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Air Quality Bureau

January 8, 2024

New Mexico Environment Department
Air Quality Bureau
Permits Section
525 Camino de los Marquez, Suite 1
Santa Fe, New Mexico 87507-3313

Subject: Permit Application for Mesa Verde Enterprises, Inc's MV 400 TPH Astec HMA Plant

NSR Permit Manager:

Attached please find two (2) hardcopies of the 20.2.72 NMAC Permit Application for Mesa Verde Enterprises, Inc's MV 400 TPH Astec HMA Plant. This letter is attached to the application copy that has the original notarized signature page (Section 22), along with an application submittal fee of $500.

Mesa Verde Enterprises, Inc (Mesa Verde) is applying for a new 20.2.72 NMAC air quality permit for a 400 ton per hour (TPH) hot mix asphalt plant to be operated within county of Dona Ana, state of New Mexico. Regulation governing this permit application is 20.2.72.200.A(1) NMAC. The asphalt plant presently operates under General Construction Permit GCP-3-9079. This permit will allow the asphalt plant to operate nighttime hours presently not allowed by the General Construction Permit 3. The New Mexico DOT is requiring increasing amount of road work be done at night for public safety.

Please let me know if you have any questions or need additional information.

Sincerely,

Paul Wade
Sr. Associate Engineer
Montrose Environmental Solutions, Inc.

Cc: Allister Gunn, Mesa Verde Enterprises, Inc

Montrose Environmental Solutions, Inc.
9100 2nd St. NW Suite 200
Albuquerque, NM 87114-1664

T: 505.830.9680 ext. 6
F: 505.830.9678
Pwade@montrose-env.com
www.montrose-env.com

Mail Application To:		For Department use only:
New Mexico Environment Department Air Quality Bureau Permits Section 525 Camino de los Marquez, Suite 1 Santa Fe, New Mexico, 87505 Phone: (505) 476-4300 Fax: (505) 476-4375 www.env.nm.gov/aqb	NEW MEXICO ENVIRONMENT DEPARTMENT	RECEIVED JAN 17 2024 Air Quality Bureau

Universal Air Quality Permit Application

Use this application for NOI, NSR, or Title V sources.

Use this application for: the initial application, modifications, technical revisions, and renewals. For technical revisions, complete Sections, 1-A, 1-B, 2-E, 3, 9 and any other sections that are relevant to the requested action; coordination with the Air Quality Bureau permit staff prior to submittal is encouraged to clarify submittal requirements and to determine if more or less than these sections of the application are needed. Use this application for streamline permits as well.

This application is submitted as (check all that apply): ☐ Request for a No Permit Required Determination (no fee)
☐ **Updating** an application currently under NMED review. Include this page and all pages that are being updated (no fee required).
Construction Status: ☐ Not Constructed ☒ Existing Permitted (or NOI) Facility ☐ Existing Non-permitted (or NOI) Facility
Minor Source: ☐ NOI 20.2.73 NMAC ☒ 20.2.72 NMAC application or revision ☐ 20.2.72.300 NMAC Streamline application
Title V Source: ☐ Title V (new) ☐ Title V renewal ☐ TV minor mod. ☐ TV significant mod. ☐ TV Acid Rain: ☐ New ☐ Renewal
PSD Major Source: ☐ PSD major source (new) ☐ Minor Modification to a PSD source ☐ a PSD major modification

Acknowledgements:

☒ I acknowledge that a pre-application meeting is available to me upon request. ☐ Title V Operating, Title IV Acid Rain, and NPR applications have no fees.

☒ $500 NSR application Filing Fee enclosed OR ☐ The full permit fee associated with 10 fee points (required w/ streamline applications).

☒ Check No.: 58283 in the amount of $500

☒ I acknowledge the required submittal format for the hard copy application is printed double sided 'head-to-toe', 2-hole punched (except the Sect. 2 landscape tables is printed 'head-to-head'), numbered tab separators. Incl. a copy of the check on a separate page.

☒ I acknowledge there is an annual fee for permits in addition to the permit review fee: www.env.nm.gov/air-quality/permit-fees-2/.

☐ This facility qualifies for the small business fee reduction per 20.2.75.11.C. NMAC. The full $500.00 filing fee is included with this application and I understand the fee reduction will be calculated in the balance due invoice. The Small Business Certification Form has been previously submitted or is included with this application. (Small Business Environmental Assistance Program Information: www.env.nm.gov/air-quality/small-biz-eap-2/.)

Citation: Please provide the **low level citation** under which this application is being submitted: **20.2.72.200.A NMAC**
(e.g. application for a new minor source would be 20.2.72.200.A NMAC, one example for a Technical Permit Revision is 20.2.72.219.B.1.b NMAC, a Title V acid rain application would be: 20.2.70.200.C NMAC)

Section 1 – Facility Information

Section 1-A: Company Information		AI # if known:	Updating Permit/NOI #:
1	Facility Name: MV 400 TPH Astec HMA Plant	Plant primary SIC Code (4 digits): 2951	
		Plant NAIC code (6 digits): 324121	
a	Facility Street Address (If no facility street address, provide directions from a prominent landmark): Site Location is 2.5 miles northeast from Organ, NM at UTM coordinates 351,720E; 3,591,850N; Zone 13; NAD 83		
2	Plant Operator Company Name: Mesa Verde Enterprises, Inc	Phone/Fax: 575-437-2995/575-437-8358	
a	Plant Operator Address: 396 La Luz Gate Rd. Alamogordo, NM 88310		

b	Plant Operator's New Mexico Corporate ID or Tax ID: 85-0123702	
3	Plant Owner(s) name(s): Mesa Verde Enterprises, Inc	Phone/Fax: 575-437-2995/575-437-8358
a	Plant Owner(s) Mailing Address(s): PO Box 907, Alamogordo, NM 88311	
4	Bill To (Company): Mesa Verde Enterprises, Inc	Phone/Fax: 575-437-2995/575-437-8358
a	Mailing Address: PO Box 907, Alamogordo, NM 88311	E-mail: allisterg@aggtecllc.com
5	☐ Preparer: ☒ Consultant: Paul Wade, Montrose Environmental Solutions, Inc.	Phone/Fax: 505-830-9680 x6/505-830-9678
a	Mailing Address: 9100 2nd St NW, Albuquerque, NM 87114-1664	E-mail: pwade@montrose-env.com
6	Plant Operator Contact: Allister Gunn	Phone/Fax: 575-437-2995/575-437-8358
a	Address: PO Box 907, Alamogordo, NM 88311	E-mail: allisterg@aggtecllc.com
7	Air Permit Contact: Allister Gunn	Title: Compliance/Safety/DOT Admin
a	E-mail: allisterg@aggtecllc.com	Phone/Fax: 575-437-2995/
b	Mailing Address: PO Box 907, Alamogordo, NM 88311	
c	The designated Air permit Contact will receive all official correspondence (i.e. letters, permits) from the Air Quality Bureau.	

Section 1-B: Current Facility Status

1.a	Has this facility already been constructed? ☒ Yes ☐ No	1.b If yes to question 1.a, is it currently operating in New Mexico? ☒ Yes ☐ No
2	If yes to question 1.a, was the existing facility subject to a Notice of Intent (NOI) (20.2.73 NMAC) before submittal of this application? ☐ Yes ☒ No	If yes to question 1.a, was the existing facility subject to a construction permit (20.2.72 NMAC) before submittal of this application? ☒ Yes ☐ No
3	Is the facility currently shut down? ☐ Yes ☒ No	If yes, give month and year of shut down (MM/YY):
4	Was this facility constructed before 8/31/1972 and continuously operated since 1972? ☐ Yes ☒ No	
5	If Yes to question 3, has this facility been modified (see 20.2.72.7.P NMAC) or the capacity increased since 8/31/1972? ☐ Yes ☐ No ☒ N/A	
6	Does this facility have a Title V operating permit (20.2.70 NMAC)? ☐ Yes ☒ No	If yes, the permit No. is: P-
7	Has this facility been issued a No Permit Required (NPR)? ☐ Yes ☒ No	If yes, the NPR No. is:
8	Has this facility been issued a Notice of Intent (NOI)? ☐ Yes ☒ No	If yes, the NOI No. is:
9	Does this facility have a construction permit (20.2.72/20.2.74 NMAC)? ☐ Yes ☒ No	If yes, the permit No. is:
10	Is this facility registered under a General permit (GCP-1, GCP-2, etc.)? ☒ Yes ☐ No	If yes, the register No. is: GCP-3-9079

Section 1-C: Facility Input Capacity & Production Rate

1	What is the facility's maximum input capacity, specify units (reference here and list capacities in Section 20, if more room is required)			
a	Current	Hourly:	Daily:	Annually:
b	Proposed	Hourly: 400	Daily: 4000	Annually: 900,000
2	What is the facility's maximum production rate, specify units (reference here and list capacities in Section 20, if more room is required)			
a	Current	Hourly:	Daily:	Annually:
b	Proposed	Hourly: 400	Daily: 4000	Annually: 900,000

Section 1-D: Facility Location Information

1	Latitude (decimal degrees): 32.45377	Longitude (decimal degrees): -106.57779	County: Dona Ana	Elevation (ft): 5380
2	UTM Zone: ☐ 12 or ☒ 13	Datum: ☒ NAD 83 ☐ WGS 84		
a	UTM E (in meters, to nearest 10 meters): 351.70	UTM N (in meters, to nearest 10 meters): 3,591.83		
3	Name and zip code of nearest New Mexico town: Organ, 88052			
4	Detailed Driving Instructions from nearest NM town (attach a road map if necessary): From Organ, New Mexico head north from the intersection of Highway 70 and County Road D087 for 1.4 miles. County Road D087 turn into Badger Road that leads to the entrance of White Sands Missile Range at 0.28 miles. Within the White Sands Missile Range travel 0.73 miles to the site.			
5	The facility is 2.5 miles northeast of Organ, NM.			
6	Land Status of facility (check one): ☐ Private ☐ Indian/Pueblo ☐ Government ☐ BLM ☐ Forest Service ☒ Military			
7	List all municipalities, Indian tribes, and counties within a ten (10) mile radius (20.2.72.203.B.2 NMAC) of the property on which the facility is proposed to be constructed or operated: Dona Ana County			
8	**20.2.72** NMAC applications **only**: Will the property on which the facility is proposed to be constructed or operated be closer than 50 km (31 miles) to other states, Bernalillo County, or a Class I area (see www.env.nm.gov/air-quality/modeling-publications/)? ☐ Yes ☒ No (20.2.72.206.A.7 NMAC) If yes, list all with corresponding distances in kilometers:			
9	Name nearest Class I area: White Mountain Wilderness Area			
10	Shortest distance (in km) from facility boundary to the boundary of the nearest Class I area (to the nearest 10 meters): 122.8			
11	Distance (meters) from the perimeter of the Area of Operations (AO is defined as the plant site inclusive of all disturbed lands, including mining overburden removal areas) to nearest residence, school or occupied structure: 0.73 miles			
12	Method(s) used to delineate the Restricted Area: Land is in the White Sands Missile Range. Permanent fencing encompasses the White Sands Missile Range and access is restricted through a locked gate. "**Restricted Area**" is an area to which public entry is effectively precluded. Effective barriers include continuous fencing, continuous walls, or other continuous barriers approved by the Department, such as rugged physical terrain with steep grade that would require special equipment to traverse. If a large property is completely enclosed by fencing, a restricted area within the property may be identified with signage only. Public roads cannot be part of a Restricted Area.			
13	Does the owner/operator intend to operate this source as a portable stationary source as defined in 20.2.72.7.X NMAC? ☒ Yes ☐ No A portable stationary source is not a mobile source, such as an automobile, but a source that can be installed permanently at one location or that can be re-installed at various locations, such as a hot mix asphalt plant that is moved to different job sites.			
14	Will this facility operate in conjunction with other air regulated parties on the same property? ☐ No ☒ Yes If yes, what is the name and permit number (if known) of the other facility? GCP-2-3269			

Section 1-E: Proposed Operating Schedule (The 1-E.1 & 1-E.2 operating schedules may become conditions in the permit.)

1	Facility **maximum** operating ($\frac{hours}{day}$): 24	($\frac{days}{week}$): 7	($\frac{weeks}{year}$): 43.3	($\frac{hours}{year}$): 7272	
2	Facility's maximum daily operating schedule (if less than 24 $\frac{hours}{day}$)? Start:	☐AM ☐PM	End:	☐AM ☐PM	
3	Month and year of anticipated start of construction: Existing Permitted Facility				
4	Month and year of anticipated construction completion: Existing Permitted Facility				
5	Month and year of anticipated startup of new or modified facility: Upon issuance of new NSR permit				
6	Will this facility operate at this site for more than one year? ☒ Yes ☐ No				

Section 1-F: Other Facility Information

1	Are there any current Notice of Violations (NOV), compliance orders, or any other compliance or enforcement issues related to this facility? ☐ Yes ☒ No If yes, specify:

a	If yes, NOV date or description of issue:		NOV Tracking No:
b	Is this application in response to any issue listed in 1-F, 1 or 1a above? ☐ Yes ☒ No If Yes, provide the 1c & 1d info below:		
c	Document Title:	Date:	Requirement # (or page # and paragraph #):
d	Provide the required text to be inserted in this permit:		
2	Is air quality dispersion modeling or modeling waiver being submitted with this application? ☒ Yes ☐ No		
3	Does this facility require an "Air Toxics" permit under 20.2.72.400 NMAC & 20.2.72.502, Tables A and/or B? ☒ Yes ☐ No		
4	Will this facility be a source of federal Hazardous Air Pollutants (HAP)? ☒ Yes ☐ No		
a	If Yes, what type of source? ☐ **Major** (☐ $\geq$10 tpy of any single HAP **OR** ☐ $\geq$25 tpy of any combination of HAPS) **OR** ☒ **Minor** (☒ <10 tpy of any single HAP **AND** ☒ <25 tpy of any combination of HAPS)		
5	Is any unit exempt under 20.2.72.202.B.3 NMAC? ☐ Yes ☒ No		
a	If yes, include the name of company providing commercial electric power to the facility: ___________________________ Commercial power is purchased from a commercial utility company, which specifically does not include power generated on site for the sole purpose of the user.		

Section 1-G: Streamline Application (This section applies to 20.2.72.300 NMAC Streamline applications only)

1	☐ I have filled out Section 18, "Addendum for Streamline Applications."	☒ N/A (This is not a Streamline application.)

Section 1-H: Current Title V Information - Required for all applications from TV Sources

(Title V-source required information for all applications submitted pursuant to 20.2.72 NMAC (Minor Construction Permits), or 20.2.74/20.2.79 NMAC (Major PSD/NNSR applications), and/or 20.2.70 NMAC (Title V))

1	Responsible Official (R.O.) (20.2.70.300.D.2 NMAC):	Phone:
a	R.O. Title:	R.O. e-mail:
b	R. O. Address:	
2	Alternate Responsible Official (20.2.70.300.D.2 NMAC):	Phone:
a	A. R.O. Title:	A. R.O. e-mail:
b	A. R. O. Address:	
3	Company's Corporate or Partnership Relationship to any other Air Quality Permittee (List the names of any companies that have operating (20.2.70 NMAC) permits and with whom the applicant for this permit has a corporate or partnership relationship):	
4	Name of Parent Company ("Parent Company" means the primary name of the organization that owns the company to be permitted wholly or in part.):	
a	Address of Parent Company:	
5	Names of Subsidiary Companies ("Subsidiary Companies" means organizations, branches, divisions or subsidiaries, which are owned, wholly or in part, by the company to be permitted.):	
6	Telephone numbers & names of the owners' agents and site contacts familiar with plant operations:	
7	Affected Programs to include Other States, local air pollution control programs (i.e. Bernalillo) and Indian tribes: Will the property on which the facility is proposed to be constructed or operated be closer than 80 km (50 miles) from other states, local pollution control programs, and Indian tribes and pueblos (20.2.70.402.A.2 and 20.2.70.7.B)? If yes, state which ones and provide the distances in kilometers:	

Section 1-I – Submittal Requirements

Each 20.2.73 NMAC (**NOI**), a 20.2.70 NMAC (**Title V**), a 20.2.72 NMAC (**NSR** minor source), or 20.2.74 NMAC (**PSD**) application package shall consist of the following:

Hard Copy Submittal Requirements:

1) One hard copy **original signed and notarized application package printed double sided 'head-to-toe' 2-hole punched** as we bind the document on top, not on the side; except Section 2 (landscape tables), which should be head-to-head. Please use **numbered tab separators** in the hard copy submittal(s) as this facilitates the review process. For NOI submittals only, hard copies of UA1, Tables 2A, 2D & 2F, Section 3 and the signed Certification Page are required. Please include a copy of the check on a separate page.
2) If the application is for a minor NSR, PSD, NNSR, or Title V application, include one working hard **copy** for Department use. This copy should be printed in book form, 3-hole punched, and **must be double sided**. Note that this is in addition to the head-to-to 2-hole punched copy required in 1) above. Minor NSR Technical Permit revisions (20.2.72.219.B NMAC) only need to fill out Sections 1-A, 1-B, 3, and should fill out those portions of other Section(s) relevant to the technical permit revision. TV Minor Modifications need only fill out Sections 1-A, 1-B, 1-H, 3, and those portions of other Section(s) relevant to the minor modification. NMED may require additional portions of the application to be submitted, as needed.
3) The entire NOI or Permit application package, including the full modeling study, should be submitted electronically. Electronic files for applications for NOIs, any type of General Construction Permit (GCP), or technical revisions to NSRs must be submitted with compact disk (CD) or digital versatile disc (DVD). For these permit application submittals, **two** CD copies are required (in sleeves, not crystal cases, please), with additional CD copies as specified below. NOI applications require only a single CD submittal. Electronic files for other New Source Review (construction) permits/permit modifications or Title V permits/permit modifications can be submitted on CD/DVD or sent through AQB's secure file transfer service.

Electronic files sent by (check one):

☐ CD/DVD attached to paper application

☒ Secure electronic transfer. Air Permit Contact Name Paul Wade, Email pwade@montrose-env.com Phone number (505) 830-9680 x6.

a. If the file transfer service is chosen by the applicant, after receipt of the application, the Bureau will email the applicant with instructions for submitting the electronic files through a secure file transfer service. Submission of the electronic files through the file transfer service needs to be completed within 3 business days after the invitation is received, so the applicant should ensure that the files are ready when sending the hard copy of the application. The applicant will not need a password to complete the transfer. **Do not use the file transfer service for NOIs, any type of GCP, or technical revisions to NSR permits.**

4) Optionally, the applicant may submit the files with the application on compact disk (CD) or digital versatile disc (DVD) following the instructions above and the instructions in 5 for applications subject to PSD review.
5) If **air dispersion modeling** is required by the application type, include the **NMED Modeling Waiver** and/or electronic air dispersion modeling report, input, and output files. The dispersion modeling ***summary report only*** should be submitted as hard copy(ies) unless otherwise indicated by the Bureau.
6) If the applicant submits the electronic files on CD and the application is subject to PSD review under 20.2.74 NMAC (PSD) or NNSR under 20.2.79 NMC include,
   a. one additional CD copy for US EPA,
   b. one additional CD copy for each federal land manager affected (NPS, USFS, FWS, USDI) and,
   c. one additional CD copy for each affected regulatory agency other than the Air Quality Bureau.

   If the application is submitted electronically through the secure file transfer service, these extra CDs do not need to be submitted.

Electronic Submittal Requirements [in addition to the required hard copy(ies)]:

1) All required electronic documents shall be submitted as 2 separate CDs or submitted through the AQB secure file transfer service. Submit a single PDF document of the entire application as submitted and the individual documents comprising the application.

2) The documents should also be submitted in Microsoft Office compatible file format (Word, Excel, etc.) allowing us to access the text and formulas in the documents (copy & paste). Any documents that cannot be submitted in a Microsoft Office compatible format shall be saved as a PDF file from within the electronic document that created the file. If you are unable to provide Microsoft office compatible electronic files or internally generated PDF files of files (items that were not created electronically: i.e. brochures, maps, graphics, etc,), submit these items in hard copy format. We must be able to review the formulas and inputs that calculated the emissions.

3) It is preferred that this application form be submitted as 4 electronic files (3 MSWord docs: Universal Application section 1 [UA1], Universal Application section 3-19 [UA3], and Universal Application 4, the modeling report [UA4]) and 1 Excel file of the tables (Universal Application section 2 [UA2]). Please include as many of the 3-19 Sections as practical in a single MS Word electronic document. Create separate electronic file(s) if a single file becomes too large or if portions must be saved in a file format other than MS Word.

4) The electronic file names shall be a maximum of 25 characters long (including spaces, if any). The format of the electronic Universal Application shall be in the format: "A-3423-FacilityName". The "A" distinguishes the file as an application submittal, as opposed to other documents the Department itself puts into the database. Thus, all electronic application submittals should begin with "A-". Modifications to existing facilities should use the core permit number (i.e. '3423') the Department assigned to the facility as the next 4 digits. Use 'XXXX' for new facility applications. The format of any separate electronic submittals (additional submittals such as non-Word attachments, re-submittals, application updates) and Section document shall be in the format: "A-3423-9-description", where "9" stands for the section # (in this case Section 9-Public Notice). Please refrain, as much as possible, from submitting any scanned documents as this file format is extremely large, which uses up too much storage capacity in our database. Please take the time to fill out the header information throughout all submittals as this will identify any loose pages, including the Application Date (date submitted) & Revision number (0 for original, 1, 2, etc.; which will help keep track of subsequent partial update(s) to the original submittal. Do not use special symbols (#, @, etc.) in file names. The footer information should not be modified by the applicant.

Table of Contents

Table 2-A: Regulated Emission Sources

Unit and stack numbering must correspond throughout the application package. If applying for a NOI under 20.2.73 NMAC, equipment exemptions under 2.72.202 NMAC do not apply.

Unit Number[1]	Source Description	Make	Model #	Serial #	Manufact-urer's Rated Capacity[3] (Specify Units)	Requested Permitted Capacity[3] (Specify Units)	Date of Manufacture[2] Date of Construction/ Reconstruction[2]	Controlled by Unit # Emissions vented to Stack #	Source Classi-fication Code (SCC)	For Each Piece of Equipment, Check One	RICE Ignition Type (CI, SI, 4SLB, 4SRB, 2SLB)[4]	Replacing Unit No.
AGGPILE	Cold Aggregate/RAP Storage Pile	NA	NA	NA	NA	370 TPH	NA 2024	NA NA	30500203	☐ Existing (unchanged) ☑ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced		
1	Feed Bin Loading 5-Bins	Astec	20-368	PCF-1014-5	400 TPH	370 TPH	Jan-21 2024	NA NA	30500216	☐ Existing (unchanged) ☑ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced		
2	Feed Bin Unloading (Conveyor)	Astec	20-368	PSS-412-60	400 TPH	370 TPH	Jan-21 2024	C1 NA	30500217	☐ Existing (unchanged) ☑ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced		
3	Scalping Screen	Astec	20-368	PSS-412-60	400 TPH	370 TPH	Jan-21 2024	C2 NA	30500204	☐ Existing (unchanged) ☑ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced		
4	Scalping Screen Unloading (Conveyor)	Astec	20-368	PSS-412-60	400 TPH	370 TPH	Jan-21 2024	C1 NA	30500217	☐ Existing (unchanged) ☑ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced		
5	Pug Mill Load	Astec	20-368	PLM-T400-60	400 TPH	376 TPH	Jan-21 2024	C1 NA	30500204	☐ Existing (unchanged) ☑ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced		
6	Pug Mill Unload (Conveyor)	Astec	20-368	PLM-T400-60	400 TPH	376 TPH	Jan-21 2024	C1 NA	30500217	☐ Existing (unchanged) ☑ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced		
7	Conveyor Transfer to Slinger Conveyor	Astec	20-368	PLM-T400-60	400 TPH	376 TPH	Jan-21 2024	C1 NA	30500217	☐ Existing (unchanged) ☑ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced		
8	RAP Bin Loading	Astec	20-368	PRB-814-50	180 TPH	180 TPH	Jan-21 2024	NA NA	30500216	☐ Existing (unchanged) ☑ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced		
9	RAP Bin Unloading (Conveyor)	Astec	20-368	PRB-814-50	180 TPH	180 TPH	Jan-21 2024	NA NA	30500217	☐ Existing (unchanged) ☑ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced		
10	RAP Screen	Astec	20-368	PRB-814-50	180 TPH	180 TPH	Jan-21 2024	NA NA	30500204	☐ Existing (unchanged) ☑ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced		
11	RAP Screen Unloading (Conveyor)	Astec	20-368	PRB-814-50	180 TPH	180 TPH	Jan-21 2024	NA NA	30500217	☐ Existing (unchanged) ☑ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced		
12	RAP Transfer Conveyor	Astec	20-368	PRB-814-50	180 TPH	180 TPH	Jan-21 2024	NA NA	30500217	☐ Existing (unchanged) ☑ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced		
13	Mineral Filler Silo Loading	Astec	20-368	DA-650	700 Barrel	6 TPH	Jan-21 2024	C4 1	30500213	☐ Existing (unchanged) ☑ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced		
14	Drum Dryer	Astec	20-368	D-PUCF-10250	400 TPH	400 TPH	Jan-21 2024	C5 2	30500201	☐ Existing (unchanged) ☑ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced		

Unit Number[1]	Source Description	Make	Model #	Serial #	Manufact-urer's Rated Capacity[3] (Specify Units)	Requested Permitted Capacity[3] (Specify Units)	Date of Manufacture[2] Date of Construction/ Reconstruction[2]	Controlled by Unit # Emissions vented to Stack #	Source Classi-fication Code (SCC)	For Each Piece of Equipment, Check One	RICE Ignition Type (CI, SI, 4SLB, 4SRB, 2SLB)[4]	Replacing Unit No.
15	Drum Mixer Unloading (Incline Conveyor)	Astec	20-368	SEB-10030	400 TPH	400 TPH	Jan-21 2024	NA NA	30500221	☐ Existing (unchanged) ☑ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced		
16	Asphalt Silo Unloading	Astec	20-368	SEB-10030	400 TPH	400 TPH	Jan-21 2024	NA NA	30500213	☐ Existing (unchanged) ☑ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced		
17	HMA Main Plant Generator	CAT	C32	JDB00173	1000 kW 1430 HP	1000 kW 1430 HP	2006 2024	NA 3	30500299	☐ Existing (unchanged) ☑ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced	CI	
18	HMA Standby Generator	Doosan	G125WCU-T4F	TBD	100 kW 114 HP	100 kW 114 HP	2014 2024	NA 4	30500299	☐ Existing (unchanged) ☑ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced	CI	
19	Asphalt Heater	Heatec	HC-120	HT-30DPAS	1.2 MM Btu	1.2 MM Btu	Jan-21 2024	NA 5	30500208	☐ Existing (unchanged) ☑ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced		
20	Asphalt Cement Storage Tanks (2)	Astec	20-368	HT-30DPAS	30,000 Gallons Each	30,000 Gallons Each	Jan-21 2024	NA NA	30500212	☐ Existing (unchanged) ☑ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced		
TRCK	Haul Road Traffic	NA	NA	NA	NA	278 Truck/Day	NA 2024	C3 NA	30602011	☐ Existing (unchanged) ☑ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced		
YARD	HMA Yard	NA	NA	NA	400 TPH	400 TPH	NA 2024	NA NA	30502014	☐ Existing (unchanged) ☑ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced		

[1] Unit numbers must correspond to unit numbers in the previous permit unless a complete cross reference table of all units in both permits is provided.

[2] Specify dates required to determine regulatory applicability.

[3] To properly account for power conversion efficiencies, generator set rated capacity shall be reported as the rated capacity of the engine in horsepower, not the kilowatt capacity of the generator set.

[4] "4SLB" means four stroke lean burn engine, "4SRB" means four stroke rich burn engine, "2SLB" means two stroke lean burn engine, "CI" means compression ignition, and "SI" means spark ignition

Table 2-B: Insignificant Activities[1] (20.2.70 NMAC) OR Exempted Equipment (20.2.72 NMAC)

All 20.2.70 NMAC (Title V) applications must list all Insignificant Activities in this table. All 20.2.72 NMAC applications must list Exempted Equipment in this table. If equipment listed on this table is exempt under 20.2.72.202.B.5, include emissions calculations and emissions totals for 202.B.5 "similar functions" units, operations, and activities in Section 6, Calculations. Equipment and activities exempted under 20.2.72.202 NMAC may not necessarily be Insignificant under 20.2.70 NMAC (and vice versa). Unit & stack numbering must be consistent throughout the application package. Per Exemptions Policy 02-012.00 (see http://www.env.nm.gov/aqb/permit/aqb_pol.html), 20.2.72.202.B NMAC Exemptions do not apply, but 20.2.72.202.A NMAC exemptions do apply to NOI facilities under 20.2.73 NMAC. List 20.2.72.301.D.4 NMAC Auxiliary Equipment for Streamline applications in Table 2-A. The List of Insignificant Activities (for TV) can be found online at https://www.env.nm.gov/wp-content/uploads/sites/2/2017/10/InsignificantListTitleV.pdf. TV sources may elect to enter both TV Insignificant Activities and Part 72 Exemptions on this form.

Unit Number	Source Description	Manufacturer	Model No. Serial No.	Max Capacity Capacity Units	List Specific 20.2.72.202 NMAC Exemption (e.g. 20.2.72.202.B.5) Insignificant Activity citation (e.g. IA List Item #1.a)	Date of Manufacture /Reconstruction[2] Date of Installation /Construction[2]	For Each Piece of Equipment, Check Onc
T3	Burner Fuel Tank	NA	NA NA	20,000 Gallons 20,000 Gallons	20.2.72.202.B.2.a NA	Jan-21 2024	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
T5	Diesel Fuel Tank	NA	NA NA	10,000 Gallons 10,000 Gallons	20.2.72.202.B.2.a NA	Jan-21 2024	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
T6	Evotherm Storage Tank	NA	NA NA	5,000 Gallons 5,000 Gallons	NA 1.a	2024 2024	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
T7	Water Storage Tank	NA	NA NA	5,000 Gallons 5,000 Gallons	NA 1.a	Jan-21 2024	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced

[1] Insignificant activities exempted due to size or production rate are defined in 20.2.70.300.D.6, 20.2.70.7.Q NMAC, and the NMED/AQB List of Insignificant Activities, dated September 15, 2008. Emissions from these insignificant activities do not need to be reported, unless specifically requested.

[2] Specify date(s) required to determine regulatory applicability.

Table 2-C: Emissions Control Equipment

Unit and stack numbering must correspond throughout the application package. Only list control equipment for TAPs if the TAP's maximum uncontrolled emissions rate is over its respective threshold as listed in 20.2.72 NMAC, Subpart V, Tables A and B. In accordance with 20.2.72.203.A(3) and (8) NMAC, 20.2.70.300.D(5)(b) and (e) NMAC, and 20.2.73.200.B(7) NMAC, the permittee shall report all control devices and list each pollutant controlled by the control device regardless if the applicant takes credit for the reduction in emissions.

Control Equipment Unit No.	Control Equipment Description	Date Installed	Controlled Pollutant(s)	Controlling Emissions for Unit Number(s)[1]	Efficiency (% Control by Weight)	Method used to Estimate Efficiency
C1	Conveyor Transfer Points - Wet Dust Suppression System	2024	Particulate	2, 4, 5, 6, 7	PM - 95.33%	AP-42 11.19.2 Emission Factors
C2	Screen - Wet Dust Suppression System	2024	Particulate	3	PM - 91.20%	AP-42 11.19.2 Emission Factors
C3	Unpaved Roads - Base Course and Water	2024	Particulate	TRCK	80%	NMED Policy
C4	Silo Baghouse	Jan-21	Particulate	13	99%	Low End of Filter Control Efficiency
C5	Drum Mixer Baghouse	Jan-21	Particulate	14	99.88%	AP-42 11.1 Emission Factors

[1] List each control device on a separate line. For each control device, list all emission units controlled by the control device.

Table 2-D: Maximum Emissions (under normal operating conditions)

☐ **This Table was intentionally left blank because it would be identical to Table 2-E.**

Maximum Emissions are the emissions at maximum capacity and prior to (in the absence of) pollution control, emission-reducing process equipment, or any other emission reduction. Calculate the hourly emissions using the worst case hourly emissions for each pollutant. For each pollutant, calculate the annual emissions as if the facility were operating at maximum plant capacity without pollution controls for 8760 hours per year, unless otherwise approved by the Department. List Hazardous Air Pollutants (HAP) & Toxic Air Pollutants (TAPs) in Table 2-I. Unit & stack numbering must be consistent throughout the application package. Fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected. Numbers shall be expressed to at least 2 decimal points (e.g. 0.41, 1.41, or 1.41E-4).

Unit No.	NOx		CO		VOC		SOx		PM[1]		PM10[1]		PM2.5[1]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
AGGPILE									1.36	3.50	0.64	1.65	0.10	0.25				
1									1.25	3.22	0.59	1.52	0.090	0.23				
2									0.57	2.50	0.21	0.92	0.032	0.14				
3									4.75	20.81	1.65	7.24	0.25	1.10				
4									0.57	2.50	0.21	0.92	0.032	0.14				
5									0.59	2.58	0.22	0.94	0.033	0.15				
6									0.59	2.58	0.22	0.94	0.033	0.15				
7									0.59	2.58	0.22	0.94	0.033	0.15				
8									0.11	0.27	0.051	0.13	0.008	0.020				
9									0.16	0.71	0.059	0.26	0.0092	0.040				
10									1.35	5.91	0.47	2.06	0.071	0.31				
11									0.16	0.71	0.059	0.26	0.0092	0.040				
12									0.16	0.71	0.059	0.26	0.0092	0.040				
12a									0.16	0.71	0.059	0.26	0.0092	0.040				
13									18.3	19.2	11.8	12.4	2.33	2.44				
14	22.0	96.4	52.0	227.8	12.8	56.1	23.2	101.6	11200	49056	2600	11388	626	2742	0.021	0.091	6.0E-03	6.8E-03
15			0.88	3.87	9.13	39.99			0.32	1.41	0.32	1.41	0.32	1.41	5.8E-04	2.6E-03		
16			1.01	4.43	3.12	13.65			0.33	1.44	0.33	1.44	0.33	1.44	5.8E-04	2.6E-03		
17	10.4	45.3	1.94	8.5	1.01	4.42	0.52	2.29	1.00	4.38	1.00	4.38	1.00	4.38			5.7E-05	1.2E-04
18	0.10	0.44	1.26	5.50	0.048	0.21	0.0018	0.0077	0.0075	0.033	0.0075	0.033	0.0075	0.033			1.0E-05	2.1E-05
19	0.22	0.96	0.055	0.24	0.0037	0.016	0.078	0.34	0.022	0.096	0.022	0.096	0.022	0.096			1.1E-05	3.9E-05
20					0.028	0.12												
TRCK									210.9	746.6	53.8	190.3	5.38	19.03				
YARD			0.14	0.62	0.44	1.93												
Totals	**32.7**	**143**	**57.3**	**251**	**23.8**	**104**	**26.6**	**116**	**11443**	**49878**	**2672**	**11616**	**636**	**2774**	**0.022**	**0.096**	**0.0061**	**0.0070**

[1]**Condensable Particulate Matter:** Include condensable particulate matter emissions for PM10 and PM2.5 if the source is a combustion source. Do not include condensable particulate matter for PM unless PM is set equal to PM10 and PM2.5. Particulate matter (PM) is not subject to an ambient air quality standard, but PM is a regulated air pollutant under PSD (20.2.74 NMAC) and Title V (20.2.70 NMAC).

Table 2-E: Requested Allowable Emissions

Unit & stack numbering must be consistent throughout the application package. Fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected. Numbers shall be expressed to at least 2 decimal points (e.g. 0.41, 1.41, or 1.41E^{-4}).

Unit No.	NOx		CO		VOC		SOx		PM[1]		PM10[1]		PM2.5[1]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
AGGPILE									2.80	1.98	1.32	0.94	0.20	0.14				
1									1.25	0.89	0.59	0.42	0.090	0.063				
2									0.027	0.032	0.0087	0.011	0.0025	0.0030				
3									0.42	0.50	0.14	0.17	0.010	0.011				
4									0.027	0.032	0.0087	0.011	0.0025	0.0030				
5									0.027	0.033	0.0090	0.011	0.0025	0.0031				
6									0.027	0.033	0.0090	0.011	0.0025	0.0031				
7									0.027	0.033	0.0090	0.011	0.0025	0.0031				
8									0.36	0.25	0.17	0.12	0.026	0.018				
9									0.162	0.195	0.0594	0.0715	0.0092	0.0111				
10									1.35	1.63	0.47	0.57	0.0713	0.086				
11									0.162	0.195	0.0594	0.0715	0.0092	0.0111				
12									0.162	0.195	0.0594	0.0715	0.0092	0.0111				
12a									0.162	0.195	0.0594	0.0715	0.0092	0.0111				
13									0.18	0.053	0.12	0.034	0.023	0.0067				
14	22.00	26.49	52.0	62.6	12.80	15.41	23.20	27.93	13.20	15.89	9.20	11.08	9.20	11.08	0.021	0.023	6.0E-03	6.8E-03
15			0.88	1.06	9.13	10.99			0.32	0.39	0.32	0.39	0.32	0.39	5.8E-04	7.0E-04		
16			1.01	1.22	3.12	3.75			0.33	0.39	0.33	0.39	0.33	0.39	5.8E-04	7.0E-04		
17	10.35	22.67	1.94	4.2	1.01	2.21	0.52	1.14	1.00	2.19	1.00	2.19	1.00	2.19			5.7E-05	1.2E-04
18	0.10	0.22	1.26	2.75	0.048	0.10	0.0018	0.0039	0.0075	0.017	0.0075	0.017	0.0075	0.017			1.0E-05	2.1E-05
19	0.22	0.80	0.055	0.20	0.0037	0.014	0.078	0.28	0.022	0.080	0.022	0.080	0.022	0.080			1.1E-05	3.9E-05
20					0.028	0.12												
TRCK									21.09	25.65	5.38	6.54	0.54	0.65				
YARD			0.14	0.17	0.44	0.53												
Totals	**32.7**	**50.2**	**57.3**	**72.2**	**26.6**	**33.1**	**23.8**	**29.4**	**43.1**	**50.9**	**19.4**	**23.3**	**11.89**	**15.19**	**0.022**	**0.025**	**0.0061**	**0.0070**

[1] **Condensable Particulate Matter:** Include condensable particulate matter emissions for PM10 and PM2.5 if the source is a combustion source. Do not include condensable particulate matter for PM unless PM is set equal to PM10 and PM2.5.

