150	0.021	0.026	0.0069	0.009	0.0020	0.0024
10	Screen Plant Conveyor	60.00	180	0.025	0.032	0.0083	0.010	0.0023	0.0029
11	Impact Crusher Plant Feeder	60.00	180	0.51	0.64	0.24	0.30	0.037	0.046
12	Impact Crusher	60.00	180	0.22	0.27	0.10	0.12	0.018	0.023
13	Impact Crusher Conveyor	60.00	180	0.025	0.032	0.0083	0.010	0.0023	0.0029
14	Conveyor	60.00	180	0.025	0.032	0.0083	0.010	0.0023	0.0029
15	Conveyor	60.00	180	0.025	0.032	0.0083	0.010	0.0023	0.0029
16	Conveyor	60.00	180	0.025	0.032	0.0083	0.010	0.0023	0.0029
STACKER	Stacker Conveyor Drop to Pile	100.00	300	0.85	1.06	0.40	0.50	0.061	0.08
FINISH	Finish Product Storage Pile	100.00	300	1.42	1.77	0.67	0.84	0.10	0.13
PRODUCT	Product Truck Loading - Finish Pile	100.00	300	1.42	1.77	0.67	0.84	0.10	0.13
	PM Aggregate Processing Totals			10.27	12.84	4.66	5.83	0.70	0.87

AAI
Aggregate/Screening Plant
Requested Regulated Emissions

ROAD	Unpaved Haul Road Traffic			7.35	7.68	1.87	1.96	0.19	0.20
			Total PM Engine	0.36	0.82	0.36	0.82	0.36	0.82
			Total PM Main Plant Equipment	10.27	12.84	4.66	5.83	0.70	0.87
			Total Haul Roads	7.35	7.68	1.87	1.96	0.19	0.20
			Total PM	17.97	21.33	6.89	8.60	1.24	1.88

			Emission Factor	Emission Rate					
EG1	Process Unit Number	Emitted Pollutants	g/kW-hr	lbs/hr	Hour	kW	Horsepower	lbs/hr	ton/yr
	Jaw Crusher Plant Engine - Tier III	NOX	4.00	1.97	4579	224	300	1.97	4.52
	Jaw Crusher Plant Engine - Tier 4F	CO	3.50	2.53	4579	328	440	2.53	5.80
SO2 emissions based on 22.4 gallon fuel/hr times 7 lbs/gal times fuel % sulfur content times a factor of 2.	Sulfur Content - 0.05%	SO2		0.16	4579	328	440	0.16	0.36
	Jaw Crusher Plant Engine - Tier 4F	VOC	0.40	0.29	4579	328	440	0.29	0.66
	Jaw Crusher Plant Engine - Tier 4F	PM	0.20	0.14	4579	328	440	0.14	0.33
	AP-42 Emission Factor lbs/hp-hr	CO2	1.08	475.20	4579	328	440	475	1088

			Emission Factor	Emission Rate					
EG2	Process Unit Number	Emitted Pollutants	g/kW-hr	lbs/hr	Hour	kW	Horsepower	lbs/hr	ton/yr
	Screen Plant Engine - Tier III	NOX	4.00	0.86	4579	98	131	0.86	1.97
	Screen Plant Engine - Tier III	CO	5.00	1.08	4579	98	131	1.08	2.47
SO2 emissions based on 6.6 gallon fuel/hr times 7 lbs/gal times fuel % sulfur content times a factor of 2.	Sulfur Content - 0.05%	SO2		0.046	4579	98	131	0.046	0.11
	Screen Plant Engine - Tier III	VOC	0.40	0.086	4579	98	131	0.086	0.20
	Screen Plant Engine - Tier III	PM	0.30	0.065	4579	98	131	0.065	0.15
	AP-42 Emission Factor lbs/hp-hr	CO2	1.08	141.48	4579	98	131	141	324

			Emission Factor	Emission Rate					
EG3	Process Unit Number	Emitted Pollutants	g/kW-hr	lbs/hr	Hour	kW	Horsepower	lbs/hr	ton/yr
	Impact Crusher Engine - Tier III	NOX	4.00	2.30	4579	261	350	2.30	5.27
	Impact Crusher Engine - Tier 4F	CO	3.50	2.59	4579	336	450	2.59	5.93
SO2 emissions based on 22.4 gallon fuel/hr times 7 lbs/gal times fuel % sulfur content times a factor of 2.	Sulfur Content - 0.05%	SO2		0.16	4579	336	450	0.16	0.36
	Impact Crusher Engine - Tier 4F	VOC	0.40	0.30	4579	336	450	0.30	0.68
	Impact Crusher Engine - Tier 4F	PM	0.20	0.15	4579	336	450	0.15	0.34
	AP-42 Emission Factor lbs/hp-hr	CO2	1.08	486.00	4579	336	450	486	1113

NOx Total	5.14	lbs/hr	11.76	tons/yr
CO Total	6.20	lbs/hr	14.19	tons/yr
SO2 Total	0.36	lbs/hr	0.82	tons/yr
VOC Total	0.67	lbs/hr	1.54	tons/yr
PM Total	17.97	lbs/hr	21.33	tons/yr
PM10 Total	6.89	lbs/hr	8.60	tons/yr
PM2.5 Total	1.24	lbs/hr	1.88	tons/yr
CO2 Total	1102.7	lbs/hr	2524.6	tons/yr

AAI
Aggregate/Screening Plant
Requested Regulated Emissions

Haul Road Traffic Main Plant
AP-42 13.2 (ver 11/06) "Unpaved Road"
Sand and Gravel Conditions - NMED Equation
Equation:
E = k(s/12)^a*(W/3)^b*[(365-p)/365]

k PM	4.9		
k PM10	1.5		
k PM2.5	0.15		
a PM	0.7		
a PM10	0.9		
a PM2.5	0.9		
b PM	0.45		
b PM10	0.45		
b PM2.5	0.45		
% Silt Content = s	4.8	%	Sand and Gravel (AP-42 13.2.2-1)
precipitation days/yr	60	days	AP-42 Figure 13.2.2-1
Hours per year	3650	hrs	

Vehicle control		80	%	water and base course	
Aggregate Truck VMT		329.54	meters round trip		
		0.409621237	miles/vehicle		
Max. Aggregate Truck/hr		13.04347826	truck/hr	23	tons/load
		32608.69565	truck/yr	300	tons/hr
Aggregate Truck VMT		5.34	miles/hr		
		13357.21	miles/yr		
Aggregate Truck weight		26.5	tons		
			PM Controlled		
Max. Aggregate Truck Emissions	Base Course and Water	7.35	lbs/hr	7.68	tons/yr
			PM10Controlled		
Max. Aggregate Truck Emissions	Base Course and Water	1.87	lbs/hr	1.96	tons/yr
			PM2.5 Controlled		
Max. Aggregate Truck Emissions	Base Course and Water	0.19	lbs/hr	0.20	tons/yr

11.19.2 Crushed Stone Processing and Pulverized Mineral Processing

11.19.2.1 Process Description [24, 25]

Crushed Stone Processing

Major rock types processed by the crushed stone industry include limestone, granite, dolomite, traprock, sandstone, quartz, and quartzite. Minor types include calcareous marl, marble, shell, and slate. Major mineral types processed by the pulverized minerals industry, a subset of the crushed stone processing industry, include calcium carbonate, talc, and barite. Industry classifications vary considerably and, in many cases, do not reflect actual geological definitions.

Rock and crushed stone products generally are loosened by drilling and blasting and then are loaded by power shovel or front-end loader into large haul trucks that transport the material to the processing operations. Techniques used for extraction vary with the nature and location of the deposit. Processing operations may include crushing, screening, size classification, material handling and storage operations. All of these processes can be significant sources of PM and PM-10 emissions if uncontrolled.

Quarried stone normally is delivered to the processing plant by truck and is dumped into a bin. A feeder is used as illustrated in Figure 11.19.2-1. The feeder or screens separate large boulders from finer rocks that do not require primary crushing, thus reducing the load to the primary crusher. Jaw, impactor, or gyratory crushers are usually used for initial reduction. The crusher product, normally 7.5 to 30 centimeters (3 to 12 inches) in diameter, and the grizzly throughs (undersize material) are discharged onto a belt conveyor and usually are conveyed to a surge pile for temporary storage or are sold as coarse aggregates.

The stone from the surge pile is conveyed to a vibrating inclined screen called the scalping screen. This unit separates oversized rock from the smaller stone. The undersized material from the scalping screen is considered to be a product stream and is transported to a storage pile and sold as base material. The stone that is too large to pass through the top deck of the scalping screen is processed in the secondary crusher. Cone crushers are commonly used for secondary crushing (although impact crushers are sometimes used), which typically reduces material to about 2.5 to 10 centimeters (1 to 4 inches). The material (throughs) from the second level of the screen bypasses the secondary crusher because it is sufficiently small for the last crushing step. The output from the secondary crusher and the throughs from the secondary screen are transported by conveyor to the tertiary circuit, which includes a sizing screen and a tertiary crusher.

Tertiary crushing is usually performed using cone crushers or other types of impactor crushers. Oversize material from the top deck of the sizing screen is fed to the tertiary crusher. The tertiary crusher output, which is typically about 0.50 to 2.5 centimeters (3/16th to 1 inch), is returned to the sizing screen. Various product streams with different size gradations are separated in the screening operation. The products are conveyed or trucked directly to finished product bins, to open area stock piles, or to other processing systems such as washing, air separators, and screens and classifiers (for the production of manufactured sand).

Some stone crushing plants produce manufactured sand. This is a small-sized rock product with a maximum size of 0.50 centimeters (3/16 th inch). Crushed stone from the tertiary sizing screen is sized in a vibrating inclined screen (fines screen) with relatively small mesh sizes.

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 Unloading - 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

e. Reference 4

f. References 4 and 15

g. Reference 4

h. References 5 and 6

i. References 5, 6, and 15

j. Reference 11

k. Reference 12

l. References 1, 3, 7, and 8

m. References 1, 3, 7, 8, and 15

n. No data available, but emission factors for PM-10 for tertiary crushers can be used as an upper limit for primary or secondary crushing

o. References 2, 3, 7, 8

p. References 2, 3, 7, 8, and 15

q. Reference 15

r. PM emission factors are presented based on PM-100 data in the Background Support Document for Section 11.19.2

s. Emission factors for PM-30 and PM-50 are available in Figures 11.19.2-3 through 11.19.2-6.

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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.

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

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;

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.

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

Nonroad Compression-Ignition Engines: Exhaust Emission Standards

	Rated Power (kW)	Tier	Model Year	NMHC (g/kW-hr)	NMHC + NOx (g/kW-hr)	NOx (g/kW-hr)	PM (g/kW-hr)	CO (g/kW-hr)	Smoke [a] (Percentage)	Useful Life (hours /years) [b]	Warranty Period (hours /years) [b]
Federal	kW < 8	1	2000-2004	-	10.5	-	1.0	8.0	20/15/50	3,000/5	1,500/2
		2	2005-2007	-	7.5	-	0.80	8.0			
		4	2008+	-	7.5	-	0.40 [c]	8.0			
	8 ≤ kW < 19	1	2000-2004	-	9.5	-	0.80	6.6		3,000/5	1,500/2
		2	2005-2007	-	7.5	-	0.80	6.6			
		4	2008+	-	7.5	-	0.40	6.6			
	19 ≤ kW < 37	1	1999-2003	-	9.5	-	0.80	5.5		5,000/7 [d]	3,000/5 [e]
		2	2004-2007	-	7.5	-	0.60	5.5			
		4	2008-2012	-	7.5	-	0.30	5.5			
			2013+	-	4.7	-	0.03	5.5			
	37 ≤ kW < 56	1	1998-2003	-	-	9.2	-	-		8,000/10	3,000/5
		2	2004-2007	-	7.5	-	0.40	5.0			
		3 [f]	2008-2011	-	4.7	-	0.40	5.0			
		4 (Option 1) [g]	2008-2012	-	4.7	-	0.30	5.0			
		4 (Option 2) [g]	2012	-	4.7	-	0.03	5.0			
		4	2013+	-	4.7	-	0.03	5.0			
	56 ≤ kW < 75	1	1998-2003	-	-	9.2	-	-			
		2	2004-2007	-	7.5	-	0.40	5.0			
		3	2008-2011	-	4.7	-	0.40	5.0			
		4	2012-2013 [h]	-	4.7	-	0.02	5.0			
			2014+ [i]	0.19	-	0.40	0.02	5.0			
	75 ≤ kW < 130	1	1997-2002	-	-	9.2	-	-			
		2	2003-2006	-	6.6	-	0.30	5.0			
		3	2007-2011	-	4.0	-	0.30	5.0			
		4	2012-2013 [h]	-	4.0	-	0.02	5.0			
			2014+	0.19	-	0.40	0.02	5.0			

Continued

	Rated Power (kW)	Tier	Model Year	NMHC (g/kW-hr)	NMHC + NOx (g/kW-hr	NOx (g/kW-hr	PM (g/kW-hr	CO (g/kW-hr)	Smoke [a] (Percentage)	Useful Life (hours /years) [b]	Warranty Period (hours /years) [b]
Federal	130 ≤ kW < 225	1	1996-2002	1.3 [j]	-	9.2	0.54	11.4	20/15/50	8,000/10	3,000/5
		2	2003-2005	-	6.6	-	0.20	3.5			
		3	2006-2010	-	4.0	-	0.20	3.5			
		4	2011-2013 [h]	-	4.0	-	0.02	3.5			
			2014+ [i]	0.19	-	0.40	0.02	3.5			
	225 ≤ kW < 450	1	1996-2000	1.3 [j]	-	9.2	0.54	11.4			
		2	2001-2005	-	6.4	-	0.20	3.5			
		3	2006-2010	-	4.0	-	0.20	3.5			
		4	2011-2013 [h]	-	4.0	-	0.02	3.5			
			2014+ [i]	0.19	-	0.40	0.02	3.5			
	450 ≤ kW < 560	1	1996-2001	1.3 [j]	-	9.2	0.54	11.4			
		2	2002-2005	-	6.4	-	0.20	3.5			
		3	2006-2010	-	4.0	-	0.20	3.5			
		4	2011-2013 [h]	-	4.0	-	0.02	3.5			
			2014+ [i]	0.19	-	0.40	0.02	3.5			
	560 ≤ kW < 900	1	2000-2005	1.3 [j]	-	9.2	0.54	11.4			
		2	2006-2010	-	6.4	-	0.20	3.5			
		4	2011-2014	0.40	-	3.5	0.10	3.5			
			2015+ [i]	0.19	-	3.5 [k]	0.04 [l]	3.5			
	kW > 900	1	2000-2005	1.3 [j]	-	9.2	0.54	11.4			
		2	2006-2010	-	6.4	-	0.20	3.5			
		4	2011-2014	0.40	-	3.5 [k]	0.10	3.5			
			2015+ [i]	0.19	-	3.5 [k]	0.04 [l]	3.5			

Notes on following page.

Notes:

- For Tier 1, 2, and 3 standards, exhaust emissions of nitrogen oxides (NOx), carbon monoxide (CO), hydrocarbons (HC), and non-methane hydrocarbons (NMHC) are measured using the procedures in 40 Code of Federal Regulations (CFR) Part 89 Subpart E. For Tier 1, 2, and 3 standards, particulate matter (PM) exhaust emissions are measured using the California Regulations for New 1996 and Later Heavy-Duty Off-Road Diesel Cycle Engines.
- For Tier 4 standards, engines are tested for transient and steady-state exhaust emissions using the procedures in 40 CFR Part 1039 Subpart F. Transient standards do not apply to engines below 37 kilowatts (kW) before the 2013 model year, constant-speed engines, engines certified to Option 1, and engines above 560 kW.
- Tier 2 and later model naturally aspirated nonroad engines shall not discharge crankcase emissions into the atmosphere unless these emissions are permanently routed into the exhaust. This prohibition does not apply to engines using turbochargers, pumps, blowers, or superchargers.
- In lieu of the Tier 1, 2, and 3 standards for NOX, NMHC + NOX, and PM, manufacturers may elect to participate in the averaging, banking, and trading (ABT) program described in 40 CFR Part 89 Subpart C.

a Smoke emissions may not exceed 20 percent during the acceleration mode, 15 percent during the lugging mode, and 50 percent during the peaks in either mode. Smoke emission standards do not apply to single-cylinder engines, constant-speed engines, or engines certified to a PM emission standard of 0.07 grams per kilowatt-hour (g/kW-hr) or lower. Smoke emissions are measured using procedures in 40 CFR Part 86 Subpart I.

b Useful life and warranty period are expressed hours and years, whichever comes first.

c Hand-startable air-cooled direct injection engines may optionally meet a PM standard of 0.60 g/kW-hr. These engines may optionally meet Tier 2 standards through the 2009 model years. In 2010 these engines are required to meet a PM standard of 0.60 g/kW-hr.

d Useful life for constant speed engines with rated speed 3,000 revolutions per minute (rpm) or higher is 5 years or 3,000 hours, whichever comes first.

e Warranty period for constant speed engines with rated speed 3,000 rpm or higher is 2 years or 1,500 hours, whichever comes first.

f These Tier 3 standards apply only to manufacturers selecting Tier 4 Option 2. Manufacturers selecting Tier 4 Option 1 will be meeting those standards in lieu of Tier 3 standards.

g A manufacturer may certify all their engines to either Option 1 or Option 2 sets of standards starting in the indicated model year. Manufacturers selecting Option 2 must meet Tier 3 standards in the 2008-2011 model years.

h These standards are phase-out standards. Not more than 50 percent of a manufacturer's engine production is allowed to meet these standards in each model year of the phase out period. Engines not meeting these standards must meet the final Tier 4 standards.

i These standards are phased in during the indicated years. At least 50 percent of a manufacturer's engine production must meet these standards during each year of the phase in. Engines not meeting these standards must meet the applicable phase-out standards.

j For Tier 1 engines the standard is for total hydrocarbons.

k The NOx standard for generator sets is 0.67 g/kW-hr.

l The PM standard for generator sets is 0.03 g/kW-hr.