Table 2-F: Additional Emissions during Startup, Shutdown, and Routine Maintenance (SSM)

X This table is intentionally left blank since all emissions at this facility due to routine or predictable startup, shutdown, or scehduled maintenance are no higher than those listed in Table 2-E and a malfunction emission limit is not already permitted or requested. If you are required to report GHG emissions as described in Section 6a, include any GHG emissions during Startup, Shutdown, and/or Scheduled Maintenance (SSM) in Table 2-P. Provide an explanations of SSM emissions in Section 6 and 6a.

All applications for facilities that have emissions during routine our predictable startup, shutdown or scheduled maintenance (SSM)[1], including NOI applications, must include in this table the Maximum Emissions during routine or predictable startup, shutdown and scheduled maintenance (20.2.7 NMAC, 20.2.72.203.A.3 NMAC, 20.2.73.200.D.2 NMAC). In Section 6 and 6a, provide emissions calculations for all SSM emissions reported in this table. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (https://www.env.nm.gov/aqb/permit/aqb_pol.html) for more detailed instructions. Numbers shall be expressed to at least 2 decimal points (e.g. 0.41, 1.41, or 1.41E-4).

Unit No.	NOx		CO		VOC		SOx		PM[2]		PM10[2]		PM2.5[2]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Totals																		

[1] **For instance**, if the short term steady-state Table 2-E emissions are 5 lb/hr and the SSM rate is 12 lb/hr, enter 7 lb/hr in this table. If the annual steady-state Table 2-E emissions are 21.9 TPY, and the number of scheduled SSM events result in annual emissions of 31.9 TPY, enter 10.0 TPY in the table below.

[2] **Condensable Particulate Matter:** Include condensable particulate matter emissions for PM10 and PM2.5 if the source is a combustion source. Do not include condensable particulate matter for PM unless PM is set equal to PM10 and PM2.5. Particulate matter (PM) is not subject to an ambient air quality standard, but it is a regulated air pollutant under PSD (20.2.74 NMAC) and Title V (20.2.70 NMAC).

Table 2-G: Stack Exit and Fugitive Emission Rates for Special Stacks

☑ I have elected to leave this table blank because this facility does not have any stacks/vents that split emissions from a single source or combine emissions from more than one source listed in table 2-A. Additionally, the emission rates of all stacks match the Requested allowable emission rates stated in Table 2-E.

Use this table to list stack emissions (requested allowable) from split and combined stacks. List Toxic Air Pollutants (TAPs) and Hazardous Air Pollutants (HAPs) in Table 2-I. List all fugitives that are associated with the normal, routine, and non-emergency operation of the facility. Unit and stack numbering must correspond throughout the application package. Refer to Table 2-E for instructions on use of the "-" symbol and on significant figures.

Stack No.	Serving Unit Number(s) from Table 2-A	NOx		CO		VOC		SOx		PM		PM10		PM2.5		☐ H_2S or ☐Lead	
		lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Totals:																	

Table 2-H: Stack Exit Conditions

Unit and stack numbering must correspond throughout the application package. Include the stack exit conditions for each unit that emits from a stack, including blowdown venting parameters and tank emissions. If the facility has multiple operating scenarios, complete a separate Table 2-H for each scenario and, for each, type scenario name here:

Stack Number	Serving Unit Number(s) from Table 2-A	Orientation (H-Horizontal V=Vertical)	Rain Caps (Yes or No)	Height Above Ground (ft)	Temp. (F)	Flow Rate		Moisture by Volume (%)	Velocity (ft/sec)	Inside Diameter (ft)
						(acfs)	(dscfs)			
1	13	H	No	60.0	0 K	8.33		Trace	10.6	1.00
2	14	V	No	30.0	270	1269.20	570.80	21.7	120.6	3.66
3	17	H	No	12.0	855	133.50		Trace	170	1.00
4	18	H	No	12.0	800	17.45		Trace	200	0.3300
5	19	V	Yes	9.0	200	23.56		Trace	30	1.00

Table 2-I: Stack Exit and Fugitive Emission Rates for HAPs and TAPs

In the table below, report the Potential to Emit for each HAP from each regulated emission unit listed in Table 2-A, only if the entire facility emits the HAP at a rate greater than or equal to one (1) ton per year For each such emission unit, HAPs shall be reported to the nearest 0.1 tpy. Each facility-wide Individual HAP total and the facility-wide Total HAPs shall be the sum of all HAP sources calculated to the nearest 0.1 ton per year. Per 20.2.72.403.A.1 NMAC, facilities not exempt [see 20.2.72.402.C NMAC] from TAP permitting shall report each TAP that has an uncontrolled emission rate in excess of its pounds per hour screening level specified in 20.2.72.502 NMAC. TAPs shall be reported using one more significant figure than the number of significant figures shown in the pound per hour threshold corresponding to the substance. Use the HAP nomenclature as it appears in Section 112 (b) of the 1990 CAAA and the TAP nomenclature as it listed in 20.2.72.502 NMAC. Include tank-flashing emissions estimates of HAPs in this table. For each HAP or TAP listed, fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected or the pollutant is emitted in a quantity less than the threshold amounts described above.

Stack No.	Unit No.(s)	Total HAPs		Formaldehyde ☑ HAP or ☐ TAP		Toluene ☑ HAP or ☐ TAP		Asphalt Fumes ☐ HAP or ☑ TAP		Calcium Oxide ☐ HAP or ☑ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP	
		lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
1	13									0.18	0.053								
2	14	4.19	4.72	1.24	1.40	1.16	1.31	4.80	5.78										
3	17	0.061	0.010																
4	18	0.0069	0.0012																
5	19	0.0016	0.0030																
	15							0.14	0.17										
	16							0.065	0.079										
	20							0.00036	0.0016										
	YARD							0.0066	0.0079										
Totals:		**4.26**	**4.73**	**1.24**	**1.40**	**1.16**	**1.31**	**5.01**	**6.04**	**0.18**	**0.053**								

Table 2-J: Fuel

Specify fuel characteristics and usage. Unit and stack numbering must correspond throughout the application package.

Unit No.	Fuel Type (low sulfur Diesel, ultra low sulfur diesel, Natural Gas, Coal, …)	Fuel Source: purchased commercial, pipeline quality natural gas, residue gas, raw/field natural gas, process gas (e.g. SRU tail gas) or other	Specify Units				
			Lower Heating Value	Hourly Usage	Annual Usage	% Sulfur	% Ash
14	On-Spec Burner Fuel Oil	purchased commercial	140,353	600.0 gallons	1,444,800 gallons	0.5	
17	#2 Diesel	purchased commercial	129,488	73.6 gallons	322,368 gallons	0.05	
18	#2 Diesel	purchased commercial	129,488	8.3 gallons	36,354 gallons	0.05	
19	#2 Diesel	purchased commercial	129,488	11.0 gallons	96,360 gallons	0.05	

Table 2-K: Liquid Data for Tanks Listed in Table 2-L

For each tank, list the liquid(s) to be stored in each tank. If it is expected that a tank may store a variety of hydrocarbon liquids, enter "mixed hydrocarbons" in the Composition column for that tank and enter the corresponding data of the most volatile liquid to be stored in the tank. If tank is to be used for storage of different materials, list all the materials in the "All Calculations" attachment, run the newest version of TANKS on each, and use the material with the highest emission rate to determine maximum uncontrolled and requested allowable emissions rate. The permit will specify the most volatile category of liquids that may be stored in each tank. Include appropriate tank-flashing modeling input data. Use additional sheets if necessary. Unit and stack numbering must correspond throughout the application package.

Tank No.	SCC Code	Material Name	Composition	Liquid Density (lb/gal)	Vapor Molecular Weight (lb/lb*mol)	Average Storage Conditions		Max Storage Conditions	
						Temperature (°F)	True Vapor Pressure (psia)	Temperature (°F)	True Vapor Pressure (psia)
T1	3-05-002-12	Hot Oil Asphalt Cement	Hot Oil Asphalt Cement	9.22	105	350	0.0347	350	0.0347
T2	3-05-002-12	Hot Oil Asphalt Cement	Hot Oil Asphalt Cement	9.22	105	350	0.0347	350	0.0347
T3	3-05-002-98	Burner Fuel Oil	Burner Fuel Oil	7.88	130	58.54	0.0062	65.66	0.0079
T4	3-05-002-98	Diesel Fuel	Diesel Fuel	7.05	130	58.54	0.0062	65.66	0.0079
T5	3-05-002-98	Diesel Fuel	Diesel Fuel	7.05	130	58.54	0.0062	65.66	0.0079

Table 2-L: Tank Data

Include appropriate tank-flashing modeling input data. Use an addendum to this table for unlisted data categories. Unit and stack numbering must correspond throughout the application package. Use additional sheets if necessary. See reference Table 2-L2. Note: 1.00 bbl = 10.159 M3 = 42.0 gal

Tank No.	Date Installed	Materials Stored	Seal Type (refer to Table 2-LR below)	Roof Type (refer to Table 2-LR below)	Capacity		Diameter (M)	Vapor Space (M)	Color (from Table VI-C)		Paint Condition (from Table VI-C)	Annual Throughput (gal/yr)	Turn-overs (per year)
					(bbl)	(M^3)			Roof	Shell			
T1	Jan-21	Hot Oil Asphalt Cement	NA	FX	714.29	113.55	3.66	2.42	OT (Yellow)	OT (Yellow)	Good	5,856,833	195.33
T2	Jan-21	Hot Oil Asphalt Cement	NA	FX	714.29	113.55	3.66	2.42	OT (Yellow)	OT (Yellow)	Good	5,856,833	195.33
T3	Jan-21	Burner Fuel Oil	NA	FX	238.10	37.85	2.44	1.95	OT (Yellow)	OT (Yellow)	Good	1,444,800	135.00
T4	Jan-21	Diesel Fuel	NA	FX	238.10	37.85	2.44	1.95	OT (Yellow)	OT (Yellow)	Good	543,996	54.40
T5	Jan-21	Diesel Fuel	NA	FX	238.10	37.85	2.44	1.95	OT (Yellow)	OT (Yellow)	Good	543,996	54.40

Table 2-L2: Liquid Storage Tank Data Codes Reference Table

Roof Type	Seal Type, Welded Tank Seal Type		Seal Type, Riveted Tank Seal Type		Roof, Shell Color	Paint Condition
FX: Fixed Roof	**Mechanical Shoe Seal**	**Liquid-mounted resilient seal**	**Vapor-mounted resilient seal**	**Seal Type**	**WH**: White	Good
IF: Internal Floating Roof	**A**: Primary only	**A**: Primary only	**A**: Primary only	**A**: Mechanical shoe, primary only	**AS**: Aluminum (specular)	Poor
EF: External Floating Roof	**B**: Shoe-mounted secondary	**B**: Weather shield	**B**: Weather shield	**B**: Shoe-mounted secondary	**AD**: Aluminum (diffuse)	
P: Pressure	**C**: Rim-mounted secondary	**C**: Rim-mounted secondary	**C**: Rim-mounted secondary	**C**: Rim-mounted secondary	**LG**: Light Gray	
					MG: Medium Gray	
					BL: Black	
					OT: Other (specify)	

Note: 1.00 bbl = 0.159 M^3 = 42.0 gal

Table 2-M: Materials Processed and Produced (Use additional sheets as necessary.)

Material Processed				Material Produced			
Description	**Chemical Composition**	**Phase (Gas, Liquid, or Solid)**	**Quantity (specify units)**	**Description**	**Chemical Composition**	**Phase**	**Quantity (specify units)**
Aggregate	Aggregate	Solid	190-370 TPH	Asphalt	Aggregate, RAP, Mineral Filler, Asphalt Cement	Solid	400 TPH
RAP	Recycled Asphalt Products	Solid	0-190 TPH				
Mineral Filler	Rock dust, Slag dust, Hydrated lime, Cement, Versabind, and/or Loess	Solid	6 TPH				
Asphalt Cement	Asphalt Cement	Heated Liquid	24 TPH				
Evotherm	Anti-Stripper	Liquid	0.4 TPH				

Table 2-N: CEM Equipment

Enter Continuous Emissions Measurement (CEM) Data in this table. If CEM data will be used as part of a federally enforceable permit condition, or used to satisfy the requirements of a state or federal regulation, include a copy of the CEM's manufacturer specification sheet in the Information Used to Determine Emissions attachment. Unit and stack numbering must correspond throughout the application package. Use additional sheets if necessary.

Stack No.	Pollutant(s)	Manufacturer	Model No.	Serial No.	Sample Frequency	Averaging Time	Range	Sensitivity	Accuracy
NA									

Table 2-O: Parametric Emissions Measurement Equipment

Unit and stack numbering must correspond throughout the application package. Use additional sheets if necessary.

Unit No.	Parameter/Pollutant Measured	Location of Measurement	Unit of Measure	Acceptable Range	Frequency of Maintenance	Nature of Maintenance	Method of Recording	Averaging Time
13	Differential Pressure	Baghouse inlet and outlet	inches of water	1 - 3 inches	Annual	Calibrate	Datalogger	1 min
14	Differential Pressure	Baghouse inlet and outlet	inches of water	2 - 6 inches	Annual	Calibrate	Datalogger	1 min

Table 2-P: Greenhouse Gas Emissions

Applications submitted under 20.2.70, 20.2.72, & 20.2.74 NMAC are required to complete this Table. Power plants, Title V major sources, and PSD major sources must report and calculate all GHG emissions for each unit. Applicants must report potential emission rates in short tons per year (see Section 6.a for assistance). Include GHG emissions during Startup, Shutdown, and Scheduled Maintenance in this table. For minor source facilities that are not power plants, are not Title V, or are not PSD, there are three options for reporting GHGs 1) report GHGs for each individual piece of equipment; 2) report all GHGs from a group of unit types, for example report all combustion source GHGs as a single unit and all venting GHG as a second separate unit; OR 3) check the following box.

☐ By checking this box, the applicant acknowledges the total CO2e emissions are less than 75,000 tons per year.

		CO_2 ton/yr	N_2O ton/yr	CH_4 ton/yr	SF_6 ton/yr	PFC/HFC ton/yr[2]									Total GHG Mass Basis ton/yr[4]	Total CO_2e ton/yr[5]
Unit No.	**GWPs [1]**	**1**	**298**	**25**	**22,800**	**footnote 3**										
14	mass GHG	15893													15893	
	CO_2e	15893														15893
17	mass GHG	3602													3602	
	CO_2e	3602														3602
18	mass GHG	385													385	
	CO_2e	385														385
19	mass GHG	712	0.0058	0.029											714	
	CO_2e	712	1.73	0.72												716
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															
	mass GHG															
	CO_2e															
	mass GHG															
	CO2e															
Total	mass GHG	20592	0.0058	0.029											20592	
	CO_2e	20592	1.72	0.72												20593

[1] **GWP** (Global Warming Potential): Applicants must use the most current GWPs codified in Table A-1 of 40 CFR part 98. GWPs are subject to change, therefore, applicants need to check 40 CFR 98 to confirm GWP values.

[2] For **HFCs** or **PFCs** describe the specific HFC or PFC compound and use a separate column for each individual compound.

[3] For each new compound, enter the appropriate GWP for each HFC or PFC compound from Table A-1 in 40 CFR 98.

[4] Green house gas emissions on a **mass basis** is the ton per year green house gas emission before adjustment with its GWP.

[5] **CO_2e** means Carbon Dioxide Equivalent and is calculated by multiplying the TPY mass emissions of the green house gas by its GWP.

Section 3

Application Summary

The **Application Summary** shall include a brief description of the facility and its process, the type of permit application, the applicable regulation (i.e. 20.2.72.200.A.X, or 20.2.73 NMAC) under which the application is being submitted, and any air quality permit numbers associated with this site. If this facility is to be collocated with another facility, provide details of the other facility including permit number(s). In case of a revision or modification to a facility, provide the lowest level regulatory citation (i.e. 20.2.72.219.B.1.d NMAC) under which the revision or modification is being requested. Also describe the proposed changes from the original permit, how the proposed modification will affect the facility's operations and emissions, de-bottlenecking impacts, and changes to the facility's major/minor status (both PSD & Title V).

The **Process Summary** shall include a brief description of the facility and its processes.

Startup, Shutdown, and Maintenance (SSM) routine or predictable emissions: Provide an overview of how SSM emissions are accounted for in this application. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) for more detailed instructions on SSM emissions.

Mesa Verde Enterprises, Inc. (Mesa Verde) is applying for a new 20.2.72 NMAC air quality permit for a 400 TPH hot mix asphalt plant to be operated within county of Dona Ana, state of New Mexico. Regulation governing this permit application is 20.2.72.200.A(1) NMAC. The asphalt plant presently operates under General Construction Permit GCP-3-9079. This permit will allow the asphalt plant to operate nighttime hours presently not allowed by the General Construction Permit 3. The New Mexico DOT is requiring increasing amount of road work be done at night for public safety.

Mesa Verde has retained Montrose Environmental Solutions, Inc. (Montrose) to assist with the permit application. The plant will be identified as MV 400 TPH Astec HMA Plant and will be located latitude 32.45395 decimal degree North and longitude -106.57758 decimal degree West. The approximate location of this facility is 2.5 miles northeast of Organ, NM in Dona Ana County. The site is located on the White Sands Missile Range. While facility-wide "potential" emission rates are greater than 100 tons per year for a single pollutant potentially making it a major source; with the proposed emission controls the facility emission rates will be below 100 tons per year and will be permitted as a "synthetic minor source".

HMA Plant

The 400 tph hot mix asphalt plant will include; aggregate/RAP storage piles, a 5-bin cold aggregate feeder, scalping screen, pug mill, mineral filler silo with screw conveyor and baghouse, drum dryer/mixer with baghouse, incline conveyor, asphalt silo, asphalt heater, six (6) transfer conveyors, Evotherm storage tank, and two (2) asphalt cement storage tanks. Evotherm promotes adhesion by acting as both a liquid antistrip and a warm mix asphalt (WMA). Evotherm is an easy-to-handle, pumpable liquid that contains no regulated HAPs or TAPs components. Evotherm and mineral filler will not be used in the mix concurrently. The plant will be powered by a 1000 kW (1430 hp) generator. A 114 kW (153 hp) standby (night) generator will provide electricity during periods the main generator is shutdown. Processed asphalt will be transported from the HMA plant to off-site sales. The HMA plant will limit processing rates to a maximum 400 tph, 4,000 tons per day, and 963,200 tpy. The hours of operation are presented below in Table 3-1. Daily production rates are presented below in Table 3-2.

The HMA plant will be co-located with GCP-2-3269 aggregate crushing and screening plant operated by Toro Rock Products, LLC. Toro Rock will be providing the aggregate used in the MV 400 TPH Astec HMA Plant asphalt mix.

TABLE 3-1: HMA Production Hours of Operation (MST)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12:00 AM	0	1	1	1	1	1	1	1	1	1	1	0
1:00 AM	0	1	1	1	1	1	1	1	1	1	1	0
2:00 AM	0	1	1	1	1	1	1	1	1	1	1	0
3:00 AM	0	1	1	1	1	1	1	1	1	1	1	0
4:00 AM	0	1	1	1	1	1	1	1	1	1	1	0
5:00 AM	0	1	1	1	1	1	1	1	1	1	1	0
6:00 AM	0	1	1	1	1	1	1	1	1	1	1	0
7:00 AM	0	1	1	1	1	1	1	1	1	1	1	0
8:00 AM	0	1	1	1	1	1	1	1	1	1	1	0
9:00 AM	0	1	1	1	1	1	1	1	1	1	1	0
10:00 AM	0	1	1	1	1	1	1	1	1	1	1	0
11:00 AM	0	1	1	1	1	1	1	1	1	1	1	0
12:00 PM	0	1	1	1	1	1	1	1	1	1	1	0
1:00 PM	0	1	1	1	1	1	1	1	1	1	1	0
2:00 PM	0	1	1	1	1	1	1	1	1	1	1	0
3:00 PM	0	1	1	1	1	1	1	1	1	1	1	0
4:00 PM	0	1	1	1	1	1	1	1	1	1	1	0
5:00 PM	0	1	1	1	1	1	1	1	1	1	1	0
6:00 PM	0	1	1	1	1	1	1	1	1	1	1	0
7:00 PM	0	1	1	1	1	1	1	1	1	1	1	0
8:00 PM	0	1	1	1	1	1	1	1	1	1	1	0
9:00 PM	0	1	1	1	1	1	1	1	1	1	1	0
10:00 PM	0	1	1	1	1	1	1	1	1	1	1	0
11:00 PM	0	1	1	1	1	1	1	1	1	1	1	0
Total	0	24	24	24	24	24	24	24	24	24	24	0

TABLE 3-2: HMA Daily Throughput

Month	HMA Tons Per Day
January	0
February	2000
March	2000
April	3200
May	4000
June	4000
July	4000
August	4000
September	3200
October	3200
November	2000
December	0

Nighttime operations for the HMA plant will follow the guidelines issued by the department "Air Quality Permitting Guidelines for Night Operations of Crushing and Screening Plants, Hot Mix Asphalt Plants, and Concrete Batch Plants" (Ver.08/14/06). Nighttime conditions acceptable to Mesa Verde Enterprises, Inc. include:

Construction and Operation

The permittee shall install data logger(s) capable of continuously recording differential pressure measured by magnahelic gauges or equivalent differential pressure gauges installed on the Drum Dryer/Mixer Baghouse (Unit 14, Control Unit C5).

Monitoring

The permittee shall, during nighttime loading of the Mineral Filler Silo (Unit 13, Control Unit C4), monitor the differential pressure across the Mineral Filler Silo Baghouse by the use of a differential pressure gauge to ensure it is within the manufacturers or facility determined specified operating range. One reading shall be taken during the silo loading operation.

The permittee shall, during nighttime operation of the plant continuously monitor and record the differential pressure across the Drum Dryer/Mixer Baghouse (Unit 14, Control Unit C5) by the use of a differential pressure gauge with a data recording system to ensure it is within the manufacturers or facility determined specified operating range.

The permittee shall, during nighttime operating hours, ensure fugitive dust control systems are functioning correctly for Units 2, 3, 4, 5, 6, and 7 per {CONDITION X}.

Recordkeeping

During night operation the permittee shall record, by the use of a data logger, a continuous record of the differential pressure across Drum Dryer/Mixer Baghouse (Unit 14, Control Unit C5).

During silo loading of the Mineral Filler Silo (Unit 13, Control Unit C4), the differential pressure shall be recorded once.

Routine or predictable emissions during Startup, Shutdown, and Maintenance (SSM)

No SSM emissions are predicted for this permit application. All control systems will be operational prior to the start or shutdown of asphalt production or aggregate processing. Maintenance will be performed during period with no production.

Section 4

Process Flow Sheet

A **process flow sheet** and/or block diagram indicating the individual equipment, all emission points and types of control applied to those points. The unit numbering system should be consistent throughout this application.

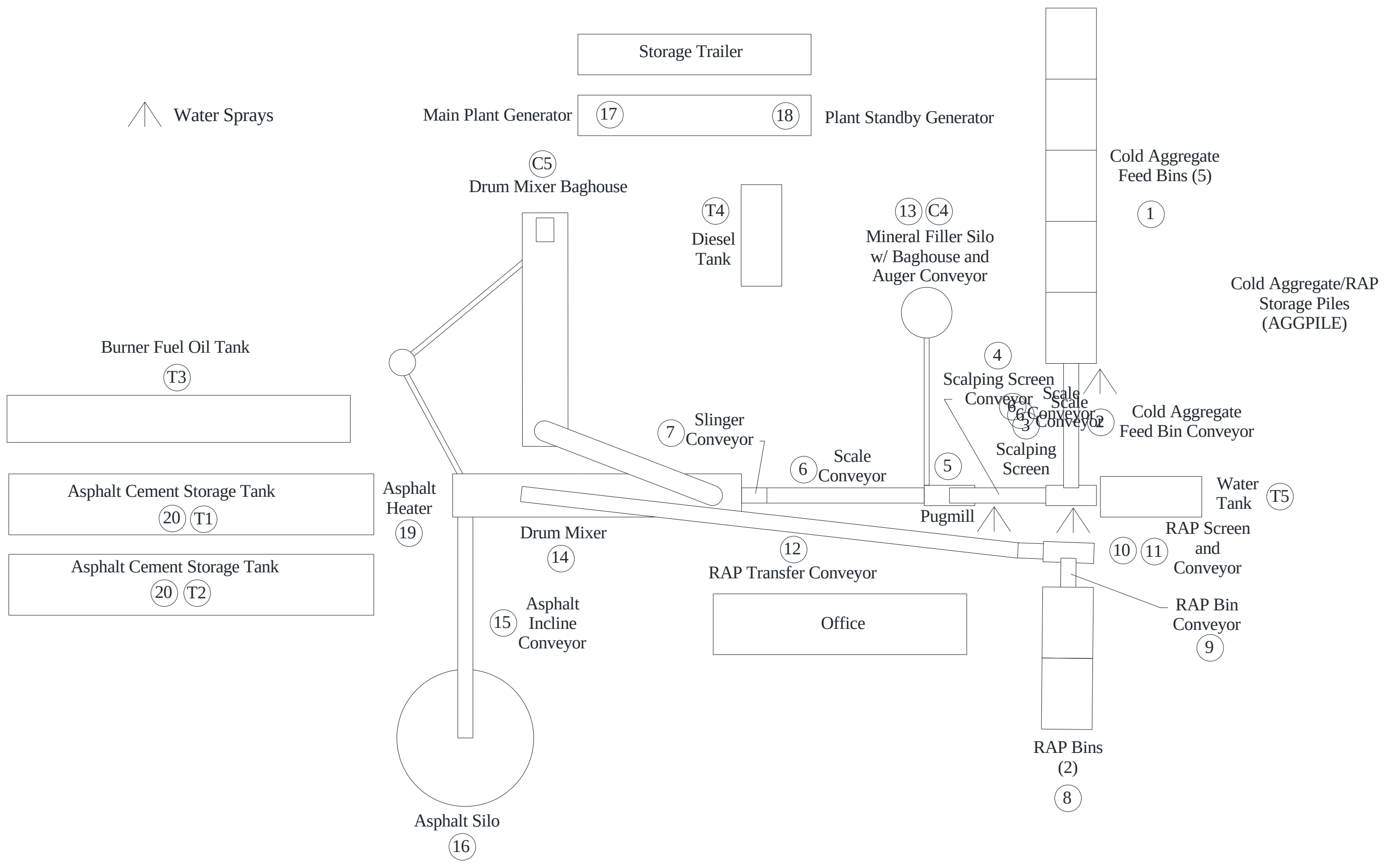

Figure 4-1: MV 400 TPH Astec Asphalt Plant Process Flow

Section 5

Plot Plan Drawn to Scale

A **plot plan drawn to scale** showing emissions points, roads, structures, tanks, and fences of property owned, leased, or under direct control of the applicant. This plot plan must clearly designate the restricted area as defined in UA1, Section 1-D.12. The unit numbering system should be consistent throughout this application.

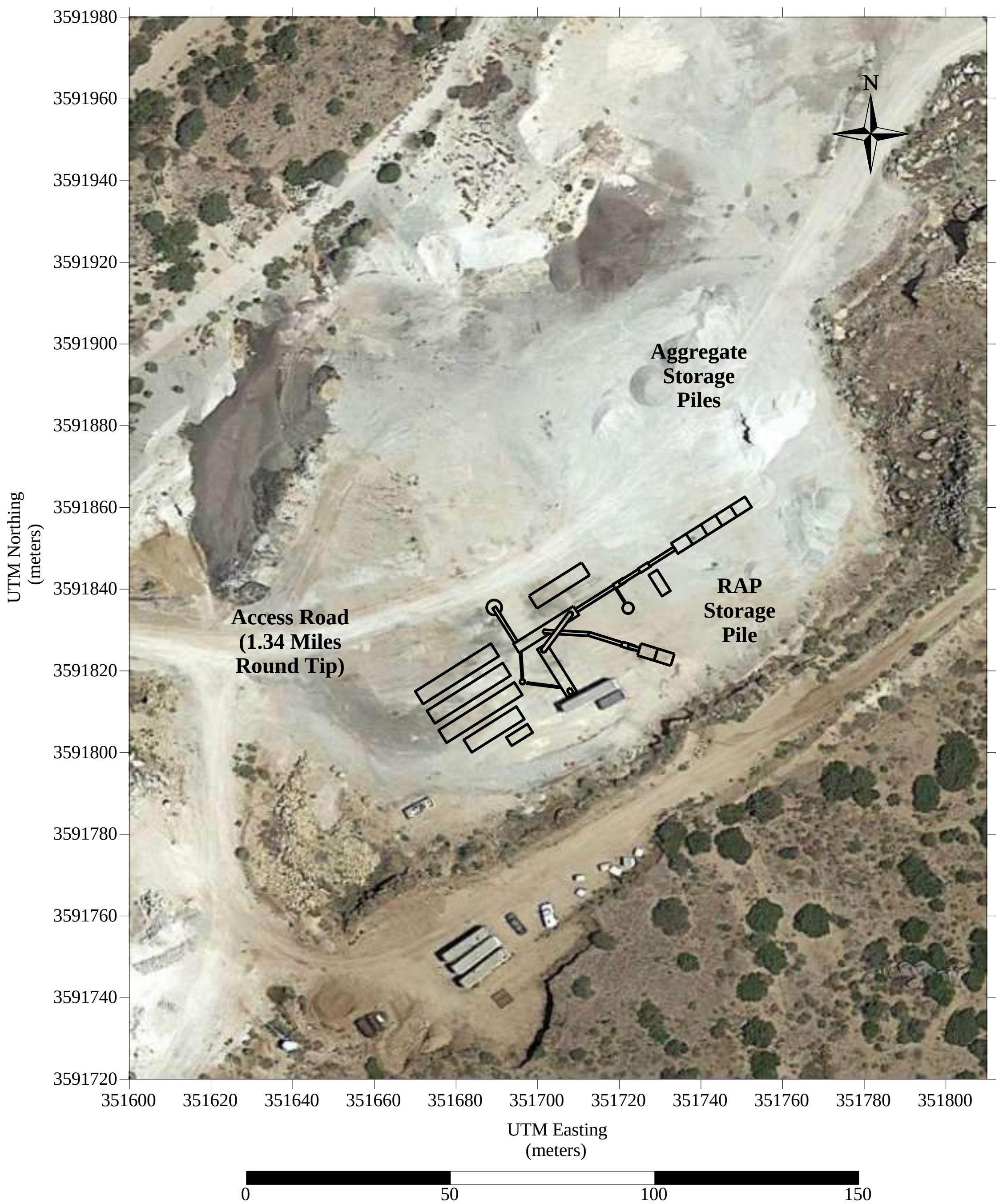

Figure 5-1: MV 400 TPH Astec Asphalt Plant Site Layout

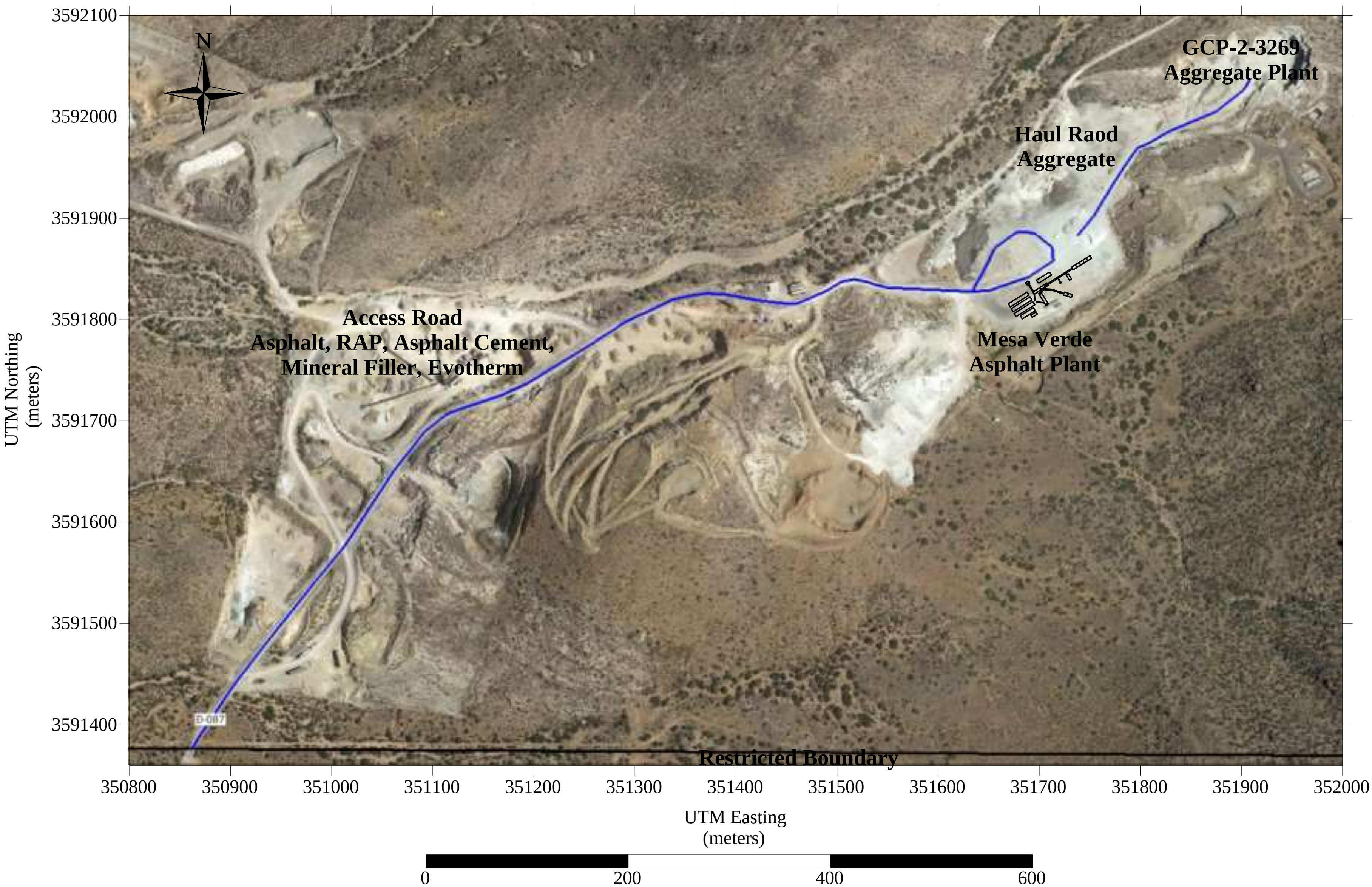

Figure 5-2: MV 400 TPH Astec Asphalt Plant Site Overview

Section 6

All Calculations

Show all calculations used to determine both the hourly and annual controlled and uncontrolled emission rates. All calculations shall be performed keeping a minimum of three significant figures. Document the source of each emission factor used (if an emission rate is carried forward and not revised, then a statement to that effect is required). If identical units are being permitted and will be subject to the same operating conditions, submit calculations for only one unit and a note specifying what other units to which the calculations apply. All formulas and calculations used to calculate emissions must be submitted. The "Calculations" tab in the UA2 has been provided to allow calculations to be linked to the emissions tables. Add additional "Calc" tabs as needed. If the UA2 or other spread sheets are used, all calculation spread sheet(s) shall be submitted electronically in Microsoft Excel compatible format so that formulas and input values can be checked. Format all spread sheets and calculations such that the reviewer can follow the logic and verify the input values. Define all variables. If calculation spread sheets are not used, provide the original formulas with defined variables. Additionally, provide subsequent formulas showing the input values for each variable in the formula. All calculations, including those calculations are imbedded in the Calc tab of the UA2 portion of the application, the printed Calc tab(s), should be submitted under this section.

Tank Flashing Calculations: The information provided to the AQB shall include a discussion of the method used to estimate tank-flashing emissions, relative thresholds (i.e., NOI, permit, or major source (NSPS, PSD or Title V)), accuracy of the model, the input and output from simulation models and software, all calculations, documentation of any assumptions used, descriptions of sampling methods and conditions, copies of any lab sample analysis. If Hysis is used, all relevant input parameters shall be reported, including separator pressure, gas throughput, and all other relevant parameters necessary for flashing calculation.

SSM Calculations: It is the applicant's responsibility to provide an estimate of SSM emissions or to provide justification for not doing so. In this Section, provide emissions calculations for Startup, Shutdown, and Routine Maintenance (SSM) emissions listed in the Section 2 SSM and/or Section 22 GHG Tables and the rational for why the others are reported as zero (or left blank in the SSM/GHG Tables). Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) for more detailed instructions on calculating SSM emissions. If SSM emissions are greater than those reported in the Section 2, Requested Allowables Table, modeling may be required to ensure compliance with the standards whether the application is NSR or Title V. Refer to the Modeling Section of this application for more guidance on modeling requirements.

Glycol Dehydrator Calculations: The information provided to the AQB shall include the manufacturer's maximum design recirculation rate for the glycol pump. If GRI-Glycalc is used, the full input summary report shall be included as well as a copy of the gas analysis that was used.

Road Calculations: Calculate fugitive particulate emissions and enter haul road fugitives in Tables 2-A, 2-D and 2-E for:

1. If you transport raw material, process material and/or product into or out of or within the facility and have PER emissions greater than 0.5 tpy.
2. If you transport raw material, process material and/or product into or out of the facility more frequently than one round trip per day.

Significant Figures:

A. All emissions standards are deemed to have at least two significant figures, but not more than three significant figures.
B. At least 5 significant figures shall be retained in all intermediate calculations.
C. In calculating emissions to determine compliance with an emission standard, the following rounding off procedures shall be used:

- **(1)** If the first digit to be discarded is less than the number 5, the last digit retained shall not be changed;
- **(2)** If the first digit discarded is greater than the number 5, or if it is the number 5 followed by at least one digit other than the number zero, the last figure retained shall be increased by one unit; **and**
- **(3)** If the first digit discarded is exactly the number 5, followed only by zeros, the last digit retained shall be rounded upward if it is an odd number, but no adjustment shall be made if it is an even number.

(4) The final result of the calculation shall be expressed in the units of the standard.

Control Devices: In accordance with 20.2.72.203.A(3) and (8) NMAC, 20.2.70.300.D(5)(b) and (e) NMAC, and 20.2.73.200.B(7) NMAC, the permittee shall report all control devices and list each pollutant controlled by the control device regardless if the applicant takes credit for the reduction in emissions. The applicant can indicate in this section of the application if they chose to not take credit for the reduction in emission rates. For notices of intent submitted under 20.2.73 NMAC, only uncontrolled emission rates can be considered to determine applicability unless the state or federal Acts require the control. This information is necessary to determine if federally enforceable conditions are necessary for the control device, and/or if the control device produces its own regulated pollutants or increases emission rates of other pollutants.

Hot Mix Asphalt Plant

Pre-Control Particulate Emission Rates

Material Handling ($PM_{2.5}$, PM_{10}, and PM)

To estimate material handling pre-control particulate emissions rates for screening, pugmill, 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 and RAP piles/ loading cold and RAP 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 (PM = 0.74, PM_{10} = 0.35, $PM_{2.5}$ = 0.053), wind speed for determining the maximum hourly emission rate is the NMED default of 11 MPH and for determining the annual emission rate is based on the average wind speed for Las Cruces found on the internet of 7.3 mph (see Section 7), and the NMED default moisture content of 2 percent.

The asphalt may will contain 1.5% mineral filler, if Evotherm is not used. Pre-control particulate emissions rates for mineral filler silo loading was obtained from EPA's Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, Section 11.12 (06/06), Table 11.12-2 "Cement Unloading to Elevated Storage Silo". To determine missing $PM_{2.5}$ emission factors the ratio of 1.92/0.38 from $PM_{10}/PM_{2.5}$ uncontrolled k factors found in AP-42 Section 11.12 (06/06), Table 11.12-4 "Central Mix Operation" was used.

Maximum hourly asphalt production is 400 tons per hours. Virgin aggregate/RAP/Mineral filler/Asphalt cement ratios used in estimating material handling particulate emission rates is equal to 47.5/45.0/1.5/6.0. These ratios are estimates and ratios may change with mix requirements, these are not requested permit conditions.

Aggregate Storage Piles and Cold Feed Bin Loading Emission Equation:

Maximum Hour Emission Factor

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

E_{PM} (lbs/ton) = $0.74 \times 0.0032 \times (11/5)^{1.3} / (2/2)^{1.4}$

E_{PM10} (lbs/ton) = $0.35 \times 0.0032 \times (11/5)^{1.3} / (2/2)^{1.4}$

$E_{PM2.5}$ (lbs/ton) = $0.053 \times 0.0032 \times (11/5)^{1.3} / (2/2)^{1.4}$

E_{PM} (lbs/ton) = 0.00660 lbs/ton;

E_{PM10} (lbs/ton) = 0.00312 lbs/ton

$E_{PM2.5}$ (lbs/ton) = 0.00047 lbs/ton

Aggregate Storage Piles and Cold Feed Bin Loading Emission Equation:

Annual Emission Factor

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

E_{PM} (lbs/ton) = 0.74 x 0.0032 x $(7.3/5)^{1.3}$ / $(2/2)^{1.4}$

E_{PM10} (lbs/ton) = 0.35 x 0.0032 x $(7.3/5)^{1.3}$ / $(2/2)^{1.4}$

$E_{PM2.5}$ (lbs/ton) = 0.053 x 0.0032 x $(7.3/5)^{1.3}$ / $(2/2)^{1.4}$

E_{PM} (lbs/ton) = 0.00387 lbs/ton;

E_{PM10} (lbs/ton) = 0.00183 lbs/ton

$E_{PM2.5}$ (lbs/ton) = 0.00025 lbs/ton

RAP material handling emission factors are reduced further to account for the inherent properties of RAP with a coating of asphalt oils which captures small particles within the material. Based on EPA documents "EIIP – Preferred and Alternative Methods for Estimating Air Emissions from Hot-Mix-Asphalt Plants, Final Report, July 1996, Table 3.2-1 Fugitive Dust – Crushed RAP material" the inherent typical efficiency of the material is 70% (see Section 7).

RAP Storage Piles and RAP Feed Bin Loading Emission Equation:

Maximum Hour Emission Factor

E (lbs/ton) = k x 0.0032 x $(U/5)^{1.3}$ / $(M/2)^{1.4}$ * 0.3

E_{PM} (lbs/ton) = 0.74 x 0.0032 x $(11/5)^{1.3}$ / $(2/2)^{1.4}$ * 0.3

E_{PM10} (lbs/ton) = 0.35 x 0.0032 x $(11/5)^{1.3}$ / $(2/2)^{1.4}$ * 0.3

$E_{PM2.5}$ (lbs/ton) = 0.053 x 0.0032 x $(11/5)^{1.3}$ / $(2/2)^{1.4}$ * 0.3

E_{PM} (lbs/ton) = 0.00198 lbs/ton;

E_{PM10} (lbs/ton) = 0.00094 lbs/ton

$E_{PM2.5}$ (lbs/ton) = 0.00014 lbs/ton

RAP Storage Piles and RAP Feed Bin Loading Emission Equation:

Annual Emission Factor

E (lbs/ton) = k x 0.0032 x $(U/5)^{1.3}$ / $(M/2)^{1.4}$ * 0.3

E_{PM} (lbs/ton) = 0.74 x 0.0032 x $(7.3/5)^{1.3}$ / $(2/2)^{1.4}$ * 0.3

E_{PM10} (lbs/ton) = 0.35 x 0.0032 x $(7.3/5)^{1.3}$ / $(2/2)^{1.4}$ * 0.3

$E_{PM2.5}$ (lbs/ton) = 0.053 x 0.0032 x $(7.3/5)^{1.3}$ / $(2/2)^{1.4}$ * 0.3

E_{PM} (lbs/ton) = 0.00116 lbs/ton;

E_{PM10} (lbs/ton) = 0.00055 lbs/ton

$E_{PM2.5}$ (lbs/ton) = 0.00008 lbs/ton

AP-42 Emission Factors:

All Bin Unloading and Conveyor Transfers = Uncontrolled Conveyor Transfer Point Emission Factor
Screening = Uncontrolled Screening Emission Factor
Pugmill Loading and Unloading = Uncontrolled Conveyor Transfer Point Emission Factor

Material Handling Emission Factors Aggregate:

Process Unit	PM Emission Factor (lbs/ton)	PM_{10} Emission Factor (lbs/ton)	$PM_{2.5}$ Emission Factor (lbs/ton)
Uncontrolled Screening	0.02500	0.00870	0.00132
Uncontrolled Screen Unloading, Pug Mill Loading and Unloading, Feed Bin Unloading, and Conveyor Transfers	0.00300	0.00110	0.00017
Uncontrolled Aggregate Storage Piles, Cold Aggregate Feeder Loading Max Hourly	0.00660	0.00312	0.00047
Uncontrolled Aggregate Storage Piles, Cold Aggregate Feeder Loading Annual	0.00538	0.00254	0.00039

RAP material handling emission factors are reduced further to account for the inherent properties of RAP with a coating of asphalt oils which captures small particles within the material. Based on EPA documents “EIIP – Preferred and Alternative Methods for Estimating Air Emissions from Hot-Mix-Asphalt Plants, Final Report, July 1996, Table 3.2-1 Fugitive Dust – Crushed RAP material” the inherent typical efficiency of the material is 70% (see Section 7).

Material Handling Emission Factors RAP:

Process Unit	PM Emission Factor (lbs/ton)	PM_{10} Emission Factor (lbs/ton)	$PM_{2.5}$ Emission Factor (lbs/ton)
Uncontrolled Screening	0.00750	0.00261	0.00040
Uncontrolled Screen Unloading, Feed Bin Unloading, and Conveyor Transfers	0.00090	0.00033	0.00005
Uncontrolled RAP Storage Piles, RAP Feeder Loading Max Hourly	0.00198	0.00094	0.00014
Uncontrolled RAP Storage Piles, RAP Feeder Loading Annual	0.00116	0.00055	0.00008

AP-42 Section 11.12 Table 11.12-2 Uncontrolled Emission Factors:

Process Unit	PM Emission Factor (lbs/ton)	PM_{10} Emission Factor (lbs/ton)	$PM_{2.5}$ Emission Factor (lbs/ton)
Mineral Filler Silo Loading	0.73	0.47	0.093

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:

$$\text{Emission Rate (tons/year)} = \frac{\text{Emission Rate (lbs/hour)} * \text{Operating Hour (hrs/year)}}{\text{2000 lbs/ton}}$$

Table 6-1 Pre-Controlled Regulated Process Equipment Emission Rates

Unit #	Process Unit Description	Process Rate (tph)	PM Emission Rate (lbs/hr)	PM 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)
AGGPILE	Cold Aggregate Storage Pile	190	1.25	3.22	0.59	1.52	0.090	0.23
1	Cold Aggregate Feed Bin Loading	190	1.25	3.22	0.59	1.52	0.090	0.23
2	Cold Aggregate Feed Bin Unloading (Conveyor)	190	0.57	2.50	0.21	0.92	0.032	0.14
3	Scalping Screen	190	4.75	20.8	1.65	7.24	0.25	1.10
4	Scalping Screen Unloading (Conveyor)	190	0.57	2.50	0.21	0.92	0.032	0.14
5	Pug Mill Load	196	0.59	2.58	0.22	0.94	0.033	0.15
6	Pug Mill Unload (Conveyor)	196	0.59	2.58	0.22	0.94	0.033	0.15
7	Conveyor Transfer to Slinger Conveyor	196	0.59	2.58	0.22	0.94	0.033	0.15
AGGPILE	RAP Storage Pile	180	0.11	0.27	1.21	3.10	0.18	0.47
8	RAP Feed Bin Loading	180	0.11	0.27	0.051	0.13	0.0077	0.020
9	RAP Feed Bin Unloading (Conveyor)	180	0.16	0.71	0.059	0.26	0.0092	0.040
10	RAP Screen	180	1.35	5.9	0.47	2.06	0.071	0.31
11	RAP Screen Unloading (Conveyor)	180	0.16	0.71	0.059	0.26	0.0092	0.040
12	RAP Transfer Conveyor	180	0.16	0.71	0.059	0.26	0.0092	0.040
12a	RAP Transfer Conveyor to Drum	180	0.16	0.71	0.059	0.26	0.0092	0.040

Unit #	Process Unit Description	Process Rate (tph)	PM Emission Rate (lbs/hr)	PM 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)
13	Mineral Filler Silo	25 tph, 52,560 tpy	18.3	19.2	11.8	12.4	2.33	2.44
		TOTALS	**30.6**	**68.5**	**16.5**	**30.7**	**3.04**	**5.24**

HMA Plant 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 road to the plant will be unpaved. Table 6-2 summarizes the emission rate for each haul truck category. Aggregate trucks travel from the existing co-located GCP-2-3269 to the HMA plant. All other traffic is from the site entrance to the HMA.

Unpaved Roads Plant HMA

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

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

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

s = % silt content (Table 13.2.2-1, "Sand and Gravel" 4.8%)
W = mean vehicle weight (26.5 tons – 15 tons truck, 23 tons load)
p = number of days with at least 0.01 in of precip. (70 days)
a = Constant PM2.5 = 0.9
PM10 = 0.9
PM = 0.7
b = Constant PM2.5 = 0.45
PM10 = 0.45
PM = 0.45
Vehicle Dust Control 0%

Trucks per Hour

Mineral Fill Trucks = 0.2 truck per hour average
Asphalt Cement Trucks = 0.8 truck per hour average
Asphalt Trucks = 13.9 truck per hour average
Aggregate Trucks = 6.6 truck per hour average
RAP Trucks = 6.3 truck per hour average
Evotherm Trucks = 0.03 truck per hour average

Trucks per Year (Uncontrolled)

Mineral Fill Trucks = 1,828 truck per year
Asphalt Cement Trucks = 7,313 truck per year
Asphalt Trucks = 121,878 truck per year
Aggregate Trucks = 57,892 truck per year
RAP Trucks = 54,845 truck per year
Evotherm Trucks = 232 truck per year

VMT =Vehicle Miles Traveled

Mineral Fill Trucks	Unpaved – 1.35067 miles per vehicle
Asphalt Cement Trucks	Unpaved – 1.35067 miles per vehicle
Aggregate Trucks	Unpaved – 0.29938 miles per vehicle
RAP Trucks	Unpaved – 1.35067 miles per vehicle
Evotherm Trucks	Unpaved – 1.35067 miles per vehicle

Miles Traveled

HMA Plant Unpaved – 30.67208 miles per hour; 268,687 miles per year

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 – 0% Control

PM = 6.87692 lbs/VMT
PM10 = 1.75267 lbs/VMT
PM2.5 = 0.17527 lbs/VMT

Annual Emission Rate Factor – 0% Control

PM = 5.55806 lbs/VMT
PM10 = 1.41655 lbs/VMT
PM2.5 = 0.14165 lbs/VMT

Table 6-2: Pre-Controlled Haul Road Fugitive Dust Emission Rates

Process Unit Description	Process Rate	PM Emission Rate (lbs/hr)	PM 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)
Mineral Filler Truck Emissions	0.28188 miles/hr; 246.9 miles/yr	1.94	6.86	0.49	1.75	0.049	0.17
Asphalt Cement Truck Emissions	1.12752 miles/hr; 9,877 miles/yr	7.75	27.45	1.98	7.00	0.20	0.70
Asphalt Truck Emissions Paved	18.79195 miles/hr; 164,617 miles/yr	129.23	457.48	32.94	116.59	3.29	11.66
Aggregate Truck Emissions Paved	1.97852 miles/hr; 17,332 miles/yr	13.61	48.17	3.47	12.28	0.35	1.23
RAP Truck Emissions	8.45638 miles/hr; 74,078 miles/yr	58.15	205.86	14.82	52.47	1.48	5.25
Evotherm Truck Emissions	0.03584 miles/hr; 314 miles/yr	0.22	0.79	0.057	0.20	0.0057	0.020
	Total	**210.9**	**746.6**	**53.8**	**190.3**	**5.38**	**19.03**

Drum Mix Hot Mix Asphalt Plant

Drum mix hot mix asphalt plant uncontrolled emissions were estimated using AP-42, Section 11.1 "Hot Mix Asphalt Plants" (revised 03/04), tables 11.1.3, 7, 8 and 14 emission equations. The drum dryer will be permitted to combust on-spec recycled oil. Hourly emission rates are based on maximum hourly asphalt production (400 tph) and maximum annual emission rates are based on operating 8760 hours per year. To determine missing $PM_{2.5}$ emission factor the sum of uncontrolled filterable from Table 11.1-4 plus uncontrolled organic and inorganic condensable in Table 11.1-3 was used. Silo filling and plant loadout emission factors were calculated using the default value of –0.5 for asphalt volatility (V) and a tank temperature setting of 350˚ F for HMA mix temperature (T).

Silo Filling

Total PM	$EF = 0.000332 + 0.00105(-V)e^{((0.0251)(T + 460) - 20.43)}$
TOC	$EF = 0.0504(-V)e^{((0.0251)(T + 460) - 20.43)}$
CO	$EF = 0.00488(-V)e^{((0.0251)(T + 460) - 20.43)}$

Plant Loadout

Total PM	$EF = 0.000181 + 0.00141(-V)e^{((0.0251)(T + 460) - 20.43)}$
TOC	$EF = 0.0172(-V)e^{((0.0251)(T + 460) - 20.43)}$
CO	$EF = 0.00558(-V)e^{((0.0251)(T + 460) - 20.43)}$

Yard emissions were found in AP-42 Section 11.1.2.5. TOC emission equation is 0.0011 lbs/ton of asphalt produced and CO is equal to the TOC emission rate times 0.32.

Emissions of VOCs (TOCs) from the asphalt cement storage tanks were determined with EPA's TANK 4.0.9d program and the procedures found in EPA's "Emission Factor Documentation for AP-42 Section 11.1 (12/2000) Section 4.4.5" for input to the TANK program.

AP-42 Section 11.1 Table 11.1-3, -4, -7, -8, and -14 Uncontrolled Emission Factors:

Process Unit	Pollutant	Emission Factor (lbs/ton)
Drum Mixer	NO_X	0.055
	CO	0.13
	SO_2	0.058
	VOC	0.032
	TOC	0.044
	PM	28.0
	PM_{10}	6.5
	$PM_{2.5}$	1.565
	CO_2	33.0
Silo Filling	CO	0.002210012
	TOC	0.022824716
	PM	0.000807515
	PM_{10}	0.000807515
	$PM_{2.5}$	0.000807515
Plant Loadout	CO	0.002527022
	TOC	0.007789387
	PM	0.000819549
	PM_{10}	0.000819549
	$PM_{2.5}$	0.000819549
Yard	CO	0.000352
	TOC	0.0011

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:

$$\text{Emission Rate (tons/year)} = \frac{\text{Emission Rate (lbs/hour)} * \text{Operating Hour (hrs/year)}}{2000 \text{ lbs/ton}}$$

Table 6-3: Pre-Controlled Hot Mix Plant Emission Rates

Process Unit Number	Process Unit Description	Pollutant	Average Hourly Process Rate (tons/hour)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
14	Asphalt Drum Dryer/Mixer	NO_X	400	22.00	96.36
		CO	400	52.00	227.76
		SO_2	400	23.20	101.62
		VOC	400	12.80	56.06
		PM	400	11200.0	49056.0
		PM_{10}	400	2600.0	11388.0
		$PM_{2.5}$	400	626.0	2741.88
		CO_2	400	13200.0	57816.0
15	Silo Filling (Drum Mixer Unloading)	CO	400	0.88	3.87
		TOC	400	9.13	39.99
		PM	400	0.32	1.41
		PM_{10}	400	0.32	1.41
		$PM_{2.5}$	400	0.32	1.41
16	Plant Loadout (Asphalt Silo Unloading)	CO	400	1.01	1.01
		TOC	400	3.12	3.12
		PM	400	0.33	1.44
		PM_{10}	400	0.33	1.44
		$PM_{2.5}$	400	0.33	1.44
20	Asphalt Cement Storage Tanks (2)	TOC	30,000 gallons each	0.028	0.12
YARD	HMA YARD	TOC	400	0.44	1.93
		CO	400	0.14	0.62

Controlled Particulate Emission Rates

No controls or emission reductions for combustion emissions (NO_X, CO, SO_2, VOC, or TOC) are proposed for the drum dryer (14), unloading the drum mixer (15), asphalt silo (16), main plant generator (17), standby generator (18), and asphalt heater (19) with the exception of limiting annual production rates for production equipment and annual hours of operation.

RAP material handling emission rates are reduced by inherent properties of RAP with a coating of asphalt oils which captures small particles within the material. Uncontrolled hourly emission rate found in Table 6-1 and annual emission are based on limiting annual production rates. For RAP processing equipment, emission factors are based on uncontrolled hourly emission rates and EPA documents "EIIP – Preferred and Alternative Methods for Estimating Air Emissions from Hot-Mix-Asphalt Plants, Final Report, July 1996, Table 3.2-1 Fugitive Dust – Crushed RAP material" the inherent typical efficiency of the material is 70% (see Section 7). These include the following emission source; AGGPILE (RAP portion), 8, 9. 10, 11, 12, and 12a.

Controlled Material Handling ($PM_{2.5}$, PM_{10}, and PM)

No fugitive dust controls or emission reductions are proposed for the aggregate storage piles (AGGPILE – Aggregate Portion), loading of the cold aggregate feed bins (1) with the exception of limiting annual production rates.

Fugitive dust control for unloading the cold aggregate feed bins onto the cold aggregate feed bin conveyor (2) will be controlled, as needed, with enclosures and/or water sprays at the exit of the feed bins. 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 scalping screen (3) 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 unloading the scalping screens (4), loading and unloading the pug mill (5 and 6), transfer from the scale conveyor to the sling conveyor (7), and RAP transfer conveyor (12) will be controlled, as needed, with enclosures and/or water sprays. 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.

Particulate emissions from loading the mineral filler silo (13) will be controlled with a baghouse dust collector on the exhaust vent (C4). This dust collector consists of filter bags and is passive with no fan. It functions only when material is loaded into the silo. The filter bags are cleaned by air pulses at set intervals. Baghouse fines are dumped back into the silo. It is estimated that this method will control to an efficiency of 99 percent or greater based on information from filter bag specifications. Additional emission reductions include limiting annual production rates.

Particulate emissions from the drum dryer/mixer (14) will be controlled with a baghouse dust collector (C5) on the exhaust vent. It is estimated that this method will control to an efficiency of 99.88 percent per AP42 Section 11.1, Table 11.1-3 "controlled emission factor vs. uncontrolled emission factor". Baghouse fines are sent to a dust box. Additional emission reductions include limiting annual production rates.

No fugitive controls or emission reductions are proposed for unloading the drum dryer/mixer or asphalt silo (15, 16) with the exception of limiting annual production rates. No fugitive controls are proposed for yard emissions (YARD) or asphalt storage tanks (20).

To estimate material handling control particulate emissions rates for 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 storage piles and cold aggregate 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 (PM = 0.74, PM_{10} = 0.35, $PM_{2.5}$ = 0.053), wind speed for determining the maximum hourly emission rate is the NMED default of 11 MPH and for determining the annual emission rate is based on the average wind speed for Las Cruces of 7.3 mph (see Section 7), and the NMED default moisture content of 2 percent.

The asphalt may will contain 1.5% mineral filler, if Evotherm is not used. Control particulate emissions rates for mineral filler silo loading was obtained from EPA's Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, Section 11.12 (06/06), Table 11.12-2 uncontrolled "Cement Unloading to Elevated Storage Silo" and a control efficiency of 99% for the baghouse.

Maximum hourly asphalt production is 400 tons per hours. Virgin aggregate/RAP/Mineral filler/Asphalt cement ratios used in estimating material handling particulate emission rates is equal to 47.5/45.0/1.5/6.0. These ratios are estimates and ratios may change with mix requirements, these are not requested permit conditions. Annual emissions in tons per year (tpy) were calculated assuming an annual production throughput of 963,200 tons of asphalt per year.

Aggregate Storage Piles and Cold Feed Bin Loading Emission Equation:

Maximum Hour Emission Factor

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

E_{PM} (lbs/ton) = $0.74 \times 0.0032 \times (11/5)^{1.3} / (2/2)^{1.4}$

E_{PM10} (lbs/ton) = $0.35 \times 0.0032 \times (11/5)^{1.3} / (2/2)^{1.4}$

$E_{PM2.5}$ (lbs/ton) = $0.053 \times 0.0032 \times (11/5)^{1.3} / (2/2)^{1.4}$

E_{PM} (lbs/ton) = 0.00660 lbs/ton;

E_{PM10} (lbs/ton) = 0.00312 lbs/ton

$E_{PM2.5}$ (lbs/ton) = 0.00047 lbs/ton

Aggregate Storage Piles and Cold Feed Bin Loading Emission Equation:

Annual Emission Factor

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

E_{PM} (lbs/ton) = $0.74 \times 0.0032 \times (7.3/5)^{1.3} / (2/2)^{1.4}$

E_{PM10} (lbs/ton) = $0.35 \times 0.0032 \times (7.3/5)^{1.3} / (2/2)^{1.4}$

$E_{PM2.5}$ (lbs/ton) = $0.053 \times 0.0032 \times (7.3/5)^{1.3} / (2/2)^{1.4}$

E_{PM} (lbs/ton) = 0.00387 lbs/ton;

E_{PM10} (lbs/ton) = 0.00183 lbs/ton

$E_{PM2.5}$ (lbs/ton) = 0.00025 lbs/ton

RAP material handling emission factors are reduced further to account for the inherent properties of RAP with a coating of asphalt which captures small particles within the material. Based on EPA documents "EIIP – Preferred and Alternative Methods for Estimating Air Emissions from Hot-Mix-Asphalt Plants, Final Report, July 1996, Table 3.2-1 Fugitive Dust – Crushed RAP material" the inherent typical efficiency of the material is 70% (see Section 7).

RAP Storage Piles and RAP Feed Bin Loading Emission Equation:

Maximum Hour Emission Factor

E (lbs/ton) = k x 0.0032 x $(U/5)^{1.3}$ / $(M/2)^{1.4}$ * 0.3

E_{PM} (lbs/ton) = 0.74 x 0.0032 x $(11/5)^{1.3}$ / $(2/2)^{1.4}$ * 0.3

E_{PM10} (lbs/ton) = 0.35 x 0.0032 x $(11/5)^{1.3}$ / $(2/2)^{1.4}$ * 0.3

$E_{PM2.5}$ (lbs/ton) = 0.053 x 0.0032 x $(11/5)^{1.3}$ / $(2/2)^{1.4}$ * 0.3

E_{PM} (lbs/ton) = 0.00198 lbs/ton;

E_{PM10} (lbs/ton) = 0.00094 lbs/ton

$E_{PM2.5}$ (lbs/ton) = 0.00014 lbs/ton

RAP Storage Piles and RAP Feed Bin Loading Emission Equation:

Annual Emission Factor

E (lbs/ton) = k x 0.0032 x $(U/5)^{1.3}$ / $(M/2)^{1.4}$ * 0.3

E_{PM} (lbs/ton) = 0.74 x 0.0032 x $(7.3/5)^{1.3}$ / $(2/2)^{1.4}$ * 0.3

E_{PM10} (lbs/ton) = 0.35 x 0.0032 x $(7.3/5)^{1.3}$ / $(2/2)^{1.4}$ * 0.3

$E_{PM2.5}$ (lbs/ton) = 0.053 x 0.0032 x $(7.3/5)^{1.3}$ / $(2/2)^{1.4}$ * 0.3

E_{PM} (lbs/ton) = 0.00116 lbs/ton;

E_{PM10} (lbs/ton) = 0.00055 lbs/ton

$E_{PM2.5}$ (lbs/ton) = 0.00008 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

Scalping Screen Conveyor = Controlled Conveyor Transfer Point Emission Factor

Pug Mill = Controlled Conveyor Transfer Point Emission Factor

Pug Mill Conveyor = Controlled Conveyor Transfer Point Emission Factor

Material Handling Emission Factors Aggregate:

Process Unit	PM 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 Screening	0.00220	0.00074	0.00005
Transfer Conveyor	0.00014	0.00005	0.000013
Controlled Pug Mill Loading and Unloading	0.00014	0.00005	0.000013
Uncontrolled Aggregate Storage Piles, Cold Aggregate Bin Loading Max Hourly	0.00660	0.00312	0.00047
Uncontrolled Aggregate Storage Piles, Cold Aggregate Bin Loading Annual	0.00387	0.00183	0.00028

RAP material handling emission factors are reduced further to account for the inherent properties of RAP with a coating of asphalt which captures small particles within the material. Based on EPA documents "EIIP – Preferred and Alternative Methods for Estimating Air Emissions from Hot-Mix-Asphalt Plants, Final Report, July 1996, Table 3.2-1 Fugitive Dust – Crushed RAP material" the inherent typical efficiency of the material is 70% (see Section 7).

Material Handling Emission Factors RAP:

Process Unit	PM Emission Factor (lbs/ton)	PM_{10} Emission Factor (lbs/ton)	$PM_{2.5}$ Emission Factor (lbs/ton)
Uncontrolled Screening	0.00750	0.00261	0.00040
Uncontrolled Screen Unloading, Feed Bin Unloading, and Conveyor Transfers	0.00090	0.00033	0.00005
Uncontrolled RAP Storage Piles, RAP Feeder Loading Max Hourly	0.00198	0.00094	0.00014
Uncontrolled RAP Storage Piles, RAP Feeder Loading Annual	0.00116	0.00055	0.00008

AP-42 Section 11.12 Table 11.12-2 Uncontrolled Emission Factors with 99% Control Efficiency:

Process Unit	PM Emission Factor (lbs/ton)	PM_{10} Emission Factor (lbs/ton)	$PM_{2.5}$ Emission Factor (lbs/ton)
Mineral Filler Silo Loading	0.0073	0.0047	0.00093

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:

$$\text{Emission Rate (tons/year)} = \frac{\text{Hourly Emission Rate (lbs/hour) * Operating Hour (hrs/year)}}{\text{2000 lbs/ton}}$$

Table 6-4 Controlled Regulated Process Equipment Emission Rates

Unit #	Process Unit Description	Process Rate (tph)	PM Emission Rate (lbs/hr)	PM 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)
AGGPILE	Cold Aggregate Storage Pile	190	1.25	0.89	0.59	0.42	0.090	0.063
1	Cold Aggregate Feed Bin Loading	190	1.25	0.89	0.59	0.42	0.090	0.063
2	Cold Aggregate Feed Bin Unloading (Conveyor)	190	0.027	0.032	0.0087	0.011	0.0025	0.0030
3	Scalping Screen	190	0.42	0.50	0.14	0.17	0.010	0.011
4	Scalping Screen Unloading (Conveyor)	190	0.027	0.032	0.0087	0.011	0.0025	0.0030
5	Pug Mill Load	196	0.027	0.033	0.0090	0.011	0.0025	0.0031
6	Pug Mill Unload (Conveyor)	196	0.027	0.033	0.0090	0.011	0.0025	0.0031
7	Conveyor Transfer to Slinger Conveyor	196	0.027	0.033	0.0090	0.011	0.0025	0.0031
AGGPILE	RAP Storage Pile	180	0.11	0.076	0.051	0.036	0.0077	0.0054
8	RAP Feed Bin Loading	180	0.11	0.076	0.051	0.036	0.0077	0.0054
9	RAP Feed Bin Unloading (Conveyor)	180	0.16	0.20	0.059	0.072	0.0092	0.011
10	RAP Screen	180	1.35	1.63	0.47	0.57	0.071	0.086
11	RAP Screen Unloading (Conveyor)	180	0.16	0.20	0.059	0.072	0.0092	0.011
12	RAP Transfer Conveyor	180	0.16	0.20	0.059	0.072	0.0092	0.011

Unit #	Process Unit Description	Process Rate (tph)	PM Emission Rate (lbs/hr)	PM 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)
12a	RAP Transfer Conveyor to Drum	180	0.16	0.20	0.059	0.072	0.0092	0.011
13	Mineral Filler Silo	25 tph, 52,560 tpy	0.18	0.053	0.12	0.034	0.023	0.0067
		TOTALS	**5.46**	**5.89**	**2.30**	**2.42**	**0.35**	**0.36**

Controlled Haul Truck Travel

Haul truck travel emissions were estimated using AP-42, Section 13.2.2 (ver.11/06) "Unpaved Roads" emission equation. All other haul roads throughout the plant are unpaved that will be controlled with surfactants or millings, and water. Haul road traffic emission rates controlled by surfactants or millings, and water have applied a control efficiency of 90%. Aggregate trucks travel from the existing co-located GCP-2-3269 to the HMA plant. All other traffic is from the site entrance to the HMA. The total number of HMA trucks per day is 278. See Figure 5-2 for identification of haul road. Table 6-5 summarizes the emission rate for each haul truck category.

Unpaved Roads Plant HMA
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
PM = 4.9
s = % silt content (Table 13.2.2-1, "Sand and Gravel" 4.8%)
W = mean vehicle weight (26.5 tons – 15 tons truck, 23 tons load)
p = number of days with at least 0.01 in of precip. (70 days)
a = Constant PM2.5 = 0.9
PM10 = 0.9
PM = 0.7
b = Constant PM2.5 = 0.45
PM10 = 0.45
PM = 0.45
Vehicle Dust Control 90%

Trucks per Hour
Mineral Fill Trucks = 0.2 truck per hour average
Asphalt Cement Trucks = 0.8 truck per hour average
Asphalt Trucks = 13.9 truck per hour average
Aggregate Trucks = 6.6 truck per hour average
RAP Trucks = 6.3 truck per hour average
Evotherm Trucks = 0.03 truck per hour average

Trucks per Year (Controlled)
Mineral Fill Trucks = 628 truck per year
Asphalt Cement Trucks = 2,513 truck per year
Asphalt Trucks = 41,878 truck per year
Aggregate Trucks = 19,892 truck per year
RAP Trucks = 18,845 truck per year
Evotherm Trucks = 80 truck per year

VMT =Vehicle Miles Traveled

	Mineral Fill Trucks	Unpaved – 1.35067 miles per vehicle
	Asphalt Cement Trucks	Unpaved – 1.35067 miles per vehicle
	Aggregate Trucks	Unpaved – 0.29938 miles per vehicle
	RAP Trucks	Unpaved – 1.35067 miles per vehicle
	Evotherm Trucks	Unpaved – 1.35067 miles per vehicle

Miles Traveled

HMA Plant Unpaved – 30.67208 miles per hour; 92,323 miles per year

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 – 90% Control

PM = 0.687692 lbs/VMT
PM10 = 0.175267 lbs/VMT
PM2.5 = 0.017527 lbs/VMT

Annual Emission Rate Factor – 90% Control

PM = 0.555806 lbs/VMT
PM10 = 0.141655 lbs/VMT
PM2.5 = 0.014165 lbs/VMT

Table 6-5: Controlled Haul Road Fugitive Dust Emission Rates

Process Unit Description	Process Rate	PM Emission Rate (lbs/hr)	PM 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)
Mineral Filler Truck Emissions	0.28188 miles/hr; 848 miles/yr	0.19	0.24	0.049	0.060	0.0049	0.0060
Asphalt Cement Truck Emissions	1.12752 miles/hr; 3,394 miles/yr	0.78	0.94	0.20	0.24	0.020	0.024
Asphalt Truck Emissions Paved	18.79195 miles/hr; 56,564 miles/yr	12.92	15.72	3.29	4.01	0.33	0.40
Aggregate Truck Emissions Paved	1.97852 miles/hr; 5,955 miles/yr	1.36	1.66	0.35	0.42	0.035	0.042
RAP Truck Emissions	8.45638 miles/hr; 25,454 miles/yr	5.82	7.07	1.48	1.80	0.15	0.18
Evotherm Truck Emissions	0.03584 miles/hr; 108 miles/yr	0.022	0.027	0.0057	0.0069	0.00057	0.00069
	Total	**21.09**	**25.65**	**5.38**	**6.54**	**0.54**	**0.65**

Drum Mix Hot Mix Asphalt Plant

Particulate emissions from the drum dryer/mixer (14) will be controlled with a baghouse dust collector (C5) on the exhaust vent. This dust collector consists of filter bags and a fan that draws all the drum mixer exhaust through the dust collector. It is estimated that this method will control to an efficiency of 99.88 percent per AP42 Section 11.1, Table 11.1-3. Additional emission reductions include limiting annual production rates. No fugitive controls are proposed for unloading the drum dryer/mixer or asphalt silo (15, 16) with the exception of limiting annual production rates. No fugitive controls are proposed for yard emissions or asphalt storage tank emissions.

Drum mix hot mix asphalt plant controlled emissions were estimated using AP-42, Section 11.1 “Hot Mix Asphalt Plants” (revised 03/04), tables 11.1-3, -4, -7, -8 and -14 emission rates for all pollutants. The drum dryer will be permitted to combust on-spec recycled oil. Hourly emission rates are based on maximum hourly asphalt production (400 tph) and maximum annual asphalt production rates of 1,000,000 tons. To determine missing $PM_{2.5}$ emission factor the sum of uncontrolled filterable from Table 11.1-4 plus uncontrolled organic and inorganic condensable in Table 11.1-3 was used. Silo filling and plant loadout emission factors were calculated using the default value of –0.5 for asphalt volatility (V) and a tank temperature setting of 350˚ F for HMA mix temperature (T).