Citations: Code of Federal Regulations (CFR) citations:

- 40 CFR 89.112 = Exhaust emission standards
- 40 CFR 1039.101 = Exhaust emission standards for after 2014 model year
- 40 CFR 1039.102 = Exhaust emission standards for model year 2014 and earlier
- 40 CFR 1039 Subpart F = Exhaust emissions transient and steady state test procedures
- 40 CFR 86 Subpart I = Smoke emission test procedures
- 40 CFR 1065 = Test equipment and emissions measurement procedures

PERFORMANCE DATA[DM8117]

May 3, 2019

Performance Number: DM8117 **Change Level: 03**

SALES MODEL:	C9	**COMBUSTION:**	DIRECT INJECTION
BRAND:	CAT	**ENGINE SPEED (RPM):**	2,200
ENGINE POWER (BHP):	300	**PEAK TORQUE SPEED (RPM):**	1,400
PEAK TORQUE (FT-LB):	987.3	**TORQUE RISE (%):**	37
COMPRESSION RATIO:	16.1	**ASPIRATION:**	TA
RATING LEVEL:	INDUSTRIAL B	**AFTERCOOLER TYPE:**	ATAAC
PUMP QUANTITY:	1	**AFTERCOOLER CIRCUIT TYPE:**	JW+OC, ATAAC
FUEL TYPE:	DIESEL	**INLET MANIFOLD AIR TEMP (F):**	120
MANIFOLD TYPE:	DRY	**JACKET WATER TEMP (F):**	192.2
GOVERNOR TYPE:	ELEC	**TURBO CONFIGURATION:**	SINGLE
CAMSHAFT TYPE:	STANDARD	**TURBO QUANTITY:**	1
IGNITION TYPE:	CI	**TURBOCHARGER MODEL:**	S310G-1.10
INJECTOR TYPE:	EUI	**CERTIFICATION YEAR:**	2005
REF EXH STACK DIAMETER (IN):	4	**PISTON SPD @ RATED ENG SPD (FT/MIN):**	2,150.9
MAX OPERATING ALTITUDE (FT):	8,501		

INDUSTRY	SUBINDUSTRY	APPLICATION
INDUSTRIAL	MINING	INDUSTRIAL
INDUSTRIAL	CONSTRUCTION	INDUSTRIAL
INDUSTRIAL	GENERAL INDUSTRIAL	INDUSTRIAL
OIL AND GAS	LAND PRODUCTION	INDUSTRIAL
INDUSTRIAL	MATERIAL HANDLING	INDUSTRIAL
INDUSTRIAL	FORESTRY	INDUSTRIAL
OIL AND GAS	WELL SERVICING	INDUSTRIAL
INDUSTRIAL	AGRICULTURE	INDUSTRIAL

General Performance Data

ENGINE SPEED	ENGINE POWER	ENGINE TORQUE	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP
RPM	BHP	LB-FT	PSI	LB/BHP-HR	GAL/HR	IN-HG	DEG F	DEG F	IN-HG	DEG F
2,200	300	717	201	0.368	15.8	46.0	118.6	1,086.8	44.5	862.6
2,100	300	751	211	0.364	15.6	46.2	116.3	1,093.2	42.5	871.8
2,000	300	789	221	0.359	15.4	46.6	115.3	1,106.3	40.5	888.0
1,900	300	830	233	0.355	15.2	47.2	115.5	1,126.5	38.3	911.0
1,800	300	876	246	0.352	15.1	47.8	114.4	1,148.2	36.3	935.3
1,700	293	907	254	0.352	14.8	47.6	111.8	1,166.0	33.8	955.6
1,600	284	933	262	0.353	14.3	46.9	109.3	1,189.3	31.2	981.6
1,500	274	959	269	0.354	13.9	45.8	107.2	1,220.1	28.4	1,015.2
1,400	264	989	277	0.356	13.4	44.7	105.6	1,260.4	25.6	1,058.2
1,300	244	988	277	0.361	12.6	41.1	102.4	1,302.4	22.0	1,111.8
1,200	226	988	277	0.366	11.8	36.7	98.9	1,354.3	18.3	1,177.9
1,100	207	988	277	0.373	11.0	31.6	95.2	1,415.6	14.5	1,256.0

ENGINE SPEED	ENGINE POWER	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)	DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)
RPM	BHP	IN-HG	DEG F	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
2,200	300	48	329.7	734.7	1,887.9	3,224.6	3,335.2	702.0	645.4
2,100	300	48	327.2	710.2	1,835.8	3,112.8	3,222.1	677.9	622.3
2,000	300	48	326.0	683.7	1,788.9	2,993.4	3,101.4	652.7	598.0
1,900	300	49	326.4	656.5	1,748.0	2,871.5	2,979.6	627.0	573.2
1,800	300	49	327.5	630.7	1,708.4	2,755.3	2,861.1	602.2	549.1
1,700	293	49	326.6	600.6	1,646.1	2,615.5	2,718.6	571.9	520.5
1,600	284	48	325.3	567.2	1,577.8	2,461.7	2,561.9	538.2	488.8
1,500	274	47	323.4	530.2	1,506.6	2,294.5	2,391.5	502.3	454.6
1,400	264	46	320.7	490.0	1,436.0	2,115.7	2,209.7	465.2	419.2
1,300	244	42	308.9	439.1	1,323.3	1,889.5	1,977.8	414.0	371.0
1,200	226	37	294.8	384.8	1,204.9	1,649.1	1,731.8	361.8	321.9
1,100	207	32	278.2	326.9	1,080.0	1,393.9	1,471.0	309.5	273.1

PERFORMANCE DATA[EM0282]

December 30, 2014

Performance Number: EM0282 **Change Level: 02**

SALES MODEL:	C13	**COMBUSTION:**	DI
ENGINE POWER (BHP):	440	**ENGINE SPEED (RPM):**	2,100
PEAK TORQUE (FT-LB):	1,485.4	**PEAK TORQUE SPEED (RPM):**	1,400
COMPRESSION RATIO:	17	**TORQUE RISE (%):**	35
RATING LEVEL:	INDUSTRIAL C - INTERMITTENT	**ASPIRATION:**	TA
PUMP QUANTITY:	1	**AFTERCOOLER TYPE:**	ATAAC
FUEL TYPE:	DIESEL	**AFTERCOOLER CIRCUIT TYPE:**	JW+OC, ATAAC
MANIFOLD TYPE:	DRY	**INLET MANIFOLD AIR TEMP (F):**	122
GOVERNOR TYPE:	ELEC	**JACKET WATER TEMP (F):**	192.2
ELECTRONICS TYPE:	ADEM4	**TURBO CONFIGURATION:**	SINGLE
CAMSHAFT TYPE:	STANDARD	**TURBO QUANTITY:**	1
IGNITION TYPE:	CI	**TURBOCHARGER MODEL:**	GTB4594 T256C .84 A/R 70/30
INJECTOR TYPE:	EUI	**CERTIFICATION YEAR:**	2013
REF EXH STACK DIAMETER (IN):	5	**PISTON SPD @ RATED ENG SPD (FT/MIN):**	2,163.4
MAX OPERATING ALTITUDE (FT):	10,200		

INDUSTRY	SUBINDUSTRY	APPLICATION
INDUSTRIAL	AGRICULTURE	INDUSTRIAL
INDUSTRIAL	FORESTRY	INDUSTRIAL
INDUSTRIAL	GENERAL INDUSTRIAL	INDUSTRIAL
INDUSTRIAL	CONSTRUCTION	INDUSTRIAL
INDUSTRIAL	MATERIAL HANDLING	INDUSTRIAL
OIL AND GAS	LAND PRODUCTION	INDUSTRIAL
OIL AND GAS	WELL SERVICING	INDUSTRIAL

General Performance Data

INLET MANIFOLD AIR TEMPERATURE ("INLET MFLD TEMP") FOR THIS CONFIGURATION IS MEASURED AT THE OUTLET OF THE AFTERCOOLER.

ENGINE SPEED	ENGINE POWER	ENGINE TORQUE	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP
RPM	BHP	LB-FT	PSI	LB/BHP-HR	GAL/HR	IN-HG	DEG F	DEG F	IN-HG	DEG F
2,100	440	1,100	217	0.354	22.4	51.7	122.0	1,100.2	68.4	851.5
2,000	440	1,155	228	0.348	22.0	51.9	122.0	1,099.6	65.8	856.0
1,900	440	1,216	240	0.342	21.6	52.3	122.0	1,105.9	62.2	868.0
1,800	440	1,283	254	0.338	21.3	52.3	122.0	1,118.7	58.6	888.1
1,700	436	1,346	266	0.335	20.9	52.0	122.0	1,131.3	56.1	905.6
1,600	426	1,400	277	0.334	20.5	52.2	122.0	1,164.1	55.2	926.7
1,500	413	1,446	286	0.334	19.9	51.1	122.0	1,189.5	51.9	949.5
1,400	396	1,484	293	0.332	19.1	49.6	122.0	1,213.0	48.7	971.9
1,300	357	1,441	285	0.332	17.2	44.7	122.0	1,219.8	42.6	987.8
1,200	319	1,397	276	0.343	15.7	39.6	122.0	1,235.9	36.6	1,018.0
1,100	276	1,319	261	0.349	13.8	33.1	122.0	1,245.1	29.4	1,047.3
1,000	231	1,211	239	0.357	11.7	27.4	122.0	1,238.5	24.1	1,056.3
900	189	1,103	218	0.362	9.7	21.7	122.0	1,198.0	19.5	1,036.3
800	150	986	195	0.366	7.8	13.9	122.0	1,165.0	12.5	1,027.7
700	110	825	163	0.370	5.8	8.0	122.0	1,074.7	7.7	965.2
600	75.1	657	130	0.365	3.9	4.2	122.0	920.8	4.7	840.2

ENGINE SPEED	ENGINE POWER	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)	DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)
RPM	BHP	IN-HG	DEG F	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
2,100	440	55	342.6	812.1	1,524.6	3,554.5	3,711.1	571.7	516.8
2,000	440	55	338.9	793.0	1,498.7	3,458.6	3,612.4	560.0	505.9
1,900	440	55	336.0	765.2	1,467.4	3,319.9	3,471.3	543.4	489.8
1,800	440	55	333.0	735.7	1,446.1	3,176.0	3,325.2	527.6	474.0
1,700	436	54	330.7	712.1	1,429.7	3,061.2	3,207.8	514.9	462.1
1,600	426	54	332.3	672.2	1,410.7	2,884.5	3,028.2	500.3	447.5
1,500	413	53	330.4	637.4	1,374.9	2,725.6	2,864.8	479.7	428.1
1,400	396	52	328.4	603.7	1,341.6	2,573.6	2,707.0	460.8	410.7
1,300	357	46	313.3	544.4	1,254.7	2,311.9	2,432.3	426.2	379.6
1,200	319	41	293.5	488.7	1,150.0	2,045.4	2,155.3	382.7	339.5
1,100	276	34	270.4	416.5	1,026.7	1,732.6	1,829.1	335.0	296.0
1,000	231	28	245.1	361.6	909.1	1,497.5	1,579.6	294.9	261.0
900	189	22	215.9	312.9	786.3	1,292.3	1,360.0	258.4	229.7

800	150	15	178.7	234.0	603.2	965.3	1,020.1	199.4	175.8
700	110	8	139.4	174.4	441.0	721.6	762.3	152.2	134.3
600	75.1	5	114.0	133.7	310.8	553.6	581.1	117.5	105.1

Bulk Density Abrasives

- All Direct Pressure Blast Machines are filled by “volume”, not “pounds” of abrasive.
- The weight of each type of abrasive is different per cubic foot of “volume”.
- The weight is called the “bulk density” of that abrasive.

It just so happens that the most common of all Blast Cleaning Abrasives, Silica Sand, weighs 100 pounds per cubic foot, and a 6.5 cubic foot machine could “theoretically” hold 650 pounds of sand, if it could be totally filled. The chart below shows the “Bulk Density” (weight per cubic foot) of several common Blast Cleaning Abrasives.

ABRASIVE TYPE	BULK DENSITY
Silica Sand	100
Mineral Sands	127
Flint	80
Garnet	147
Coal Slag	85
Copper Slag	112
Nickel Slag	85
Sodium Bicarbonate	61

ABRASIVE TYPE	BULK DENSITY
Nut Shells	45
Corn Cobs	35 to 42
Aluminum Oxide	120
Silicon Carbide	106
Steel Shot/Grit	250
Glass Shot	100
Plastic Grit	45 to 48
Ferric Oxide	172

As a general rule, it can safely be figured that a typical Blast Machine can only hold abrasive in about 75% of its inside space. So, a typical 650 pound (6 cubic foot) machine will only freely hold 488 pounds of Silica Sand which happens to weigh 100 pounds per cubic foot (bulk density). But, that same machine can hold 1219 pounds of Steel Grit, but only 219 pounds of Nut Shells. But it is still as full as it possibly can be due to its filling angle of repose.

Attachment D
USGS Topographic Maps

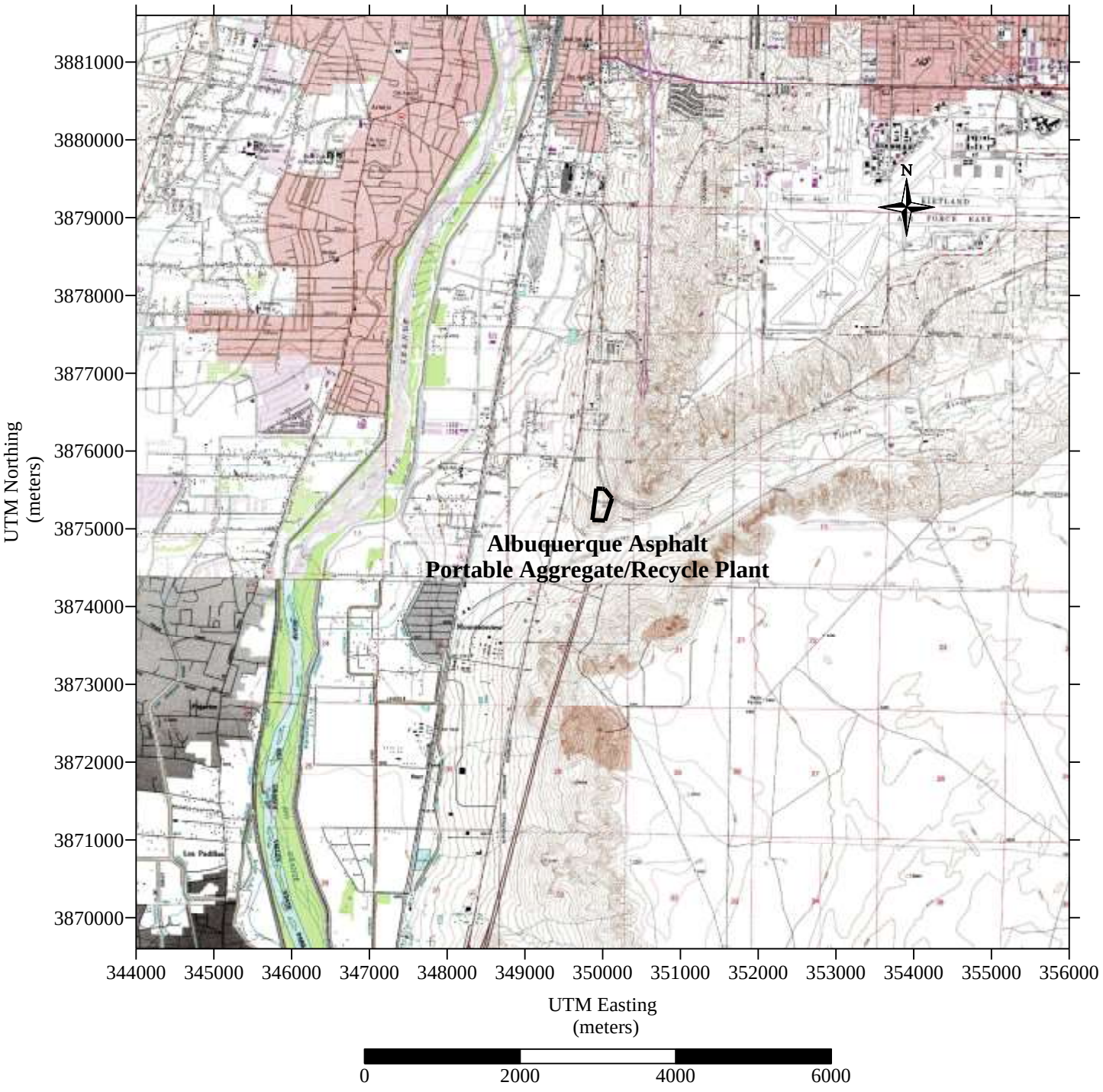

Figure D-1: 7 ½ Minute Topo Map Showing Site Location
Albuquerque West 7 ½ Minute Quadrant
NAD 83

Attachment E
Facility Process Description

Facility Process Description

The Albuquerque Asphalt's 300 tons/hr Portable Aggregate/Recycle Plant will consist of storage material piles (RAW, FINISH), a jaw crusher plant (feeder, jaw crusher, crusher conveyor), a screen plant (feeder, screen, three (3) screen conveyors, two (2) additional stacker conveyors), an impact crusher plant (feeder, impact crusher, impact crusher conveyor, three (3) recycle conveyors), truck loading, and three (3) diesel-fired engines (440 hp jaw crusher plant, 131 hp screen plant, 450 hp impact crusher plant).