<u>Silo Filling</u>

Total PM	$EF = 0.000332 + 0.00105(-V)e^{((0.0251)(T + 460) - 20.43)}$
TOC	$EF = 0.0504(-V)e^{((0.0251)(T + 460) - 20.43)}$
CO	$EF = 0.00488(-V)e^{((0.0251)(T + 460) - 20.43)}$

<u>Plant Loadout</u>

Total PM	$EF = 0.000181 + 0.00141(-V)e^{((0.0251)(T + 460) - 20.43)}$
TOC	$EF = 0.0172(-V)e^{((0.0251)(T + 460) - 20.43)}$
CO	$EF = 0.00558(-V)e^{((0.0251)(T + 460) - 20.43)}$

Yard emissions were found in AP-42 Section 11.1.2.5. TOC emission equation is 0.0011 lbs/ton of asphalt produced and CO is equal to the TOC emission rate times 0.32.

Emissions of VOCs (TOCs) from the asphalt cement storage tanks were determined with EPA’s TANK 4.0.9d program and the procedures found in EPA’s “Emission Factor Documentation for AP-42 Section 11.1 (12/2000) Section 4.4.5” for input to the TANK program.

AP-42 Section 11.1 Table 11.1-3, -4, -7, -8, and -14 Controlled Emission Factors:

Process Unit	Pollutant	Emission Factor (lbs/ton)
Drum Mixer	NO_X	0.055
	CO	0.13
	SO_2	0.058
	VOC	0.032
	TOC	0.044
	PM	0.033
	PM_{10}	0.023
	$PM_{2.5}$	0.023
	CO_2	33.0
Silo Filling	CO	0.002210012
	TOC	0.022824716
	PM	0.000807515
	PM_{10}	0.000807515
	$PM_{2.5}$	0.000807515
Plant Loadout	CO	0.002527022
	TOC	0.007789387
	PM	0.000819549
	PM_{10}	0.000819549
	$PM_{2.5}$	0.000819549
Yard	CO	0.000352
	TOC	0.0011

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:

$$\text{Emission Rate (tons/year)} = \frac{\text{Emission Rate (lbs/hour)} * \text{Operating Hour (hrs/year)}}{\text{2000 lbs/ton}}$$

Table 6-6: Controlled Hot Mix Plant Emission Rates

Process Unit Number	Process Unit Description	Pollutant	Average Hourly Process Rate (tons/hour)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
14	Asphalt Drum Dryer/Mixer	NO_X	400	22.00	26.49
		CO	400	52.00	62.61
		SO_2	400	23.20	27.93
		VOC	400	12.80	15.41
		PM	400	13.20	15.89
		PM_{10}	400	9.20	11.08
		$PM_{2.5}$	400	9.20	11.08
		CO_2	400	13200	15893
15	Silo Filling (Drum Mixer Unloading)	CO	400	0.88	1.06
		TOC	400	9.13	10.99
		PM	400	0.32	0.39
		PM_{10}	400	0.32	0.39
		$PM_{2.5}$	400	0.32	0.39
16	Plant Loadout (Asphalt Silo Unloading)	CO	400	1.01	1.22
		TOC	400	3.12	3.75
		PM	400	0.33	0.39
		PM_{10}	400	0.33	0.39
		$PM_{2.5}$	400	0.33	0.39
20	Asphalt Cement Storage Tanks (2)	TOC	30,000 gallons each	0.028	0.12
YARD	HMA YARD	TOC	400	0.44	0.53
		CO	400	0.14	0.17

Diesel-Fired Asphalt Heater

One diesel-fired asphalt heater (19) heats the asphalt oil before it is mixed with the aggregate in the drum dryer/mixer. The unit is rated at 1,200,000 Btu/hr. The estimated hourly diesel combusted is 11 gal/hr. Emissions of nitrogen oxides (NO_X), carbon monoxides (CO), sulfur dioxide (SO_2), hydrocarbons (VOC) and particulate (PM) are estimated using AP-42 Section 1.3 (9/98). Sulfur content of diesel will not exceed 0.05%. No controls are proposed for the fuel asphalt heater. 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 7272 hours per year.

AP-42 Emission Factors: Section 1.4

Diesel Emission Factors

Pollutant	Emission Factor
Nitrogen Oxides	20 lbs/1000 gallons
Carbon Monoxides	5.00 lbs/1000 gallons
Particulate	0.34 lbs/1000 gallons
Hydrocarbons	142S lbs/1000 gallons S = %sulfur
Sulfur Dioxides	2.00 lbs/1000 gallons
Carbon Dioxide	73.96 kg CO_2 per mmBTU

The following equation was used to calculate the hourly emission rate for asphalt heater pollutant (NO_X, CO, VOC, PM):

Emission Rate (lbs/hr) = EF (lbs/1000 gal) * fuel usage (gal/hr)

The following equation was used to calculate the hourly emission rate for asphalt heater pollutant (SO_2):

Emission Rate (lbs/hr) = 142 * Sulfur Content (0.05%) * fuel usage (9.4 gal/hr) / 1000 gal/hr

The following equation was used to calculate the hourly emission rate for asphalt heater pollutant (CO_2):

Emission Rate (lbs/hr) = 73.96 kg * fuel usage (120000 BTU) / 1000000 BTU * 2.20462 lbs/kg

The following equation was used to calculate the annual emission rate for asphalt heater pollutant (NO_X, CO, VOC, PM, SO_2, CO_2):

$$\text{Emission Rate (tons/year)} = \frac{\text{Emission Rate (lbs/hour) * Operating Hour (hrs/year)}}{\text{2000 lbs/ton}}$$

Table 6-7: Pre-Controlled Combustion Emission Rates for Asphalt Heater

Process Unit Number	Pollutant	Fuel Usage (gal/hr)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
19	NO_X	11	0.22	0.96
	CO	11	0.055	0.24
	VOC	11	0.0037	0.016
	SO_2	11	0.078	0.34
	PM	11	0.022	0.096
	CO_2	11	196.3	860

Table 6-8: Controlled Combustion Emission Rates for Asphalt Heater

Process Unit Number	Pollutant	Fuel Usage (scf/hr)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
19	NO_X	11	0.22	0.80
	CO	11	0.055	0.20
	VOC	11	0.0037	0.014
	SO_2	11	0.078	0.28
	PM	11	0.022	0.080
	CO_2	11	196.3	714

Estimates for 1430 hp HMA Plant Main Diesel-Fired Engine (NO_X, CO, SO_2, VOC, PM, and CO_2)

A 1430 horsepower (hp), 1000 kilowatt (kW) engine (Unit 17) provides power to the HMA plant. Emission rates for NO_X, and CO are based on stack test with a 50% safety factor. PM and VOC emission factors are based on EPA AP-42 Section 3.4. Sulfur dioxide (SO_2) emissions are estimated based on sulfur content of diesel fuel, not to exceed 0.05% fuel content and a fuel usage rate of 73.6 gal/hr. CO_2 emission rates are found in AP-42 Section 3.3. Uncontrolled annual emissions in tons per year (tpy) were calculated assuming daylight operation of 8760 hours per year. Controlled annual emissions in tons per year (tpy) were calculated assuming operation of 4380 hours per year.

<u>Stack Test:</u>

Pollutant	Stack Test + 50% (lbs/hr)
Nitrogen Oxide	10.35
Carbon Monoxides	1.94

<u>AP-42 Section 3.4:</u>

Pollutant	Emission Factor (lbs/hp-hr)
Particulate	0.0007
Hydrocarbons	0.00071

Sulfur dioxide emission rate was calculated using the fuel consumption rate for this engine of 73.6 gallons per hour, a fuel density of 7.1 pounds per gallon, a fuel sulfur content of 500 PPM, 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

$$\text{Emission Rate (lbs/hr)} = \frac{73.6\ \text{gallons}}{\text{hr}} \left| \frac{7.1\ \text{lbs}}{\text{gallon}} \right| \frac{0.0005\ \text{lbs Sulfur}}{\text{lbs of fuel}} \left| \frac{2\ \text{lbs Sulfur Dioxide}}{1\ \text{lb Sulfur}} \right.$$

Emission Rate (lbs/hr) = 0.52 lbs/hr

Carbon Dioxide emissions were estimated using AP-42 Table 3.3-1 emission factor of 1.15 lbs/hp-hr.

The following equation was used to calculate the annual emission rate for each engine pollutant:

$$\text{Emission Rate (tons/year)} = \frac{\text{Emission Rate (lbs/hour)} * \text{Operating Hour (hrs/year)}}{2000\ \text{lbs/ton}}$$

Table 6-9: Pre-Controlled Combustion Emission Rates

Process Unit Number	Pollutant	Engine Rating (hp)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
17	NO_X	1430	10.35	45.33
	CO	1430	1.94	8.48
	SO_2	1430	0.52	2.29
	VOC	1430	1.01	4.42
	PM	1430	1.00	4.38
	PM_{10}	1430	1.00	4.38
	$PM_{2.5}$	1430	1.00	4.38
	CO_2	1430	1645	7203

Table 6-10: Controlled Combustion Emission Rates

Process Unit Number	Pollutant	Engine Rating (hp)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
17	NO_X	1430	10.35	22.67
	CO	1430	1.94	4.24
	SO_2	1430	0.52	1.14
	VOC	1430	1.01	2.21
	PM	1430	1.00	2.19
	PM_{10}	1430	1.00	2.19
	$PM_{2.5}$	1430	1.00	2.19
	CO_2	1430	1645	3601

Estimates for 153 hp HMA Plant Standby Diesel-Fired Engine (NO_X, CO, SO_2, VOC, PM, and CO_2)

A 153 horsepower (hp), 114 kilowatt (kW) engine (Unit 18) provides standby power to the HMA plant. Emission rates for NOx, CO, PM and NMHC (VOC) are based on EPA AP-42 Tier 4f emission factors. Sulfur dioxide (SO_2) emissions are estimated based on sulfur content of diesel fuel, not to exceed 0.0015% fuel content and a fuel usage rate of 8.3 gal/hr. CO_2 emission rates are found in AP-42 Section 3.3. Uncontrolled annual emissions in tons per year (tpy) were calculated assuming daylight operation of 8760 hours per year. Controlled annual emissions in tons per year (tpy) were calculated assuming operation of 4380 hours per year.

EPA Tier 4f:

Pollutant	Emission Factor (g/kW-hr)
Nitrogen Oxide	0.40
Carbon Monoxides	5.00
Particulate	0.03
Hydrocarbons	0.19

Sulfur dioxide emission rate was calculated using the fuel consumption rate for this engine of 8.3 gallons per hour, a fuel density of 7.1 pounds per gallon, a fuel sulfur content of 15 PPM, 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

$$\text{Emission Rate (lbs/hr)} = \frac{8.3\text{ gallons}}{\text{hr}} \left| \frac{7.1\text{ lbs}}{\text{gallon}} \right| \frac{0.000015\text{ lbs Sulfur}}{\text{lbs of fuel}} \left| \frac{2\text{ lbs Sulfur Dioxide}}{1\text{ lb Sulfur}} \right.$$

Emission Rate (lbs/hr) = 0.0018 lbs/hr

Carbon Dioxide emissions were estimated using AP-42 Table 3.3-1 emission factor of 1.15 lbs/hp-hr.

The following equation was used to calculate the annual emission rate for each engine pollutant:

$$\text{Emission Rate (tons/year)} = \frac{\text{Emission Rate (lbs/hour) * Operating Hour (hrs/year)}}{\text{2000 lbs/ton}}$$

Table 6-11: Pre-Controlled Combustion Emission Rates

Process Unit Number	Pollutant	Engine Rating (hp)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
18	NO_X	153	0.10	0.44
	CO	153	1.26	5.50
	SO_2	153	0.0018	0.0077
	VOC	153	0.048	0.21
	PM	153	0.0075	0.033
	PM_{10}	153	0.0075	0.033
	$PM_{2.5}$	153	0.0075	0.033
	CO_2	153	176	771

Table 6-12: Controlled Combustion Emission Rates

Process Unit Number	Pollutant	Engine Rating (hp)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
18	NO_X	153	0.10	0.22
	CO	153	1.26	2.75
	SO_2	153	0.0018	0.0039
	VOC	153	0.048	0.10
	PM	153	0.0075	0.017
	PM_{10}	153	0.0075	0.017
	$PM_{2.5}$	153	0.0075	0.017
	CO_2	153	176	385

Table 6-13 Summary of Uncontrolled NOx, CO, SO_2, and PM HMA Emission Rates

Uncontrolled Emission Totals															
Unit #	Description	NOx		CO		SO_2		VOC		PM		PM_{10}		$PM_{2.5}$	
		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
AGGPILE	Cold Aggregate/RAP Storage Pile	-	-	-	-	-	-	-	-	1.36	3.50	0.64	1.65	0.10	0.25
1	Feed Bin Loading	-	-	-	-	-	-	-	-	1.25	3.22	0.59	1.52	0.090	0.23
2	Feed Bin Unloading	-	-	-	-	-	-	-	-	0.57	2.50	0.21	0.92	0.032	0.14
3	Scalping Screen	-	-	-	-	-	-	-	-	4.75	20.8	1.65	7.24	0.25	1.10
4	Scalping Screen Unloading	-	-	-	-	-	-	-	-	0.57	2.50	0.21	0.92	0.032	0.14
5	Pug Mill Load	-	-	-	-	-	-	-	-	0.59	2.58	0.22	0.94	0.033	0.15
6	Pug Mill Unload	-	-	-	-	-	-	-	-	0.59	2.58	0.22	0.94	0.033	0.15
7	Conveyor Transfer to Slinger Conveyor	-	-	-	-	-	-	-	-	0.59	2.58	0.22	0.94	0.033	0.15
8	RAP Bin Loading	-	-	-	-	-	-	-	-	0.11	0.27	0.051	0.13	0.0077	0.020
9	RAP Bin Unloading	-	-	-	-	-	-	-	-	0.16	0.71	0.059	0.26	0.0092	0.040
10	RAP Screen	-	-	-	-	-	-	-	-	1.35	5.9	0.47	2.06	0.071	0.31
11	RAP Screen Unloading	-	-	-	-	-	-	-	-	0.16	0.71	0.059	0.26	0.0092	0.040
12	RAP Transfer Conveyor	-	-	-	-	-	-	-	-	0.16	0.71	0.059	0.26	0.0092	0.040
13	Mineral Filler Silo Loading	-	-	-	-	-	-	-	-	0.16	0.71	0.059	0.26	0.0092	0.040
14	Drum Dryer	22.0	96.4	52.0	228	23.2	101.6	12.8	56.1	11200	49056	2600	11388	626	2742
15	Drum Mixer Unloading	-	-	0.88	3.87	-	-	9.13	40.0	0.32	1.41	0.32	1.41	0.32	1.41
16	Asphalt Silo Unloading	-	-	1.01	4.43	-	-	3.12	13.6	0.33	1.44	0.33	1.44	0.33	1.44
17	Main Plant Generator	10.4	45.3	1.94	8.5	0.52	2.29	1.01	4.42	1.00	4.38	1.00	4.38	1.00	4.38
18	Standby Generator	0.10	0.44	1.26	5.50	0.0018	0.0077	0.048	0.21	0.0075	0.033	0.0075	0.033	0.0075	0.033

Table 6-13 Summary of Uncontrolled NOx, CO, SO_2, and PM HMA Emission Rates

Uncontrolled Emission Totals															
Unit #	Description	NOx		CO		SO_2		VOC		PM		PM_{10}		$PM_{2.5}$	
		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
19	Asphalt Heater	0.22	0.96	0.055	0.24	0.078	0.34	0.0037	0.016	0.022	0.096	0.022	0.096	0.022	0.096
20	Asphalt Cement Storage Tanks (2)	-	-	-	-	-	-	0.028	0.12	-	-	-	-	-	-
TRCK	Haul Road Traffic	-	-	-	-	-	-	-	-	210.9	746.6	53.8	190.3	5.38	19.03
YARD	HMA Yard	-	-	0.14	0.62	-	-	0.44	1.93	-	-	-	-	-	-
	Total	**32.7**	**143**	**57.3**	**251**	**23.8**	**104**	**26.6**	**116**	**11443**	**49878**	**2672**	**11616**	**636**	**2774**

Table 6-14 Summary of Allowable NOx, CO, SO_2, and PM HMA Emission Rates

Uncontrolled Emission Totals															
Unit #	Description	NOx		CO		SO_2		VOC		PM		PM_{10}		$PM_{2.5}$	
		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
AGGPILE	Cold Aggregate/RAP Storage Pile	-	-	-	-	-	-	-	-	1.36	1.80	0.64	0.85	0.10	0.13
1	Feed Bin Loading	-	-	-	-	-	-	-	-	1.25	0.89	0.59	0.42	0.090	0.063
2	Feed Bin Unloading	-	-	-	-	-	-	-	-	0.027	0.032	0.0087	0.011	0.0025	0.0030
3	Scalping Screen	-	-	-	-	-	-	-	-	0.42	0.50	0.14	0.17	0.010	0.011
4	Scalping Screen Unloading	-	-	-	-	-	-	-	-	0.027	0.032	0.0087	0.011	0.0025	0.0030
5	Pug Mill Load	-	-	-	-	-	-	-	-	0.027	0.033	0.0090	0.011	0.0025	0.0031
6	Pug Mill Unload	-	-	-	-	-	-	-	-	0.027	0.033	0.0090	0.011	0.0025	0.0031
7	Conveyor Transfer to Slinger Conveyor	-	-	-	-	-	-	-	-	0.027	0.033	0.0090	0.011	0.0025	0.0031
8	RAP Bin Loading	-	-	-	-	-	-	-	-	0.11	0.076	0.051	0.036	0.0077	0.0054
9	RAP Bin Unloading	-	-	-	-	-	-	-	-	0.16	0.20	0.059	0.072	0.0092	0.011
10	RAP Screen	-	-	-	-	-	-	-	-	1.35	1.63	0.47	0.57	0.071	0.086
11	RAP Screen Unloading	-	-	-	-	-	-	-	-	0.16	0.20	0.059	0.072	0.0092	0.011
12	RAP Transfer Conveyor	-	-	-	-	-	-	-	-	0.16	0.20	0.059	0.072	0.0092	0.011
13	Mineral Filler Silo Loading	-	-	-	-	-	-	-	-	0.16	0.20	0.059	0.072	0.0092	0.011
14	Drum Dryer	22.0	26.5	52.0	62.6	23.2	27.9	12.8	15.4	13.2	15.9	9.20	11.1	9.20	11.1
15	Drum Mixer Unloading	-	-	0.88	1.06	-	-	9.13	10.99	0.32	0.39	0.32	0.39	0.32	0.39
16	Asphalt Silo Unloading	-	-	1.01	1.22	-	-	3.12	3.75	0.33	0.39	0.33	0.39	0.33	0.39
17	Main Plant Generator	10.4	22.7	1.94	4.24	0.52	1.14	1.01	2.21	1.00	2.19	1.00	2.19	1.00	2.19
18	Standby Generator	0.10	0.22	1.26	2.75	0.0018	0.0039	0.048	0.105	0.0075	0.017	0.0075	0.017	0.0075	0.017

Table 6-14 Summary of Allowable NOx, CO, SO_2, and PM HMA Emission Rates

Uncontrolled Emission Totals															
Unit #	Description	NOx		CO		SO_2		VOC		PM		PM_{10}		$PM_{2.5}$	
		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
19	Asphalt Heater	0.22	0.80	0.055	0.20	0.078	0.28	0.0037	0.014	0.022	0.080	0.022	0.080	0.022	0.080
20	Asphalt Cement Storage Tanks (2)	-	-	-	-	-	-	0.028	0.12	-	-	-	-	-	-
TRCK	Haul Road Traffic	-	-	-	-	-	-	-	-	21.09	25.65	5.38	6.54	0.54	0.65
YARD	HMA Yard	-	-	0.14	0.17	-	-	0.44	0.53	-	-	-	-	-	-
Total		**32.7**	**50.2**	**57.3**	**72.2**	**23.8**	**29.4**	**26.6**	**33.1**	**41.4**	**50.5**	**18.6**	**23.1**	**11.77**	**15.16**

Estimates for State Toxic Air Pollutants (Asphalt Fumes)

The Hot Mix Asphalt Plant (HMA) drum dryer/mixer, asphalt silo loading, asphalt silo unloading, yard emissions, and heated asphalt cement storage tank are sources of asphalt fumes listed in the NMED's 20.2.72 NMAC, 502 "Toxic Air Pollutants and Emissions", Table A. Emissions of asphalt fumes from the drum dryer/mixer are based on PM organic condensable emission factors found in AP-42 Section 11.1, Table 11.1-3 (0.012 pounds per ton x 400 tons/hr; 0.012 pounds per ton x 963,200 tons/yr) from the drum dryer/mixer baghouse stack or 4.80 pounds per hour/5.78 tons per year.

Emissions of asphalt fumes from the asphalt silo loading (15), asphalt plant unloading (16), yard (asphalt transported in asphalt trucks-YARD), and hot oil asphalt storage tanks (20) assumed that the emissions of concern from the silo filling, plant loadout, hot oil asphalt storage tanks, and yard asphalt fumes sources are the PAH HAPs plus other semi-volatile HAPs from the particulate (PM) organics and the volatile organic HAPs from the Total Organic Compounds (TOC). These two combined make up asphalt fume emissions from the silo filling, plant loadout, hot oil asphalt storage tanks, and yard sources. Using information found in AP-42 Section 11.1, Tables 11.1-14, 15, and 16 were reviewed and the following emission equations or emission factors were used to estimate asphalt fumes emissions from silo filling, silo unloading, hot oil asphalt storage tanks, and yard.

<u>Drum Loadout</u>
Asphalt Fumes $EF = 0.00036(-V)e^{((0.0251)(T+460)-20.43)}$

<u>Silo Filling</u>
Asphalt Fumes $EF = 0.00078(-V)e^{((0.0251)(T+460)-20.43)}$

<u>Asphalt Storage Tanks</u>
Asphalt Fumes EF = VOC emissions from TANKs * 1.3%

<u>Yard</u>
Asphalt Fumes EF = 0.0000165 lbs/ton of asphalt loaded

Silo filling and plant loadout emission factors were calculated using the default value of –0.5 for asphalt volatility (V) and a tank temperature setting of 350˚ F for HMA mix temperature (T). Inputting these values in to the equations gives you a pound per ton value of 0.0003532 lbs/ton and 0.0001630 lbs/ton or asphalt fumes emission rates of 0.14 pounds/hour/0.17 tons/yr and 0.065 pounds per hour/0.079 tons/yr (400 tph; 963,200 tpy of asphalt production).

Emissions of asphalt fumes from the Yard were based on 1.5 percent of the TOC emission. Yard emission factors are found in AP-42 Section 11.1.2.5. TOC emission factor is 0.0011 lbs/ton of asphalt produced. Asphalt fumes emissions are 0.0000165 lbs/ton of asphalt produced or 0.0066 pounds per hour and 0.0079 tons/yr (400 tph of asphalt production).

Emissions of asphalt fumes from the asphalt cement storage (2) tanks (20) were determined with EPA's TANK 4.0.9d program and the procedures found in EPA's "Emission Factor Documentation for AP-42 Section 11.1 (12/2000) Section 4.4.5" for input to the TANK program. The annual VOC emissions for working and breathing losses from two 30,000 gallon tank were estimated at 244 pounds per year or 0.028 pounds per hour. Based on 1.3 percent of the VOC emissions (0.028 pounds per hour total from both tanks), the asphalt fumes emission rate is 0.00036 pounds per hour and 0.0016 tons/yr.

Total asphalt fumes from the HMA plant is 5.01 pounds per hour and 6.04 tons per year.

Estimates for State Toxic Air Pollutants (Calcium Hydroxide)

A potential mineral filler that will be used is lime (calcium hydroxide). Calcium hydroxide is listed in the NMED's 20.2.72 NMAC, 502 "Toxic Air Pollutants and Emissions", Table A. Controlled PM emissions of lime from the mineral filler silo during loading is 0.18 pounds per hour.

Estimates for Hydrogen Sulfide Pollutants

The Hot Mix Asphalt Plant (HMA) drum dryer/mixer, asphalt silo loading, and asphalt silo unloading are sources of hydrogen sulfide (H_2S) listed as a state regulated ambient air quality standard. Emission factors of H_2S from the drum dryer/mixer, asphalt silo loading, and asphalt silo unloading are based on a 2001 study performed by the North Carolina Division of Air Quality and the city of Salisbury, NC. From the study the H_2S emission factors from these sources are:

Process Unit Number	Process Unit Description	H_2S Emission Factor
14	Drum Dryer/Mixer and Baghouse	0.0000518 lbs/ton
15	Drum Mixer Unloading	0.000001460 lbs/ton
16	Asphalt Silo Unloading	0.000001460 lbs/ton

Table 6-15: Controlled Hot Mix Plant Emission Rates

Process Unit Number	Process Unit Description	Pollutant	Average Hourly Process Rate (tons/hour)	Emission Rate (lbs/hr)	Emission Rate (tons/yr)
14	Drum Dryer/Mixer and Baghouse	H_2S	400	0.021	0.025
15	Drum Mixer Unloading	H_2S	400	0.00058	0.00070
16	Asphalt Silo Unloading	H_2S	400	0.00058	0.00070
			Total H_2S	**0.022**	**0.026**

Estimates for Federal HAPs Air Pollutants

The Hot Mix Asphalt Plant (HMA) drum dryer (14), main plant generator (17), standby generator (18), and asphalt heater (19) are sources of HAPs as it appears in Section 112 (b) of the 1990 CAAA. Emissions of HAPs were determined for the drum mixer using AP-42 Section 11.1 Tables 11.1-10, 11.1-12. Emissions of HAPs were determined for the plant generators using AP-42 Section 3.3 Table 3.3-2; Section 1.3 Table 1.3-10. Emissions of HAPs were determined for the asphalt heater using AP-42 Section 1.4.

The following tables summarize the HAPs emission rates from the drum mixer, main plant generator, standby generator, and asphalt heater. Total combined HAPs emissions from MV 400 TPH Astec HMA Plant is 4.26 pounds per hour and 4.73 tons per year.

Table 6-16: HAPs Emission Rates from the Drum Dryer/Mixer (14)

EPA HAPS Emissions Drum Mixer Hot Mix Asphalt Plant with Fabric Filter

Average Hourly Production Rate:	400	tons per hour
Yearly Production Rate:	963200	tons per year

Type of Fuel:	Waste Fuel Oil
Emission Factors	AP-42 Section 11.1 Tables 11.1-10, 11.1-12

Non-PAH HAPS	CAS#		Emission Factor (lbs/ton)	Emission Rate (lbs/hr)	Emission Rate (ton/yr)
Acetaldehyde	75-07-0		1.3E-03	0.520000	0.626080
Acrolein	107-02-8		2.6E-05	0.010400	0.012522
Benzene	71-43-2		3.9E-04	0.156000	0.187824
Ethylbenzene	100-41-4		2.4E-04	0.096000	0.115584
Formaldehyde	50-00-0		3.1E-03	1.240000	1.492960
Hexane	110-54-3		9.2E-04	0.368000	0.443072
Isooctane	540-84-1		4.0E-05	0.016000	0.019264
Methyl Ethyl Ketone	78-93-3		2.0E-05	0.008000	0.009632
Propionaldehyde	123-38-6		1.3E-04	0.052000	0.062608
Quinone	106-51-4		1.6E-04	0.064000	0.077056
Methyl chorlform	71-55-6		4.8E-05	0.019200	0.023117
Toluene	108-88-3		2.9E-03	1.160000	1.396640
Xylene	1330-20-7		2.0E-04	0.080000	0.096320
		Total Non-PAH HAPS	9.5E-03	3.789600	4.562678

PAH HAPS	CAS#		Emission Factor (lbs/ton)	Emission Rate (lbs/hr)	Emission Rate (ton/yr)
2-Methylnaphthalene	91-57-6		1.7E-04	0.068000	0.081872
Acenaphthene	83-32-9		1.4E-06	0.000560	0.000674
Acenaphthylene	208-96-8		2.2E-05	0.008800	0.010595
Anthracene	120-12-7		3.1E-06	0.001240	0.001493
Benzo(a)anthracene	56-55-3		2.1E-07	0.000084	0.000101
Benzo(a)pyrene	50-32-8		9.8E-09	0.000004	0.000005
Benzo(b)fluoranthene	205-99-2		1.0E-07	0.000040	0.000048
Benzo(b)pyrene	192-97-2		1.1E-07	0.000044	0.000053
Benzo(g,h,l)perylene	191-24-2		4.0E-08	0.000016	0.000019
Benzo(k)fluoranthene	207-08-9		4.1E-08	0.000016	0.000020
Chrysene	218-01-9		1.8E-07	0.000072	0.000087
Fluoranthene	206-44-0		6.1E-07	0.000244	0.000294
Fluorene	86-73-7		1.1E-05	0.004400	0.005298
Indeno(1,2,3-cd)pyrene	193-39-5		7.0E-09	0.000003	0.000003
Naphthalene	91-20-3		6.5E-04	0.260000	0.313040
Perylene	198-55-0		8.8E-09	0.000004	0.000004
Phenanthrene	85-01-8		2.3E-05	0.009200	0.011077
Pyrene	129-00-0		3.0E-06	0.001200	0.001445
		Total PAH HAPS	8.8E-04	0.353927	0.426128

HAPS Metals		Emission Factor (lbs/ton)	Emission Rate (lbs/hr)	Emission Rate (ton/yr)
Arsenic		5.6E-07	0.000224	0.000270
Beryllium		0.0E+00	0.000000	0.000000
Cadmium		4.1E-07	0.000164	0.000197
Chromium		5.5E-06	0.002200	0.002649
Cobalt		2.6E-08	0.000010	0.000013
Hexavalent Chromium		4.5E-07	0.000180	0.000217
Lead		1.5E-05	0.006000	0.007224
Manganese		7.7E-06	0.003080	0.003708
Mercury		2.6E-06	0.001040	0.001252
Nickel		6.3E-05	0.025200	0.030341
Phosphorus		2.8E-05	0.011200	0.013485
Selenium		3.5E-07	0.000140	0.000169
	Total Metals HAPS	1.2E-04	0.049438	0.059524
	Total HAPS		**4.19297**	**5.04833**

Table 6-17: HAPs Emission Rates from the Main Plant Generator (17)

Horsepower Rating:	1430	horsepower	
Fuel Usage:	73.6	gallons/hr	
MMBtu/hr:	9.4208	Btu	(based on 128000 Btu/gallon)
Btu x 10^-12/hr:	9.4208E-06	Btu x10^-12	(based on 128000 Btu/gallon)
Yearly Operating Hours:	4380	hours per year	

Type of Fuel:	Diesel
Emission Factors	AP-42 Section 3.3 and Section 1.3

Non-PAH HAPS	CAS#		Emission Factor (lbs/mmBtu)	Emission Rate (lbs/hr)	Emission Rate (ton/yr)
Acetaldehyde	75-07-0		7.67E-04	0.007226	0.015824
Acrolein	107-02-8		9.25E-05	0.000871	0.001908
Benzene	71-43-2		9.33E-04	0.008790	0.019249
1,3-Butadiene	106-99-0		3.91E-05	0.000368	0.000807
Formaldehyde	50-00-0		1.18E-03	0.011117	0.024345
Propylene	115-07-1		2.58E-03	0.024306	0.053229
Toluene	108-88-3		4.09E-04	0.003853	0.008438
Xylene	1330-20-7		2.85E-04	0.002685	0.005880
		Total Non-PAH HAPS	6.29E-03	0.059215	0.129682

PAH HAPS	CAS#		Emission Factor (lbs/mmBtu)	Emission Rate (lbs/hr)	Emission Rate (ton/yr)
Acenaphthene	83-32-9		1.42E-06	0.000013	0.000029
Acenaphthylene	208-96-8		5.06E-06	0.000048	0.000104
Anthracene	120-12-7		1.87E-06	0.000018	0.000039
Benzo(a)anthracene	56-55-3		1.68E-06	0.000016	0.000035
Benzo(a)pyrene	50-32-8		1.88E-07	0.000002	0.000004
Benzo(b)fluoranthene	205-99-2		9.91E-08	0.000001	0.000002
Benzo(a)pyrene	192-97-2		1.55E-07	0.000001	0.000003
Benzo(g,h,I)perylene	191-24-2		4.89E-07	0.000005	0.000010
Benzo(k)fluoranthene	207-08-9		1.55E-07	0.000001	0.000003
Dibenz(a,h)anthracene			5.83E-07	0.000005	0.000012
Chrysene	218-01-9		3.53E-07	0.000003	0.000007
Fluoranthene	206-44-0		7.61E-06	0.000072	0.000157
Fluorene	86-73-7		2.92E-05	0.000275	0.000602
Indeno(1,2,3-cd)pyrene	193-39-5		3.75E-07	0.000004	0.000008
Naphthalene	91-20-3		8.48E-05	0.000799	0.001750
Phenanthrene	85-01-8		2.94E-05	0.000277	0.000607
Pyrene	129-00-0		4.78E-06	0.000045	0.000099
		Total PAH HAPS	1.68E-04	0.001585	0.003471

HAPS Metals		**Emission Factor (lbs/Btu^12)**	**Emission Rate (lbs/hr)**	**Emission Rate (ton/yr)**
Arsenic		4	0.000038	0.000083
Beryllium		3	0.000028	0.000062
Cadmium		3	0.000028	0.000062
Chromium		3	0.000028	0.000062
Lead		9	0.000085	0.000186
Manganese		6	0.000057	0.000124
Mercury		3	0.000028	0.000062
Nickel		3	0.000028	0.000062
Selenium		15	0.000141	0.000309
	Total Metals HAPS	49	0.000462	0.001011
	Total HAPS		**0.06126**	**0.01036**

Table 6-18: HAPs Emission Rates from the Standby Plant Generator (18)

Horsepower Rating:	114	horsepower	
Fuel Usage:	8.3	gallons/hr	
MMBtu/hr:	1.0624	Btu	(based on 128000 Btu/gallon)
Btu x 10^-12/hr:	1.0624E-06	Btu x10^-12	(based on 128000 Btu/gallon)
Yearly Operating Hours:	4380	hours per year	

Type of Fuel:	Diesel
Emission Factors	AP-42 Section 3.3 and Section 1.3

Non-PAH HAPS	CAS#		Emission Factor (lbs/mmBtu)	Emission Rate (lbs/hr)	Emission Rate (ton/yr)
Acetaldehyde	75-07-0		7.67E-04	0.000815	0.001785
Acrolein	107-02-8		9.25E-05	0.000098	0.000215
Benzene	71-43-2		9.33E-04	0.000991	0.002171
1,3-Butadiene	106-99-0		3.91E-05	0.000042	0.000091
Formaldehyde	50-00-0		1.18E-03	0.001254	0.002745
Propylene	115-07-1		2.58E-03	0.002741	0.006003
Toluene	108-88-3		4.09E-04	0.000435	0.000952
Xylene	1330-20-7		2.85E-04	0.000303	0.000663
		Total Non-PAH HAPS	6.29E-03	0.006678	0.014624

PAH HAPS	CAS#		Emission Factor (lbs/mmBtu)	Emission Rate (lbs/hr)	Emission Rate (ton/yr)
Acenaphthene	83-32-9		1.42E-06	0.000002	0.000003
Acenaphthylene	208-96-8		5.06E-06	0.000005	0.000012
Anthracene	120-12-7		1.87E-06	0.000002	0.000004
Benzo(a)anthracene	56-55-3		1.68E-06	0.000002	0.000004
Benzo(a)pyrene	50-32-8		1.88E-07	0.000000	0.000000
Benzo(b)fluoranthene	205-99-2		9.91E-08	0.000000	0.000000
Benzo(a)pyrene	192-97-2		1.55E-07	0.000000	0.000000
Benzo(g,h,I)perylene	191-24-2		4.89E-07	0.000001	0.000001
Benzo(k)fluoranthene	207-08-9		1.55E-07	0.000000	0.000000
Dibenz(a,h)anthracene			5.83E-07	0.000001	0.000001
Chrysene	218-01-9		3.53E-07	0.000000	0.000001
Fluoranthene	206-44-0		7.61E-06	0.000008	0.000018
Fluorene	86-73-7		2.92E-05	0.000031	0.000068
Indeno(1,2,3-cd)pyrene	193-39-5		3.75E-07	0.000000	0.000001
Naphthalene	91-20-3		8.48E-05	0.000090	0.000197
Phenanthrene	85-01-8		2.94E-05	0.000031	0.000068
Pyrene	129-00-0		4.78E-06	0.000005	0.000011
		Total PAH HAPS	1.68E-04	0.000179	0.000391

HAPS Metals		**Emission Factor (lbs/Btu^12)**	**Emission Rate (lbs/hr)**	**Emission Rate (ton/yr)**
Arsenic		4	0.000004	0.000009
Beryllium		3	0.000003	0.000007
Cadmium		3	0.000003	0.000007
Chromium		3	0.000003	0.000007
Lead		9	0.000010	0.000021
Manganese		6	0.000006	0.000014
Mercury		3	0.000003	0.000007
Nickel		3	0.000003	0.000007
Selenium		15	0.000016	0.000035
	Total Metals HAPS	49	0.000052	0.000114
	Total HAPS		**0.00691**	**0.00117**

Table 6-19: HAPs Emission Rates from the Asphalt Heater (19)

Btu Rating	1.2	mmBtu/hr	(based on 128000 Btu/gallon)
Fuel Usage:	11	gallons/hr	
Btu x 10^-12/hr:	0.0000012	Btu x10^-12	(based on 128000 Btu/gallon)
Yearly Operating Hours:	7272	hours per year	

Type of Fuel:	Diesel
Emission Factors	AP-42 Section 1.3

Organic Compounds	CAS#		Emission Factor (lbs/10^3 gal)	Emission Rate (lbs/hr)	Emission Rate (ton/yr)
Acenaphthene	83-32-9		2.11E-05	0.000000	0.000001
Acenaphthylene	208-96-8		2.53E-07	0.000000	0.000000
Anthracene	120-12-7		1.22E-06	0.000000	0.000000
Benzene	71-43-2		2.14E-04	0.000002	0.000009
Benzo(a)anthracene	56-55-3		4.01E-06	0.000000	0.000000
Benzo(b,k)fluoranthene	205-99-2		1.48E-06	0.000000	0.000000
Benzo(g,h,I)perylene	191-24-2		2.26E-06	0.000000	0.000000
Chrysene	218-01-9		2.38E-06	0.000000	0.000000
Dibenz(a,h)anthracene			1.67E-06	0.000000	0.000000
Ethylbenzene	100-41-4		6.36E-05	0.000001	0.000003
Fluoranthene	206-44-0		4.84E-06	0.000000	0.000000
Fluorene	86-73-7		4.47E-06	0.000000	0.000000
Formaldehyde	50-00-0		6.10E-02	0.000671	0.002440
Indeno(1,2,3-cd)pyrene	193-39-5		2.14E-06	0.000000	0.000000
Naphthalene	91-20-3		1.13E-03	0.000012	0.000045
Phenanthrene	85-01-8		1.05E-05	0.000000	0.000000
Pyrene	129-00-0		4.25E-06	0.000000	0.000000
Toluene	108-88-3		6.20E-03	0.000068	0.000248
Xylene	1330-20-7		1.09E-04	0.000001	0.000004
		Total Organic Compounds	6.88E-02	0.000757	0.002751

HAPS Metals		Emission Factor (lbs/Btu^12)	Emission Rate (lbs/hr)	Emission Rate (ton/yr)
Arsenic		4	0.000005	0.000017
Beryllium		3	0.000004	0.000013
Cadmium		3	0.000004	0.000013
Chromium		3	0.000004	0.000013
Lead		9	0.000011	0.000039
Manganese		6	0.000007	0.000026
Mercury		3	0.000004	0.000013
Nickel		3	0.000004	0.000013
Selenium		15	0.000018	0.000065
	Total Metals HAPS	49	0.000059	0.000214
	Total HAPS		**0.00157**	**0.00296**

Section 6.a

Green House Gas Emissions

(Submitting under 20.2.70, 20.2.72 20.2.74 NMAC)

Title V (20.2.70 NMAC), Minor NSR (20.2.72 NMAC), and PSD (20.2.74 NMAC) applicants must estimate and report greenhouse gas (GHG) emissions to verify the emission rates reported in the public notice, determine applicability to 40 CFR 60 Subparts, and to evaluate Prevention of Significant Deterioration (PSD) applicability. GHG emissions that are subject to air permit regulations consist of the sum of an aggregate group of these six greenhouse gases: carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

Calculating GHG Emissions:

1. Calculate the ton per year (tpy) GHG mass emissions and GHG CO_2e emissions from your facility.
2. GHG mass emissions are the sum of the total annual tons of greenhouse gases without adjusting with the global warming potentials (GWPs). GHG CO_2e emissions are the sum of the mass emissions of each individual GHG multiplied by its GWP found in Table A-1 in 40 CFR 98 Mandatory Greenhouse Gas Reporting.
3. Emissions from routine or predictable start up, shut down, and maintenance must be included.
4. Report GHG mass and GHG CO_2e emissions in Table 2-P of this application. Emissions are reported in **short** tons per year and represent each emission unit's Potential to Emit (PTE).
5. All Title V major sources, PSD major sources, and all power plants, whether major or not, must calculate and report GHG mass and CO2e emissions for each unit in Table 2-P.
6. For minor source facilities that are not power plants, are not Title V, and are not PSD there are three options for reporting GHGs in Table 2-P: 1) report GHGs for each individual piece of equipment; 2) report all GHGs from a group of unit types, for example report all combustion source GHGs as a single unit and all venting GHGs as a second separate unit; 3) or check the following X By checking this box, the applicant acknowledges the total CO2e emissions are less than 75,000 tons per year.

Sources for Calculating GHG Emissions:

- Manufacturer's Data
- AP-42 Compilation of Air Pollutant Emission Factors at http://www.epa.gov/ttn/chief/ap42/index.html
- EPA's Internet emission factor database WebFIRE at http://cfpub.epa.gov/webfire/
- 40 CFR 98 Mandatory Green House Gas Reporting except that tons should be reported in short tons rather than in metric tons for the purpose of PSD applicability.
- API Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry. August 2009 or most recent version.
- Sources listed on EPA's NSR Resources for Estimating GHG Emissions at http://www.epa.gov/nsr/clean-air-act-permitting-greenhouse-gases:

Global Warming Potentials (GWP):
Applicants must use the Global Warming Potentials codified in Table A-1 of the most recent version of 40 CFR 98 Mandatory Greenhouse Gas Reporting. The GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to that of one unit mass of CO_2 over a specified time period.

"Greenhouse gas" for the purpose of air permit regulations is defined as the aggregate group of the following six gases: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. **(20.2.70.7 NMAC, 20.2.74.7 NMAC).** You may also find GHGs defined in 40 CFR 86.1818-12(a).

Metric to Short Ton Conversion:
Short tons for GHGs and other regulated pollutants are the standard unit of measure for PSD and title V permitting programs. 40 CFR 98 Mandatory Greenhouse Reporting requires metric tons.
1 metric ton = 1.10231 short tons (per Table A-2 to Subpart A of Part 98 – Units of Measure Conversions)

Section 7

Information Used to Determine Emissions

Information Used to Determine Emissions shall include the following:

- ☒ If manufacturer data are used, include specifications for emissions units and control equipment, including control efficiencies specifications and sufficient engineering data for verification of control equipment operation, including design drawings, test reports, and design parameters that affect normal operation.
- ☒ If test data are used, include a copy of the complete test report. If the test data are for an emissions unit other than the one being permitted, the emission units must be identical. Test data may not be used if any difference in operating conditions of the unit being permitted and the unit represented in the test report significantly effect emission rates.
- ☒ If the most current copy of AP-42 is used, reference the section and date located at the bottom of the page. Include a copy of the page containing the emissions factors, and clearly mark the factors used in the calculations.
- ☐ If an older version of AP-42 is used, include a complete copy of the section.
- ☒ If an EPA document or other material is referenced, include a complete copy.
- ☐ Fuel specifications sheet.
- ☐ If computer models are used to estimate emissions, include an input summary (if available) and a detailed report, and a disk containing the input file(s) used to run the model. For tank-flashing emissions, include a discussion of the method used to estimate tank-flashing emissions, relative thresholds (i.e., permit or major source (NSPS, PSD or Title V)), accuracy of the model, the input and output from simulation models and software, all calculations, documentation of any assumptions used, descriptions of sampling methods and conditions, copies of any lab sample analysis.

A-XXXX-7-AP42S1-3	Asphalt Heater Combustion and HAPs Emission Factors
A-XXXX-7-AP42S1-3	Diesel-Fired Engine HAPs Emission Factors
A-XXXX-7-AP42S3-3	Diesel-Fired Engine HAPs Emission Factors
A-XXXX-7-AP42S11-1	HMA Plant and HAPs Emission Factors
A-XXXX-7-AP42S11-12	Mineral Filler Silo Emission Factors
A-XXXX-7-AP42S11-19-2	Screen, Pugmill, and Transfer Point Emission Factors
A-XXXX-7-AP42S13-2-2	Unpaved Road Emission Factors
A-XXXX-7-AP42S13-2-4	Material Handling Emission Factors
A-XXXX-7-Unit14StackTest	Unit 14: HMA Plant Baghouse PM, NOx & CO Stack Test
A-XXXX-7-Unit17AP42S3-4	Unit 17: HMA Plant Main Engine PM &VOC Emission Factors
A-XXXX-7-Unit17StackTest	Unit 17: HMA Plant Main Engine NOx & CO Stack Test
A-XXXX-7-Unit18Tier4f	Unit 18: HMA Plant Standby Engine
A-XXXX-7-Unit19AsphaltHeater	Unit 19: Asphalt Cement Heater
A-XXXX-7-EPAii03	EPA documents “EIIP – Preferred and Alternative Methods for Estimating Air Emissions from Hot-Mix-Asphalt Plants, Final Report, July 1996, Table 3.2-1 Fugitive Dust – Crushed RAP material”
A-XXXX-7-WindspeedLasCruces	Wind Speed Average 1996-2006
A-XXXX-7-ACTANK1	Unit 20: HMA Plant Asphalt Cement Storage Tank (#1)
A-XXXX-7-ACTANK2	Unit 20: HMA Plant Asphalt Cement Storage Tank (#2)
A-XXXX-7-HMAEI.xls	MSCI HMA Plant Emissions Spreadsheet (Electronic File)
A-XXXX-7-HMARELOCATEEI.xls	MSCI HMA Plant Relocation Emissions Spreadsheet (Electronic File)

1.3 Fuel Oil Combustion

1.3.1 General[1-3]

Two major categories of fuel oil are burned by combustion sources: distillate oils and residual oils. These oils are further distinguished by grade numbers, with Nos. 1 and 2 being distillate oils; Nos. 5 and 6 being residual oils; and No. 4 being either distillate oil or a mixture of distillate and residual oils. No. 6 fuel oil is sometimes referred to as Bunker C. Distillate oils are more volatile and less viscous than residual oils. They have negligible nitrogen and ash contents and usually contain less than 0.3 percent sulfur (by weight). Distillate oils are used mainly in domestic and small commercial applications, and include kerosene and diesel fuels. Being more viscous and less volatile than distillate oils, the heavier residual oils (Nos. 5 and 6) may need to be heated for ease of handling and to facilitate proper atomization. Because residual oils are produced from the residue remaining after the lighter fractions (gasoline, kerosene, and distillate oils) have been removed from the crude oil, they contain significant quantities of ash, nitrogen, and sulfur. Residual oils are used mainly in utility, industrial, and large commercial applications.

1.3.2 Firing Practices[4]

The major boiler configurations for fuel oil-fired combustors are watertube, firetube, cast iron, and tubeless design. Boilers are classified according to design and orientation of heat transfer surfaces, burner configuration, and size. These factors can all strongly influence emissions as well as the potential for controlling emissions.

Watertube boilers are used in a variety of applications ranging from supplying large amounts of process steam to providing space heat for industrial facilities. In a watertube boiler, combustion heat is transferred to water flowing through tubes which line the furnace walls and boiler passes. The tube surfaces in the furnace (which houses the burner flame) absorb heat primarily by radiation from the flames. The tube surfaces in the boiler passes (adjacent to the primary furnace) absorb heat primarily by convective heat transfer.

Firetube boilers are used primarily for heating systems, industrial process steam generators, and portable power boilers. In firetube boilers, the hot combustion gases flow through the tubes while the water being heated circulates outside of the tubes. At high pressures and when subjected to large variations in steam demand, firetube units are more susceptible to structural failure than watertube boilers. This is because the high-pressure steam in firetube units is contained by the boiler walls rather than by multiple small-diameter watertubes, which are inherently stronger. As a consequence, firetube boilers are typically small and are used primarily where boiler loads are relatively constant. Nearly all firetube boilers are sold as packaged units because of their relatively small size.

A cast iron boiler is one in which combustion gases rise through a vertical heat exchanger and out through an exhaust duct. Water in the heat exchanger tubes is heated as it moves upward through the tubes. Cast iron boilers produce low pressure steam or hot water, and generally burn oil or natural gas. They are used primarily in the residential and commercial sectors.

Another type of heat transfer configuration used on smaller boilers is the tubeless design. This design incorporates nested pressure vessels with water in between the shells. Combustion gases are fired into the inner pressure vessel and are then sometimes recirculated outside the second vessel.

Table 1.3-9. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM FUEL OIL COMBUSTION[a]

Organic Compound	Average Emission Factor[b] ($lb/10^3$ Gal)	EMISSION FACTOR RATING
Benzene	2.14E-04	C
Ethylbenzene	6.36E-05[c]	E
Formaldehyde[d]	3.30E-02	C
Naphthalene	1.13E-03	C
1,1,1-Trichloroethane	2.36E-04[c]	E
Toluene	6.20E-03	D
o-Xylene	1.09E-04[c]	E
Acenaphthene	2.11E-05	C
Acenaphthylene	2.53E-07	D
Anthracene	1.22E-06	C
Benz(a)anthracene	4.01E-06	C
Benzo(b,k)fluoranthene	1.48E-06	C
Benzo(g,h,i)perylene	2.26E-06	C
Chrysene	2.38E-06	C
Dibenzo(a,h) anthracene	1.67E-06	D
Fluoranthene	4.84E-06	C
Fluorene	4.47E-06	C
Indo(1,2,3-cd)pyrene	2.14E-06	C
Phenanthrene	1.05E-05	C
Pyrene	4.25E-06	C
OCDD	3.10E-09[c]	E

[a] Data are for residual oil fired boilers, Source Classification Codes (SCCs) 1-01-004-01/04.
[b] References 64-72. To convert from $lb/10^3$ gal to $kg/10^3$ L, multiply by 0.12.
[c] Based on data from one source test (Reference 67).
[d] The formaldehyde number presented here is based only on data from utilities using No. 6 oil. The number presented in Table 1.3-7 is based on utility, commercial, and industrial boilers.

Table 1.3-10. EMISSION FACTORS FOR TRACE ELEMENTS FROM DISTILLATE FUEL OIL COMBUSTION SOURCES[a]

EMISSION FACTOR RATING: E

Firing Configuration (SCC)	Emission Factor (lb/10^{12} Btu)										
	As	Be	Cd	Cr	Cu	Pb	Hg	Mn	Ni	Se	Zn
Distillate oil fired (1-01-005-01, 1-02-005-01, 1-03-005-01)	4	3	3	3	6	9	3	6	3	15	4

[a] Data are for distillate oil fired boilers, SCC codes 1-01-005-01, 1-02-005-01, and 1-03-005-01. References 29-32, 40-44 and 83. To convert from lb/10^{12} Btu to pg/J, multiply by 0.43.

Table 1.3-11. EMISSION FACTORS FOR METALS FROM UNCONTROLLED NO. 6 FUEL OIL COMBUSTION[a]

Metal	Average Emission Factor[b, d] ($lb/10^3$ Gal)	EMISSION FACTOR RATING
Antimony	5.25E-03[c]	E
Arsenic	1.32E-03	C
Barium	2.57E-03	D
Beryllium	2.78E-05	C
Cadmium	3.98E-04	C
Chloride	3.47E-01	D
Chromium	8.45E-04	C
Chromium VI	2.48E-04	C
Cobalt	6.02E-03	D
Copper	1.76E-03	C
Fluoride	3.73E-02	D
Lead	1.51E-03	C
Manganese	3.00E-03	C
Mercury	1.13E-04	C
Molybdenum	7.87E-04	D
Nickel	8.45E-02	C
Phosphorous	9.46E-03	D
Selenium	6.83E-04	C
Vanadium	3.18E-02	D
Zinc	2.91E-02	D

[a] Data are for residual oil fired boilers, Source Classification Codes (SCCs) 1-01-004-01/04.

[b] References 64-72. 18 of 19 sources were uncontrolled and 1 source was controlled with low efficiency ESP. To convert from $lb/10^3$ gal to $kg/10^3$ L, multiply by 0.12.

[c] References 29-32,40-44.

[d] For oil/water mixture, reduce factors in proportion to water content of the fuel (due to dilution). To adjust the listed values for water content, multiply the listed value by 1-decimal fraction of water (ex: For fuel with 9 percent water by volume, multiply by 1-0.9=.91).

Table 3.3-1. EMISSION FACTORS FOR UNCONTROLLED GASOLINE AND DIESEL INDUSTRIAL ENGINES[a]

Pollutant	Gasoline Fuel (SCC 2-02-003-01, 2-03-003-01)		Diesel Fuel (SCC 2-02-001-02, 2-03-001-01)		EMISSION FACTOR RATING
	Emission Factor (lb/hp-hr) (power output)	Emission Factor (lb/MMBtu) (fuel input)	Emission Factor (lb/hp-hr) (power output)	Emission Factor (lb/MMBtu) (fuel input)	
NO_x	0.011	1.63	0.031	4.41	D
CO	0.439	62.7	6.68 E-03	0.95	D
SO_x	5.91 E-04	0.084	2.05 E-03	0.29	D
PM-10[b]	7.21 E-04	0.10	2.20 E-03	0.31	D
CO_2[c]	1.08	154	1.15	164	B
Aldehydes	4.85 E-04	0.07	4.63 E-04	0.07	D
TOC					
Exhaust	0.015	2.10	2.47 E-03	0.35	D
Evaporative	6.61 E-04	0.09	0.00	0.00	E
Crankcase	4.85 E-03	0.69	4.41 E-05	0.01	E
Refueling	1.08 E-03	0.15	0.00	0.00	E

[a] References 2,5-6,9-14. When necessary, an average brake-specific fuel consumption (BSFC) of 7,000 Btu/hp-hr was used to convert from lb/MMBtu to lb/hp-hr. To convert from lb/hp-hr to kg/kw-hr, multiply by 0.608. To convert from lb/MMBtu to ng/J, multiply by 430. SCC = Source Classification Code. TOC = total organic compounds.

[b] PM-10 = particulate matter less than or equal to 10 µm aerodynamic diameter. All particulate is assumed to be ≤ 1 µm in size.

[c] Assumes 99% conversion of carbon in fuel to CO_2 with 87 weight % carbon in diesel, 86 weight % carbon in gasoline, average BSFC of 7,000 Btu/hp-hr, diesel heating value of 19,300 Btu/lb, and gasoline heating value of 20,300 Btu/lb.

11.1 Hot Mix Asphalt Plants

11.1.1 General[1-3,23, 392-394]

Hot mix asphalt (HMA) paving materials are a mixture of size-graded, high quality aggregate (which can include reclaimed asphalt pavement [RAP]), and liquid asphalt cement, which is heated and mixed in measured quantities to produce HMA. Aggregate and RAP (if used) constitute over 92 percent by weight of the total mixture. Aside from the amount and grade of asphalt cement used, mix characteristics are determined by the relative amounts and types of aggregate and RAP used. A certain percentage of fine aggregate (less than 74 micrometers [µm] in physical diameter) is required for the production of good quality HMA.

Hot mix asphalt paving materials can be manufactured by: (1) batch mix plants, (2) continuous mix (mix outside dryer drum) plants, (3) parallel flow drum mix plants, and (4) counterflow drum mix plants. This order of listing generally reflects the chronological order of development and use within the HMA industry.

In 1996, approximately 500 million tons of HMA were produced at the 3,600 (estimated) active asphalt plants in the United States. Of these 3,600 plants, approximately 2,300 are batch plants, 1,000 are parallel flow drum mix plants, and 300 are counterflow drum mix plants. The total 1996 HMA production from batch and drum mix plants is estimated at about 240 million tons and 260 million tons, respectively. About 85 percent of plants being manufactured today are of the counterflow drum mix design, while batch plants and parallel flow drum mix plants account for 10 percent and 5 percent respectively. Continuous mix plants represent a very small fraction of the plants in use ($\leq$0.5 percent) and, therefore, are not discussed further.

An HMA plant can be constructed as a permanent plant, a skid-mounted (easily relocated) plant, or a portable plant. All plants can have RAP processing capabilities. Virtually all plants being manufactured today have RAP processing capability. Most plants have the capability to use either gaseous fuels (natural gas) or fuel oil. However, based upon Department of Energy and limited State inventory information, between 70 and 90 percent of the HMA is produced using natural gas as the fuel to dry and heat the aggregate.

11.1.1.1 Batch Mix Plants –

Figure 11.1-1 shows the batch mix HMA production process. Raw aggregate normally is stockpiled near the production unit. The bulk aggregate moisture content typically stabilizes between 3 to 5 percent by weight.

Processing begins as the aggregate is hauled from the storage piles and is placed in the appropriate hoppers of the cold feed unit. The material is metered from the hoppers onto a conveyer belt and is transported into a rotary dryer (typically gas- or oil-fired). Dryers are equipped with flights designed to shower the aggregate inside the drum to promote drying efficiency.

As the hot aggregate leaves the dryer, it drops into a bucket elevator and is transferred to a set of vibrating screens, where it is classified into as many as four different grades (sizes) and is dropped into individual “hot” bins according to size. At newer facilities, RAP also may be transferred to a separate heated storage bin. To control aggregate size distribution in the final batch mix, the operator opens various hot bins over a weigh hopper until the desired mix and weight are obtained. Concurrent with the aggregate being weighed, liquid asphalt cement is pumped from a heated storage tank to an asphalt bucket, where it is weighed to achieve the desired aggregate-to-asphalt cement ratio in the final mix.

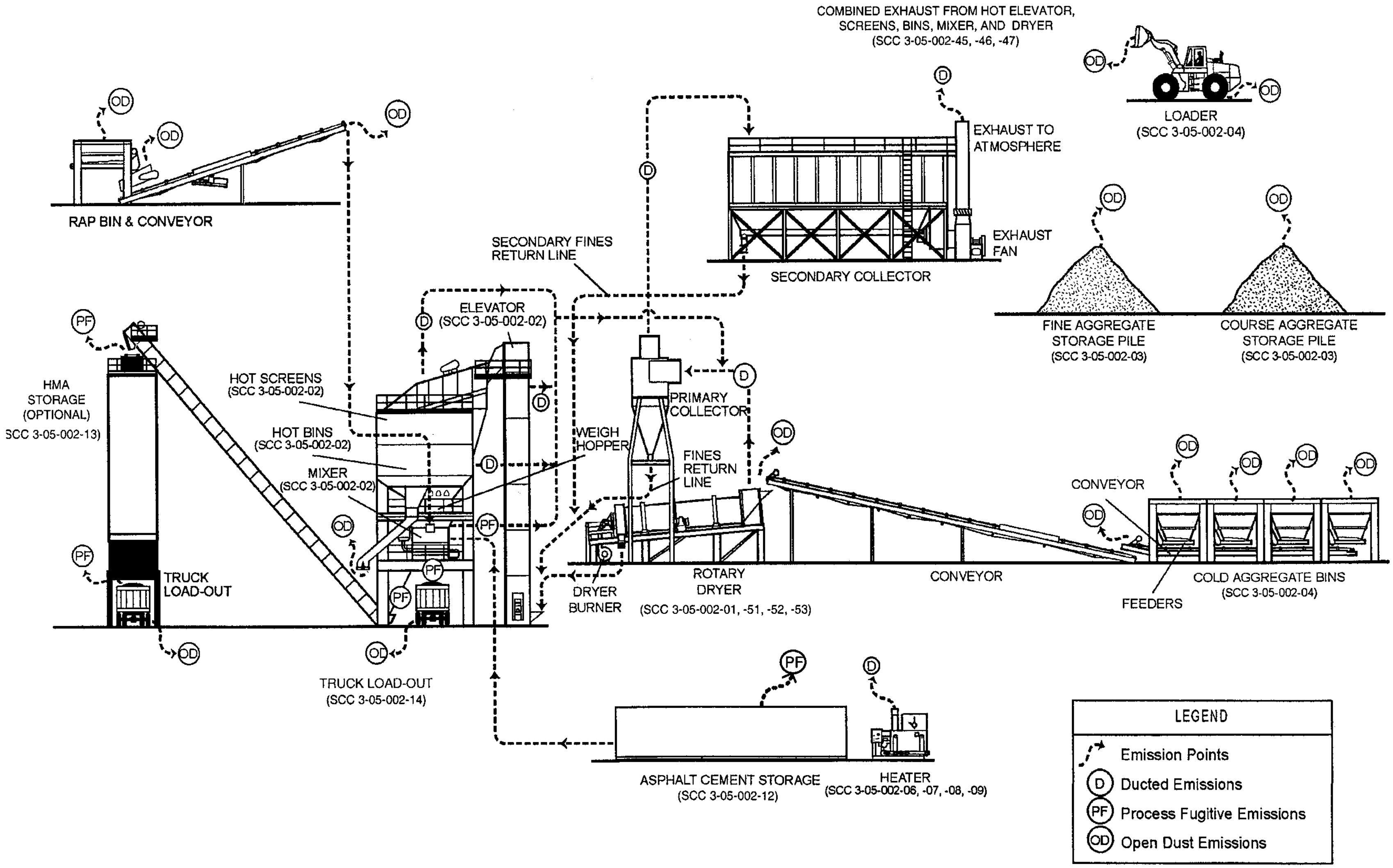

Figure 11.1-1. General process flow diagram for batch mix asphalt plants (source classification codes in parentheses).[3]

The aggregate from the weigh hopper is dropped into the mixer (pug mill) and dry-mixed for 6 to 10 seconds. The liquid asphalt is then dropped into the pug mill where it is mixed for an additional period of time. At older plants, RAP typically is conveyed directly to the pug mill from storage hoppers and combined with the hot aggregate. Total mixing time usually is less than 60 seconds. Then the hot mix is conveyed to a hot storage silo or is dropped directly into a truck and hauled to the job site.

11.1.1.2 Parallel Flow Drum Mix Plants –

Figure 11.1-2 shows the parallel flow drum mix process. This process is a continuous mixing type process, using proportioning cold feed controls for the process materials. The major difference between this process and the batch process is that the dryer is used not only to dry the material but also to mix the heated and dried aggregates with the liquid asphalt cement. Aggregate, which has been proportioned by size gradations, is introduced to the drum at the burner end. As the drum rotates, the aggregates, as well as the combustion products, move toward the other end of the drum in parallel. Liquid asphalt cement flow is controlled by a variable flow pump electronically linked to the new (virgin) aggregate and RAP weigh scales. The asphalt cement is introduced in the mixing zone midway down the drum in a lower temperature zone, along with any RAP and particulate matter (PM) from collectors.

The mixture is discharged at the end of the drum and is conveyed to either a surge bin or HMA storage silos, where it is loaded into transport trucks. The exhaust gases also exit the end of the drum and pass on to the collection system.

Parallel flow drum mixers have an advantage, in that mixing in the discharge end of the drum captures a substantial portion of the aggregate dust, therefore lowering the load on the downstream PM collection equipment. For this reason, most parallel flow drum mixers are followed only by primary collection equipment (usually a baghouse or venturi scrubber). However, because the mixing of aggregate and liquid asphalt cement occurs in the hot combustion product flow, organic emissions (gaseous and liquid aerosol) may be greater than in other asphalt mixing processes. Because data are not available to distinguish significant emissions differences between the two process designs, this effect on emissions cannot be verified.

11.1.1.3 Counterflow Drum Mix Plants –

Figure 11.1-3 shows a counterflow drum mix plant. In this type of plant, the material flow in the drum is opposite or counterflow to the direction of exhaust gases. In addition, the liquid asphalt cement mixing zone is located behind the burner flame zone so as to remove the materials from direct contact with hot exhaust gases.

Liquid asphalt cement flow is controlled by a variable flow pump which is electronically linked to the virgin aggregate and RAP weigh scales. It is injected into the mixing zone along with any RAP and particulate matter from primary and secondary collectors.

Because the liquid asphalt cement, virgin aggregate, and RAP are mixed in a zone removed from the exhaust gas stream, counterflow drum mix plants will likely have organic emissions (gaseous and liquid aerosol) that are lower than parallel flow drum mix plants. However, the available data are insufficient to discern any differences in emissions that result from differences in the two processes. A counterflow drum mix plant can normally process RAP at ratios up to 50 percent with little or no observed effect upon emissions.

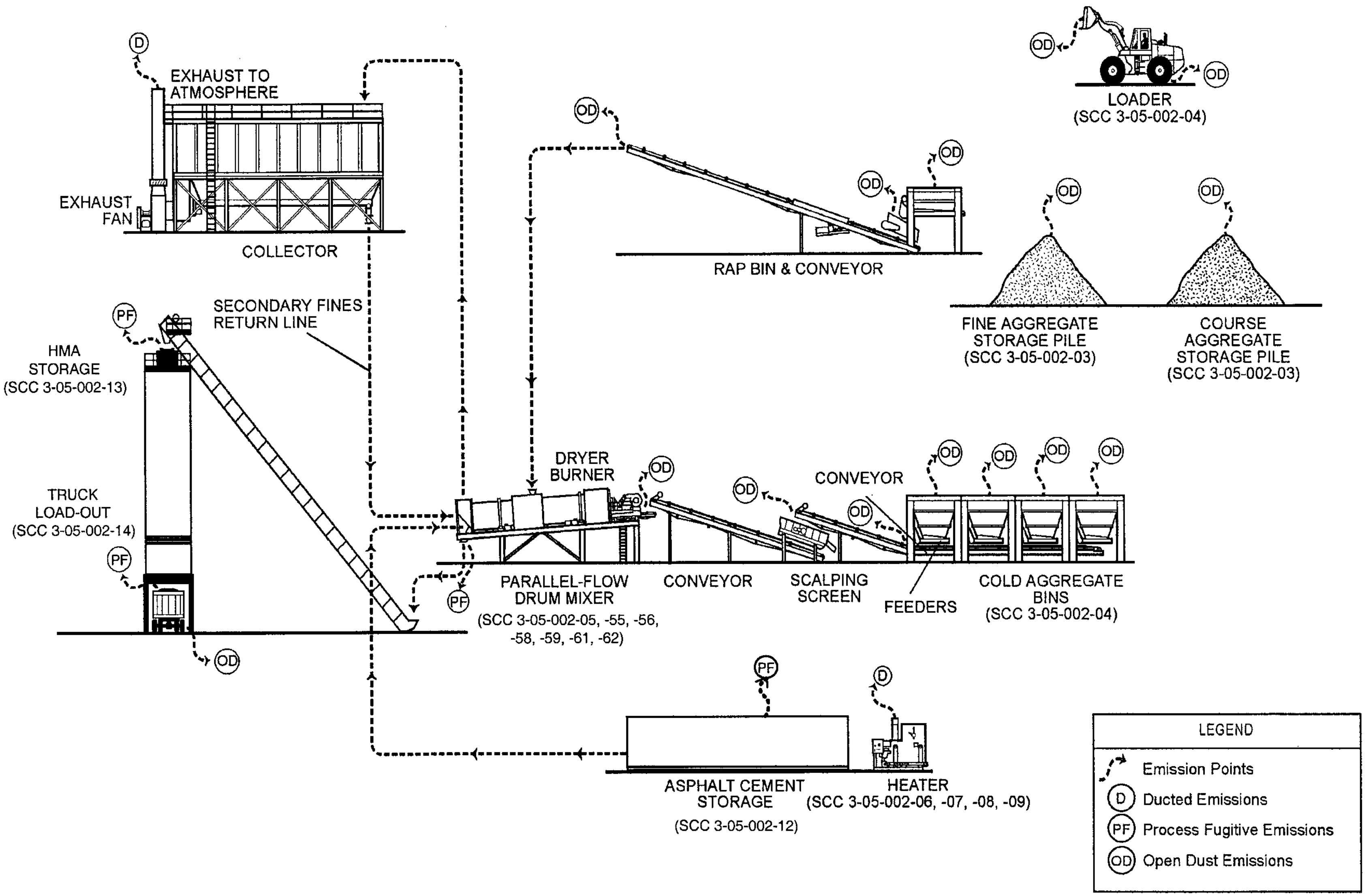

Figure 11.1-2. General process flow diagram for parallel-flow drum mix asphalt plants (source classification codes in parentheses).[3]

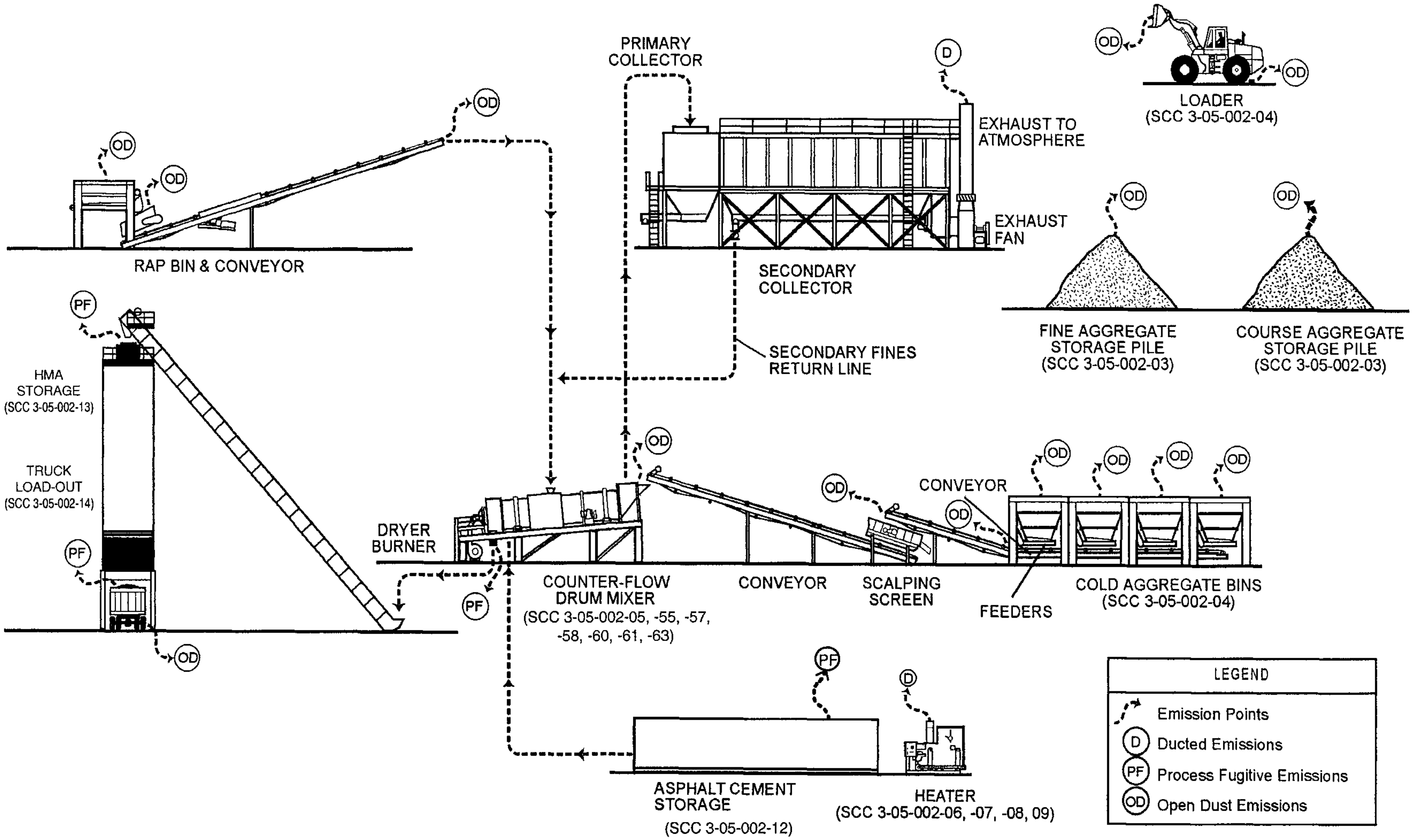

Figure 11.1-3. General process flow diagram for counter-flow drum mix asphalt plants (source classification codes in parentheses).[3]

11.1.1.4 Recycle Processes[393] –

In recent years, the use of RAP has been initiated in the HMA industry. Reclaimed asphalt pavement significantly reduces the amount of virgin rock and asphalt cement needed to produce HMA.

In the reclamation process, old asphalt pavement is removed from the road base. This material is then transported to the plant, and is crushed and screened to the appropriate size for further processing. The paving material is then heated and mixed with new aggregate (if applicable), and the proper amount of new asphalt cement is added to produce HMA that meets the required quality specifications.

11.1.2 Emissions And Controls[2-3,23]

Emissions from HMA plants may be divided into ducted production emissions, pre-production fugitive dust emissions, and other production-related fugitive emissions. Pre-production fugitive dust sources associated with HMA plants include vehicular traffic generating fugitive dust on paved and unpaved roads, aggregate material handling, and other aggregate processing operations. Fugitive dust may range from 0.1 µm to more than 300 µm in aerodynamic diameter. On average, 5 percent of cold aggregate feed is less than 74 µm (minus 200 mesh). Fugitive dust that may escape collection before primary control generally consists of PM with 50 to 70 percent of the total mass less than 74 µm. Uncontrolled PM emission factors for various types of fugitive sources in HMA plants are addressed in Sections 11.19.2, "Crushed Stone Processing", 13.2.1, "Paved Roads", 13.2.2, "Unpaved Roads", 13.2.3, "Heavy Construction Operations", and 13.2.4, "Aggregate Handling and Storage Piles." Production-related fugitive emissions and emissions from ducted production operations are discussed below. Emission points discussed below refer to Figure 11.1-1 for batch mix asphalt plants and to Figures 11.1-2 and 11.1-3 for drum mix plants.