From the raw material source onsite (RAW), a front-end loader transfer aggregate/recycle into the jaw crusher feeder (Unit 1). From the jaw crusher feeder, material is transferred and crushed in the primary (jaw) crusher (Unit 2). Crushed material from the primary crusher is conveyed (Unit 3) to the screen feeder (Unit 4). From the screen feeder, material is transferred and screened in the screen (Unit 5). Oversized material from the screen is transferred by conveyor (Unit 10) to the impact crusher feeder (Unit 11) for further sizing. From the impact crusher feeder, material is transferred and crushed in the impact crusher (Unit 12). Crushed material from the impact crusher is conveyed (Unit 13) to three (3) recycled conveyors (Units 14, 15, 16) to the screen feeder (Unit 4). Product from the screen is conveyed (Units 6 and 8) and stacked (Units 7 and 9) on one of two storage piles (STACKER). Material is transported by front-end loader from the stacker storage piles to the finish storage pile (FINISH). Material is transported by front-end loader from the finish storage pile to haul trucks (PRODUCT).

Fugitive dust generated during aggregate processing will be controlled by the inherent moisture content of the material and a "Wet Dust Suppression System" to no more than 7% opacity at screening and conveyor transfer points and 12% opacity at crushing operations. No fugitive dust controls are proposed for the jaw crusher feeder loading, aggregate storage piles (RAW and FINISH), or loading haul trucks with product.

The jaw crusher plant is powered by a maximum 440 hp diesel-fired engine (Unit EG1). The screen plant is powered by a maximum 131 hp diesel-fired engine (Unit EG2). The impact crusher plant is powered by a maximum 450 hp diesel-fired engine (Unit EG1). No emission controls are proposed for engines.

Truck traffic (ROAD) will be limited to 32,609 trucks per year. Fugitive road dust will be controlled by base course or millings and watering to reduce excess fugitive emissions.

Process flow diagrams are presented in Attachment A.

Attachment F
Regulatory Applicability Determinations

The following is a list of city and federal regulations that may or may not be applicable to AAI.

Albuquerque/Bernalillo County Regulations

20.11.1 NMAC– General Provisions: Applicable to AAI

Requirement: Compliance with ambient air quality standards.

Compliance: Compliance with 20.11.8 NMAC is compliance with this regulation.

20.11.2 NMAC– Permit Fees: Applicable to AAI

Requirement: A one-time permit application fee will be assessed by the Albuquerque/Bernalillo County Environmental Department.

Compliance: AAI will pay all required permit revision application fees applicable to their facility.

20.11.5 NMAC– Visible Air Contaminants: Applicable to AAI

Requirement: Places limits of 20 percent opacity on stationary combustion equipment.

Compliance: AAI will perform any required opacity observations for the 300 tons/hr portable aggregate/recycle plant engines using Method 9 and/or Method 22 with certified opacity observers.

20.11.8 NMAC– Ambient Air Quality Standards: Applicable to AAI

Requirement: Compliance with state and federal ambient air quality standards.

Compliance: AAI's 300 tons/hr portable aggregate/recycle plant demonstrated compliance by performing and submitting dispersion modeling analysis for applicable pollutants per Albuquerque/ Bernalillo County and New Mexico State Environmental Department's modeling guidelines.

20.11.41 NMAC– Authority to Construct: Applicable to AAI

Requirement: Requires the facility to obtain a permit prior to start of construction.

Compliance: AAI is applying for a new 20.11.41 NMAC permit with this application.

20.11.49 NMAC– Excess Emissions: Applicable to AAI

Requirement: To implement requirements for the reporting of excess emissions and establish affirmative defense provisions for facility owners and operators for excess emissions.

Compliance: AAI will report all excess emissions following 20.11.49 NMAC guidelines.

20.11.63 NMAC– New Source Performance Standards: Applicable to AAI

Requirement: Adoption of all federal 40 CFR Part 60 new source performance standards.

Compliance: 40 CFR Part 60 NSPS Subparts OOO and IIII has been identified for this permit application.

The aggregate handling equipment from unloading the initial feed bin to stacker conveyors are applicable to 40 CFR Part 60 NSPS Subpart OOO. Initial 40 CFR Part 60 NSPS Subpart OOO opacity testing will be completed following 40 CFR Part 60 NSPS Subpart A and OOO requirements.

The plant engines are portable and will not be located more than 12 months at the initial site. Under these conditions the engine is a "non-road" engine, not stationary source, so they are exempt under Subpart IIII. If the engine is located at one site for more than 12 consecutive months or seasonally, it would become applicable to Subpart IIII.

20.11.64 NMAC– Emission Standards for Hazardous Air Pollutants for Stationary Sources: Not Applicable to AAI at this time

Requirement: Adoption of all federal 40 CFR Part 61 and 63 National Emissions Standards for Hazardous Air Pollutants (HAPS).

Compliance: 40 CFR Part 63 NSPS Subpart ZZZZ has been identified for this permit application.

The engines are portable and will not be located more than 12 months at the initial site. Under these conditions the engine is a "non-road" engine, not stationary source, so they are exempt under Subpart ZZZZ. If the engine is located at one site for more than 12 consecutive months or seasonally, it would become applicable to Subpart ZZZZ.

20.11.66 NMAC– Process Equipment: Applicable to AAI

Requirement: The objective of this Part is to achieve attainment of regulatory air pollution standards and to minimize air pollution emissions.

Compliance: Except as otherwise provided in this section, AAI shall not cause or allow the emission of particulate matter to the atmosphere from process equipment in any one hour in total quantities in excess of the amount shown in 20.11.66.18 NMAC Table 1.

20.11.67 NMAC–Equipment, Emissions, Limitations: Not Applicable to AAI

Requirement: To prevent equipment covered by this Part from being constructed, placed, maintained, altered, used, or operated unless the equipment meets the applicable emission limitations established by 20.11.67 NMAC.

Compliance: No stationary source for Orchard Heaters; Kraft Mills; Coal, Oil, or Gas Burning Equipment is located on site.

20.11.90 NMAC– Administration, Enforcement, Inspection: Applicable to AAI

Requirement: General requirement on record keeping and data submission. AAI will notify the bureau regarding periods of excess emissions along with cause of the excess and actions taken to minimize duration and recurrence.

Compliance: It is expected that specific record keeping and data submission requirements will be specified in the 20.11.41 NMAC permit issued to AAI. It is expected the 20.11.41 NMAC permit issued to AAI will contain specific methods for determining compliance with each specific emission limitation. AAI's 300 tons/hr portable aggregate/recycle plant will report any periods of excess emissions as required by specific 20.11.90 NMAC provisions.

Federal Regulations

40 CFR 50 – National Ambient Air Quality Standards: Applicable to AAI

Requirement: Compliance with federal ambient air quality standards.

Compliance: AAI's 300 tons/hr portable aggregate/recycle plant demonstrated compliance by performing and submitting dispersion modeling analysis for applicable pollutants per Albuquerque/ Bernalillo County and New Mexico State Environmental Department's modeling guidelines in the original and revised permit applications. For this revision the department has waived modeling analysis due to the size of the additional units' emissions.

40 CFR 60 Dc – NSPS Standards of Performance for Small Industrial-Commercial-Institutional Stream Generating Units: Not Applicable to AAI

Requirement: For any affected facility to which this subpart applies is each steam generating unit for which construction, modification, or reconstruction is commenced after June 9, 1989 and that has a maximum design heat input capacity of 100 million Btu per hour of less, but greater than or equal to 10 million Btu per hour. A steam generating unit is defined as a device that combusts any fuel and produces steam or heats water or any other heat transfer medium.

Compliance: No hot water boiler is proposed for this emergency permit.

40 CFR 60 OOO – NSPS Standards of Performance for Aggregate Facilities: Applicable to AAI

Requirement: No facility will discharge or cause to discharge gases containing particulate matter in excess of 0.05 gr/dscm from any stack. No facility will discharge or cause to discharge from any transfer point on belt conveyors or screen exhibiting opacities greater than 7 percent. No facility will discharge or cause to discharge from any crusher exhibiting opacities greater than 12 percent.

Compliance: AAI's 300 tons/hr portable aggregate/recycle plant will perform any required opacity observations using Method 9 and/or Method 22 with certified opacity observers.

40 CFR 60 IIII – NSPS Standards of Performance for Stationary Compression Ignition Internal Combustion Engine: Not Applicable to AAI at this time

Requirement: The provisions of this subpart are applicable to manufacturers, owners, and operators of stationary compression ignition (CI) internal combustion engines (ICE).

Compliance: The engine is portable and will not be located more than 12 months at the initial site. Under these conditions the engine is a "non-road" engine, not stationary source, so they are exempt under Subpart IIII. If the engine is located at one site for more than 12 consecutive months or seasonally, it would become applicable to Subpart IIII.

40 CFR 63 ZZZZ – NATIONAL EMISSIONS STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR STATIONARY RECIPROCATING INTERNAL COMBUSTION ENGINES: NOT APPLICABLE TO AAI AT THIS TIME

Requirement: Facilities are subject to this subpart if they own or operate a stationary RICE, except if the stationary RICE is being tested at a stationary RICE test cell/stand.

Compliance: The engine is portable and will not be located more than 12 months at the initial site. Under these conditions the engine is a "non-road" engine, not stationary source, so they are exempt under Subpart ZZZZ. If the engine is located at one site for more than 12 consecutive months or seasonally, it would become applicable to Subpart ZZZZ.

Attachment G

Dispersion Modeling Summary

DISPERSION MODEL REPORT
FOR ALBUQUERQUE ASPHALT, INC.
NEW 20.11.41 NMAC PERMIT APPLICATION

Albuquerque, New Mexico

PREPARED FOR
ALBUQUERQUE ASPHALT, INC.

July 9, 2019
Revised October 16, 2019

Prepared by

Montrose Air Quality Services, LLC.

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1.0 INTRODUCTION

This dispersion modeling analysis was conducted by Montrose Air Quality Services, LLC. (Montrose) on behalf of Albuquerque Asphalt, Inc. (AAI), to evaluate ambient air quality impacts from a new 300 ton/hr portable aggregate/recycle plant. The location of the AAI's new 300 ton/hr portable aggregate/recycle plant is in the lot east of 4560 Broadway Blvd SE, end of Prosperity Extension Ave SE. in Albuquerque, NM. The equipment UTM coordinate is 349,990 Easting; 3,875,290 Nothing, NAD 83, Zone 13. The objective of this evaluation is to determine whether ambient air concentrations from the maximum operation of the proposed project for nitrogen dioxide, carbon monoxide, sulfur dioxide, and particulate matter; both 10 microns or less (PM_{10}) and 2.5 microns or less ($PM_{2.5}$); are below Class II federal and state ambient air quality standards (NAAQS and NMAAQS) found in 40 CFR part 50 and the City of Albuquerque/Bernalillo County (COABC) air quality regulation 20.11.8 NMAC.

The dispersion modeling was conducted using the American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Committee Dispersion Model (AERMOD), Version 18018. This model is recommended by EPA for determining Class II impacts within 50 km of the source being assessed. Additionally, AERMOD was developed to handle complex terrain. In this analysis, AERMOD was used to estimate pollutant ambient air concentrations of NO_2, CO, SO_2, PM_{10} and $PM_{2.5}$ from the AAI facility emission sources. Montrose employs the general modeling procedures outlined in "Permit Modeling Guidelines, Albuquerque Environmental Health Department", revised 12/20/2018, "New Mexico Air Pollution Control Bureau, Dispersion Modeling Guidelines", revised 01/01/2019, and the most up to date EPA's *Guideline on Air Quality Models*.

Aggregate material handling equipment, stockpiles, and haul roads were input into the model as volume sources. Model input parameters for material handling and processes from aggregate crushing, screening, transfers, storage, and truck loading will follow the NMED model guidelines Table 27. Model input parameters for haul roads will follow the NMED model guidelines Tables 28 and 29. Engine/generator point sources were based on parameters that present worst-case inputs for dispersion modeling, within reasonable operating conditions.

Figure 1 below shows the location of the site overview. Figure 2 below shows the equipment process flow diagram.

Additional neighboring sources identified by the COABC AQP Program included in the dispersion model analysis are AAI's 400 TPH Hot Mix Asphalt Plant operating under Permit #3291-M1 located south-southeast of this site (combustion and particulate sources), P&G Enterprises (NO_2), Black Rock Services, Inc. (NO_2), and PNM's Rio Bravo Generating Station (NO_2), Coronado Wrecking Services (NO_2), and D & R Tank (PM_{10}).