11.1.2.1 Batch Mix Plants –

As with most facilities in the mineral products industry, batch mix HMA plants have two major categories of emissions: ducted sources (those vented to the atmosphere through some type of stack, vent, or pipe), and fugitive sources (those not confined to ducts and vents but emitted directly from the source to the ambient air). Ducted emissions are usually collected and transported by an industrial ventilation system having one or more fans or air movers, eventually to be emitted to the atmosphere through some type of stack. Fugitive emissions result from process and open sources and consist of a combination of gaseous pollutants and PM.

The most significant ducted source of emissions of most pollutants from batch mix HMA plants is the rotary drum dryer. The dryer emissions consist of water (as steam evaporated from the aggregate); PM; products of combustion (carbon dioxide [CO_2], nitrogen oxides [NO_x], and sulfur oxides [SO_x]); carbon monoxide (CO); and small amounts of organic compounds of various species (including volatile organic compounds [VOC], methane [CH_4], and hazardous air pollutants [HAP]). The CO and organic compound emissions result from incomplete combustion of the fuel. It is estimated that between 70 and 90 percent of the energy used at HMA plants is from the combustion of natural gas.

Other potential process sources include the hot-side conveying, classifying, and mixing equipment, which are vented either to the primary dust collector (along with the dryer gas) or to a separate dust collection system. The vents and enclosures that collect emissions from these sources are commonly called "fugitive air" or "scavenger" systems. The scavenger system may or may not have its own separate air mover device, depending on the particular facility. The emissions captured and transported by the scavenger system are mostly aggregate dust, but they may also contain gaseous organic compounds and a fine aerosol of condensed organic particles. This organic aerosol is created by the condensation of vapor into particles during cooling of organic vapors volatilized from the asphalt cement in the mixer (pug mill). The amount of organic aerosol produced depends to a large extent on the temperature of the asphalt cement and aggregate entering the pug mill. Organic vapor and its associated aerosol also are emitted directly to the atmosphere as process fugitives during truck load-out, from the bed of the truck itself during transport to the job site, and from the asphalt storage tank. Both the low molecular weight organic compounds and the higher weight organic aerosol contain small amounts of HAP. The ducted emissions from the heated asphalt storage tanks include gaseous and aerosol organic compounds and combustion products from the tank heater.

The choice of applicable emission controls for PM emissions from the dryer and vent line includes dry mechanical collectors, scrubbers, and fabric filters. Attempts to apply electrostatic precipitators have met with little success. Practically all plants use primary dust collection equipment such as large diameter cyclones, skimmers, or settling chambers. These chambers often are used as classifiers to return collected material to the hot elevator and to combine it with the drier aggregate. To capture remaining PM, the primary collector effluent is ducted to a secondary collection device. Most plants use either a fabric filter or a venturi scrubber for secondary emissions control. As with any combustion process, the design, operation, and maintenance of the burner provides opportunities to minimize emissions of NO_x, CO, and organic compounds.

11.1.2.2 Parallel Flow Drum Mix Plants –

The most significant ducted source of emissions from parallel-flow drum mix plants is the rotary drum dryer. Emissions from the drum consist of water (as steam evaporated from the aggregate); PM; products of combustion; CO; and small amounts of organic compounds of various species (including VOC, CH_4, and HAP). The organic compound and CO emissions result from incomplete combustion of the fuel and from heating and mixing of the liquid asphalt cement inside the drum. Although it has been suggested that the processing of RAP materials at these type plants may increase organic compound emissions because of an increase in mixing zone temperature during processing, the data supporting this hypothesis are very weak. Specifically, although the data show a relationship only between RAP content and condensible organic particulate emissions, 89 percent of the variations in the data were the result of other unknown process variables.

Once the organic compounds cool after discharge from the process stack, some condense to form a fine organic aerosol or “blue smoke” plume. A number of process modifications or restrictions have been introduced to reduce blue smoke, including installation of flame shields, rearrangement of flights inside the drum, adjustments of the asphalt injection point, and other design changes.

11.1.2.3 Counterflow Drum Mix Plants –

The most significant ducted source of emissions from counterflow drum mix plants is the rotary drum dryer. Emissions from the drum consist of water (as steam evaporated from the aggregate); PM; products of combustion; CO; and small amounts of organic compounds of various species (including VOC, CH_4, and HAP). The CO and organic compound emissions result primarily from incomplete combustion of the fuel, and can also be released from the heated asphalt. Liquid asphalt cement, aggregate, and sometimes RAP, are mixed in a zone not in contact with the hot exhaust gas stream. As a result, kiln stack emissions of organic compounds from counterflow drum mix plants may be lower than parallel flow drum mix plants. However, variations in the emissions due to other unknown process variables are more significant. As a result, the emission factors for parallel flow and counterflow drum mix plants are the same.

11.1.2.4 Parallel and Counterflow Drum Mix Plants –

Process fugitive emissions associated with batch plant hot screens, elevators, and the mixer (pug mill) are not present in the drum mix processes. However, there are fugitive PM and VOC emissions from transport and handling of the HMA from the drum mixer to the storage silo and also from the load-out operations to the delivery trucks. Since the drum process is continuous, these plants have surge bins or storage silos. The fugitive dust sources associated with drum mix plants are similar to those of batch mix plants with regard to truck traffic and to aggregate material feed and handling operations.

Table 11.1-1 presents emission factors for filterable PM and PM-10, condensable PM, and total PM for batch mix HMA plants. Particle size data for batch mix HMA plants, based on the control technology used, are shown in Table 11.1-2. Table 11.1-3 presents filterable PM and PM-10, condensable PM, and total PM emission factors for drum mix HMA plants. Particle size data for drum mix HMA plants, based on the control technology used, are shown in Table 11.1-4. Tables 11.1-5 and -6 present emission factors for CO, CO_2, NO_x, sulfur dioxide (SO_2), total organic compounds (TOC), formaldehyde, CH_4, and VOC from batch mix plants. Tables 11.1-7 and -8 present emission factors for CO, CO_2, NO_x, SO_2, TOC, CH_4, VOC, and hydrochloric acid (HCl) from drum mix plants. The emission factors for CO, NO_x, and organic compounds represent normal plant operations without scrutiny of the burner design, operation, and maintenance. Information provided in Reference 390 indicates that attention to burner design, periodic evaluation of burner operation, and appropriate maintenance can reduce these emissions. Table 11.1-9 presents organic pollutant emission factors for batch mix plants. Table 11.1-10 presents organic pollutant emission factors for drum mix plants. Tables 11.1-11 and -12 present metals emission factors for batch and drum mix plants, respectively. Table 11.1-13 presents organic pollutant emission factors for hot (asphalt) oil systems.

11.1.2.5 Fugitive Emissions from Production Operations -

Emission factors for HMA load-out and silo filling operations can be estimated using the data in Tables 11.1-14, -15, and -16. Table 11.1-14 presents predictive emission factor equations for HMA load-out and silo filling operations. Separate equations are presented for total PM, extractable organic PM (as measured by EPA Method 315), TOC, and CO. For example, to estimate total PM emissions from drum mix or batch mix plant load-out operations using an asphalt loss-on-heating of 0.41 percent and temperature of 290°F, the following calculation is made:

$$
\begin{aligned}
EF &= 0.000181 + 0.00141(-V)e^{((0.0251)(290 + 460) - 20.43)} \\
&= 0.000181 + 0.00141(-(-0.41))e^{((0.0251)(290 + 460) - 20.43)} \\
&= 0.000181 + 0.00141(0.41)e^{(-1.605)} \\
&= 0.000181 + 0.00141(0.41)(0.2009) \\
&= 0.000181 + 0.000116 \\
&= 0.00030 \text{ lb total PM/ton of asphalt loaded}
\end{aligned}
$$

Tables 11.1-15 and -16 present speciation profiles for organic particulate-based and volatile particulate-based compounds, respectively. The speciation profile shown in Table 11.1-15 can be applied to the extractable organic PM emission factors estimated by the equations in Table 11.1-14 to estimate emission factors for specific organic PM compounds. The speciation profile presented in Table 11.1-16 can be applied to the TOC emission factors estimated by the equations in Table 11.1-14 to estimate emission factors for specific volatile organic compounds. The derivations of the predictive emission factor equations and the speciation profiles can be found in Reference 1.

For example, to estimate TOC emissions from drum mix plant load-out operations using an asphalt loss-on-heating of 0.41 percent and temperature of 290°F, the following calculation is made:

$$
\begin{aligned}
EF &= 0.0172(-V)e^{((0.0251)(290 + 460) - 20.43)} \\
&= 0.0172(-(-0.41))e^{((0.0251)(290 + 460) - 20.43)} \\
&= 0.0172(0.41)e^{(-1.605)} \\
&= 0.0172(0.41)(0.2009) \\
&= 0.0014 \text{ lb TOC/ton of asphalt loaded}
\end{aligned}
$$

To estimate the benzene emissions from the same operation, use the TOC emission factor calculated above and apply the benzene fraction for load-out emissions from Table 11.1-16:

$$\begin{aligned} EF &= 0.0014\ (0.00052) \\ &= 7.3 \times 10^{-7} \text{ lb benzene/ton of asphalt loaded} \end{aligned}$$

Emissions from asphalt storage tanks can be estimated using the procedures described in AP-42 Section 7.1, Organic Liquid Storage Tanks, and the TANKS software. Site-specific data should be used for storage tank specifications and operating parameters, such as temperature. If site-specific data for Antoine's constants for an average asphalt binder used by the facility are unavailable, the following values for an average liquid asphalt binder can be used:

A = 75,350.06
B = 9.00346

These values should be inserted into the Antoine's equation in the following form:

$$\log_{10} P = \frac{-0.05223A}{T} + B$$

where:

P = vapor pressure, mm Hg
T = absolute temperature, Kelvin

The assumed average liquid molecular weight associated with these Antoine's constants is 1,000 atomic mass units and the average vapor molecular weight is 105. Emission factors estimated using these default values should be assigned a rating of E. Carbon monoxide emissions can be estimated by multiplying the THC emissions calculated by the TANKS program by 0.097 (the ratio of silo filling CO emissions to silo filling TOC emissions).

Vapors from the HMA loaded into transport trucks continue following load-out operations. The TOC emissions for the 8-minute period immediately following load-out (yard emissions) can be estimated using an emission factor of 0.00055 kg/Mg (0.0011 lb/ton) of asphalt loaded. This factor is assigned a rating of E. The derivation of this emission factor is described in Reference 1. Carbon monoxide emissions can be estimated by multiplying the TOC emissions by 0.32 (the ratio of truck load-out CO emissions to truck load-out THC emissions).

11.2.3 Updates Since the Fifth Edition

The Fifth Edition was released in January 1995. Revisions to this section since that date are summarized below. For further detail, consult the background report for this section. This and other documents can be found on the CHIEF Web Site at http://www.epa.gov/ttn/chief/, or by calling the Info CHIEF Help Desk at (919)541-1000.

December 2000

- All emission factors were revised and new factors were added. For selected pollutant emissions, separate factors were developed for distilate oil, No. 6 oil and waste oil fired dryers. Dioxin and Furan emission factors were developed for oil fired drum mix plants. Particulate, VOC and CO factors were developed for silo filling, truck load out and post truck load out operations at batch plants and drum mix plants. Organic species profiles were developed for silo filling, truck load out and post truck load out operations.

March 2004

- The emission factor for formaldehyde for oil fired hot oil heaters was revised. An emission factor for formaldehyde for gas fired hot oil heaters and emission factors for CO and CO_2 for gas and oil fired hot oil heaters were developed. (Table 11.1-13)

Table 11.1-3. PARTICULATE MATTER EMISSION FACTORS FOR DRUM MIX HOT MIX ASPHALT PLANTS[a]

	Filterable PM				Condensable PM[b]				Total PM			
Process	PM[c]	EMISSION FACTOR RATING	PM-10[d]	EMISSION FACTOR RATING	Inorganic	EMISSION FACTOR RATING	Organic	EMISSION FACTOR RATING	PM[e]	EMISSION FACTOR RATING	PM-10[f]	EMISSION FACTOR RATING
Dryer[g] (SCC 3-05-002-05,-55 to -63)												
Uncontrolled	28[h]	D	6.4	D	0.0074[j]	E	0.058[k]	E	28	D	6.5	D
Venturi or wet scrubber	0.026[m]	A	ND	NA	0.0074[n]	A	0.012[p]	A	0.045	A	ND	NA
Fabric filter	0.014[q]	A	0.0039	C	0.0074[n]	A	0.012[p]	A	0.033	A	0.023	C

[a] Factors are lb/ton of product. SCC = Source Classification Code. ND = no data. NA = not applicable. To convert from lb/ton to kg/Mg, multiply by 0.5.
[b] Condensable PM is that PM collected using an EPA Method 202, Method 5 (analysis of "back-half" or impingers), or equivalent sampling train.
[c] Filterable PM is that PM collected on or before the filter of an EPA Method 5 (or equivalent) sampling train.
[d] Particle size data from Reference 23 were used in conjunction with the filterable PM emission factors shown.
[e] Total PM is the sum of filterable PM, condensable inorganic PM, and condensable organic PM.
[f] Total PM-10 is the sum of filterable PM-10, condensable inorganic PM, and condensable organic PM.
[g] Drum mix dryer fired with natural gas, propane, fuel oil, and waste oil. The data indicate that fuel type does not significantly effect PM emissions.
[h] References 31, 36-38, 340.
[j] Because no data are available for uncontrolled condensable inorganic PM, the emission factor is assumed to be equal to the maximum controlled condensable inorganic PM emission factor.
[k] References 36-37.
[m] Reference 1, Table 4-14. Average of data from 36 facilities. Range: 0.0036 to 0.097 lb/ton. Median: 0.020 lb/ton. Standard deviation: 0.022 lb/ton.
[n] Reference 1, Table 4-14. Average of data from 30 facilities. Range: 0.0012 to 0.027 lb/ton. Median: 0.0051 lb/ton. Standard deviation: 0.0063 lb/ton.
[p] Reference 1, Table 4-14. Average of data from 41 facilities. Range: 0.00035 to 0.074 lb/ton. Median: 0.0046 lb/ton. Standard deviation: 0.016 lb/ton.
[q] Reference 1, Table 4-14. Average of data from 155 facilities. Range: 0.00089 to 0.14 lb/ton. Median: 0.010 lb/ton. Standard deviation: 0.017 lb/ton.

Table 11.1-4. SUMMARY OF PARTICLE SIZE DISTRIBUTION FOR DRUM MIX DRYERS[a]

EMISSION FACTOR RATING: E

Particle Size, µm[b]	Cumulative Mass Less Than or Equal to Stated Size (%)[c]		Emission Factors, lb/ton	
	Uncontrolled[d]	Fabric Filter	Uncontrolled[d]	Fabric Filter
1.0	ND	15[e]	ND	0.0021[e]
2.5	5.5	21[f]	1.5	0.0029[f]
10.0	23	30[g]	6.4	0.0042[g]
15.0	27	35[d]	7.6	0.0049[d]

[a] Emission factor units are lb/ton of HMA produced. Rounded to two significant figures. SCC 3-05-002-05, and 3-05-002-55 to -63. ND = no data available. To convert from lb/ton to kg/Mg, multiply by 0.5.
[b] Aerodynamic diameter.
[c] Applies only to the mass of filterable PM.
[d] Reference 23, Table 3-35. The emission factors are calculated using the particle size data from this reference in conjunction with the filterable PM emission factor shown in Table 11.1-3.
[e] References 214, 229. The emission factors are calculated using the particle size data from these references in conjunction with the filterable PM emission factor shown in Table 11.1-3.
[f] References 23, 214, 229. The emission factors are calculated using the particle size data from these references in conjunction with the filterable PM emission factor shown in Table 11.1-3.
[g] Reference 23, 25, 229. The emission factors are calculated using the particle size data from these references in conjunction with the filterable PM emission factor shown in Table 11.1-3. EMISSION FACTOR RATING: D.

Table 11.1-7. EMISSION FACTORS FOR CO, CO_2, NO_x, AND SO_2 FROM DRUM MIX HOT MIX ASPHALT PLANTS[a]

Process	CO[b]	EMISSION FACTOR RATING	CO_2[c]	EMISSION FACTOR RATING	NO_x	EMISSION FACTOR RATING	SO_2[c]	EMISSION FACTOR RATING
Natural gas-fired dryer (SCC 3-05-002-55,-56,-57)	0.13	B	33[d]	A	0.026[e]	D	0.0034[f]	D
No. 2 fuel oil-fired dryer (SCC 3-05-002-58,-59,-60)	0.13	B	33[d]	A	0.055[g]	C	0.011[h]	E
Waste oil-fired dryer (SCC 3-05-002-61,-62,-63)	0.13	B	33[d]	A	0.055[g]	C	0.058[j]	B
Coal-fired dryer[k] (SCC 3-05-002-98)	ND	NA	33[d]	A	ND	NA	0.19[m]	E

[a] Emission factor units are lb per ton of HMA produced. SCC = Source Classification Code. ND = no data available. NA = not applicable. To convert from lb/ton to kg/Mg, multiply by 0.5.

[b] References 25, 44, 48, 50, 149, 154, 197, 214, 229, 254, 339-342, 344, 346, 347, 390. The CO emission factors represent normal plant operations without scrutiny of the burner design, operation, and maintenance. Information is available that indicates that attention to burner design, periodic evaluation of burner operation, and appropriate maintenance can reduce CO emissions. Data for dryers firing natural gas, No. 2 fuel oil, and No. 6 fuel oil were combined to develop a single emission factor because the magnitude of emissions was similar for dryers fired with these fuels.

[c] Emissions of CO_2 and SO_2 can also be estimated based on fuel usage and the fuel combustion emission factors (for the appropriate fuel) presented in AP-42 Chapter 1. The CO_2 emission factors are an average of all available data, regardless of the dryer fuel (emissions were similar from dryers firing any of the various fuels). Fifty percent of the fuel-bound sulfur, up to a maximum (as SO_2) of 0.1 lb/ton of product, is expected to be retained in the product, with the remainder emitted as SO_2.

[d] Reference 1, Table 4-15. Average of data from 180 facilities. Range: 2.6 to 96 lb/ton. Median: 31 lb/ton. Standard deviation: 13 lb/ton.

[e] References 44-45, 48, 209, 341, 342.

[f] References 44-45, 48.

[g] References 25, 50, 153, 214, 229, 344, 346, 347, 352-354.

[h] References 50, 119, 255, 340

[j] References 25, 299, 300, 339, 345, 351, 371-377, 379, 380, 386-388.

[k] Dryer fired with coal and supplemental natural gas or fuel oil.

[m] References 88, 108, 189-190.

Table 11.1-8. EMISSION FACTORS FOR TOC, METHANE, VOC, AND HCl FROM DRUM MIX HOT MIX ASPHALT PLANTS[a]

Process	TOC[b]	EMISSION FACTOR RATING	CH_4[c]	EMISSION FACTOR RATING	VOC[d]	EMISSION FACTOR RATING	HCl[e]	EMISSION FACTOR RATING
Natural gas-fired dryer (SCC 3-05-002-55, -56,-57)	0.044[f]	B	0.012	C	0.032	C	ND	NA
No. 2 fuel oil-fired dryer (SCC 3-05-002-58, -59,-60)	0.044[f]	B	0.012	C	0.032	C	ND	NA
Waste oil-fired dryer (SCC 3-05-002-61, -62,-63)	0.044[f]	E	0.012	C	0.032	E	0.00021	D

[a] Emission factor units are lb per ton of HMA produced. SCC = Source Classification Code. ND = no data available. NA = not applicable. To convert from lb/ton to kg/Mg, multiply by 0.5.

[b] TOC equals total hydrocarbons as propane as measured with an EPA Method 25A or equivalent sampling train plus formaldehyde.

[c] References 25, 44-45, 48, 50, 339-340, 355. Factor includes data from natural gas-, No. 2 fuel oil, and waste oil-fired dryers. Methane measured with an EPA Method 18 or equivalent sampling train.

[d] The VOC emission factors are equal to the TOC factors minus the sum of the methane emission factors and the emission factors for compounds with negligible photochemical reactivity shown in Table 11.1-10; differences in values reported are due to rounding.

[e] References 348, 374, 376, 379, 380.

[f] References 25, 44-45, 48, 50, 149, 153-154, 209-212, 214, 241, 242, 339-340, 355.

Table 11.1-10. EMISSION FACTORS FOR ORGANIC POLLUTANT EMISSIONS FROM DRUM MIX HOT MIX ASPHALT PLANTS[a]

Process	Pollutant CASRN	Pollutant Name	Emission Factor, lb/ton	Emission Factor Rating	Ref. No.
Natural gas-fired dryer with fabric filter[b] (SCC 3-05-002-55, -56,-57)	Non-PAH hazardous air pollutants[c]				
	71-43-2	Benzene[d]	0.00039	A	25,44,45,50, 341, 342, 344-351, 373, 376, 377, 383, 384
	100-41-4	Ethylbenzene	0.00024	D	25,44,45
	50-00-0	Formaldehyde[e]	0.0031	A	25,35,44,45,50, 339-344, 347-349, 371-373, 384, 388
	110-54-3	Hexane	0.00092	E	339-340
	540-84-1	Isooctane (2,2,4-trimethylpentane)	4.0×10^{-5}	E	339-340
	71-55-6	Methyl chloroform[f]	4.8×10^{-5}	E	35
	108-88-3	Toluene	0.00015	D	35,44,45
	1330-20-7	Xylene	0.00020	D	25,44,45
		Total non-PAH HAPs	0.0051		
	PAH HAPs				
	91-57-6	2-Methylnaphthalene[g]	7.4×10^{-5}	D	44,45,48
	83-32-9	Acenaphthene[g]	1.4×10^{-6}	E	48
	208-96-8	Acenaphthylene[g]	8.6×10^{-6}	D	35,45,48
	120-12-7	Anthracene[g]	2.2×10^{-7}	E	35,48
	56-55-3	Benzo(a)anthracene[g]	2.1×10^{-7}	E	48
	50-32-8	Benzo(a)pyrene[g]	9.8×10^{-9}	E	48
	205-99-2	Benzo(b)fluoranthene[g]	1.0×10^{-7}	E	35,48
	192-97-2	Benzo(e)pyrene[g]	1.1×10^{-7}	E	48
	191-24-2	Benzo(g,h,i)perylene[g]	4.0×10^{-8}	E	48
	207-08-9	Benzo(k)fluoranthene[g]	4.1×10^{-8}	E	35,48
	218-01-9	Chrysene[g]	1.8×10^{-7}	E	35,48
	206-44-0	Fluoranthene[g]	6.1×10^{-7}	D	35,45,48
	86-73-7	Fluorene[g]	3.8×10^{-6}	D	35,45,48,163
	193-39-5	Indeno(1,2,3-cd)pyrene[g]	7.0×10^{-9}	E	48
	91-20-3	Naphthalene[g]	9.0×10^{-5}	D	35,44,45,48,163
	198-55-0	Perylene[g]	8.8×10^{-9}	E	48
	85-01-8	Phenanthrene[g]	7.6×10^{-6}	D	35,44,45,48,163
	129-00-0	Pyrene[g]	5.4×10^{-7}	D	45,48
		Total PAH HAPs	0.00019		

Table 11.1-10 (cont.)

Process	Pollutant CASRN	Pollutant Name	Emission Factor, lb/ton	Emission Factor Rating	Ref. No.
Natural gas-fired dryer with fabric filter[b] (SCC 3-05-002-55, -56,-57) (cont.)	Total HAPs		0.0053		
	Non-HAP organic compounds				
	106-97-8	Butane	0.00067	E	339
	74-85-1	Ethylene	0.0070	E	339-340
	142-82-5	Heptane	0.0094	E	339-340
	763-29-1	2-Methyl-1-pentene	0.0040	E	339,340
	513-35-9	2-Methyl-2-butene	0.00058	E	339,340
	96-14-0	3-Methylpentane	0.00019	D	339,340
	109-67-1	1-Pentene	0.0022	E	339-340
	109-66-0	n-Pentane	0.00021	E	339-340
		Total non-HAP organics	0.024		
No. 2 fuel oil-fired dryer with fabric filter (SCC 3-05-002-58, -59,-60)	Non-PAH HAPs[c]				
	71-43-2	Benzene[d]	0.00039	A	25,44,45,50, 341, 342, 344-351, 373, 376, 377, 383, 384
	100-41-4	Ethylbenzene	0.00024	D	25,44,45
	50-00-0	Formaldehyde[e]	0.0031	A	25,35,44,45,50, 339-344, 347-349, 371-373, 384, 388
	110-54-3	Hexane	0.00092	E	339-340
	540-84-1	Isooctane (2,2,4-trimethylpentane)	4.0×10^{-5}	E	339-340
	71-55-6	Methyl chloroform[f]	4.8×10^{-5}	E	35
	108-88-3	Toluene	0.0029	E	25, 50, 339-340
	1330-20-7	Xylene	0.00020	D	25,44,45
		Total non-PAH HAPs	0.0078		
	PAH HAPs				
	91-57-6	2-Methylnaphthalene[g]	0.00017	E	50
	83-32-9	Acenaphthene[g]	1.4×10^{-6}	E	48
	208-96-8	Acenaphthylene[g]	2.2×10^{-5}	E	50
	120-12-7	Anthracene[g]	3.1×10^{-6}	E	50,162
	56-55-3	Benzo(a)anthracene[g]	2.1×10^{-7}	E	48
	50-32-8	Benzo(a)pyrene[g]	9.8×10^{-9}	E	48
	205-99-2	Benzo(b)fluoranthene[g]	1.0×10^{-7}	E	35,48
	192-97-2	Benzo(e)pyrene[g]	1.1×10^{-7}	E	48

Table 11.1-10 (cont.)

Process	Pollutant CASRN	Pollutant Name	Emission Factor, lb/ton	Emission Factor Rating	Ref. No.
No. 2 fuel oil-fired dryer with fabric filter (SCC 3-05-002-58, -59,-60) (cont.)	191-24-2	Benzo(g,h,i)perylene[g]	$4.0x10^{-8}$	E	48
	207-08-9	Benzo(k)fluoranthene[g]	$4.1x10^{-8}$	E	35,48
	218-01-9	Chrysene[g]	$1.8x10^{-7}$	E	35,48
	206-44-0	Fluoranthene[g]	$6.1x10^{-7}$	D	35,45,48
	86-73-7	Fluorene[g]	$1.1x10^{-5}$	E	50,164
	193-39-5	Indeno(1,2,3-cd)pyrene[g]	$7.0x10^{-9}$	E	48
	91-20-3	Naphthalene[g]	0.00065	D	25,50,162,164
	198-55-0	Perylene[g]	$8.8x10^{-9}$	E	48
	85-01-8	Phenanthrene[g]	$2.3x10^{-5}$	D	50,162,164
	129-00-0	Pyrene[g]	$3.0x10^{-6}$	E	50
		Total PAH HAPs	0.00088		
		Total HAPs	0.0087		
	Non-HAP organic compounds				
	106-97-8	Butane	0.00067	E	339
	74-85-1	Ethylene	0.0070	E	339-340
	142-82-5	Heptane	0.0094	E	339-340
	763-29-1	2-Methyl-1-pentene	0.0040	E	339,340
	513-35-9	2-Methyl-2-butene	0.00058	E	339,340
	96-14-0	3-Methylpentane	0.00019	D	339,340
	109-67-1	1-Pentene	0.0022	E	339-340
	109-66-0	n-Pentane	0.00021	E	339-340
		Total non-HAP organics	0.024		

Table 11.1-10 (cont.)

Process	Pollutant CASRN	Pollutant Name	Emission Factor, lb/ton	Emission Factor Rating	Ref. No.
Fuel oil- or waste oil-fired dryer with fabric filter (SCC 3-05-002-58, -59,-60,-61,-62, -63)		Dioxins			
	1746-01-6	2,3,7,8-TCDD[g]	$2.1x10^{-13}$	E	339
		Total TCDD[g]	$9.3x10^{-13}$	E	339
	40321-76-4	1,2,3,7,8-PeCDD[g]	$3.1x10^{-13}$	E	339
		Total PeCDD[g]	$2.2x10^{-11}$	E	339-340
	39227-28-6	1,2,3,4,7,8-HxCDD[g]	$4.2x10^{-13}$	E	339
	57653-85-7	1,2,3,6,7,8-HxCDD[g]	$1.3x10^{-12}$	E	339
	19408-24-3	1,2,3,7,8,9-HxCDD[g]	$9.8x10^{-13}$	E	339
		Total HxCDD[g]	$1.2x10^{-11}$	E	339-340
	35822-46-9	1,2,3,4,6,7,8-HpCDD[g]	$4.8x10^{-12}$	E	339
		Total HpCDD[g]	$1.9x10^{-11}$	E	339-340
	3268-87-9	Octa CDD[g]	$2.5x10^{-11}$	E	339
		Total PCDD[g]	$7.9x10^{-11}$	E	339-340
		Furans			
	51207-31-9	2,3,7,8-TCDF[g]	$9.7x10^{-13}$	E	339
		Total TCDF[g]	$3.7x10^{-12}$	E	339-340
		1,2,3,7,8-PeCDF[g]	$4.3x10^{-12}$	E	339-340
		2,3,4,7,8-PeCDF[g]	$8.4x10^{-13}$	E	339
		Total PeCDF[g]	$8.4x10^{-11}$	E	339-340
		1,2,3,4,7,8-HxCDF[g]	$4.0x10^{-12}$	E	339
		1,2,3,6,7,8-HxCDF[g]	$1.2x10^{-12}$	E	339
		2,3,4,6,7,8-HxCDF[g]	$1.9x10^{-12}$	E	339
		1,2,3,7,8,9-HxCDF[g]	$8.4x10^{-12}$	E	340
		Total HxCDF[g]	$1.3x10^{-11}$	E	339-340
		1,2,3,4,6,7,8-HpCDF[g]	$6.5x10^{-12}$	E	339
		1,2,3,4,7,8,9-HpCDF[g]	$2.7x10^{-12}$	E	339
		Total HpCDF[g]	$1.0x10^{-11}$	E	339-340
	39001-02-0	Octa CDF[g]	$4.8x10^{-12}$	E	339
		Total PCDF[g]	$4.0x10^{-11}$	E	339-340
		Total PCDD/PCDF[g]	$1.2x10^{-10}$	E	339-340

Table 11.1-10 (cont.)

Process	Pollutant: CASRN	Pollutant: Name	Emission Factor, lb/ton	Emission Factor Rating	Ref. No.
Fuel oil- or waste oil-fired dryer (uncontrolled) (SCC 3-05-002-58, -59,-60,-61,-62, -63)	Hazardous air pollutants[c]				
	Dioxins				
		Total HxCDD[g]	5.4×10^{-12}	E	340
	35822-46-9	1,2,3,4,6,7,8-HpCDD[g]	3.4×10^{-11}	E	340
		Total HpCDD[g]	7.1×10^{-11}	E	340
	3268-87-9	Octa CDD[g]	2.7×10^{-9}	E	340
		Total PCDD[g]	2.8×10^{-9}	E	340
	Furans				
		Total TCDF[g]	3.3×10^{-11}	E	340
		Total PeCDF[g]	7.4×10^{-11}	E	340
		1,2,3,4,7,8-HxCDF[g]	5.4×10^{-12}	E	340
		2,3,4,6,7,8-HxCDF[g]	1.6×10^{-12}	E	340
		Total HxCDF[g]	8.1×10^{-12}	E	340
Fuel oil- or waste oil-fired dryer (uncontrolled) (SCC 3-05-002-58, -59,-60,-61,-62, -63) (cont.)		1,2,3,4,6,7,8-HpCDF[g]	1.1×10^{-11}	E	340
		Total HpCDF[g]	3.8×10^{-11}	E	340
		Total PCDF[g]	1.5×10^{-10}	E	340
		Total PCDD/PCDF[g]	3.0×10^{-9}	E	340

Table 11.1-10 (cont.)

Process	Pollutant		Emission Factor, lb/ton	Emission Factor Rating	Ref. No.
	CASRN	Name			
Waste oil-fired dryer with fabric filter (SCC 3-05-002-61, -62,-63)	Non-PAH HAPs[c]				
	75-07-0	Acetaldehyde	0.0013	E	25
	107-02-8	Acrolein	2.6×10^{-5}	E	25
	71-43-2	Benzene[d]	0.00039	A	25,44,45,50,341,342, 344-351, 373, 376, 377, 383, 384
	100-41-4	Ethylbenzene	0.00024	D	25,44,45
	50-00-0	Formaldehyde[e]	0.0031	A	25,35,44,45,50,339-344,347-349,371-373, 384, 388
	110-54-3	Hexane	0.00092	E	339-340
	540-84-1	Isooctane (2,2,4-trimethylpentane)	4.0×10^{-5}	E	339-340
	78-93-3	Methyl Ethyl Ketone	2.0×10^{-5}	E	25
	123-38-6	Propionaldehyde	0.00013	E	25
	106-51-4	Quinone	0.00016	E	25
	71-55-6	Methyl chloroform[f]	4.8×10^{-5}	E	35
	108-88-3	Toluene	0.0029	E	25, 50, 339-340
	1330-20-7	Xylene	0.00020	D	25,44,45
		Total non-PAH HAPs	0.0095		
	PAH HAPs				
	91-57-6	2-Methylnaphthalene[g]	0.00017	E	50
	83-32-9	Acenaphthene[g]	1.4×10^{-6}	E	48
	208-96-8	Acenaphthylene[g]	2.2×10^{-5}	E	50
	120-12-7	Anthracene[g]	3.1×10^{-6}	E	50,162
	56-55-3	Benzo(a)anthracene[g]	2.1×10^{-7}	E	48
	50-32-8	Benzo(a)pyrene[g]	9.8×10^{-9}	E	48
	205-99-2	Benzo(b)fluoranthene[g]	1.0×10^{-7}	E	35,48
	192-97-2	Benzo(e)pyrene[g]	1.1×10^{-7}	E	48
	191-24-2	Benzo(g,h,i)perylene[g]	4.0×10^{-8}	E	48

Table 11.1-10 (cont.)

Process	Pollutant		Emission Factor, lb/ton	Emission Factor Rating	Ref. No.
	CASRN	Name			
Waste oil-fired dryer with fabric filter (SCC 3-05-002-61, -62,-63) (cont.)	207-08-9	Benzo(k)fluoranthene[g]	$4.1x10^{-8}$	E	35,48
	218-01-9	Chrysene[g]	$1.8x10^{-7}$	E	35,48
	206-44-0	Fluoranthene[g]	$6.1x10^{-7}$	D	35,45,48
	86-73-7	Fluorene[g]	$1.1x10^{-5}$	E	50,164
	193-39-5	Indeno(1,2,3-cd)pyrene[g]	$7.0x10^{-9}$	E	48
	91-20-3	Naphthalene[g]	0.00065	D	25,50,162,164
	198-55-0	Perylene[g]	$8.8x10^{-9}$	E	48
	85-01-8	Phenanthrene[g]	$2.3x10^{-5}$	D	50,162,164
	129-00-0	Pyrene[g]	$3.0x10^{-6}$	E	50
		Total PAH HAPs	0.00088		
		Total HAPs	0.010		
	Non-HAP organic compounds				
	67-64-1	Acetone[f]	0.00083	E	25
	100-52-7	Benzaldehyde	0.00011	E	25
	106-97-8	Butane	0.00067	E	339
	78-84-2	Butyraldehyde	0.00016	E	25
	4170-30-3	Crotonaldehyde	$8.6x10^{-5}$	E	25
	74-85-1	Ethylene	0.0070	E	339, 340
	142-82-5	Heptane	0.0094	E	339, 340
	66-25-1	Hexanal	0.00011	E	25
	590-86-3	Isovaleraldehyde	$3.2x10^{-5}$	E	25
	763-29-1	2-Methyl-1-pentene	0.0040	E	339, 340
	513-35-9	2-Methyl-2-butene	0.00058	E	339, 340
	96-14-0	3-Methylpentane	0.00019	D	339, 340
	109-67-1	1-Pentene	0.0022	E	339, 340
	109-66-0	n-Pentane	0.00021	E	339, 340
	110-62-3	Valeraldehyde	$6.7x10^{-5}$	E	25
		Total non-HAP organics	0.026		

[a] Emission factor units are lb/ton of hot mix asphalt produced. Table includes data from both parallel flow and counterflow drum mix dryers. Organic compound emissions from counterflow systems are expected to be less than from parallel flow systems, but the available data are insufficient to quantify

Table 11.1-10 (cont.)

accurately the difference in these emissions. CASRN = Chemical Abstracts Service Registry Number. SCC = Source Classification Code. To convert from lb/ton to kg/Mg, multiply by 0.5.

[b] Tests included dryers that were processing reclaimed asphalt pavement. Because of limited data, the effect of RAP processing on emissions could not be determined.

[c] Hazardous air pollutants (HAP) as defined in the 1990 Clean Air Act Amendments (CAAA).