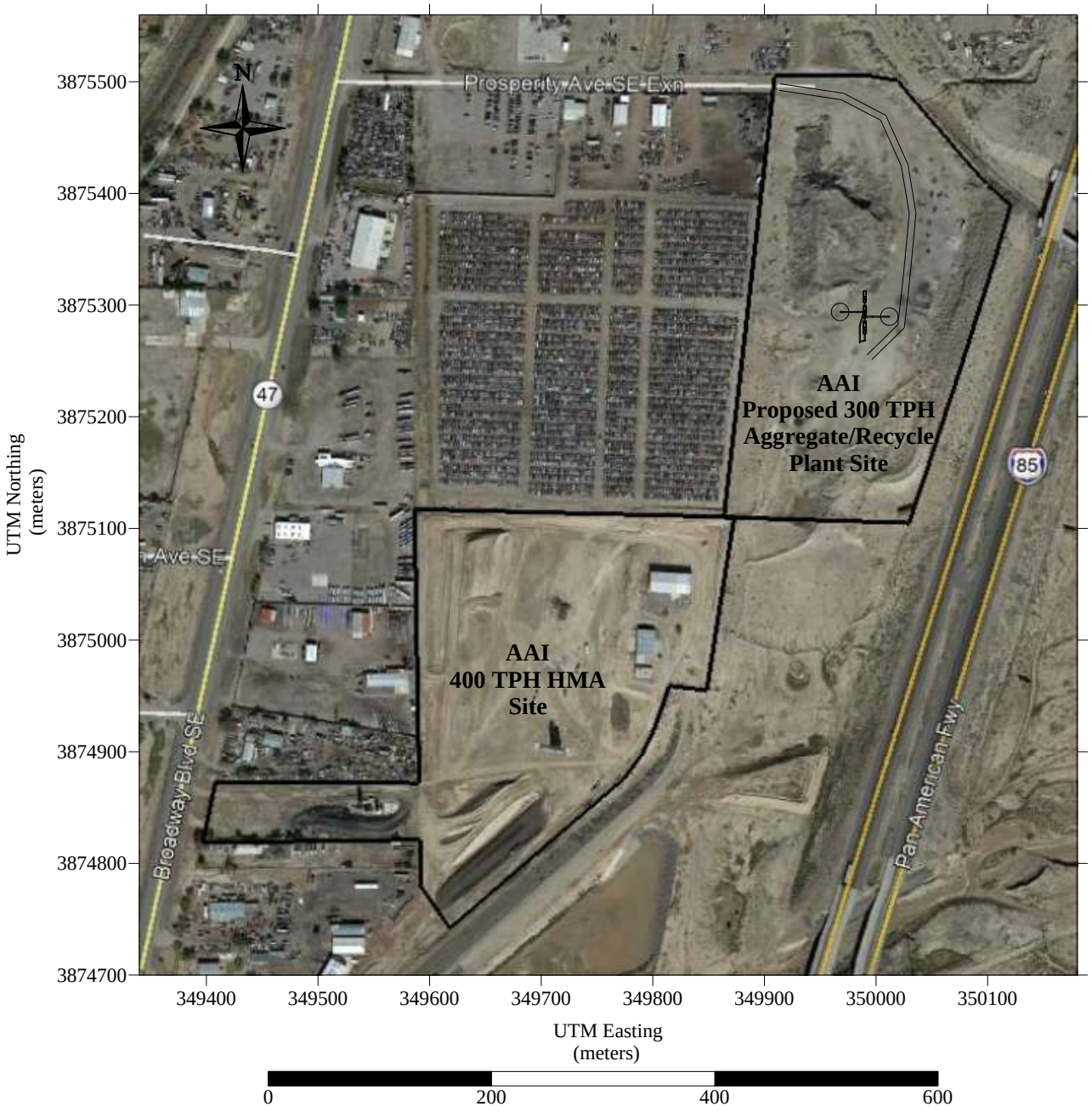

FIGURE 1: AAI Site Layout Overview

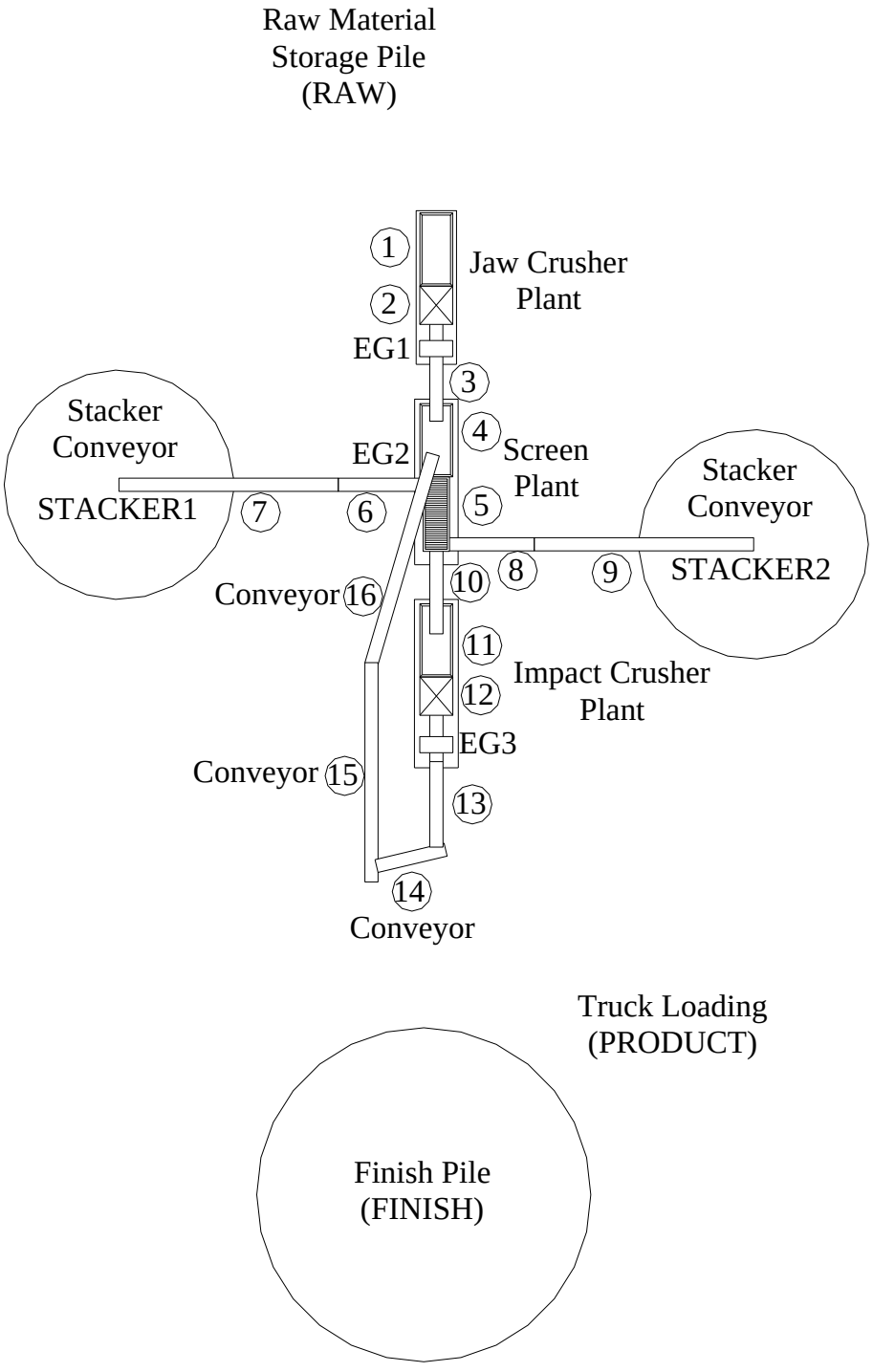

FIGURE 2: Equipment Process Flow Diagram

Neighboring Particulate Source - D & R Tank

D & R Tank operating under Permit #1038. In Permit #1038 only TSP emission rates are addressed. In the permit, TSP for abrasive blasting is 28.6 tons per year and for haul roads 2.1 tons per year. To convert these values to PM_{10}, ratios for TSP/PM10 were determined. To determine PM_{10} emission ratios for abrasive blasting, particulate size distribution testing found in Advanced Technology Institute document "Residual Risk from Abrasive Blasting Emissions: Particle Size and Metal Speciation", dated December 2005, Table 2: "Size Distribution of Airborne Particles from Dry Abrasive Blasting, Single Particle Optical Scanning (SPOS) Method" was used. In Table 1 the highest percentage for PM_{30} (TSP) and PM_{10} is found in coal slag abrasive at PM_{30} – 36.62% and PM_{10} – 8.87%.

Table 1: Size Distribution of Airborne Particles from Dry Abrasive Blasting Single Particle Optical Scanning (SPOS) Method

Particle Size Micron	Cumulative Mass % (all particles less than the size indicated)					
	Barshot %	Coal Slag %	Copper Slag %	Garnet %	Steel Grit %	Sp. Sand %
1.01	0.16	0.19	0.22	0.16	0.33	0.17
2.46	0.37	0.63	0.54	0.37	0.92	0.57
3.93	0.56	1.28	0.86	0.56	1.56	1.13
6.99	1.16	3.89	2.42	1.16	4.56	3.06
10.07	2.11	8.87	7.27	2.11	9.92	6.19
15.29	4.09	18.74	21.47	4.09	17.62	12.00
19.86	6.02	25.59	30.62	6.02	23.15	16.30
24.47	8.46	31.13	36.18	8.46	28.82	20.67
30.16	12.54	36.62	40.98	12.54	35.94	26.89
400	100.00	100.00	100.00	100.00	100.00	100.00

Normalizing this to TSP, the ratio of PM_{10} / TSP is 0.2422. The hourly emission rates for abrasive blasting, based on operating 8760 hours per year, are as follows:

Pollutant	Particle Size Distribution %	Ratio to TSP	Emission Rate TPY	Emission Rate PPH
PM30	36.62	1	28.60	6.52968
PM10	8.87	0.2422	6.93	1.58160
PM2.5	0.63	0.0172	0.49	0.11233

The other particulate source is for haul road traffic. To convert TSP to PM_{10}, AP-42 Table 13.2.2-2 "Industrial Roads", k factors were used. The hourly emission rates for haul road traffic, based on operating 8760 hours per year, are as follows:

Pollutant	K Factor	Ratio to TSP	Emission Rate TPY	Emission Rate PPH
PM30	4.9	1	2.1	0.47945
PM10	1.5	0.306	0.643	0.14677
PM2.5	0.15	0.0306	0.0643	0.01468

Combined facility hourly particulate emission rates are:

Pollutant	Emission Rate TPY	Emission Rate PPH
PM30	30.7	7.00913
PM10	7.57	1.72837
PM2.5	0.56	0.12701

For D &R Tank, the hourly emission rate used in all cumulative PM_{10} modeling is 1.72837 lbs/hr.

No previous dispersion modeling from the air quality program was available for D and R Tank Company Permit #1038. To reflect their particulate emissions from outdoor sand blasting, previous sand blasting modeling for Megacorp was reviewed, which was prepared during the June 2013 Lafarge Permit 1626-RV3 relocation modeling. Reviewing Google Earth, the blackened area is what is assumed to be the sand blasting location. Based on a conservative estimate of the area, I used 22 meters as the initial horizontal width or SYINT of 5.12 meters (22 meters / 4.3). For the release height I selected 10 feet (3.048 meters), not knowing how large the sand blasted material, but assuming tanks are 10 to 20 feet tall. To determine the SZINT, I multiplied the release height by 2 and divided that resulting number by 2.15 to get 2.83 meters.

Neighboring Particulate Source - Albuquerque Asphalt, Inc's HMA Plant

AAI's 400 TPH Hot Mix Asphalt Plant operating under Permit #3291-M1 located south-southeast of this site. Dispersion modeling for the HMA included 12 different modeling scenarios to account for limiting daily throughput over a 24-hour operating schedule. The modeling scenarios include 12 different operating times. The worst-case ambient impact from AAI's 400 TPH Hot Mix Asphalt Plant operating hours is Model Scenario 1. Model Scenario 1 was used, since it provided the highest impacts for PM 24-hour and annual averaging periods when combined with AAI's portable aggregate/recycle plant sources.

2.0 DISPERSION MODELING PROTOCOL

This section identifies the technical approach and dispersion model inputs that will be used for the Class II federal and State ambient air quality standards for this source. COABC Air Quality Program (AQP) requires that all applicable criteria pollutant emissions be modeled using the most recent versions of US EPA's approved models and be compared with National Ambient Air Quality Standards (NAAQS), and Bernalillo County Ambient Air Quality Standards. Table 2 shows the NAAQS and Bernalillo County Ambient Air Quality Standards that the source's ambient impacts must meet in order to demonstrate compliance. Table 2 also lists the Class II Significant Impact Levels (SILs) which are used to assess whether a source has a significant impact at downwind receptors.

The dispersion modeling analysis will be performed to estimate concentrations resulting from the operation of the AAI sources using requested maximum permitted emission rates for new sources while all emission sources are operating. The modeling will determine the maximum off site concentrations for nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), and particulate matter; both 10 microns or less (PM_{10}) and 2.5 microns or less ($PM_{2.5}$), for comparison with modeling significance levels, national/Bernalillo County ambient air quality standards (AAQS). The modeling will follow the guidance and protocols outlined in the "Permit Modeling Guidelines, Albuquerque Environmental Health Department", revised 12/20/2018, "New Mexico Air Pollution Control Bureau, Dispersion Modeling Guidelines", revised 01/01/2019, and the most up to date EPA's *Guideline on Air Quality Models*.

Initial modeling will be performed with AAI aggregate plant sources for all facility pollutants and averaging periods to determine receptors that exceed pollutant SILs. Receptors that exceed SILs located within AAI's HMA facility will be eliminated from cumulative modeling. Cumulative modeling will be performed for those pollutants and averaging periods for all receptors that exceeds the SILs, and will include significant neighboring sources along with background ambient concentrations.

TABLE 2: National and New Mexico Ambient Air Quality Standard Summary

Pollutant	Avg. Period	Sig. Lev. ($\mu g/m^3$)	Class I Sig. Lev. ($\mu g/m^3$)	NAAQS	NMAAQS	PSD Increment Class I	PSD Increment Class II
CO	8-hour	500		9,000 ppb(1)	8,700 ppb(2)		
	1-hour	2,000		35,000 ppb(1)	13,100 ppb(2)		
NO_2	annual	1.0	0.1	53 ppb(3)	50 ppb(2)	2.5 $\mu g/m^3$	25 $\mu g/m^3$
	24-hour	5.0			100 ppb(2)		
	1-hour	7.52		100 ppb(4)			
$PM_{2.5}$	annual	0.2	0.05	12 $\mu g/m^3$(5)		1 $\mu g/m^3$	4 $\mu g/m^3$
	24-hour	1.2	0.27	35 $\mu g/m^3$(6)		2 $\mu g/m^3$	9 $\mu g/m^3$
PM_{10}	annual	1.0	0.2			4 $\mu g/m^3$	17 $\mu g/m^3$
	24-hour	5.0	0.3	150 $\mu g/m^3$(7)		8 $\mu g/m^3$	30 $\mu g/m^3$
SO_2	annual	1.0	0.1		20 ppb(2)	2 $\mu g/m^3$	20 $\mu g/m^3$
	24-hour	5.0	0.2		100 ppb(2)	5 $\mu g/m^3$	91 $\mu g/m^3$
	3-hour	25.0	1.0	500 ppb(1)		25 $\mu g/m^3$	512 $\mu g/m^3$
	1-hour	7.8		75 ppb(8)			

Standards converted from ppb to $\mu g/m^3$ use a reference temperature of 25° C and a reference pressure of 760 millimeters of mercury.
(1) Not to be exceeded more than once each year.
(2) Not to be exceeded.
(3) Annual mean.
(4) 98th percentile of 1-hour daily maximum concentrations, averaged over 3 years.
(5) Annual mean, averaged over 3 years.
(6) 98th percentile, averaged over 3 years.
(7) Not to be exceeded more than once per year on average over 3 years.
(8) 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years.

2.1 DISPERSION MODEL SELECTION

The dispersion modeling will be conducted using the American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Committee Dispersion Model (AERMOD), Version 18081. This model is recommended by EPA for determining Class II impacts within 50 km of the source being assessed. Additionally, AERMOD was developed to handle complex terrain. In this analysis, AERMOD will be used to estimate pollutant ambient air concentrations of NO_2, CO, SO_2, PM_{10}, and $PM_{2.5}$ from AAI emission sources.

AERMOD is a Gaussian plume dispersion model that is based on planetary boundary layer principles for characterizing atmospheric stability. The model evaluates the non-Gaussian vertical behavior of plumes during convective conditions with the probability density function and the superposition of several Gaussian plumes. AERMOD modeling system has three components: AERMAP, AERMET, and AERMOD. AERMAP is the terrain preprocessor program. AERMET is the meteorological data preprocessor. AERMOD includes the dispersion modeling algorithms and was developed to handle simple and complex terrain issues using improved algorithms. AERMOD uses the dividing streamline concept to address plume interactions with elevated terrain.

AERMOD will be run using all the regulatory default options including use of:

- Gradual Plume Rise
- Stack-tip Downwash
- Buoyancy-induced Dispersion
- Calms and Missing Data Processing Routine
- Upper-bound downwash concentrations for super-squat buildings
- Default wind speed profile exponents
- Calculate Vertical Potential Temperature Gradient
- No use of gradual plume rise
- Rural Dispersion

2.2 BUILDING WAKE EFFECTS

No buildings are located at the AAI aggregate site. AAI HMA plant buildings will be included in the cumulative impact analysis (CIA) model and these buildings will be analyzed as a building downwash source using the BPIP-Prime program. The results of the BPIP-Prime output will be inputted into the AERMOD CIA model.

2.3 METEOROLOGICAL DATA

Dispersion model meteorological input file to be used in this modeling analysis are years 2001 - 2005 Albuquerque met data (AERMET version 16216) available from the COABC AQP.

2.4 RECEPTORS AND TOPOGRAPHY

Modeling will be completed using as many receptor locations to ensure that the maximum estimated impacts are identified. Initial radius of impact modeling will be performed with receptors within 3 kilometers of the model boundary. Because of the nature of the emissions from the site, it is expected the maximum concentrations will be on or near the site fenceline.

The refined receptor grid will include receptors located at 50 meters apart out to 500 meters from the property line, 100 meters apart from 500 meters out to 1000 meters, and 250 meters apart from 1000 meters out to 3000 meters. Fenceline receptor spacing will be 25 meters.

All refined model receptors will be preprocessed using the AERMAP software associated with AERMOD. The AERMAP software establishes a base elevation and a height scale for each receptor location. The height scale is a measure of the receptor's location and base elevation and its relation to the terrain feature that has the greatest influence in dispersion for that receptor. AERMAP will be run using National Elevation Data (NED) data. Output from AERMAP will be used as input to the AERMOD runstream file for each model run.

2.5 MODELED EMISSION SOURCES INPUTS

The permitted operating time for the facilities aggregate production includes daylight hours as seen in Table 3. Within those hours the plant will limit daily throughput to 3,000 tons or an equivalent to operate at maximum hourly throughput of 300 tph for 10 hours. For AAI combustion emission sources these will be modeled for all proposed operating hours found in Table 3. Initial significant impact and cumulative impact particulate modeling, the hourly blocks will include two model scenarios, operating 10 hours straight in the morning hours and operating 10 hours straight in the afternoon hours as summarized on Table 4. Using the results of the significant impact particulate modeling, CIA modeling will include AAI HMA sources and D & R Tank sources (PM_{10}). The model operating time scenario for the AAI's HMA will be its Modeling Operating Scenario 1.

TABLE 3: Aggregate Facility Daily Hours of Operation (MST) (Engine Model Hours)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	1	1	1	1	1	0.5	0	0	0
6:00 AM	0	0.5	1	1	1	1	1	1	1	1	0.5	0
7:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
8:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
9:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
10:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
11:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
12:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
1:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
2:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
3:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
4:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
5:00 PM	0.5	1	1	1	1	1	1	1	1	1	0	0
6:00 PM	0	0	0	1	1	1	1	1	0.5	0	0	0
7:00 PM	0	0	0	0	0	0.5	0.5	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	**10.5**	**11.5**	**12**	**14**	**14**	**14.5**	**14.5**	**14**	**13**	**12**	**10.5**	**10**

TABLE 4: Aggregate Plant Particulate SILs Model Scenario Time Segments

Model Months	Model Scenario #1	Model Scenario #2
January	7 AM to 5 PM	7:30 AM to 5:30 PM
February	6:30 AM to 4:30 PM	8 AM to 6 PM
March	6 AM to 4 PM	8 AM to 6 PM
April	5 AM to 3 PM	9 AM to 7 PM
May	5 AM to 3 PM	9 AM to 7 PM
June	5 AM to 3 PM	9:30 AM to 7:30 PM
July	5 AM to 3 PM	9:30 AM to 7:30 PM
August	5 AM to 3 PM	9 AM to 7 PM
September	5:30 AM to 3:30 PM	8:30 PM to 6:30 AM
October	6 AM to 4 PM	8 PM to 6 AM
November	6:30 AM to 4:30 PM	7 PM to 5 AM
December	7 AM to 5 PM	7 AM to 5 PM

2.5.1 AAI Facility Road Vehicle Traffic Model Inputs

The access road fugitive dust for truck traffic will be modeled as a line of volume sources. The NMED AQB's approved procedure for Modeling Haul Roads will be followed to develop modeling input parameters for haul roads. Volume source characterization followed the steps described in the NMED Air Quality Bureau's Guidelines.

2.5.2 AAI Facility Material Handling Volume Source Model Inputs

Particulate emissions from material handling and processes from aggregate crushing, screening, transfers, storage, and truck loading will be modeled as volume sources. Model input parameters for feeders, crushers, screens, transfer points, and truck loading will follow the NMED Air Quality Bureau's model guidelines Table 27. Storage piles (RAW, FP) model inputs were based on a pile length of 40 feet (SYINIT), dust plume height of 16 feet (SZINIT), and release height of 8 feet.

2.5.3 AAI Facility Point Source Model Inputs

Model input parameters for engines include; stack height, exit direction, stack diameter, stack flow rate, stack velocity, and stack exhaust temperature and will be input based on available information for the Tier III and Tier 4F engines. This information can be found in Attachment C in the documents on the CAT 440 hp Tier 4F and CAT 300 hp Tier III engines.

Calculated emission rates from all AAI portable aggregate/recycle plant sources will follow previously accepted AP-42 emission factors for material handling and haul roads emission sources, and EPA Tier III and Tier 4F emission factors for facility diesel-fired engines. Tables 5 through 7 summarize the model input for the AAI Facility.

TABLE 5: Summary of Particulate Model Inputs for Point Sources at the AAI Aggregate Facility

Source Description	Model ID	Stack Height (m)	Stack Temp. (K)	Exit Vel. (m/s)	Stack Dia. (m)	PM10 Emission Rate (lbs/hr)	PM2.5 Emission Rate (lbs/hr)
Jaw Crusher Plant Engine (EG1)	EG1	3.0480	727.5944	60.9600	0.1016	0.14467	0.14467
Screen Plant Engine (EG2)	EG2	3.0480	727.5944	60.9600	0.0762	0.06461	0.06461
Impact Crusher Plant Engine (EG3)	EG3	3.0480	727.5944	60.9600	0.1016	0.14796	0.14796

TABLE 6: Summary of Combustion Model Inputs for Point Sources at the AAI Aggregate Facility

Source Description	Model ID	Stack Height (m)	Stack Temp. (K)	Exit Vel. (m/s)	Stack Dia. (m)	NOx Emission Rate (lbs/hr)	CO Emission Rate (lbs/hr)	SO2 Emission Rate (lbs/hr)
Jaw Crusher Plant Engine (EG1)	EG1	3.0480	727.5944	60.9600	0.1016	1.97275	2.53170	0.15680
Screen Plant Engine (EG2)	EG2	3.0480	727.5944	60.9600	0.0762	0.86143	1.07679	0.04620
Impact Crusher Plant Engine (EG3)	EG3	3.0480	727.5944	60.9600	0.1016	2.30154	2.58924	0.15680

TABLE 7: Summary of Model Inputs for Volume Sources at the AAI Aggregate Facility

Source Description	Model ID	Release Height (meter)	Horizontal Dimension (meters)	Vertical Dimension (meters)	PM10 Emission Rate (lbs/hr)	PM2.5 Emission Rate (lbs/hr)
Raw Material Source	RAW	2.44	2.84	2.27	0.66977	0.10142
Jaw Crusher Plant Feeder	1	6.00	1.16	2.33	0.66977	0.10142
Jaw Crusher	2	6.00	1.16	2.33	0.16200	0.03000

Source Description	Model ID	Release Height (meter)	Horizontal Dimension (meters)	Vertical Dimension (meters)	PM10 Emission Rate (lbs/hr)	PM2.5 Emission Rate (lbs/hr)
Jaw Crusher Conveyor	3	2.00	0.47	0.93	0.01380	0.00390
Screening Plant Feeder	4	6.00	1.16	2.33	0.64318	0.09740
Screen	5	4.00	1.16	2.33	0.35520	0.02400
Screen Plant Conveyor	6	2.00	0.47	0.93	0.00690	0.00195
Conveyor	7	2.00	0.47	0.93	0.00690	0.00195
Screen Plant Conveyor	8	2.00	0.47	0.93	0.00690	0.00195
Conveyor	9	2.00	0.47	0.93	0.00690	0.00195
Screen Plant Conveyor	10	2.00	0.47	0.93	0.00828	0.00234
Impact Crusher Plant Feeder	11	6.00	1.16	2.33	0.24119	0.03652
Impact Crusher	12	6.00	1.16	2.33	0.09720	0.01800
Impact Crusher Conveyor	13	2.00	0.47	0.93	0.00828	0.00234
Conveyor	14	2.00	0.47	0.93	0.00828	0.00234
Conveyor	15	2.00	0.47	0.93	0.00828	0.00234
Conveyor	16	2.00	0.47	0.93	0.00828	0.00234
Stacker Conveyor Pile Loading	STK1	4.00	0.47	0.93	0.20100	0.03044
Stacker Conveyor Pile Loading	STK2	4.00	0.47	0.93	0.20100	0.03044
Finish Pile	FP	2.44	2.84	2.27	0.66977	0.10142
Truck Loading	TL	6.00	1.16	2.33	0.66977	0.10142
Plant Access Road Volume 1-26 (Unit #1)	HR_0001-26	3.40	6.05	3.16	1.87287	0.18729

2.6 PARTICLE SIZE DISTRIBUTION

PM_{10} emissions may be modeled with plume depletion. Plume deposition simulates the effect of gravity as particles "fall-out" from the plume to the ground as the plume travels downwind. Therefore, the farther the plume travels from the emission point to the receptor, the greater the effect of plume deposition and the greater the decrease in modeled impacts or concentrations. Particle size distribution, particle mass fraction, and particle density are required inputs to the model to perform this function.

The particle size distribution data used in the modeling for aggregate handling (aggregate, RAP, concrete) is based upon data obtained from the City of Albuquerque AQB's "Air Dispersion Modeling Guidelines for Air Quality Permitting", revised 12/20/18, Table 1. Particle size distribution for fugitive road dust was obtained from the New Mexico Environmental Department (NMED) Air Quality Bureau (ABQ) based on the particle size *k* factors found in the AP-42 13.2.2 emission equations for unpaved roads (ver. 11/06). Silo loading for neighboring baghouse emission sources (mineral filler/lime) particle size distribution came from NMED AQB accepted values. Particle size distribution for neighboring HMA baghouse stack emissions was obtained from NMED AQB accepted values for hot mix asphalt plant stack particle size distributions. Particle size distribution for neighboring abrasive blasting emissions based on particulate size distribution testing found in Advanced Technology Institute document "Residual Risk from Abrasive Blasting Emissions: Particle Size and Metal Speciation", dated December 2005, Table 2: "Size Distribution of Airborne Particles from Dry Abrasive Blasting, Single Particle Optical Scanning (SPOS) Method".

The mass-mean particle diameter was calculated using the formula:

$$d = ((d^3_1 + d^2_1 d_2 + d_1 d^2_2 + d^3_2) / 4)^{1/3}$$

Where: d = mass-mean particle diameter
d_1 = low end of particle size category range
d_2 = high end of particle size category range

Representative average particle densities for particle types emitted in the modeling analysis were obtained from NMED accepted values and an internet search. The list below summarizes these values.

Material	Bulk Density (g/cm^3)	Density Information Source
Lime (Mineral Filler)	3.3	NMED
Cement	2.85	NMED
Fly Ash	1.04	NMED
Cement/Fly Ash	1.04	NMED
Aggregate, Road Dust	2.5	NMED
Soot (Exhaust)	1.5	NMED
Asphalt Exhaust	1.5	NMED
Abrasive Blasting	1.4	Internet Search (see Attachment C)

The densities and size distribution for PM_{10} emission sources are presented in Tables 8, 9, 10, 11, 12, and 13.

TABLE 8: Aggregate Handling Fugitive Source Depletion Parameters

Particle Size Category (μm)	Mass Mean Particle Diameter (μm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
PM10			
2.5 – 5	3.88	22.6	2.5
5 – 10	7.77	77.4	2.5

Parameters based on values from the Albuquerque Air Quality Division Modeling Guidelines.

TABLE 9: Vehicle Fugitive Dust Depletion Parameters

Particle Size Category (μm)	Mass Mean Particle Diameter (μm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
PM10			
0 – 2.5	1.57	25.0	2.5
2.5 – 10	6.92	75.0	2.5

NMED: Based on AP-42 Section 13.2.2 k factors

TABLE 10: Combustion Depletion Parameters

Particle Size Category (μm)	Mass Mean Particle Diameter (μm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
PM10			
0 – 10	1.57	100.0	1.5

NMED

TABLE 11: Neighbor HMA Mineral Filler Silo Baghouse Source Depletion Parameters

Particle Size Category (μm)	Mass Mean Particle Diameter (μm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
PM10			
0 – 2.5	1.57	25.0	3.3
2.5 – 10	6.91	75.0	3.3

NMED

TABLE 12: Neighbor Cement Silo Baghouse Source Depletion Parameters

Particle Size Category (μm)	Mass Mean Particle Diameter (μm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
PM10			
0 – 2.5	1.57	25.0	2.85
2.5 – 10	6.91	75.0	2.85

NMED

TABLE 13: Neighbor Fly Ash Silo Baghouse Source Depletion Parameters

Particle Size Category (μm)	Mass Mean Particle Diameter (μm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
PM10			
0 – 2.5	1.57	25.0	1.04
2.5 – 10	6.91	75.0	1.04

NMED

TABLE 14: Neighbor CBP Central Baghouse Source Depletion Parameters

Particle Size Category (μm)	Mass Mean Particle Diameter (μm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
PM10			
0 – 2.5	1.57	25.0	1.04
2.5 – 10	6.91	75.0	1.04

NMED

TABLE 15: Neighbor HMA Baghouse Stack Depletion Parameters

Particle Size Category (μm)	Mass Mean Particle Diameter (μm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
PM10			
0-1.0	0.63	50.0	1.5
1.0-2.5	1.85	19.0	1.5
2.5-10	6.92	31.0	1.5

NMED: Based on AP-42 Section 11.1 Tables 11.1-3 and 11.1-4.

TABLE 16: Neighbor D & R Tank Abrasive Blasting Depletion Parameters

Particle Size Category (μm)	Mass Mean Particle Diameter (μm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
PM10			
0-1.01	0.6363	2.14	1.4
1.01-2.46	1.8305	4.96	1.4
2.46-3.93	3.2500	7.33	1.4
3.93-6.99	5.5984	29.43	1.4
6.99-10.07	8.6198	56.14	1.4

Advanced Technology Institute document "Residual Risk from Abrasive Blasting Emissions: Particle Size and Metal Speciation", dated December 2005, Table 2: "Size Distribution of Airborne Particles from Dry Abrasive Blasting, Single Particle Optical Scanning (SPOS) Method". Density based on coal slag, see Attachment C.

2.7 $PM_{2.5}$ SECONDARY EMISSIONS MODELING

The form of the $PM_{2.5}$ 24-hour design value is based on the 98th percentile or the highest 8th high result. Calculated $PM_{2.5}$ combustion emission rates included into the model consist of both filterable and condensable components. Secondary $PM_{2.5}$ emissions from combustion sources are created by the conversion to nitrates and sulfates as the exhaust plume travels away from the source and mixes with ambient air. Fugitive dust emission sources do not consist of a condensable component and will not create secondary emissions of $PM_{2.5}$.

$PM_{2.5}$ secondary emission concentration analysis will follow EPA guidelines. Based on requested permitted emission rates, the Tier 1 analysis will be used since direct $PM_{2.5}$ emissions are less than 10 tpy, and NOx and SO_2 emissions are less than 40 tpy. The comparison with the $PM_{2.5}$ 24-hour NAAQS with model results will be based on the 98th percentile or highest 8th high.

2.8 NO_2 DISPERSION MODELING ANALYSIS

The AERMOD model predicts ground-level concentrations of any generic pollutant without chemical transformations. Thus, the modeled NO_X emission rate will give ground-level modeled concentrations of NO_X. NAAQS values are presented as NO_2.

EPA has a three-tier approach to modeling NO_2 concentrations.

- Tier I – total conversion, or all NOx = NO_2
- Tier II –Ambient Ratio Method 2 (ARM2)
- Tier III – case-by-case detailed screening methods, such as OLM and Plume Volume Molar Ratio Method (PVMRM) and NO_2/NO_X in-stack ratio

Initial modeling will be performed using both Tier I and Tier II methodologies. If these modeling iterations demonstrate that less conservative methods for determining 1-hour, 24-hour, and annual NO_2 compliance would be needed for this project, then ambient impact of 1-hour, 24-hour, and annual NOx predicted by the model will use Tier III – OLM or PVMRM.

For OLM or PVMRM, three inputs can be selected in the model, the ISR, the NO_2/NO_X equilibrium ratio for the ambient air, and the ambient ozone concentration. The ISR will be determined for each source or group of sources. The NO_2/NO_X equilibrium ratio will be the EPA default of 0.90. Ozone input will be from monitored ozone data collected from city monitoring station.

Based on EPA's ISR databases, a proposed conservative NO_2/NO_X ISR ratio for the proposed site diesel-fired RICE is 0.15. No data could be found for AAI HMA drum so to be conservative the EPA default ISR of 0.50 will be used. For the AAI HMA natural gas combustion, to be conservative, the EPA default ISR of 0.50 will be used. For neighboring sources, since the ISR

has a diminishing impact on ambient NO_2/NO_X ratios as a plume is transported farther downwind due to mixing and reaction towards background ambient NO_2/NO_X ratios, a default ISR of 0.20[1] in lieu of source specific data will be used. Table 17 summarizes the ISR selected for each NO_X source in the NO_2 1-hour modeling.

TABLE 17: Summary of Selected ISR

Source Description	Selected ISR
AAI HMA Baghouse Stack	0.50
AAI HMA Natural Gas Heaters	0.50
AAI Generator/Engine	0.15
Neighboring Diesel-Fired Engine Sources	0.15
Neighboring Default Sources	0.50
Neighboring PNM Sources	0.20

For NO_X, NAAQS and NMAAQS applicable averaging periods include 1-hour, 24-hour and annual averages.

Model Ozone Data

For OLM or PVMRM, modeling of the project-generated 1-hour NO_2 concentrations requires use of ambient monitored O_3 concentrations. Background ambient O_3 concentrations for the project area during the 2001-2005 meteorological data years have been obtained from the Del Norte (Years 2001 - 2002)[2] monitoring station and South Valley (Years 2003 – 2005) monitoring station, which is the monitoring site nearest to the project.

Concerning data substitution for missing hourly O_3 ambient monitoring data, the hourly O_3 data are used within the AERMOD air dispersion model when operated using the PVMRM option that simulates the atmospheric chemistry of O_3 reacting with initially emitted nitric oxide (NO) to form NO_2. If there is only a limited amount of O_3 in the plume, then the reaction is limited, forming less NO_2 than occurs with the simplifying assumption of complete conversion. The model disperses the initial NO_X emissions, which are mostly NO, during each of the 8,760 hours in a 365-day year. If the hourly ambient O_3 data from the nearest monitoring station have missing data, the missing O_3 hours are given substituted concentrations with the following procedure to better simulate the resulting NO_2 concentrations:

- If two or fewer consecutive hours of O_3 ambient concentrations are missing, the missing concentrations will be based on the highest previous or subsequent hour concentrations.

[1] Technical support document (TSD) for NO2-related AERMOD modifications, EPA- 454/B-15-004, July 2015

[2] Ozone monitoring did not begin at the South Valley monitoring station until July 2002. Del Norte monitoring station data is substituted for years 2001 - 2002 into the background ozone data input into the dispersion model.

- If three or more consecutive hours of O_3 ambient concentrations are missing, then substitution for each missing concentration will be based on the highest 1 hour for same hour in the day over that month. Example: for data missing in January for the first hour of the day will be substituted for the highest value for all first hour of the day in January, etc.