[d] Based on data from 19 tests. Range: 0.000063 to 0.0012 lb/ton; median: 0.00030; Standard deviation: 0.00031.

[e] Based on data from 21 tests. Range: 0.0030 to 0.014 lb/ton; median: 0.0020; Standard deviation: 0.0036.

[f] Compound has negligible photochemical reactivity.

[g] Compound is classified as polycyclic organic matter, as defined in the 1990 CAAA. Total PCDD is the sum of the total tetra through octa dioxins; total PCDF is sum of the total tetra through octa furans; and total PCDD/PCDF is the sum of total PCDD and total PCDF.

Table 11.1-12. EMISSION FACTORS FOR METAL EMISSIONS FROM DRUM MIX HOT MIX ASPHALT PLANTS[a]

Process	Pollutant	Emission Factor, lb/ton	Emission Factor Rating	Reference Numbers
Fuel oil-fired dryer, uncontrolled (SCC 3-05-002-58, -59,-60)	Arsenic[b]	$1.3x10^{-6}$	E	340
	Barium	0.00025	E	340
	Beryllium[b]	0.0	E	340
	Cadmium[b]	$4.2x10^{-6}$	E	340
	Chromium[b]	$2.4x10^{-5}$	E	340
	Cobalt[b]	$1.5x10^{-5}$	E	340
	Copper	0.00017	E	340
	Lead[b]	0.00054	E	340
	Manganese[b]	0.00065	E	340
	Nickel[b]	0.0013	E	340
	Phosphorus[b]	0.0012	E	340
	Selenium[b]	$2.4x10^{-6}$	E	340
	Thallium	$2.2x10^{-6}$	E	340
	Zinc	0.00018	E	340
Natural gas- or propane-fired dryer, with fabric filter (SCC 3-05-002-55, -56,-57))	Antimony	$1.8x10^{-7}$	E	339
	Arsenic[b]	$5.6x10^{-7}$	D	25, 35, 339-340
	Barium	$5.8x10^{-6}$	E	25, 339-340
	Beryllium[b]	0.0	E	339-340
	Cadmium[b]	$4.1x10^{-7}$	D	25, 35, 162, 301, 339-340
	Chromium[b]	$5.5x10^{-6}$	C	25, 162-164, 301, 339-340
	Cobalt[b]	$2.6x10^{-8}$	E	339-340
	Copper	$3.1x10^{-6}$	D	25, 162-164, 339-340
	Hexavalent chromium[b]	$4.5x10^{-7}$	E	163
	Lead[b]	$6.2x10^{-7}$	E	35
	Manganese[b]	$7.7x10^{-6}$	D	25, 162-164, 339-340
	Mercury[b]	$2.4x10^{-7}$	E	35, 163
	Nickel[b]	$6.3x10^{-5}$	D	25, 163-164, 339-340
	Phosphorus[b]	$2.8x10^{-5}$	E	25, 339-340
	Silver	$4.8x10^{-7}$	E	25, 339-340
	Selenium[b]	$3.5x10^{-7}$	E	339-340
	Thallium	$4.1x10^{-9}$	E	339-340
	Zinc	$6.1x10^{-5}$	C	25, 35, 162-164, 339-340

Table 11.1-12 (cont.)

Process	Pollutant	Emission Factor, lb/ton	Emission Factor Rating	Reference Numbers
No. 2 fuel oil-fired dryer or waste oil/drain oil/No. 6 fuel oil-fired dryer, with fabric filter (SCC 3-05-002-58, -59,-60,-61,-62,-63)	Antimony	$1.8x10^{-7}$	E	339
	Arsenic[b]	$5.6x10^{-7}$	D	25, 35, 339-340
	Barium	$5.8x10^{-6}$	E	25, 339-340
	Beryllium[b]	0.0	E	339-340
	Cadmium[b]	$4.1x10^{-7}$	D	25, 35, 162, 301, 339-340
	Chromium[b]	$5.5x10^{-6}$	C	25, 162-164, 301, 339-340
	Cobalt[b]	$2.6x10^{-8}$	E	339-340
	Copper	$3.1x10^{-6}$	D	25, 162-164, 339-340
	Hexavalent chromium[b]	$4.5x10^{-7}$	E	163
	Lead[b]	$1.5x10^{-5}$	C	25, 162, 164, 178-179, 183, 301, 315, 339-340
	Manganese[b]	$7.7x10^{-6}$	D	25, 162-164, 339-340
	Mercury[b]	$2.6x10^{-6}$	D	162, 164, 339-340
	Nickel[b]	$6.3x10^{-5}$	D	25, 163-164, 339-340
	Phosphorus[b]	$2.8x10^{-5}$	E	25, 339-340
	Silver	$4.8x10^{-7}$	E	25, 339-340
	Selenium[b]	$3.5x10^{-7}$	E	339-340
	Thallium	$4.1x10^{-9}$	E	339-340
	Zinc	$6.1x10^{-5}$	C	25, 35, 162-164, 339-340

[a] Emission factor units are lb/ton of HMA produced. SCC = Source Classification Code. To convert from lb/ton to kg/Mg, multiply by 0.5. Emission factors apply to facilities processing virgin aggregate or a combination of virgin aggregate and RAP.

[b] Arsenic, beryllium, cadmium, chromium, hexavalent chromium, cobalt, lead, manganese, mercury, nickel, and selenium compounds are HAPs as defined in the 1990 CAAA. Elemental phosphorus also is a listed HAP, but the phosphorus measured by Method 29 is not elemental phosphorus.

Table 11.1-14. PREDICTIVE EMISSION FACTOR EQUATIONS FOR LOAD-OUT AND SILO FILLING OPERATIONS[a]

EMISSION FACTOR RATING: C

Source	Pollutant	Equation
Drum mix or batch mix plant load-out (SCC 3-05-002-14)	Total PM[b]	$EF = 0.000181 + 0.00141(-V)e^{((0.0251)(T + 460) - 20.43)}$
	Organic PM[c]	$EF = 0.00141(-V)e^{((0.0251)(T + 460) - 20.43)}$
	TOC[d]	$EF = 0.0172(-V)e^{((0.0251)(T + 460) - 20.43)}$
	CO	$EF = 0.00558(-V)e^{((0.0251)(T + 460) - 20.43)}$
Silo filling (SCC 3-05-002-13)	Total PM[b]	$EF = 0.000332 + 0.00105(-V)e^{((0.0251)(T + 460) - 20.43)}$
	Organic PM[c]	$EF = 0.00105(-V)e^{((0.0251)(T + 460) - 20.43)}$
	TOC[d]	$EF = 0.0504(-V)e^{((0.0251)(T + 460) - 20.43)}$
	CO	$EF = 0.00488(-V)e^{((0.0251)(T + 460) - 20.43)}$

[a] Emission factor units are lb/ton of HMA produced. SCC = Source Classification Code. To convert from lb/ton to kg/Mg, multiply by 0.5. EF = emission factor; V = asphalt volatility, as determined by ASTM Method D2872-88 "Effects of Heat and Air on a Moving Film of Asphalt (Rolling Thin Film Oven Test - RTFOT)," where a 0.5 percent loss-on-heating is expressed as "-0.5." Regional- or site-specific data for asphalt volatility should be used, whenever possible; otherwise, a default value of -0.5 should be used for V in these equations. T = HMA mix temperature in °F. Site-specific temperature data should be used, whenever possible; otherwise a default temperature of 325°F can be used. Reference 1, Tables 4-27 through 4-31, 4-34 through 4-36, and 4-38 through 4-41.

[b] Total PM, as measured by EPA Method 315 (EPA Method 5 plus the extractable organic particulate from the impingers). Total PM is assumed to be predominantly PM-2.5 since emissions consist of condensed vapors.

[c] Extractable organic PM, as measured by EPA Method 315 (methylene chloride extract of EPA Method 5 particulate plus methylene chloride extract of impinger particulate).

[d] TOC as propane, as measured with an EPA Method 25A sampling train or equivalent sampling train.

11.12 CONCRETE BATCHING

11.12-1 Process Description [1-5]

Concrete is composed essentially of water, cement, sand (fine aggregate) and coarse aggregate. Coarse aggregate may consist of gravel, crushed stone or iron blast furnace slag. Some specialty aggregate products could be either heavyweight aggregate (of barite, magnetite, limonite, ilmenite, iron or steel) or lightweight aggregate (with sintered clay, shale, slate, diatomaceous shale, perlite, vermiculite, slag pumice, cinders, or sintered fly ash). Supplementary cementitious materials, also called mineral admixtures or pozzolan minerals may be added to make the concrete mixtures more economical, reduce permeability, increase strength, or influence other concrete properties. Typical examples are natural pozzolans, fly ash, ground granulated blast-furnace slag, and silica fume, which can be used individually with portland or blended cement or in different combinations. Chemical admixtures are usually liquid ingredients that are added to concrete to entrain air, reduce the water required to reach a required slump, retard or accelerate the setting rate, to make the concrete more flowable or other more specialized functions.

Approximately 75 percent of the U.S. concrete manufactured is produced at plants that store, convey, measure and discharge these constituents into trucks for transport to a job site. At most of these plants, sand, aggregate, cement and water are all gravity fed from the weight hopper into the mixer trucks. The concrete is mixed on the way to the site where the concrete is to be poured. At some of these plants, the concrete may also be manufactured in a central mix drum and transferred to a transport truck. Most of the remaining concrete manufactured are products cast in a factory setting. Precast products range from concrete bricks and paving stones to bridge girders, structural components, and panels for cladding. Concrete masonry, another type of manufactured concrete, may be best known for its conventional 8 x 8 x 16-inch block. In a few cases concrete is dry batched or prepared at a building construction site. Figure 11.12-1 is a generalized process diagram for concrete batching.

The raw materials can be delivered to a plant by rail, truck or barge. The cement is transferred to elevated storage silos pneumatically or by bucket elevator. The sand and coarse aggregate are transferred to elevated bins by front end loader, clam shell crane, belt conveyor, or bucket elevator. From these elevated bins, the constituents are fed by gravity or screw conveyor to weigh hoppers, which combine the proper amounts of each material.

11.12-2 Emissions and Controls [6-8]

Particulate matter, consisting primarily of cement and pozzolan dust but including some aggregate and sand dust emissions, is the primary pollutant of concern. In addition, there are emissions of metals that are associated with this particulate matter. All but one of the emission points are fugitive in nature. The only point sources are the transfer of cement and pozzolan material to silos, and these are usually vented to a fabric filter or “sock”. Fugitive sources include the transfer of sand and aggregate, truck loading, mixer loading, vehicle traffic, and wind erosion from sand and aggregate storage piles. The amount of fugitive emissions generated during the transfer of sand and aggregate depends primarily on the surface moisture content of these materials. The extent of fugitive emission control varies widely from plant to plant. Particulate emission factors for concrete batching are give in Tables 11.12-1 and 11.12-2.

Types of controls used may include water sprays, enclosures, hoods, curtains, shrouds, movable and telescoping chutes, central duct collection systems, and the like. A major source of potential emissions, the movement of heavy trucks over unpaved or dusty surfaces in and around the plant, can be controlled by good maintenance and wetting of the road surface.

Predictive equations that allow for emission factor adjustment based on plant specific conditions are given in the Background Document for Chapter 11.12 and Chapter 13. Whenever plant specific data are available, they should be used with these predictive equations (e.g. Equations 11.12-1 through 11.12-3) in lieu of the general fugitive emission factors presented in Table 11.12-1 through11.12-5 in order to adjust to site specific conditions, such as moisture levels and localized wind speeds.

11.12-3 Updates since the 5th Edition.

October 2001 – This major revision of the section replaced emissions factors based upon engineering judgment and poorly documented and performed source test reports with emissions tests conducted at modern operating truck mix and central mix facilities. Emissions factors for both total PM and total PM_{10} were developed from this test data.

June 2006 – This revision of the section supplemented the two source tests with several additional source tests of central mix and truck mix facilities. The measurement of the capture efficiency, local wind speed and fines material moisture level was improved over the previous two source tests. In addition to quantifying total PM and PM_{10}, $PM_{2.5}$ emissions were quantified at all of the facilities. Single value emissions factors for truck mix and central mix operations were revised using all of the data. Additionally, parameterized emissions factor equations using local wind speed and fines material moisture content were developed from the newer data.

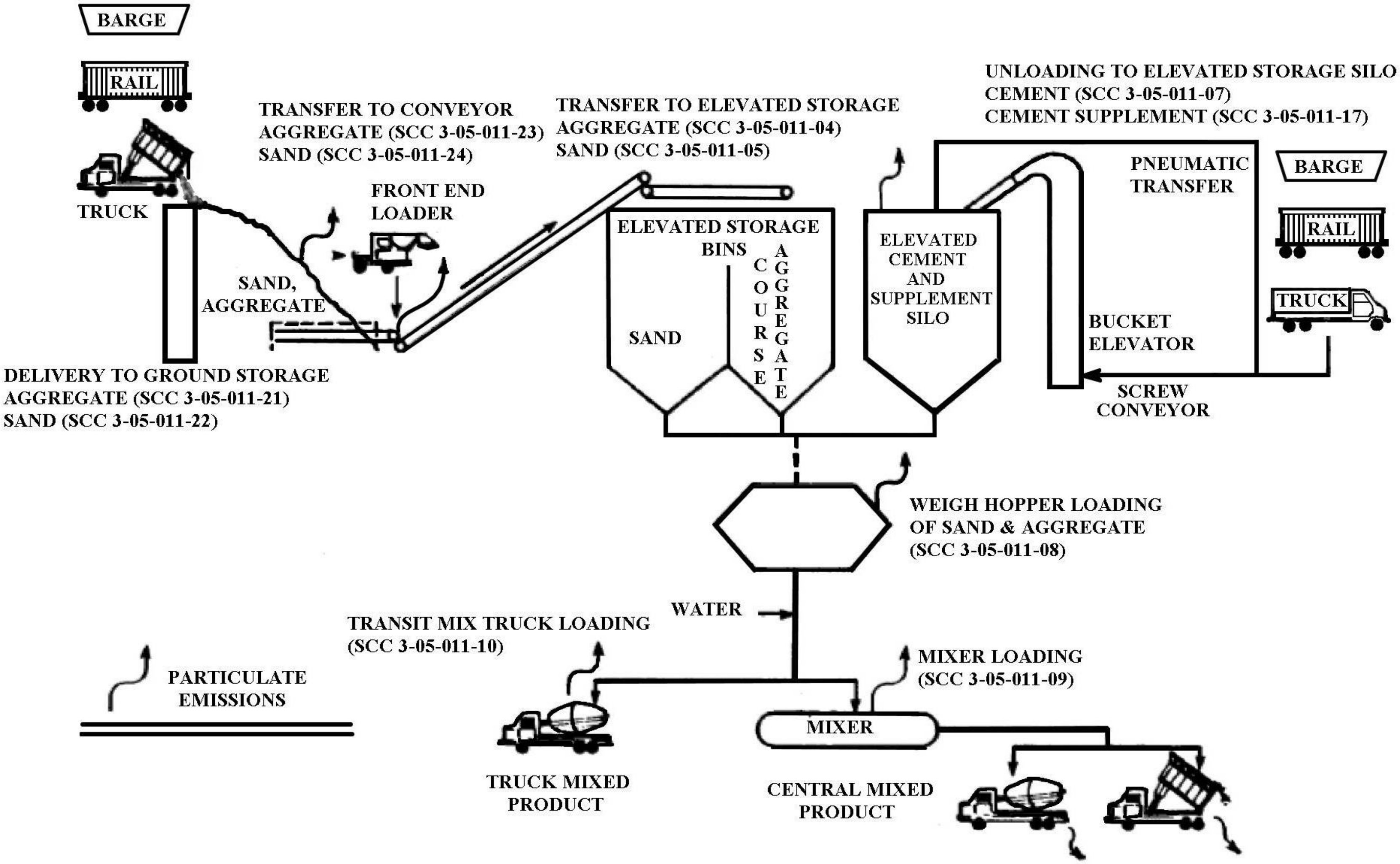

Figure 11.12-1. Typical Concrete Batching Process.

TABLE 11.12-2 (ENGLISH UNITS)
EMISSION FACTORS FOR CONCRETE BATCHING [a]

Source (SCC)	Uncontrolled				Controlled			
	Total PM	Emission Factor Rating	Total PM_{10}	Emission Factor Rating	Total PM	Emission Factor Rating	Total PM_{10}	Emission Factor Rating
Aggregate transfer [b] (3-05-011-04,-21,23)	0.0069	D	0.0033	D	ND		ND	
Sand transfer [b] (3-05-011-05,22,24)	0.0021	D	0.00099	D	ND		ND	
Cement unloading to elevated storage silo (pneumatic)[c] (3-05-011-07)	0.72	E	0.46	E	0.00099	D	0.00034	D
Cement supplement unloading to elevated storage silo (pneumatic)[d] (3-05-011-17)	3.14	E	1.10	E	0.0089	D	0.0049	E
Weigh hopper loading [e] (3-05-011-08)	0.0051	D	0.0024	D	ND		ND	
Mixer loading (central mix)[f] (3-05-011-09)	0.544 or Eqn. 11.12-1	B	0.134 or Eqn. 11.12-1	B	0.0173 or Eqn. 11.12-1	B	0.0048 or Eqn. 11.12-1	B
Truck loading (truck mix)[g] (3-05-011-10)	0.995	B	0.278	B	0.0568 or Eqn. 11.12-1	B	0.0160 or Eqn. 11.12-1	B
Vehicle traffic (paved roads)	See AP-42 Section 13.2.1							
Vehicle traffic (unpaved roads)	See AP-42 Section 13.2.2							
Wind erosion from aggregate and sand storage piles	See AP-42 Section 13.2.5							

ND = No data

[a] All emission factors are in lb of pollutant per ton of material loaded unless noted otherwise. Loaded material includes course aggregate, sand, cement, cement supplement and the surface moisture associated with these materials. The average material composition of concrete batches presented in references 9 and 10 was 1865 lbs course aggregate, 1428 lbs sand, 491 lbs cement and 73 lbs cement supplement. Approximately 20 gallons of water was added to this solid material to produce 4024 lbs (one cubic yard) of concrete.

[b] Reference 9 and 10. Emission factors are based upon an equation from AP-42, Section 13.2.2, with k_{PM-10} =.35, k_{PM} = .74, U = 10mph, $M_{aggregate}$ =1.77%, and M_{sand} = 4.17%. These moisture contents of the materials ($M_{aggregate}$ and M_{sand}) are the averages of the values obtained from Reference 9 and Reference 10.

[c] The uncontrolled PM & PM-10 emission factors were developed from Reference 9. The controlled emission factor for PM was developed from References 9, 10, 11, and 12. The controlled emission factor for PM-10 was developed from References 9 and 10.

[d] The controlled PM emission factor was developed from Reference 10 and Reference 12, whereas the controlled PM-10 emission factor was developed from only Reference 10.

[e] Emission factors were developed by using the Aggregate and Sand Transfer Emission Factors in conjunction with the ratio of aggregate and sand used in an average $yard^3$ of concrete. The unit for these emission factors is lb of pollutant per ton of aggregate and sand.

[f] References 9, 10, and 14. The emission factor units are lb of pollutant per ton of cement and cement supplement. The general factor is the arithmetic mean of all test data.

[g] Reference 9, 10, and 14. The emission factor units are lb of pollutant per ton of cement and cement supplement. The general factor is the arithmetic mean of all test data.

The particulate matter emissions from truck mix and central mix loading operations are calculated in accordance with the values in Tables 11.12-1 or 11.12-2 or by Equation 11.12-1[14] when site specific data are available.

$$E = k\,(0.0032)\left[\frac{U^a}{M^b}\right] + c \qquad \text{Equation 11.12-1}$$

E	=	Emission factor in lbs./ton of cement and cement supplement
k	=	Particle size multiplier (dimensionless)
U	=	Wind speed, miles per hour (mph)
M	=	Minimum moisture (% by weight) of cement and cement supplement
a, b	=	Exponents
c	=	Constant

The parameters for Equation 11.12-1 are summarized in Tables 11.12-3 and 11.12-4.

Table 11.12-3. Equation Parameters for Truck Mix Operations

Condition	Parameter Category	k	a	b	c
Controlled[1]	Total PM	0.8	1.75	0.3	0.013
	PM_{10}	0.32	1.75	0.3	0.0052
	$PM_{10\text{-}2.5}$	0.288	1.75	0.3	0.00468
	$PM_{2.5}$	0.048	1.75	0.3	0.00078
Uncontrolled[1]	Total PM	0.995			
	PM_{10}	0.278			
	$PM_{10\text{-}2.5}$	0.228			
	$PM_{2.5}$	0.050			

Table 11.12-4. Equation Parameters for Central Mix Operations

Condition	Parameter Category	k	a	b	c
Controlled[1]	Total PM	0.19	0.95	0.9	0.0010
	PM_{10}	0.13	0.45	0.9	0.0010
	$PM_{10\text{-}2.5}$	0.12	0.45	0.9	0.0009
	$PM_{2.5}$	0.03	0.45	0.9	0.0002
Uncontrolled[1]	Total PM	5.90	0.6	1.3	0.120
	PM_{10}	1.92	0.4	1.3	0.040
	$PM_{10\text{-}2.5}$	1.71	0.4	1.3	0.036
	$PM_{2.5}$	0.38	0.4	1.3	0

1. Emission factors expressed in lbs/tons of cement and cement supplement

To convert from units of lbs/ton to units of kilograms per mega gram, the emissions calculated by Equation 11.12-1 should be divided by 2.0.

Particulate emission factors per yard of concrete for an average batch formulation at a typical facility are given in Tables 11.12-4 and 11.12-5. For truck mix loading and central mix loading, the

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.

Oversized material is processed in a cone crusher or a hammermill (fines crusher) adjusted to produce small diameter material. The output is returned to the fines screen for resizing.

In certain cases, stone washing is required to meet particulate end product specifications or demands.

Pulverized Mineral Processing

Pulverized minerals are produced at specialized processing plants. These plants supply mineral products ranging from sizes of approximately 1 micrometer to more than 75 micrometers aerodynamic diameter. Pharmaceutical, paint, plastics, pigment, rubber, and chemical industries use these products. Due to the specialized characteristics of the mineral products and the markets for these products, pulverized mineral processing plants have production rates that are less than 5% of the production capacities of conventional crushed stone plants. Two alternative processing systems for pulverized minerals are summarized in Figure 11-19.2-2.

In dry processing systems, the mineral aggregate material from conventional crushing and screening operations is subject to coarse and fine grinding primarily in roller mills and/or ball mills to reduce the material to the necessary product size range. A classifier is used to size the ground material and return oversized material that can be pulverized using either wet or dry processes. The classifier can either be associated with the grinding operation, or it can be a stand-alone process unit. Fabric filters control particulate matter emissions from the grinding operation and the classifier. The products are stored in silos and are shipped by truck or in bags.

In wet processing systems, the mineral aggregate material is processed in wet mode coarse and fine grinding operations. Beneficiation processes use flotation to separate mineral impurities. Finely ground material is concentrated and flash dried. Fabric filters are used to control particulate matter emissions from the flash dryer. The product is then stored in silos, bagged, and shipped.

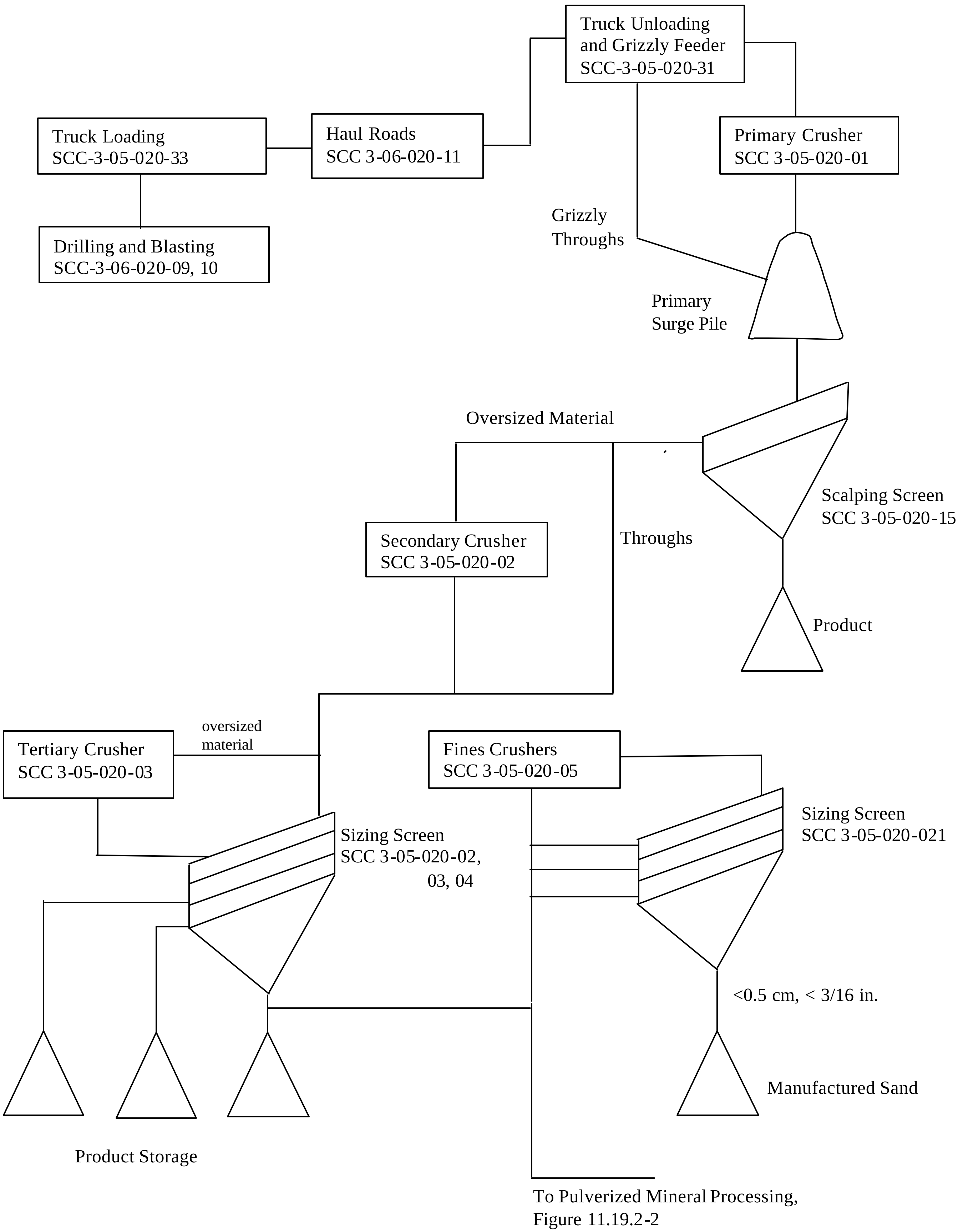

Figure 11.19.2-1. Typical stone processing plant

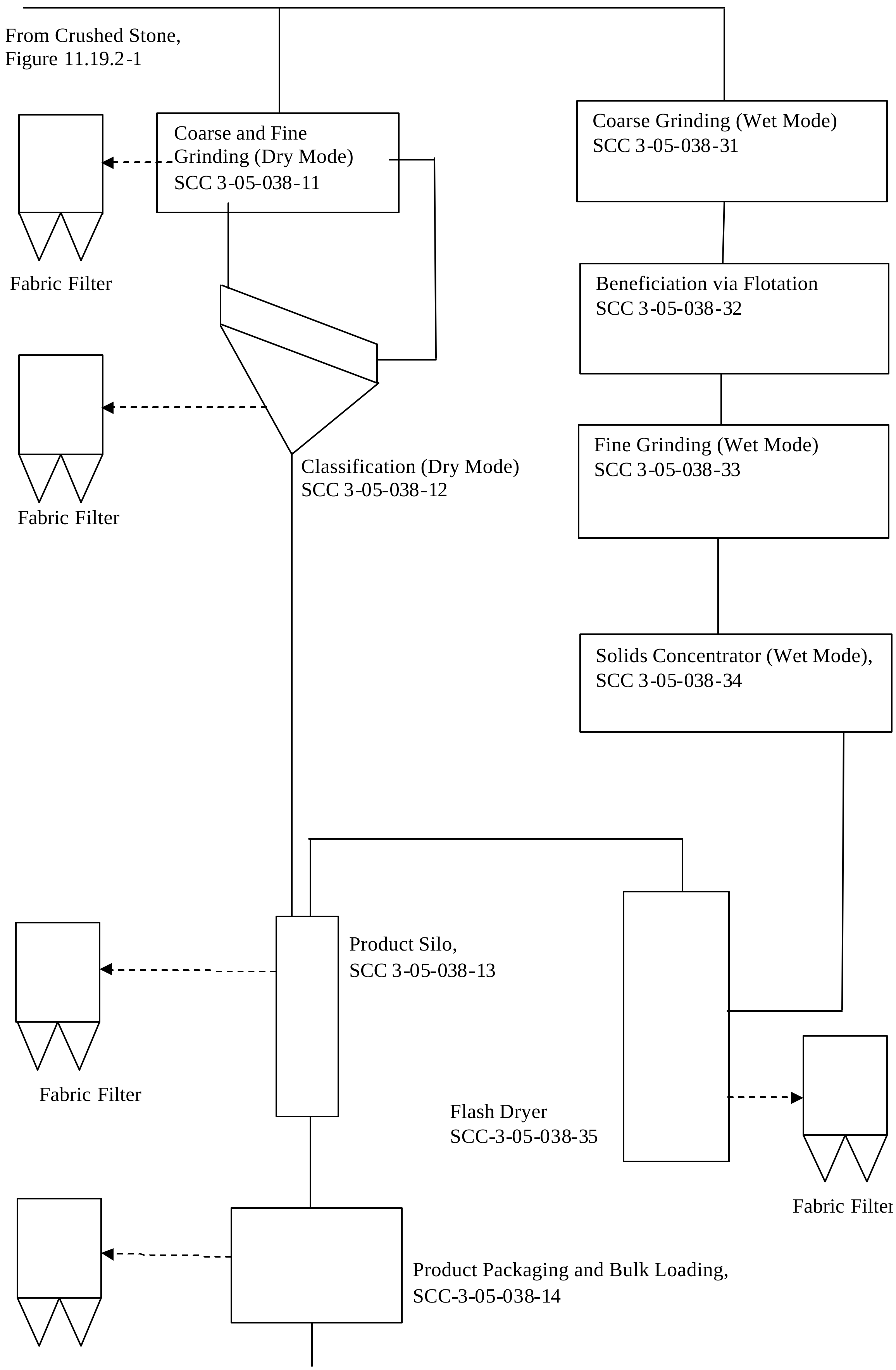

Figure 11.19.2-2 Flowchart for Pulverized Mineral Processing

11.19.2.2 Emissions and Controls [10, 11, 12, 13, 14, and 26]

Crushed Stone Processing

Emissions of PM, PM-10, and PM-2.5 occur from a number of operations in stone quarrying and processing. A substantial portion of these emissions consists of heavy particles that may settle out within the plant. As in other operations, crushed stone emission sources may be categorized as either process sources or fugitive dust sources. Process sources include those for which emissions are amenable to capture and subsequent control. Fugitive dust sources generally involve the reentrainment of settled dust by wind or machine movement. Emissions from process sources should be considered fugitive unless the sources are vented to a baghouse or are contained in an enclosure with a forced-air vent or stack. Factors affecting emissions from either source category include the stone size distribution and the surface moisture content of the stone processed, the process throughput rate, the type of equipment and operating practices used, and topographical and climatic factors.

Of graphical and seasonal factors, the primary variables affecting uncontrolled PM emissions are wind and material moisture content. Wind parameters vary with geographical location, season, and weather. It can be expected that the level of emissions from unenclosed sources (principally fugitive dust sources) will be greater during periods of high winds. The material moisture content also varies with geographical location, season, and weather. Therefore, the levels of uncontrolled emissions from both process emission sources and fugitive dust sources generally will be greater in arid regions of the country than in temperate ones and greater during the summer months because of a higher evaporation rate.

The moisture content of the material processed can have a substantial effect on emissions. This effect is evident throughout the processing operations. Surface wetness causes fine particles to agglomerate on or to adhere to the faces of larger stones, with a resulting dust suppression effect. However, as new fine particles are created by crushing and attrition and as the moisture content is reduced by evaporation, this suppressive effect diminishes and may disappear. Plants that use wet suppression systems (spray nozzles) to maintain relatively high material moisture contents can effectively control PM emissions throughout the process. Depending on the geographical and climatic conditions, the moisture content of mined rock can range from nearly zero to several percent. Because moisture content is usually expressed on a basis of overall weight percent, the actual moisture amount per unit area will vary with the size of the rock being handled. On a constant mass-fraction basis, the per-unit area moisture content varies inversely with the diameter of the rock. The suppressive effect of the moisture depends on both the absolute mass water content and the size of the rock product. Typically, wet material contains >1.5 percent water.

A variety of material, equipment, and operating factors can influence emissions from crushing. These factors include (1) stone type, (2) feed size and distribution, (3) moisture content, (4) throughput rate, (5) crusher type, (6) size reduction ratio, and (7) fines content. Insufficient data are available to present a matrix of rock crushing emission factors detailing the above classifications and variables. Available data indicate that PM-10 and PM-2.5 emissions from limestone and granite processing operations are similar. Therefore, the emission factors developed from the emissions data gathered at limestone and granite processing facilities are considered to be representative of typical crushed stone processing operations. Emission factors for filterable PM, PM-10, and PM-2.5 emissions from crushed stone processing operations are presented in Tables 11.19.2-1 (Metric units) and 11.19.2-2 (English units.)

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.

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

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

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

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

[a]References 1,5-15.

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

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

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

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

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

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

13.2.4 Aggregate Handling And Storage Piles

13.2.4.1 General

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

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

13.2.4.2 Emissions And Correction Parameters

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

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

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

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

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

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

13.2.4.3 Predictive Emission Factor Equations

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

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

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

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

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

(1)

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

where:

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

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

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

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

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

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

To retain the quality rating of the equation when it is applied to a specific facility, reliable correction parameters must be determined for specific sources of interest. The field and laboratory procedures for aggregate sampling are given in Reference 3. In the event that site-specific values for correction parameters cannot be obtained, the appropriate mean from Table 13.2.4-1 may be used, but the quality rating of the equation is reduced by 1 letter.

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

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

13.2.4.4 Controls[12-13]

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

References For Section 13.2.4

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TEST REPORT

FROM ONE

400 TPH ASTEC PEBH-77-21W
DRUM MIXER BAGHOUSE

IN SERVICE AT THE

MV GCP HMA 1 PLANT

PREPARED FOR

MESA VERDE ENTERPRISES

NEW MEXICO ENVIRONMENT DEPARTMENT
AIR QUALITY BUREAU PERMIT NUMBER GCP-3-9079
AIRS# 35-777-1605

TEST DATES

MAY 17-18, 2021

PREPARED BY:

COMPLIANCE SERVICES AND TESTING, LLC

PROJECT NUMBER:

2233

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Table of Contents

Introduction

Mesa Verde Enterprises (MV) contracted Compliance Services and Testing (CST) to perform an emissions test on a Baghouse used for the collection of particulate matter from a portable asphalt plant. The plant is located in Glencoe, New Mexico in Lincoln County. The testing was to show compliance with a permit issued to this facility, GCP-3-9079 and followed procedures with the NMED approved protocol. The test was originally scheduled for the week of April 19th 2021, with a shortened notification period, due to an uncertain production schedule. The test was postponed due to a COVID-19 shut down of the paving project. The test was rescheduled for the week of May 17th, the soonest CST and MV could align schedules.

The testing followed the procedures set forth in the Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 1 for sampling locations, Method 2 for velocity determination, Method 3A for oxygen (O_2) and carbon dioxide (CO_2) concentrations, Method 4 for moisture content (H_2O), Method 5 for total suspended particles (TSP), Method 9 for opacity percentage, Method 7E for nitrogen [NO_X defined as nitric oxide (NO) plus nitrogen dioxide (NO_2)], and Method 10 for carbon monoxide (CO) concentrations. Table 1 summarizes the background information pertinent to these tests.

The information contained in this report has been reviewed and approved as being truthful, accurate, and complete.

Table 1 - Background Data

Source Operator:	**Mesa Verde Enterprises** Attn: Allister Gunn, Jr. Compliance Officer P.O. Box 907 Alamogordo, NM 88311
Test Contractor:	**Compliance Services and Testing** Attn: Chris Spencer 7108 Washington NE Ste. A Albuquerque, New Mexico 87109 Phone: (505) 681-4909
Test Participants:	**CST** Chris Spencer – Director Efren Alvarado – Field Technician Jacob Anderson – Field Technician **Mesa Verde** Colton Hackett – Field Support Gabriel Killebrew – Opacity Reader Ray Horton – Plant Operator
Test Dates:	May 17-18th, 2021
Location:	27480 US-70, Glencoe, NM 88324
Test Methods:	**Title 40 of the Code of Federal Regulations, Part 60, Appendix A** Methods 1-4 for Exhaust Flow Rate Method 5 for Total Suspended Particles Method 7E for Nitrogen Oxides Method 9 for Opacity Method 10 for Carbon Monoxide
Regulatory Permit:	Permit Number GCP-3-9079

Summary of Results

A portable baghouse was tested to demonstrate compliance with the General Construction Permit #3 in place for the facility. Particulate emissions as well as gaseous emissions were tested on-site. The unit was running at normal load with is considered maximum site load. Unit operating parameters are listed in detail in Appendix A of the report. A summary of the results is listed below.