2.9 AMBIENT MODELING BACKGROUND

Ambient background concentrations will be added to the dispersion modeling results and compared to the NAAQS and NMAAQS. Background concentrations were obtained from the COABC AQP Modeling Section with the exception of the 1-hour NO_2 background methodology discussed below.

CO 1-hr:	2635 micrograms per cubic meter
CO 8-hr:	1718 micrograms per cubic meter
NO_2 Annual:	30 micrograms per cubic meter
SO_2 1-hr:	13.1 micrograms per cubic meter
SO_2 24-hr:	0 micrograms per cubic meter
SO_2 Annual:	0 micrograms per cubic meter
PM_{10} 24-hr:	35 micrograms per cubic meter
$PM_{2.5}$ 24-hr:	18.0 micrograms per cubic meter
$PM_{2.5}$ annual:	7.2 micrograms per cubic meter

NO_2 1-hour Background data

NO_2 1-hour background data will be based on the Tier 2 procedure found in EPA guidance documents[3] for determining background concentrations.

> *"Based on this guidance, we believe that an appropriate methodology for incorporating background concentrations in the cumulative impact assessment for the 1-hour NO_2 standard would be to use multiyear averages of the 98th-percentile of the available background concentrations by season and hour-of-day, excluding periods when the source in question is expected to impact the monitored concentration (which is only relevant for modified sources). For situations involving a significant mobile source component to the background monitored concentrations, inclusion of a day-of-week component to the temporal variability may also be appropriate. The rank associated with the 98th-percentile of daily maximum 1-hour values should be generally consistent with the number of "samples" within that distribution for each combination based on the temporal resolution but also account for the number of samples "ignored" in specifying the 98th-percentile based on the annual distribution. For example, Table 1 in Section 5 of Appendix S specifies the rank associated with the 98th-percentile value based on the annual number of days with valid data. Since the number of days per season will range from 90 to 92, Table 1 would indicate that the 2nd-highest value from the seasonal distribution should be used to represent the 98th-percentile. On the other hand use of the 2nd-highest value for each season would effectively "ignore" only 4 values for the year rather than the 7 values*

[3] Memo: "Additional Clarification Regarding Application of Appendix W Modeling Guidance for 1-hour N02 National Ambient Air Quality Standard" Tyler Fox, Leader, Air Quality Modeling Group, C439-01, dated March 1, 2011.

"ignored" from the annual distribution. Balancing these considerations, we recommend that background values by season and hour-of-day used in this context should be based on the 3rd-highest value for each season and hour-of-day combination, whereas the 8th-highest value should be used if values vary by hour-of-day only. For more detailed temporal pairing, such as season by hour-of- day and day-of-week or month by hour-of-day, the 1st-highest values from the distribution for each temporal combination should be used."

The NO_2 background data was provided by the COAAQP Modeling Section and is presented below.

TABLE 18: Monitored Seasonal NO_2 Background – 3rd Highest Hourly µg/m^3

Hour	Winter	Spring	Summer	Fall
1	72.1	47.6	29.3	65.6
2	67.8	48.3	27.7	59.7
3	67.7	46	26.4	57.9
4	68.4	48.9	26.6	58.9
5	69.1	51.7	32.7	58
6	69.7	63.9	39.3	57.8
7	72.8	70.7	46.4	63.5
8	77.6	71.8	48.5	64.5
9	80	61.1	34.2	65.9
10	71.4	48	27.3	55
11	62	28.6	24.3	47.3
12	48.1	18.9	19.9	35.4
13	36.9	17.6	17	28.2
14	35.1	15.7	15.9	25.3
15	33.6	14.8	17.4	24.2
16	37.2	15.3	19.4	28
17	48.4	17.1	20.4	38
18	73	19.4	19.3	69.6
19	79.3	38.5	21.7	79.1
20	78.1	53.2	30.9	77.1
21	77.3	48	34.1	73.4
22	76.5	56.3	30.8	70.4
23	75	58.8	34.9	69.7
24	72.4	57.9	33.6	70.9

3.0 MODEL SUMMARY

This section summarizes the model results, following the technical approach approved in Section 2 of this report, for Class II federal ambient air quality standards for this facility. Model results show for each modeled criteria pollutant and applicable averaging periods for nitrogen dioxide, carbon monoxide, sulfur dioxide, and particulate matter; both 10 microns or less (PM_{10}) and 2.5 microns or less ($PM_{2.5}$), the proposed AAI aggregate/recycle plant does not contribute to an exceedance of Class II federal and state ambient air quality standards (NAAQS and NMAAQS) and the City of Albuquerque/Bernalillo County (COABC) air quality regulation 20.11.8 NMAC. The modeling followed the guidance and protocols outlined in the protocol found in Section 2 of this report; the "Permit Modeling Guidelines, Albuquerque Environmental Health Department", revised 12/20/2018; "New Mexico Air Pollution Control Bureau, Dispersion Modeling Guidelines", revised 01/01/2019; and the most up to date EPA's *Guideline on Air Quality Models*.

The permitted operating time for the facilities aggregate production includes daylight hours. Within those hours the plant will limit hourly throughput to 300 tph and daily throughput to 3,000 tons or an equivalent to operate at maximum hourly throughput of 300 tph for 10 hours.

For AAI combustion emission sources these will be modeled for all proposed operating hours found in Table 19. Neighboring sources included with combustion modeling are; AAI HMA operating under Permit #3291-M1, AAI Complete Concrete operating under Permit #1836-6AR, Black Rock Services HMA operating under Permit #1694-M2-RV4, PG Enterprises operating under Permit #1246-M1-RV1, Coronado Wrecking Services operating under Permits #1515 and #1761-M1, and PNM Rio Bravo Generating Station operating under Permit #0694-M3.

Initial significant impact and cumulative impact particulate modeling, the hourly blocks included two model scenarios, operating 10 hours straight in the morning hours and operating 10 hours straight in the afternoon hours as summarized on Table 20. Using the results of the SIL particulate modeling, CIA modeling included neighboring AAI HMA operating under Permit #3291-M1 sources, D & R Tank operating under Permit #1038 sources, and SIL receptors using in model operating time scenarios 1 and 2. The model operating time scenario for the AAI's HMA was its Modeling Operating Scenario 1.

TABLE 19: Aggregate Facility Daily Hours of Operation (MST) (Engine Model Hours)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	1	1	1	1	1	0.5	0	0	0
6:00 AM	0	0.5	1	1	1	1	1	1	1	1	0.5	0
7:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
8:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
9:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
10:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
11:00 AM	1	1	1	1	1	1	1	1	1	1	1	1
12:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
1:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
2:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
3:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
4:00 PM	1	1	1	1	1	1	1	1	1	1	1	1
5:00 PM	0.5	1	1	1	1	1	1	1	1	1	0	0
6:00 PM	0	0	0	1	1	1	1	1	0.5	0	0	0
7:00 PM	0	0	0	0	0	0.5	0.5	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	**10.5**	**11.5**	**12**	**14**	**14**	**14.5**	**14.5**	**14**	**13**	**12**	**10.5**	**10**

TABLE 20: Aggregate Plant Particulate SILs Model Scenario Time Segments

Model Months	Model Scenario #1	Model Scenario #2
January	7 AM to 5 PM	7:30 AM to 5:30 PM
February	6:30 AM to 4:30 PM	8 AM to 6 PM
March	6 AM to 4 PM	8 AM to 6 PM
April	5 AM to 3 PM	9 AM to 7 PM
May	5 AM to 3 PM	9 AM to 7 PM
June	5 AM to 3 PM	9:30 AM to 7:30 PM
July	5 AM to 3 PM	9:30 AM to 7:30 PM
August	5 AM to 3 PM	9 AM to 7 PM
September	5:30 AM to 3:30 PM	8:30 PM to 6:30 AM
October	6 AM to 4 PM	8 PM to 6 AM
November	6:30 AM to 4:30 PM	7 PM to 5 AM
December	7 AM to 5 PM	7 AM to 5 PM

3.1 SIGNIFICANT IMPACT LEVEL (SILs) MODELING ANALYSIS

Significant impact level AERMOD dispersion modeling was completed for NO_2, CO, SO_2, PM_{10}, and $PM_{2.5}$. All SIL models were run in terrain mode with AAI aggregate/recycle plant emission sources only. Table 21 lists the results of the modeling for pollutant and averaging period that falls below the applicable SILs.

TABLE 21: Summary of Air Dispersion Modeling Results below SILs

Parameter	Maximum Modeled Concentration ($\mu g/m^3$)	Significant Impact Level ($\mu g/m^3$)	% of SIL
CO 1 Hr.	246.3	2000	12.3
CO 8 Hr.	95.6	500	19.2
SO_2 3 Hr.	7.3	25.0	29.2
SO_2 24 Hr.	2.4	5.0	48.0
SO_2 Annual	0.38	1.0	38.0

For CO 1-hour and 8-hour averaging periods and SO_2 3-hour, 24-hour and annual averaging periods the model results show impacts below the SILs. No cumulative impact analysis modeling was performed for CO 1-hour and 8-hour averaging periods and SO_2 3-hour, 24-hour and annual averaging periods.

3.2 CUMULATIVE IMPACT ANALYSIS (CIA) MODEL RESULTS

The model results using the maximum operation at AAI aggregate/recycle plant, significant neighboring sources, and approved ambient background are summarized below in Table 22. Dispersion modeling analysis followed the modeling protocol outline in Section 2 of this report.

TABLE 22: Summary of CIA Modeling Results Including Background

Parameter	Maximum Modeled Concentration ($\mu g/m^3$)	Significant Impact Level ($\mu g/m^3$)	Maximum Modeled Concentration With Background ($\mu g/m^3$)	Lowest Applicable Standard ($\mu g/m^3$)	% of Standard
NO_2 1 Hr. 8th highest 1-hour daily maximum	103.1	7.52	175.8	188	93.5
NO_2 24 Hr.	46.8	5	76.8	188	40.9
NO_2 Annual	7.78	1	37.8	94	40.2
$PM_{2.5}$ 24 Hr. High 8th High	13.5	1.2	31.5	35	90.0
$PM_{2.5}$ Annual	1.9	0.2	9.1	12	75.8
PM_{10} 24 Hr. High 2nd High	74.5	5	100.5	150	67.0
SO_2 1 Hr. 4th highest 1-hour daily maximum	72.7	7.8	85.8	196.4	43.7

Note: Background concentrations are found in Section 2.9 of the modeling protocol. Dispersion modeling inputs and settings are presented in Section 2.

3.2.1 NO_2 Cumulative Impact Analysis Modeling Results

NO_2 CIA modeling was performed with terrain elevations and building downwash (AAI HMA) for AAI aggregate/recycle plant. NO_X emission rates represented the maximum hourly rate for AAI aggregate/recycle plant point sources, significant neighboring sources, and for all AAI aggregate/recycle plant initial modeling receptors that were above the NO_2 SILs. Significant neighbors include; AAI HMA operating under Permit #3291-M1, Black Rock Services HMA operating under Permit #1694-M2-RV4, PG Enterprises operating under Permit #1246-M1-RV1, Coronado Wrecking Services operating under Permits #1515 and #1761-M1, and PNM Rio Bravo Generating Station operating under Permit #0694-M3.

Table 23 shows the NO_2 8th highest 1-hour daily maximum 24-hour maximum, and annual model results and highest impact locations for receptors above the SILs.

TABLE 23: NO_2 CIA MODEL RESULTS

	Modeled Concentration ($\mu g/m^3$)	Modeled Concentration With Background ($\mu g/m^3$)	Location UTMs E/N	
NO_2 1 Hr. 8th highest 1-hour daily maximum	103.1	175.8	350086.0	3875281.6
NO_2 24 Hr.	47.8	76.8	349857.4	3874999.4
NO_2 Annual	7.78	37.8	350079.0	3875259.5

For NO_2 1-hour modeling, the Tier III PVMRM approach found in Section 2.8 of this report was used for the analysis. For NO_2 24-hour modeling and annual averaging periods, the Tier II ARM2 approach found in Section 2.8 of this report was used for the analysis.

Dispersion modeling meteorology for this analysis included 5 years of data, 2001 – 2005 Albuquerque Meteorological data, was obtained from the COABC AQP.

Albuquerque Del Norte Monitor, years 2012 – 2014, 1-hour and annual NO_2 background concentrations found in Section 2.9 of this report were added to the modeled results and compared to the lowest applicable ambient standard.

Model results show the highest 24-hour and annual concentrations, where AAI aggregate/recycle plant source makes a significant contribution, occurred along the eastern AAI aggregate/recycle plant restricted boundary for the annual average and along the eastern AAI HMA plant restricted boundary for the 24-hour averaging period.

For the NO_2 1-hour model, concentration exceeded the NAAQS within PG Enterprises and Coronado Wrecking boundaries. When modeling excluding their individual sources the model results were well below the NAAQS. Two receptors east of Coronado Wrecking also had modeled concentrations above the NO_2 1-hour NAAQS. For these receptors, when the modeled concentrations were above the NAAQS, the contribution from AAI aggregate/recycle plant sources were below the NO_2 1-hour SIL. All Model Rank for Group ALL concentrations were reviewed until the concentrations were below the NO_2 1-hour NAAQS. Table 24 summarizes the results of the model for these two receptors

TABLE 24: NO_2 CIA MODEL RESULTS EAST OF CORONADO

Receptor		Rank	Group All ($\mu g/m^3$)	Group AAIAGG ($\mu g/m^3$)
UTME	UTMN			
350350	3876050	8TH	207.5	0.0085
350350	3876050	9TH	202.8	0.0091
350350	3876050	10TH	201.5	0.0098
350350	3876050	11TH	197.4	0.0066
350350	3876050	12TH	195.2	0.0062
350350	3876050	13TH	192.4	0.0080
350350	3876050	14TH	186.3	0.0056
350300	3876000	8TH	196.8	0.0066
350300	3876000	9TH	194.1	0.0084
350300	3876000	10TH	192.3	0.010
350300	3876000	11TH	190.7	0.010
350300	3876000	12TH	189.1	0.014
350300	3876000	13TH	187.3	0.0067

For the NO_2 1-hour model, where AAI aggregate/recycle plant source makes a significant contribution, occurred along the eastern AAI aggregate/recycle plant restricted boundary.

Figure 3 shows aa aerial map of the NO_2 8^{th} highest 1-hour daily maximum concentration, highest 24-hour concentration, and highest annual concentration locations including background where AAI aggregate/recycle plant sources contribute above the NO_2 SILs.

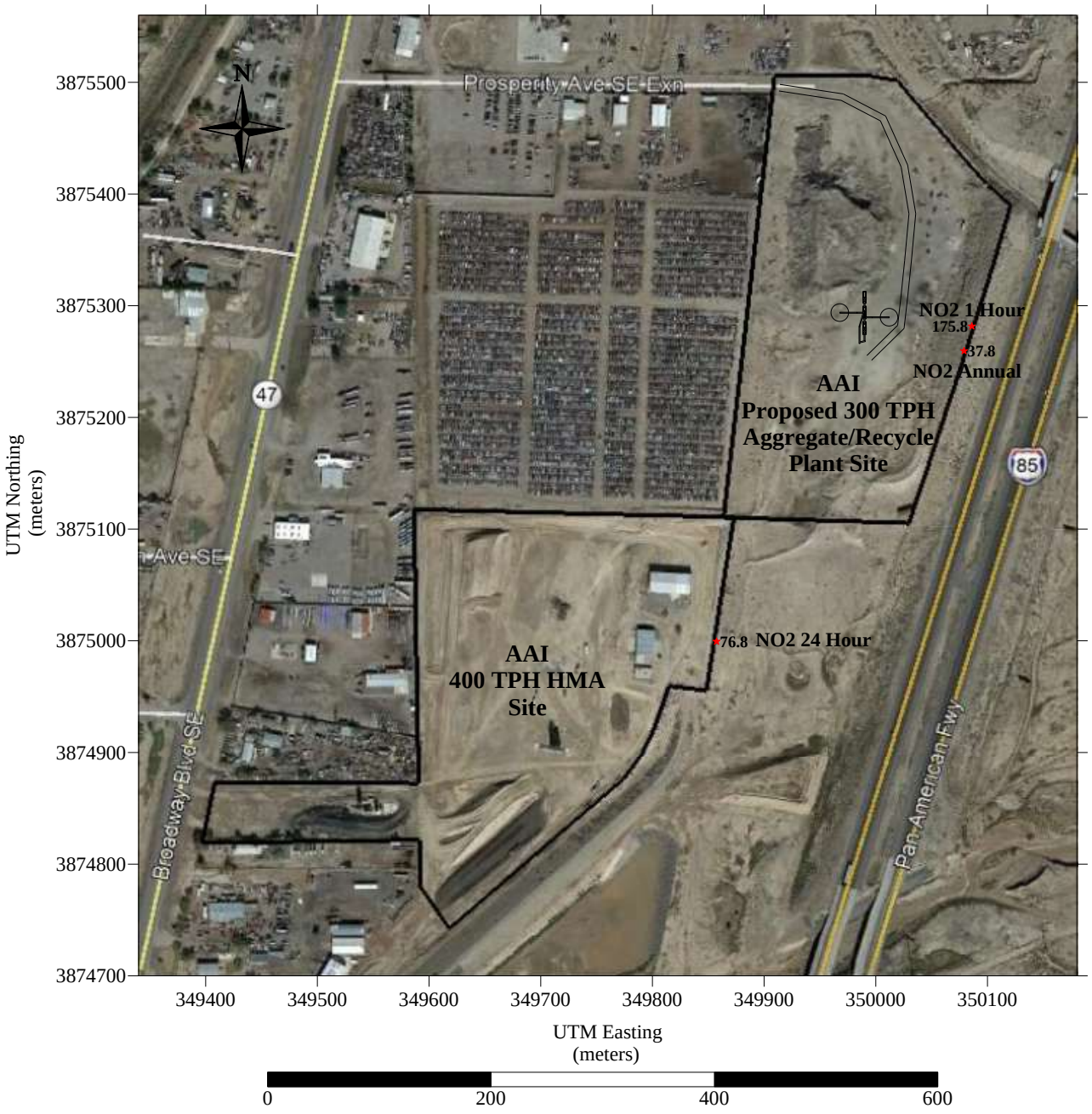

Figure 3: Aerial Map Showing the Location of the NO_2 Highest Concentration Model Result ($\mu g/m^3$)

3.2.2 $PM_{2.5}$ Direct and Secondary Formation CIA Modeling Results

Particulate matter includes both "primary" PM, which is directly emitted into the air, and "secondary" PM, which forms indirectly from fuel combustion and other sources. Primary PM consists of carbon (soot)—emitted from cars, trucks, heavy equipment, forest fires, and burning waste—and crustal material from unpaved roads, stone crushing, construction sites, and metallurgical operations. Secondary PM forms in the atmosphere from gases. Some of these reactions require sunlight and/or water vapor. Secondary PM includes:

- Sulfates formed from sulfur dioxide emissions from power plants and industrial facilities;
- Nitrates formed from nitrogen oxide emissions from cars, trucks, industrial facilities, and power plants; and
- Carbon formed from reactive organic gas emissions from cars, trucks, industrial facilities, forest fires, and biogenic sources such as trees.

AERMOD does not account for secondary formation of $PM_{2.5}$ for near-field modeling. Any secondary contribution of the AAI aggregate/recycle plant's source emissions is not explicitly accounted for in the model results. While representative background monitoring data for $PM_{2.5}$ should adequately account for secondary contribution from existing background sources, AAI aggregate/recycle plant sources emits less than significant emission rate (SER) of $PM_{2.5}$ precursors (NO_X, SO_2, VOC), so no assessment of their potential contribution to cumulative impacts as secondary $PM_{2.5}$ was performed. Total permit modification emissions of precursors include:

- Nitrogen Oxides (NO_X) – 17.4 tons per year (below SER)
- Sulfur Dioxides(SO_2) – 1.2 tons per year (below SER)
- Volatile Organic Carbon (VOC) – 2.3 tons per year (below SER).

For the AAI aggregate/recycle plant, direct "primary" $PM_{2.5}$ emission rates are less than 10 tons per year (Significant Emission Rate - SER), and NO_X and SO_2 emission rates are less than 40 tons per year (SER), falling into category "Case 1" in EPA's May, 2014 "Guidance for $PM_{2.5}$ Permit Modeling". For Case 1, no secondary $PM_{2.5}$ ambient impacts associated with the AAI aggregate/recycle plant are required to be addressed.

CIA direct "primary" $PM_{2.5}$ modeling was performed with terrain and meteorology which included 5 years of data, 2001 – 2005 Albuquerque Meteorological data, obtained from the AEHD AQP. Modeling was performed for both 24 hour and annual averaging periods with maximum $PM_{2.5}$ hourly emission rate for AAI aggregate/recycle plant sources, significant neighboring sources (AAI HMA operating under Permit #3291-M1), and all AAI aggregate/recycle plant initial modeling receptors that were above the $PM_{2.5}$ SILs. $PM_{2.5}$ emission rates represented the maximum hourly rate for all emission sources. South Valley representative 24-hour and annual $PM_{2.5}$ background concentrations was added to the modeled results and compared to the lowest applicable ambient

standard. The 24-hour and annual background concentrations that were used for $PM_{2.5}$ averaging periods are found in Section 2.9 of this report.

Results showed that direct "primary" $PM_{2.5}$ annual averaging period from AAI aggregate/recycle plant sources, where AAI aggregate/recycle plant source makes a significant contribution, are located on the eastern AAI aggregate/recycle plant boundary. Results showed that direct "primary" $PM_{2.5}$ 24-hour averaging period from AAI aggregate/recycle plant sources, where AAI aggregate/recycle plant source makes a significant contribution, are located on the eastern AAI HMA boundary. The result from direct "primary" $PM_{2.5}$ emissions dispersion modeling, plus a representative $PM_{2.5}$ background concentrations from Section 2.9 of this report, which includes monitored secondary $PM_{2.5}$ concentrations, were used to show compliance with national $PM_{2.5}$ annual and 24-hour average AAQS.

Table 25 shows the $PM_{2.5}$ 8th highest 24-hour daily maximum and annual model results and locations.

TABLE 25: $PM_{2.5}$ CIA MODEL RESULTS

	Modeled Concentration ($\mu g/m^3$)	**Modeled Concentration With Background ($\mu g/m^3$)**	**Location UTMs E/N**	
24 Hour Average Highest 8th High	13.5	31.5	349783.5	3874883.5
Annual Average	1.9	9.1	350072.0	3875237.5

Figure 4 summarize the results of the modeling analysis.

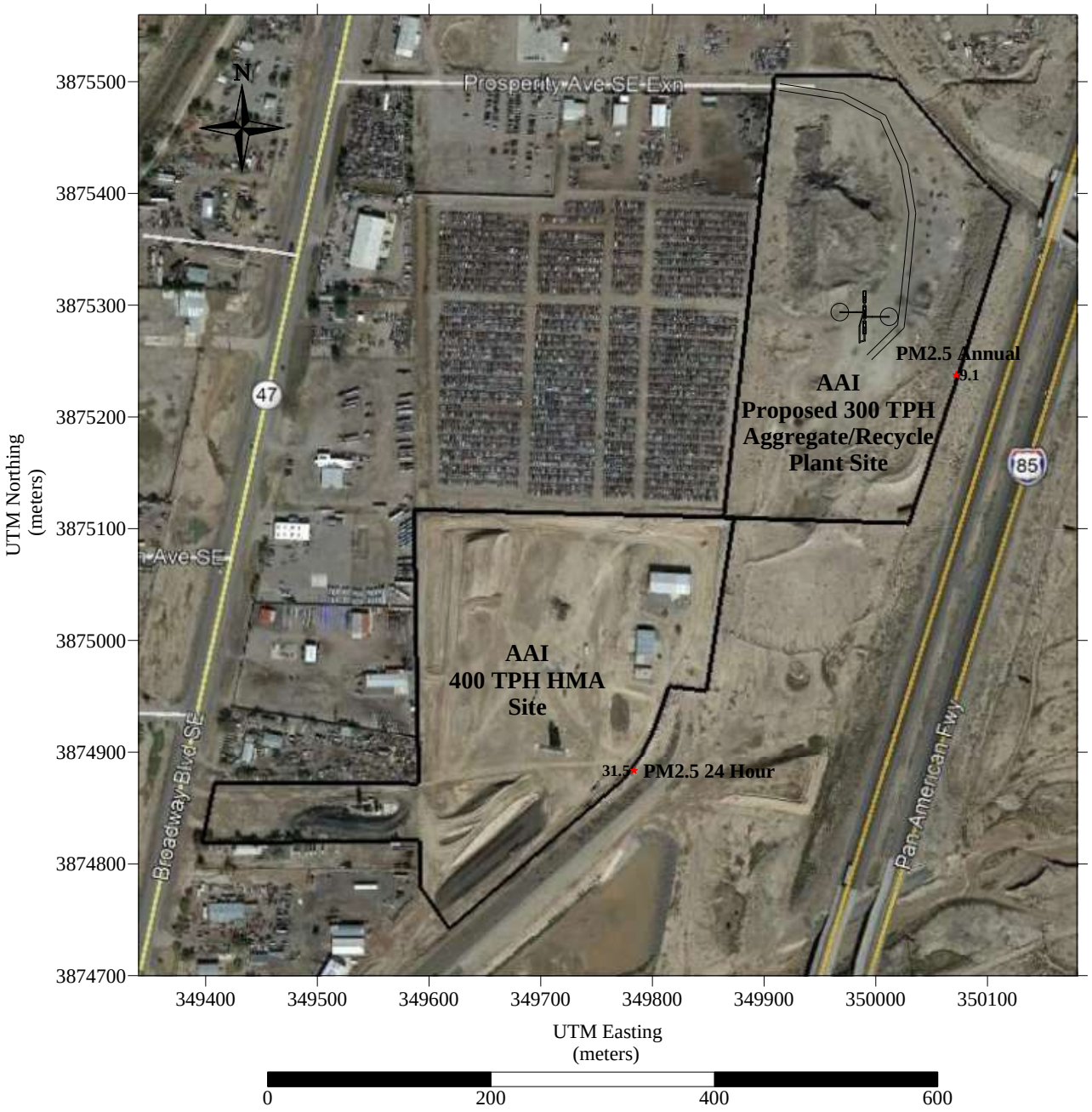

Figure 4: Aerial Map Showing the Location of the $PM_{2.5}$ Highest Model Results ($\mu g/m^3$)

3.2.3 PM_{10} Cumulative Impact Analysis Modeling Results

CIA PM_{10} modeling was performed with terrain and meteorology which included 5 years of data, 2001 – 2005 Albuquerque Meteorological data, obtained from the AEHD AQP. Modeling was performed for 24-hour averaging period with maximum PM_{10} hourly emission rate for AAI aggregate/recycle plant sources, significant neighboring sources (AAI HMA operating under Permit #3291-M1 and D & R Tank operating under Permit #1038), and all AAI aggregate/recycle plant initial modeling receptors that were above the PM_{10} SILs. South Valley representative 24-hour PM_{10} background concentrations was added to the modeled results and compared to the lowest applicable ambient standard. The 24-hour background concentrations that were used for PM_{10} averaging period are found in Section 2.9 of this report.

Results showed that PM_{10}, where AAI aggregate/recycle plant source makes a significant contribution, is located on the western AAI HMA boundary.

Cumulative modeling results show the highest concentrations were within D & R Tank boundaries, but for those receptors and date of concentration, AAI aggregate/recycle plant were below SILs. For PM_{10} modeling scenarios 1 and 2, refined modeling reviewed receptors located within D & R Tank's boundary to identify, for these modeling scenarios, where the highest concentrations occurred when AAI aggregate/recycle plant contribution were above SILs and excluding D & R Tank's sources.

The result from PM_{10} emissions dispersion modeling, plus a representative PM_{10} background concentrations from Section 2.9 of this report, were used to show compliance with national PM_{10} 24-hour average AAQS.

Table 26 shows the PM_{10} 2nd highest 24-hour daily maximum model results and locations.

TABLE 26: PM_{10} CIA MODEL RESULTS

	Modeled Concentration ($\mu g/m^3$)	**Modeled Concentration With Background ($\mu g/m^3$)**	**Location UTMs E/N**	
24 Hour Average Highest 2nd High	74.5	100.5	349593.0	3875009.5

Figure 5 summarize the results of the modeling analysis.

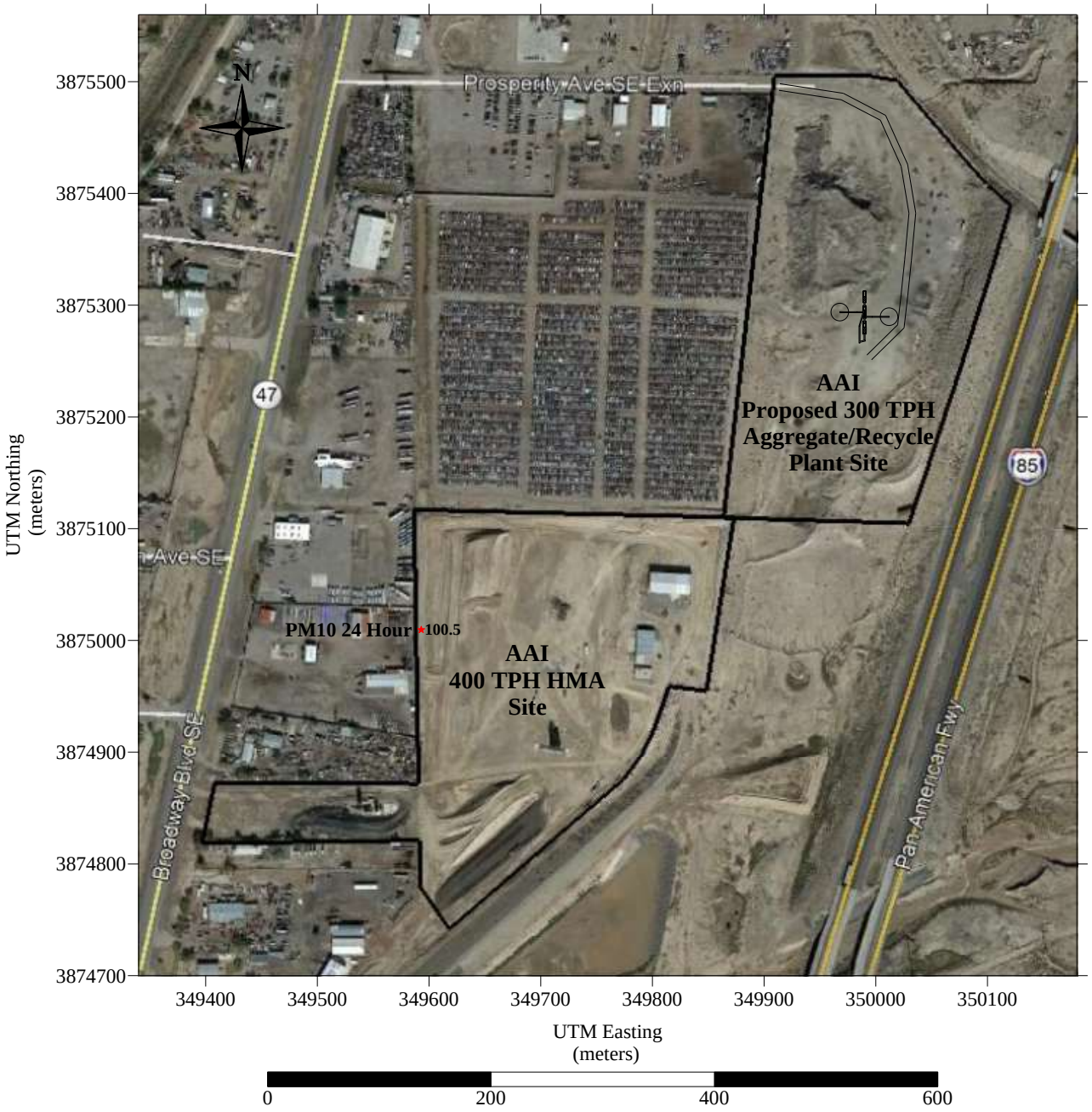

Figure 5: Aerial Map Showing the Location of the PM_{10} Highest Model Results ($\mu g/m^3$)

3.2.4 SO_2 Cumulative Impact Analysis Modeling Results

SO_2 CIA modeling was performed with terrain elevations and building downwash (AAI HMA) for AAI aggregate/recycle plant. SO_2 emission rates represented the maximum hourly rate for AAI aggregate/recycle plant point sources, significant neighboring sources (AAI HMA operating under Permit #3291-M1, Black Rock Services HMA operating under Permit #1694-M2-RV4), for all AAI aggregate/recycle plant initial modeling receptors that were above the SO_2 SILs.

Table 27 shows the SO_2 4th highest 1-hour daily maximum model results and highest concentration locations.

TABLE 27: SO_2 CIA MODEL RESULTS

	Modeled Concentration ($\mu g/m^3$)	**Modeled Concentration With Background ($\mu g/m^3$)**	**Location UTMs E/N**	
1 Hour Average Highest 4th High	72.7	85.8	349876.2	3875184.3

Dispersion modeling meteorology for this analysis included 5 years of data, 2001 – 2005 Albuquerque Meteorological data, was obtained from the COABC AQP.

Albuquerque city-wide 1-hour SO_2 background concentrations found in Section 2.9 of this report were added to the 1-hour modeled results and compared to the lowest applicable ambient standard.

Maximum 1-hour concentration, where AAI aggregate/recycle plant source makes a significant contribution, occurred along the western AAI aggregate/recycle plant restricted boundary.

Figure 6 shows an aerial map of the SO_2 4th highest 1 hour daily maximum concentration locations including background where AAI aggregate/recycle plant sources contribute above the SO_2 SILs.

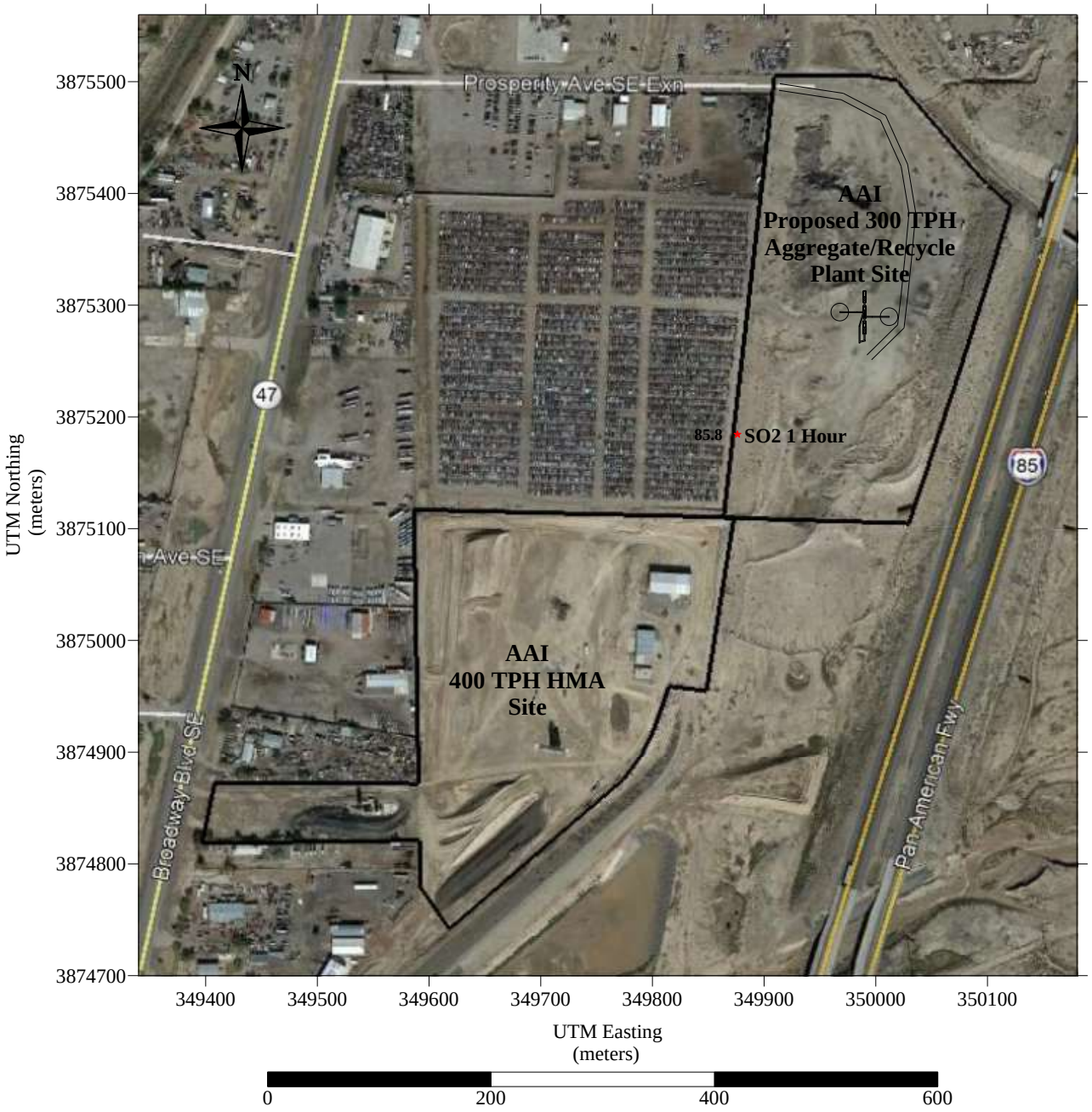

Figure 6: Aerial Map Showing the Location of the SO_2 Highest Model Results

Modeling File List

Model File Name	Description
Albuquerque Asphalt UPullIt CombustROI	AAI aggregate/recycle plant Combustion ROI modeling
Albuquerque Asphalt UPullIt PM10dROIS1-2	AAI aggregate/recycle plant PM10 ROI modeling with plume depletion, operating scenarios 1 - 2
Albuquerque Asphalt UPullIt PM25ROIS1-2	AAI aggregate/recycle plant PM2.5 ROI modeling, operating scenarios 1 - 2
Albuquerque Asphalt UPullIt NO2 CIA	AAI aggregate/recycle plant CIA NO2 24-hour and annual averaging periods
Albuquerque Asphalt UPullIt NO2 1Hour CIA	AAI aggregate/recycle plant CIA NO2 1-hour averaging period
Albuquerque Asphalt UPullIt SO2 CIA	AAI aggregate/recycle plant CIA SO2 1-hour and 24-hour averaging periods
Albuquerque Asphalt UPullIt CIA PM10dS1-2	AAI aggregate/recycle plant CIA PM10 with plume depletion 24-hour averaging period using Scenarios 1 and 2, and AAI HMA Operating Scenario 1 concurrently
Albuquerque Asphalt UPullIt CIA PM10dS1-2 Refined	AAI aggregate/recycle plant refined CIA PM10 with plume depletion 24-hour averaging period using Operating Scenarios 1 and 2, and AAI HMA Operating Scenario 1 concurrently. Model determines the highest 2nd high concentration for receptor of D & R Tank where AAI aggregate/recycle plant sources are significant near or along D & R Tank boundaries.
Albuquerque Asphalt UPullIt CIA PM25 24hrS1-2	AAI aggregate/recycle plant CIA PM2.5 24-hour averaging period using Operating Scenarios 1 and 2, and AAI HMA Operating Scenario 1 concurrently
Albuquerque Asphalt UPullIt CIA PM25 yrS1-2	AAI aggregate/recycle plant CIA PM2.5 annual averaging period using Operating Scenarios 1 and 2, and AAI HMA Operating Scenario 1 concurrently

Attachment H
Public Notice Documents

SUBJECT: Public Notice of Proposed Air Quality Construction Permit Application

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	Albuquerque Asphalt, Inc.
Site or Facility Name	300 tons/hr portable aggregate/recycle plant
Site or Facility Address	Lot east of 4560 Broadway Blvd SE, end of Prosperity Extension Ave SE, Albuquerque, NM 87105
New or Existing Source	New Source
Anticipated Date of Application Submittal	July 12, 2019
Summary of Proposed Source to Be Permitted	Aggregate/Recycle Crushing and Screening Plant whose initial project will be recycling an existing pile located in the lot east of 4560 Broadway Blvd SE, end of Prosperity Extension Ave SE. Project will take 3 to 5 months to complete, depending on weather. Crushed material will be transported to Albuquerque Asphalt's HMA plant located at 5028 Broadway Blvd SE. Requested permit equipment list will consist of a variety of options depending on the rental availability of the equipment when the project begins. Permit emissions will represent the worst-case emissions from all possible equipment options.

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:
- Dan Fisher
- Dan@alb-asphalt.com
- (505) 831-7311

For inquiries regarding the air quality permitting process, contact:
- City of Albuquerque Environmental Health Department Air Quality Program
- aqd@cabq.gov
- (505) 768-1972

Notice of Intent to Construct

Under 20.11.41.13B NMAC, the owner/operator is required 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 with-in one-half mile of the exterior boundaries of the property on which the source is or is proposed to be located* if they propose to construct or establish a new facility or make modifications to an existing facility that is subject to 20.11.41 NMAC – Construction Permits. **A copy of this form must be included with the application.**

Applicant's Name and Address: Albuquerque Asphalt, Inc., 202 94th St SW, Albuquerque, NM 87121; Mail Address: PO Box 66450, Albuquerque, NM 87193

Owner / Operator's Name and Address: Albuquerque Asphalt, Inc., 202 94th St SW, Albuquerque, NM 87121

Actual or Estimated Date the Application will be submitted to the Department: July 12, 2019

Exact Location of the Source or Proposed Source: Lot east of 4560 Broadway Blvd SE, end of Prosperity Extension Ave SE, Albuquerque, NM 87105. UTM coordinate is 349,990 Easting; 3,875,290 Nothing, NAD 83, Zone 13.

Description of the Source: 300 tons/hr portable aggregate/recycle plant which will process aggregate, recycled asphalt, and concrete. At the initial location described above, the project will last 3 to 5 months, depending on weather conditions.

Nature of the Business: 300 tons/hr portable aggregate/recycle plant which will crush and screen aggregate, recycled asphalt, and concrete.

Process or Change for which the permit is requested: Permit will include a crushing and screening aggregate/recycle plant which will process 300 tons per hour, 3,000 tons per day, and 750,000 tons per year of aggregate, recycled asphalt, and concrete.

Preliminary Estimate of the Maximum Quantities of each regulated air contaminant the source will emit:

Initial Construction Permit

	Pounds Per Hour (lbs/hr)	Tons Per Year (tpy)
CO	6.33	21.46
NOx	7.23	24.52
NOx + NMHC	***	***
VOC	0.72	2.45
SO_2	0.36	1.22
TSP	17.98	21.74
PM10	6.90	9.01
PM2.5	1.24	2.29
VHAP	***	***

Net Changes In Emissions

(Only for permit Modifications or Technical Revisions)

	lbs/hr	tpy	Estimated Total TPY
CO	+/- ***	+/- ***	***
NOx	+/- ***	+/- ***	***
NOx + NMHC	+/- ***	+/- ***	***
VOC	+/- ***	+/- ***	***
SO_2	+/- ***	+/- ***	***
TSP	+/- ***	+/- ***	***
PM10	+/- ***	+/- ***	***
PM2.5	+/- ***	+/- ***	***
VHAP	+/- ***	+/- ***	***

City of Albuquerque- Environmental Health Department
Air Quality Program- Permitting Division
Phone: (505) 768-1972 Email: aqd@cabq.gov

Maximum Operating Schedule: 24 hours per day, 7 days per week, up to 3,000 tons per day

Normal Operating Schedule: Daylight hours, 7 days per week, up to 3,000 tons per day

Current Contact Information for Comments and Inquires:

Name: Dan Fisher, Vice President of Engineering
Address: P.O. BOX 66450, Albuquerque, NM 87193
Phone Number: (505) 831-7311
E-Mail Address: Dan@alb-asphalt.com

If you have any comments about the construction or operation of the above facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to the address below:

Environmental Health Manager

Permitting Division

Albuquerque Environmental Health Department

Air Quality Program

PO Box 1293

Albuquerque, New Mexico 87103

(505) 768-1972

Other comments and questions may be submitted verbally.

Please refer to the company name and facility name, as used in this notice or send a copy of this notice along with your comments, since the Department may not have received the permit application at the time of this notice. Please include a legible mailing address with your comments. Once the Department has performed a preliminary review of the application and its air quality impacts, if required, the Department's notice will be published on the City of Albuquerque's website, https://www.cabq.gov/airquality/air-quality-permits and mailed to neighborhood associations and neighborhood coalitions near the facility location or near the facility proposed location.

Tim Keller, Mayor

Environmental Health Department

Air Quality Program

Interoffice Memorandum

Sandra K. Begay, Director

TO: PAUL WADE, SENIOR ENGINEER, MONTROSE AIR QUALITY SERVICES

FROM: REGAN EYERMAN, SENIOR ENVIRONMENTAL HEALTH SCIENTIST

SUBJECT: DETERMINATION OF NEIGHBORHOOD ASSOCIATIONS AND COALITIONS WITHIN 0.5 MILES OF STRUCTURES, INC., ALBUQUERQUE, NM 87121

DATE: June 7, 2019

DETERMINATION:

On June 7, 2019 I used the City of Albuquerque Zoning Advanced Map Viewer (http://sharepoint.cabq.gov/gis) to review which City of Albuquerque (COA) Neighborhood Associations (NAs) and Neighborhood Coalitions are located within 0.5 miles of Bernalillo County Parcel UPC 101405240231910155, U-Pull-And-Pay, LLC.

I then used the City of Albuquerque Office of Neighborhood Coordination's Monthly Master NA List dated May 2019 and the Bernalillo County Monthly Neighborhood Association May 2019 Excel file to determine the contact information for each NA and NC located within 0.5 miles of Bernalillo County Parcel UPC 101405240231910155, U-Pull-And-Pay, LLC.

Duplicates have been deleted. Contact information is as follows:

COA/BC Association or Coalition	Name	Email or Mailing Address
District 6 Coalition of NAs	Eileen Jessen	eileentjessen@gmail.com
District 6 Coalition of NAs	Gina Dennis	GinaForNM@gmail.com
Mountain View Community Action	Marla Painter	marladesk@gmail.com
Mountain View Community Action	Josie Lopez	josiemlopez@gmail.com
Mountain View NA	Nora Garcia	ngarcia49@yahoo.com
Mountain View NA	Julian Vargas	javargasconst@gmail.com
South Valley Alliance	Sara Newton Juarez	snjart@yahoo.com
South Valley Alliance	Zoe Economou	zoecon@unm.edu
South Valley Coalition of NAs	Marcia Fernandez	mbfernandez1@gmail.com
South Valley Coalition of NAs	Roberto Roibal	rroibal@comcast.net

PROPOSED AIR QUALITY CONSTRUCTION PERMIT

1. Applicant's Name: Albuquerque Asphalt, Inc. Address: MAIL ADDRESS: P.O. Box 16450, Albuquerque, NM 87193 202 94th St. SW Albuquerque, NM 87121
   Owner or Operator's Name: Albuquerque Asphalt, Inc. 202 94th St SW Albuquerque, NM 87121
   Owner or Operator's Address: 202 94th St SW Albuquerque, NM 87121
   Actual or Estimated Date the Application will be Submitted to the Department: July 12, 2019
2. Exact Location of the Source or Proposed Source: UTM Coordinate is 349,990 Easting, 3,815,280 Northing, NAD 83, Zone 13.
3. Description of the Source: Portable Aggregate/Recycle Plant which will Process Aggregate, Recycled Asphalt, and Concrete. At the initial location described above, the Project will last 3 to 6 months, Depending on weather conditions.
   Nature of the Business: Portable Aggregate/Recycle Plant which will Crush and Screen Aggregate, Recycled Asphalt and Concrete.
   Process or Change for which the permit is being requested: Permit will include a Crushing and Screening Aggregate/Recycle Plant which will process 300 Tons per Hour, 3,000 Tons per Day and 750,000 Tons per Year of Aggregate, Recycled Asphalt and Concrete.

Preliminary Estimate of the Maximum Quantities of each regulated air contaminant the source will emit:

Initial Construction Permit

	Pounds Per Hour (lbs/hr)	Tons Per Year (tpy)
CO	6.33	21.46
NOx	7.23	24.52
SO2	0.36	1.22
VOC	0.72	2.45
TSP	17.98	21.74
PM10	6.90	9.01
PM2.5	1.24	2.29
VHAP	###	###

Net Changes In Emissions
(for permit Modifications or Technical Revisions)

	Pounds Per Hour (lbs/hr)	Tons Per Year (tpy)	Estimated Total Tons Per Year
CO	+/-	+/-	
NOx	+/-	+/-	
SO2	+/-	+/-	
VOC	+/-	+/-	
TSP	+/-	+/-	
PM10	+/-	+/-	
PM2.5	+/-	+/-	
VHAP	+/-	+/-	

4. Maximum Operating Schedule: 24 Hours per Day, 7 Days per Week, up to 3,000 Tons per Day.
   Normal Operating Schedule: Daylight Hours, 7 Days per Week, up to 3,000 Tons per Day.
5. Current Contact Information for Comments and Inquires:
   Name: Dan Fisher Vice President of Engineering
   Address: P.O. Box 16450, Albuquerque, NM 87193
   Phone Number: (505) 891-7311
   E-Mail Address: Dan@abcasphalt.com

City of Albuquerque - Environmental Health Department - Air Quality Program - Stationary Source Permitting
Phone Number (505) 768-1972 E-Mail Address: aqd@cabq.gov

THIS SIGN SHALL REMAIN POSTED UNTIL THE DEPARTMENT TAKES FINAL ACTION ON THE PERMIT APPLICATION

ALBUQUERQUE ASPHALT, INC.
ALBUQUERQUE, NM 87193-6450

97400

DATE	INVOICE NO.	DESCRIPTION	INVOICE AMOUNT	DEDUCTION	BALANCE
7-09-19	07092019	U-Haul It Permit	2865.00	.00	2865.00

CHECK DATE	7-09-19	CHECK NUMBER	97400	TOTALS	2865.00	.00	2865.00

PLEASE DETACH THIS PORTION AND RETAIN FOR YOUR RECORDS.

Albuquerque Asphalt, Inc.
P.O. BOX 66450
Albuquerque, NM 87193-6450
Off. (505) 831-7311

WELLS FARGO BANK, NA
ALBUQUERQUE, NM 87103-1081

95-219
1070

97400

ay: **********Two thousand eight hundred sixty-five dollars and no cents

DATE	CHECK NO.	AMOUNT
July 9, 2019	97400	$******2,865.00

PAY TO THE ORDER OF City of Albuquerque Fund 242

ALBUQUERQUE ASPHALT, INC.

MP

[redacted]

B95896-4