Table 2 – Summarized Emission Results

	NOx	***CO***	***TSP***	***Opacity***	***% Load***
Unit #	***tpy**	**tpy**	**gr/dscf**	**%**	**%**
Limits	***(Facility-95)***	***(Facility-95)***	***(0.04)***	***(20%)***	***400 tph***
Baghouse	10.36	37.86	0.0027	0	78.9

tph = tons per hour; tpy = tons per year; gr = grains
*Tons per Year based on 3460 daylight hours

Table 3 lists the analytical analyzers and sensitivities and Figures 1 and 2 details the sampling systems used for the testing. Appendix A contains the tabular results plus all field and operational data. Appendix B contains the example calculations. Appendix C contains the quality assurance and quality control documentation. Appendix D contains copies of the calibration gases. Appendix E is reserved for the inclusion of the visible emissions and opacity field sheets taken by Gabriel Killebrew of Mesa Verde. Appendix F contains the datalog record.

Process Description and Sampling Location

The function of the MV GCP HMA 1 Plant is to produce asphalt. Hot mix asphalt is used primarily as paving material and consists of a mixture of aggregate and liquid asphalt cement, which are heated and mixed in measured quantities. In a drum mix plant, a rotary dryer serves to dry the aggregate and mix it with the liquid asphalt cement. After mixing, the HMA generally is transferred to a storage bin or silo, where it is stored temporarily. From the silo, the HMA is emptied into haul trucks, which transport the material to the job site. The dust from the drying and mixing processes and the exhaust from the diesel-fueled furnace is directed to the Baghouse exhaust stack. Fabric filters are located in the baghouse and serve to collect the particulate matter created from these processes. No controls are in place to eliminate the gaseous emissions.

The gaseous and particulate sampling took place from a single port in the exhaust stack. Multiple ports (5 total) are installed, however, only a single port was accessible given the configuration of the stack with regards to the safety rails. The Method 5 probe was traversed along a single line that meet the minimum Method 1 distances with regards to upstream and downstream disturbances. A cyclonic angle check was performed on the stack before sampling to ensure that the flow was laminar. The results from that test showed no cyclonic flow. The required sampling time for each of 25 points along five traverse lines was 2.5 minutes for a total of 62.5 minutes. The isokinetic sampling data was recorded every 2.5 minutes.

Summary of Results
Unit #14 - Baghouse

Company: Mesa Verde Enterprises
Location: MV GCP HMA 1
Technician: CS, EA, JA
Source: Unit #14 Baghouse
Production Capacity: 400 pph
Sample System: 1

Test Run Number	***1***	***2***	***3***	
Date	5/18/21	5/18/21	5/18/21	
Plant Operating Parameters				***Average***
Loading Rate (pph)	313.2	323.3	310.3	**315.6**
Load (%)	78.30	80.83	77.58	**78.9**
Baghouse Pressure Drop ("H2O)	3.52	3.71	3.76	**3.66**
Constants				
Constant K_{1A} (L / g)	1.336	1.336	1.336	**1.336**
Constant K_3 (°R-L / "Hg-cf)	499.7	499.7	499.7	**499.7**
Conversion Factor ("Hg / "H2O)	0.0735	0.0736	0.0736	**0.0735**
Pitot Tube Constant K_p (√(lb/lb.mol-"Hg/°R-"H20)	5129.4	5129.4	5129.4	**5129.4**
STP / Time Constant K_y (°R-min / "Hg-hr)	1058.8	1058.8	1058.8	**1058.8**
Ambient Conditions				
Pressure Altitude (MSL)	5820	5820	5820	**5820**
Atmospheric Pressure ("Hg)	24.17	24.17	24.17	**24.17**
Average Dry Bulb Temperature (°F)	55.3	67.7	74.1	**65.7**
Average Wet Bulb Temperature (°F)	44.0	49.5	51.7	**48.4**
Humidity (lb/lb air)	0.0049	0.0050	0.0048	**0.0049**
Stack Parameters				
Static Stack Pressure (P_g - "H2O)	-0.52	-0.52	-0.52	**-0.52**
Absolute Stack Pressure (P_s - "Hg)	24.13	24.13	24.13	**24.13**
Average Stack Temperature (T_s - °R)	681.8	684.8	688.8	**685.2**
Stack Moisture (B_{ws} - %)	18.537	17.090	16.789	**17.472**
Dry Gas Fraction (1-B_{ws})	0.8146	0.8291	0.8321	**0.825**
Dry Stack Gas Molecular Wt. (M_D - lbs/lb-mole)	29.053	29.133	29.090	**29.092**
Wet Stack Gas Molecular Wt. (M_S - lbs/lb-mole)	27.004	27.231	27.228	**27.154**
Dry Gas Meter Sampling Data				
Sampling Time (min)	62.5	62.5	62.5	**62.5**
Corrected Metered Volume ($Vm_{corrected}$ - cf)	56.728	53.636	57.481	**55.948**
Volume of DGM Sample (Vm_{std} - L)	1286.730	1209.880	1292.256	**1262.956**
Corrected Metered Volume (dscf)	45.718	41.659	44.870	**44.082**
Nozzle Diameter (ft^2)	3.41E-04	3.41E-04	3.41E-04	**3.41E-04**
Isokinetic Rate (%) {90≤X≤110}	107.41	103.71	104.83	**105.32**
Stack Velocity and Flow Rate				
Stack Velocity (V_s - ft/sec)	65.49	60.99	65.14	**63.87**
Stack Velocity (V_s - ft/min)	3929.35	3659.67	3908.26	**3832.43**
Stack Flow, wet (Q_a - acf/sec)	898.66	836.98	893.83	**876.49**
Stack Flow, wet (Q_a - acf/min)	53,919.36	50,218.81	53,630.03	**52,589.40**
Stack Flow, dry (Q_s - scf/min)	27,431.22	25,887.03	27,584.49	**26,967.58**
Stack Flow, dry (Q_s - scf/hr)	1,645,873	1,553,222	1,655,070	**1,618,055**
TSP Data				
Rinse Mass (g)	0.0072	0.0054	0.0096	**0.0074**
Acetone Blank Mass (g)	0.0	0.0	0.0	**0.0**
Filter Mass (g)	0.0001	0.0002	0.0004	**0.0002**
Total Mass Collected (g)	0.0073	0.0056	0.0100	**0.0076**
Total Mass Collected (gr)	0.1127	0.0864	0.1543	**0.1178**
Particulate Matter Emissions Rates / Opacity				
Opacity (%) ***{Permit Limit = 20%}***	0.0	0.0	0.0	**0.00**
TSP Concentration (gr/dscf) ***{Permit Limit = 0.04}***	0.0025	0.0021	0.0034	**0.0027**
TSP (lbs/hr)	0.58	0.46	0.81	**0.62**
TSP (tpy)	1.00	0.80	1.41	**1.07**
Measured Gaseous Emissions (Instrument Drift Corrected)				
Sampling Time (min)	60	60	60	**60**
NOx (ppmv)	21.72	36.93	34.68	**31.11**
CO (ppmv)	123.02	188.84	246.10	**185.99**
O2 (vol %)	17.98	16.20	16.31	**16.83**
CO2 (vol %)	2.09	3.03	2.74	**2.62**
Calculated Mass Emissions Rates				
NOx (lbs/hr)	4.27	6.85	6.85	**5.99**
CO (lbs/hr)	14.72	21.32	29.61	**21.88**
*NOx (tons/yr) ***{Facility Wide Limit = 95}***	7.39	11.85	11.86	**10.36**
*CO (tons/yr) ***{Facility Wide Limit = 95}***	25.47	36.89	51.23	**37.86**

g=grams; gr=grains
*** Based on 3460 Daylight Hours**

3.4 Large Stationary Diesel And All Stationary Dual-fuel Engines

3.4.1 General

The primary domestic use of large stationary diesel engines (greater than 600 horsepower [hp]) is in oil and gas exploration and production. These engines, in groups of 3 to 5, supply mechanical power to operate drilling (rotary table), mud pumping, and hoisting equipment, and may also operate pumps or auxiliary power generators. Another frequent application of large stationary diesels is electricity generation for both base and standby service. Smaller uses include irrigation, hoisting, and nuclear power plant emergency cooling water pump operation.

Dual-fuel engines were developed to obtain compression ignition performance and the economy of natural gas, using a minimum of 5 to 6 percent diesel fuel to ignite the natural gas. Large dual-fuel engines have been used almost exclusively for prime electric power generation. This section includes all dual-fuel engines.

3.4.2 Process Description

All reciprocating internal combustion (IC) engines operate by the same basic process. A combustible mixture is first compressed in a small volume between the head of a piston and its surrounding cylinder. The mixture is then ignited, and the resulting high-pressure products of combustion push the piston through the cylinder. This movement is converted from linear to rotary motion by a crankshaft. The piston returns, pushing out exhaust gases, and the cycle is repeated.

There are 2 ignition methods used in stationary reciprocating IC engines, compression ignition (CI) and spark ignition (SI). In CI engines, combustion air is first compression heated in the cylinder, and diesel fuel oil is then injected into the hot air. Ignition is spontaneous because the air temperature is above the autoignition temperature of the fuel. SI engines initiate combustion by the spark of an electrical discharge. Usually the fuel is mixed with the air in a carburetor (for gasoline) or at the intake valve (for natural gas), but occasionally the fuel is injected into the compressed air in the cylinder. Although all diesel- fueled engines are compression ignited and all gasoline- and gas-fueled engines are spark ignited, gas can be used in a CI engine if a small amount of diesel fuel is injected into the compressed gas/air mixture to burn any mixture ratio of gas and diesel oil (hence the name dual fuel), from 6 to 100 percent diesel oil.

CI engines usually operate at a higher compression ratio (ratio of cylinder volume when the piston is at the bottom of its stroke to the volume when it is at the top) than SI engines because fuel is not present during compression; hence there is no danger of premature autoignition. Since engine thermal efficiency rises with increasing pressure ratio (and pressure ratio varies directly with compression ratio), CI engines are more efficient than SI engines. This increased efficiency is gained at the expense of poorer response to load changes and a heavier structure to withstand the higher pressures.[1]

3.4.3 Emissions And Controls

Most of the pollutants from IC engines are emitted through the exhaust. However, some total organic compounds (TOC) escape from the crankcase as a result of blowby (gases that are vented from the oil pan after they have escaped from the cylinder past the piston rings) and from the fuel tank

Table 3.4-1. GASEOUS EMISSION FACTORS FOR LARGE STATIONARY DIESEL AND ALL STATIONARY DUAL-FUEL ENGINES[a]

Pollutant	Diesel Fuel (SCC 2-02-004-01)			Dual Fuel[b] (SCC 2-02-004-02)		
	Emission Factor (lb/hp-hr) (power output)	Emission Factor (lb/MMBtu) (fuel input)	EMISSION FACTOR RATING	Emission Factor (lb/hp-hr) (power output)	Emission Factor (lb/MMBtu) (fuel input)	EMISSION FACTOR RATING
NO_x						
Uncontrolled	0.024	3.2	B	0.018	2.7	D
Controlled	0.013[c]	1.9[c]	B	ND	ND	NA
CO	5.5 E-03	0.85	C	7.5 E-03	1.16	D
SO_x[d]	8.09 E-03S_1	1.01S_1	B	4.06 E-04S_1 + 9.57 E-03S_2	0.05S_1 + 0.895S_2	B
CO_2[e]	1.16	165	B	0.772	110	B
PM	0.0007[c]	0.1[c]	B	ND	ND	NA
TOC (as CH_4)	7.05 E-04	0.09	C	5.29 E-03	0.8	D
Methane	f	f	E	3.97 E-03	0.6	E
Nonmethane	f	f	E	1.32 E-03	0.2[g]	E

[a] Based on uncontrolled levels for each fuel, from References 2,6-7. When necessary, the average heating value of diesel was assumed to be 19,300 Btu/lb with a density of 7.1 lb/gallon. The power output and fuel input values were averaged independently from each other, because of the use of actual brake-specific fuel consumption (BSFC) values for each data point and of the use of data possibly sufficient to calculate only 1 of the 2 emission factors (e. g., enough information to calculate lb/MMBtu, but not lb/hp-hr). Factors are based on averages across all manufacturers and duty cycles. The actual emissions from a particular engine or manufacturer could vary considerably from these levels. To convert from lb/hp-hr to kg/kw-hr, multiply by 0.608. To convert from lb/MMBtu to ng/J, multiply by 430. SCC = Source Classification Code.

[b] Dual fuel assumes 95% natural gas and 5% diesel fuel.

[c] References 8-26. Controlled NO_x is by ignition timing retard.

[d] Assumes that all sulfur in the fuel is converted to SO_2. S_1 = % sulfur in fuel oil; S_2 = % sulfur in natural gas. For example, if sulfer content is 1.5%, then S = 1.5.

[e] Assumes 100% conversion of carbon in fuel to CO_2 with 87 weight % carbon in diesel, 70 weight % carbon in natural gas, dual-fuel mixture of 5% diesel with 95% natural gas, average BSFC of 7,000 Btu/hp-hr, diesel heating value of 19,300 Btu/lb, and natural gas heating value of 1050 Btu/scf.

[f] Based on data from 1 engine, TOC is by weight 9% methane and 91% nonmethane.

[g] Assumes that nonmethane organic compounds are 25% of TOC emissions from dual-fuel engines. Molecular weight of nonmethane gas stream is assumed to be that of methane.

TEST REPORT

FROM ONE

CATERPILLAR C32 ACERT
COMPRESSION IGNITION COMBUSTION ENGINE

IN SERVICE AT THE

MV GCP HMA 1 PLANT

PREPARED FOR

MESA VERDE ENTERPRISES

NEW MEXICO ENVIRONMENT DEPARTMENT
AIR QUALITY BUREAU PERMIT NUMBER GCP-3-9079
AIRS # 35-777-1605

TEST DATE

MAY 17, 2021

PREPARED BY

COMPLIANCE SERVICES AND TESTING, LLC

PROJECT NUMBER

2233

COMPLIANCE SERVICES & TESTING

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June 10, 2021

Mr. Allister Gunn, Jr.
Mesa Verde Enterprises.
P.O. Box 907
Alamogordo, NM 88311

Re: Emissions testing at the MV GCP HMA 1 Facility

Mr. Gunn, Jr.,

On May 17, 2021, exhaust emissions testing was performed on a Caterpillar C32 ACERT diesel generator engine in service at the Mesa Verde Enterprises MV GCP HMA 1 Facility, near Glencoe, NM. The engine is used to provide power at a hot mix asphalt plant. The testing was conducted to determine its compliance status NMED-AQB GCP-3-9079 permit. The crusher engine is identified as follows:

Engine Information	
Manufacturer	Caterpillar
Model Number	C32 ACERT
Unit Number	19
Serial Number	JDB00173
Rated Horsepower	1362
Rated Speed	1800

The testing followed procedures found in the ASTM D6522-00 Performance Testing protocol, per NMED and GCP-3 conventions. The exhaust flow rate for the diesel generator engine was determined by using EPA Method 2 (velocity head pressures). The theoretical moisture content at the observed oxygen concentration was stoichiometrically calculated using Method 19. The mass emission rates are reported in terms of pounds per hour and tons per year based of 3640 hours (daylight hours year-round) in lieu of 8760 (24 hours/day 365 days/year).

The test matrix consisted of three 20-minute test runs on engine exhaust in accordance with 40CFR60.8 requirements. Stack gas entered the system through a stainless-steel probe with an in-line filter. The sample was delivered to a specially designed stainless-steel minimum-contact condenser, which dried the sample without removing NO_X or other compounds of interest. That sample was then passed to the manifold where it was partitioned to the NO_X, CO, O_2 and CO_2 analyzers through glass and stainless-steel rotameters for flow control of the sample. CST personnel recorded engine operational data such as engine speed from engine control panel. The feed rate was given by the manufacture. The percent load was determined by the exhaust flow rate and oxygen content. Three 10-minute Method 9 opacity readings were performed on the engine concurrent with each gaseous test run.

A summary of the results is presented in the appendix and is in tabular format. This table includes emission concentrations, engine operational data, and mass emission rates. The quality assurance and control results associated with the EPA test methods are also presented in tabular format in the appendix. Examples of these procedures include multipoint calibrations, a NO_X converter efficiency test, instrument linearization checks, zero and span instrument drift checks between each test run, and sample and analyzer interference test results. The appendix also includes field data sheets, the datalog record, example calculations, calibration gas certifications, instrument detection principles and limits, and a sampling system diagram.

Respectfully,

Efren Alvarado
Compliance Services & Testing

APPENDIX

Summary of Results
Quality Assurance Worksheets
Field Data Sheets
Example Calculations
Sample System Diagram
List of Analytical Instrumentation
Calibration Certificates
Method 9 Opacity Worksheets
Opacity Reader Certification
Datalog Record

Summary of Results
Unit #19

Company: Mesa Verde Enterprises
Location: MV GCP HMA 1
Source: Catapillar C32 ACERT   SN: JDB00173
Engine Site Rating: 1362 Hp @ 1800 RPM
Generator Rating: 1008 kW @ 1800 RPM
Technician: EA

Test Run Number	***1***	***2***	***3***	
Unit Number	**19**	**19**	**19**	
Unit Hours	**6519**	**6519**	**6520**	
Date	5/17/21	5/17/21	5/17/21	
Start Time	11:21	11:42	12:03	
Stop Time	11:41	12:02	12:23	
Engine / Generator Operational Parameters				***Average***
Load (%)	55	55	55	**55.0**
Engine Horsepower (Hp)	746	750	751	**748.7**
Engine Speed (rpm)	1797	179	1797	**1257.7**
Turbo Boost (psig)	14	14	14	**14.0**
Air Manifold Temperature (°F)	93	93	93	**93.0**
Generator Wattage (kW)	406	402	420	**409.3**
Voltage (V)	482	482	482	**482.0**
Volt Amp (kVA)	501	510	508	**506.3**
Reactive Power (kVAR)	305	307	308	**306.7**
Amperage (A)	629	602	607	**612.7**
Frequency (Hz)	60	60	60	**60.0**
Power Facotr	0.8	0.8	0.8	**0.8**
Fuel Data				
Fuel Pressure (psig)	97	97	97	**97.0**
Calculated Fuel Consumption (Gal/Hr)	33.0	33.0	33.0	**33.0**
O2 F-Factor (DSCF/MMBtu, HHV basis)	9190	9190	9190	**9190.0**
Fuel Heating Value (Btu/gal, HHV)	136000	136000	136000	**136000.0**
BHp Specific Fuel Rate (Btu/Hp-hr, HHV basis)	8500	8500	8500	**8500.0**
Ambient Conditions				
Pressure Altitude (MSL)	5830	5830	5830	**5830**
Atmospheric Pressure ("Hg)	24.16	24.16	24.16	**24.16**
Dry Bulb Temperature (°F)	52.2	52.2	52.2	**52.2**
Wet Bulb Temperature (°F)	43.6	43.6	43.6	**43.6**
Humidity (lb/lb air)	0.0054	0.0054	0.0054	**0.0054**
Measured Exhaust Emissions				
NOx (ppmv)	454.65	458.87	463.09	**458.87**
CO (ppmv)	140.96	142.20	141.04	**141.40**
O2 (vol %)	11.23	11.17	11.16	**11.18**
CO2 (vol %)	6.15	6.13	6.11	**6.13**
Opacity (%) **{Limit = 10%}**	0.00	0.00	0.00	**0.00**
Exhaust Flow Rates				
Dry Standard Cubic Feet per Minute	2,097.16	2,096.82	2,096.81	**2,096.93**
Dry Standard Cubic Feet per Hour	125,830	125,809	125,808	**125,816**
Calculated Mass Emission Rates				
NOx (lbs/hr)	6.83	6.89	6.96	**6.90**
CO (lbs/hr)	1.29	1.30	1.29	**1.29**
*NOx (tons/yr)	11.82	11.93	12.04	**11.93**
*CO (tons/yr)	2.23	2.25	2.23	**2.24**

*** Based on 3460 daylight hours per year**

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

HELICAL COIL HEATERS

FOR HOT MIX ASPHALT

HC-120 with side pumps and Stackpack heat exchanger

HEATEC THERMAL FLUID (hot oil) heaters for the hot mix asphalt (HMA) industry are designed around a helical coil. Our coil meets ASME code.

Although we make several other types of heaters for other industries, our helical coil heaters are the most popular heater in the HMA industry. Their popularity comes from their simplicity, efficiency, low maintenance and relatively low cost.

MODELS AND OUTPUTS

Nine standard models are available. Rated thermal outputs range from 0.7 to 4 million Btu per hour. All can be customized to meet your specific needs.

TWO BASIC CONFIGURATIONS

Heatec helical coil heaters are available in two basic configurations: HC and HCS. The HC configuration (above) has a manifold that enables the heater to operate with multiple thermal fluid circuits.

HEATEC

Heatec HCS helical coil heater for single thermal fluid circuit

LH side of Heatec HCS helical coil heater

The HCS configuration is virtually identical to the HC except that it is intended to operate with a single circuit. It has no manifold.

HCS heater can be upgraded

However, the HCS heater can be upgraded to the HC configuration by adding an optional manifold. The upgrade can be done at any time as needed.

High efficiency reduces costs

A hallmark of our helical coil heater is high thermal efficiency. Thermal efficiencies of our standard heaters range up to 85 percent LHV, depending upon fluid outlet temperature and fuel.

Thermal efficiency is the total amount of heat produced by the burner versus the portion actually transferred to thermal fluid flowing through the coil. Thus, in our heaters, up to 85 percent of the total heat is transferred to the thermal fluid. Increasing efficiency reduces fuel usage.

Achieving super-efficiency

Adding a **STACKPACK™** heat exchanger boosts thermal efficiency another 5 percent. It makes our current heater super-efficient. That extra percentage reduces monthly fuel usage by 261 gallons of No. 2 fuel oil or 345 therms of natural gas. The Stackpack heat exchanger usually pays for itself in a year or less.

Controls

Heater controls automatically maintain the operating temperature set by the operator. Accuracy is within a half percent of set temperature. The temperature of thermal fluid at the heater's outlet can be maintained up to 450 degrees F (depending on variables).

Numerous safety features ensure heater operation is always within prescribed limits. Heaters shut down automatically if an abnormal operating condition occurs.

Switches and sensors in a ***limit*** circuit ensure normal operation. They monitor burner flame, thermal fluid temperature, exhaust gas temperature, flow of thermal fluid, and combustion air pressure.

Burner controls

Fireye™ burner management controls known as BurnerLogix™ provide proper and safe operation of the burner. They include a display, burner control, programmer, annunciator and flame scanner.

The burner control uses a microprocessor for its management functions. The processor provides the proper burner sequencing, ignition and flame monitoring protection.

The controls provide important messages about the operating status of the heater. If there is an alarm condition, a message will appear on the display. The message identifies the cause of the alarm, including which safety device in the *limit* circuit may have caused the shutdown.

Control panel

Main controls are in a UL approved NEMA-4 panel, which protects against wind-blown dust and rain, splashing water and hose-directed water. Wiring workmanship is meticulous and meets strict standards. All wires and terminals are labeled for easy identification of circuits. A laminated circuit diagram is furnished.

NOTE: Fireye and BurnerLogix are trademarks of Fireye, Inc.

HCS-100 single circuit heater with optional Stackpack™ heat exchanger.

1. Hot oil (thermal fluid) recirculation pump and motor.
2. Fully modulating burner.
3. Rain shield.
4. End plates bolt on and have lifting eyes.
5. Stackpack™ heat exchanger (optional).
6. Exhaust stack.
7. Thermal fluid expansion tank.
8. Low media level switch (not visible).
9. One of four lifting eyes.
10. Single circuit configuration shown can be upgraded to multiple circuit by adding manifold.
11. 3" ceramic fiberglass insulation.
12. Helical coil. Built to ASME code.
13. Heater shell. Welded A-36 steel plate.
14. Pressure differential switch.
15. Thermal fluid Y-strainer.

SPECIFICATIONS

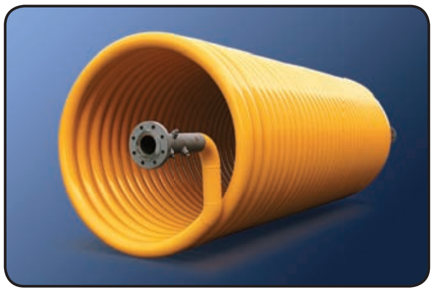
BASIC MODEL	MAXIMUM OUTPUT	FUEL USED PER HOUR		RECIRCULATION PUMP		EXPANSION TANK	APPROXIMATE OVERALL SIZE			NET WEIGHT
	Btu/Hour	No. 2 Fuel Oil Gallons	Natural Gas Cubic feet/hour	Hp	GPM	Gallons	Length	Width	Height	Pounds
SINGLE CIRCUIT HEATERS										
HCS-70	700,000	6	910	10	100	100	10’-5”	5’-7”	8’-10”	3,700
HCS-100	1,200,000	11	1,560	10	100	175	12’-1”	5’-9”	9”-0”	5,000
HCS-175	2,000,000	18	2,600	15	150	280	14’-5”	6’-3”	9’-7”	6,500
HCS-250	3,000,000	27	3,900	15	150	280	15’-9”	7’-4”	10’-6”	9,300
HCS-350	4,000,000	36	5,200	15	200	400	18’-1”	7’-4”	11’-5”	10,700
MULTI-CIRCUIT HEATERS										
HC-120	1,200,000	11	1560	10	100	175	12’-1”	5’-11”	9”-0”	5,100
HC-200	2,000,000	18	2600	15	150	280	14’-5”	6’-5”	9’-7”	6,600
HC-300	3,000,000	27	3,900	15	150	280	15’-9”	7’-6”	10’-6”	9,500
HC-400	4,000,000	36	5,200	15	200	400	18’-1”	7’-6”	11’-5”	10,900

The amount of fuel used is for a thermal efficiency of 85% and one hour of operation at maximum output. A properly sized heater normally runs for intermittent periods at lower outputs. No. 2 fuel usage is based on 132,000 Btu per gallon, its LHV (low heating value). Natural gas usage is based on 905 Btu per cubic foot, its LHV. Heights include the exhaust stack without a Stackpack heat exchanger. The Stackpack exchanger for the HCS-350 and HC-400 weighs 800 pounds and adds 2’-7” to their height. For all other models it weighs 460 pounds and adds 1’-9” to their height.

NOTE: Specifications are subject to change without prior notice or obligation.

Burner modulation

The heater has a fully modulating burner with appropriate turndown ratios. Modulation allows its firing rate to closely match the heat demand. This conserves fuel, reduces temperature overshooting and eliminates constant on-off recycling.



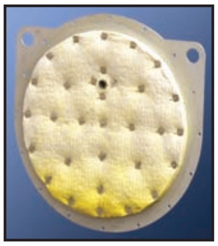
Helical coils

Helical coils in our heaters set us apart from others that produce helical coil heaters for the HMA industry. We are the only heater manufacturer that builds *all* coils to ASME code. Certification is optional.

Coils in HCS heaters have a three year warranty. Coils in HC heaters have a five year warranty.

Insulation

The shell of our heater is fully insulated with 3 inches of ceramic fiberglass insulation. The end plates are also insulated. All insulation is treated to retard errosion.



Options

Options include: Stackpack heat exchanger, seven-day time clock, sock filter, automated monitor (dialer), burners for various fuels, and steel valves. A variety of electrical power options are available.

Factory testing and startup

All HC and HCS heaters are factory-tested. We provide startup services with fees based on time at site plus travel time and expenses.

Warranty and factory support

Our heaters have a one-year limited warranty. Additionally, the coils have an extended warranty as noted earlier. Round-the-clock support is available from our in-house parts and service departments.

HEATEC

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HEATEC, INC. an Astec Industries Company

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VOLUME II: CHAPTER 3

PREFERRED AND ALTERNATIVE METHODS FOR ESTIMATING AIR EMISSIONS FROM HOT-MIX ASPHALT PLANTS

Final Report

July 1996

Prepared by:
Eastern Research Group, Inc.
Post Office Box 2010
Morrisville, North Carolina 27560

Prepared for:
Point Sources Committee
Emission Inventory Improvement Program

In the counterflow drum mixing process, the aggregate is proportioned through a cold feed system prior to introduction to the drying process. As opposed to the parallel flow drum mixing process though, the aggregate moves opposite to the flow of the exhaust gases. After drying and heating take place, the aggregate is transferred to a part of the drum that is not exposed to the exhaust gas and coated with asphalt cement. This process prevents stripping of the asphalt cement by the hot exhaust gas. If RAP is used, it is usually introduced into the coating chamber.

2.2 EMISSION SOURCES

Emissions from HMA plants derive from both controlled (i.e., ducted) and uncontrolled sources. Section 7 lists the source classification codes (SCCs) for these emission points.

2.2.1 MATERIAL HANDLING (FUGITIVE EMISSIONS)

Material handling includes the receipt, movement, and processing of fuel and materials used at the HMA facility. Fugitive particulate matter (PM) emissions from aggregate storage piles are typically caused by front-end loader operations that transport the aggregate to the cold feed unit hoppers. The amount of fugitive PM emissions from aggregate piles will be greater in strong winds (Gunkel, 1992). Piles of RAP, because RAP is coated with asphalt cement, are not likely to cause significant fugitive dust problems. Other pre-dryer fugitive emission sources include the transfer of aggregate from the cold feed unit hoppers to the dryer feed conveyor and, subsequently, to the dryer entrance. Aggregate moisture content prior to entry into the dryer is typically 3 percent to 7 percent. This moisture content, along with aggregate size classification, tend to minimize emissions from these sources, which contribute little to total facility PM emissions. PM less than or equal to 10 µm in diameter (PM_{10}) emissions from these sources are reported to account for about 19 percent of their total PM emissions (NAPA, 1995).

If crushing, breaking, or grinding operations occur at the plant, these may result in fugitive PM emissions (TNRCC, 1994). Also, fine particulate collected from the baghouses can be a source of fugitive emissions as the overflow PM is transported by truck (enclosed or tarped) for on-site disposal. At all HMA plants there may be PM and slight process fugitive volatile organic compound (VOC) emissions from the transport and handling of the hot-mix from the mixer to the storage silo and also from the load-out operations to the delivery trucks (EPA, 1994a). Small amounts of VOC emissions can also result from the transfer of liquid and gaseous fuels, although natural gas is normally transported in a pipeline (Gunkel, 1992, Wiese, 1995).

TABLE 3.2-1

TYPICAL HOT-MIX ASPHALT PLANT EMISSION CONTROL TECHNIQUES

Emission Source	Pollutant	Control Technique	Typical Efficiency (%)
Process	PM and PM_{10}	Cyclones	50 - 75[a,b]
		Multiple cyclones	90[c]
		Settling chamber	<50[b]
		Baghouse	99 - 99.97[a,d]
		Venturi scrubber	90 - 99.5[d,e]
	VOC	Dryer and combustion process modifications	37 - 86[f,g]
	SO_x	Limestone	50[b,e]
		Low sulfur fuel	80[c]
Fugitive dust	PM and PM_{10}	Paving and maintenance	60 - 99[g]
		Wetting and crusting agents	70[b] - 80[c]
		Crushed RAP material, asphalt shingles	70[h]

[a] Control efficiency dependent on particle size ratio and size of equipment.
[b] Source: Patterson, 1995c.
[c] Source: EIIP, 1995.
[d] Typical efficiencies at a hot-mix asphalt plant.
[e] Source: TNRCC, 1995.
[f] Source: Gunkel, 1992.
[g] Source: TNRCC, 1994.
[h] Source: Patterson, 1995a.

NEW MEXICO

AVERAGE WIND SPEED - MPH

STATION	ID	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
ALAMOGORDO AIRPORT ASOS	KALM	1996-2006	5.1	6.3	7.1	7.9	7.1	6.9	6.1	5.3	5.2	5.2	5.0	5.0	6.0
ALAMOGORDO-HOLLOMAN AFB	KHMN	1996-2006	8.5	9.7	10.6	11.8	10.8	10.6	9.8	9.1	8.8	8.5	8.1	8.3	9.6
ALBUQUERQUE AP ASOS	KABQ	1996-2006	7.0	8.2	9.3	11.1	10.0	10.0	8.7	8.3	8.0	7.9	7.2	6.9	8.5
ALBUQUERQUE-DBLE EAGLE	KAEG	1999-2006	7.1	7.9	9.0	10.6	9.5	8.6	7.0	6.2	7.0	6.5	6.5	6.1	7.7
ARTESIA AIRPORT ASOS	KATS	1997-2006	7.8	9.1	10.1	10.9	10.2	9.9	7.8	6.9	7.6	7.8	7.6	7.4	8.5
CARLSBAD AIRPORT ASOS	KCNM	1996-2006	9.2	9.8	10.9	11.4	10.4	9.9	8.5	7.7	8.2	8.5	8.4	8.8	9.3
CLAYTON MUNI AP ASOS	KCAO	1996-2006	11.9	12.7	13.4	14.6	13.4	13.0	11.7	10.8	11.8	12.1	12.1	12.0	12.4
CLINES CORNERS	KCQC	1998-2006	16.2	16.1	15.7	16.9	14.6	13.5	10.6	10.1	11.8	13.3	15.0	16.0	14.1
CLOVIS AIRPORT AWOS	KCVN	1996-2006	12.3	12.3	13.4	13.8	12.4	11.9	9.7	8.9	9.7	10.9	11.6	12.2	11.6
CLOVIS-CANNON AFB	KCVS	1996-2006	12.5	12.6	13.6	13.8	12.2	12.5	10.7	10.0	10.2	11.3	11.7	12.4	12.0
DEMING AIRPORT ASOS	KDMN	1996-2006	8.7	9.7	10.9	12.0	10.6	10.1	8.9	8.1	8.4	8.2	8.5	8.1	9.3
FARMINGTON AIRPORT ASOS	KFMN	1996-2006	7.3	8.3	9.0	9.8	9.4	9.4	8.7	8.2	8.0	7.8	7.6	7.3	8.4
GALLUP AIRPORT ASOS	KGUP	1996-2006	5.7	6.9	7.8	10.0	9.0	8.8	6.9	6.0	6.5	6.1	5.6	5.3	7.0
GRANTS-MILAN AP ASOS	KGNT	1997-2006	7.8	8.8	9.6	10.9	10.0	9.8	8.1	7.2	7.9	8.4	8.0	7.6	8.7
HOBBS AIRPORT AWOS	KHOB	1996-2006	11.3	11.9	12.6	13.4	12.5	12.3	11.0	10.0	10.2	10.6	10.7	11.1	11.4
LAS CRUCES AIRPORT AWOS	KLRU	2000-2006	6.4	7.5	8.8	10.1	8.7	8.2	6.8	6.0	6.2	6.1	6.4	6.0	7.3
LAS VEGAS AIRPORT ASOS	KLVS	1996-2006	10.9	12.2	12.5	14.3	12.4	11.8	10.0	9.2	10.9	10.8	11.0	10.9	11.4
LOS ALAMOS AP AWOS	KLAM	2005-2006	3.9	5.7	7.5	8.1	7.1	7.3	5.3	4.8	5.7	5.1	4.4	3.2	5.4
RATON AIRPORT ASOS	KRTN	1998-2006	8.9	9.4	10.4	12.2	10.8	10.2	8.4	8.1	8.6	9.0	8.6	8.5	9.4
ROSWELL AIRPORT ASOS	KROW	1996-2006	7.4	8.9	9.9	11.1	10.3	10.2	8.8	7.9	8.3	8.0	7.5	7.3	8.8
RUIDOSO AIRPORT AWOS	KSRR	1996-2006	8.8	9.6	10.0	11.6	10.0	8.4	5.9	5.3	6.4	7.4	7.9	8.7	8.3
SANTA FE AIRPORT ASOS	KSAF	1996-2006	8.9	9.5	9.9	11.2	10.6	10.5	9.2	8.8	8.8	9.1	8.7	8.5	9.5
SILVER CITY AP AWOS	KSVC	1999-2006	8.1	8.7	9.9	10.8	10.2	9.9	8.5	7.2	6.9	7.6	7.9	7.7	8.5
TAOS AIRPORT AWOS	KSKX	1996-2006	5.8	6.5	7.7	9.1	8.6	8.5	7.1	6.6	6.7	6.6	6.0	5.7	7.0
TRUTH OR CONSEQ AP ASOS	KTCS	1996-2006	7.4	8.7	9.9	11.1	10.4	9.8	8.1	7.4	7.7	8.0	7.7	7.3	8.6
TUCUMCARI AIRPORT ASOS	KTCC	1999-2006	10.0	11.2	11.9	13.6	11.9	11.6	9.9	9.3	10.0	10.0	10.4	10.2	10.8

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification	
User Identification:	MVHMAAC1
City:	Roswell
State:	New Mexico
Company:	Mesa Verde Enterprises
Type of Tank:	Horizontal Tank
Description:	Mesa Verde Enterprises Astec Asphalt Cement Tank
Tank Dimensions	
Shell Length (ft):	52.00
Diameter (ft):	10.00
Volume (gallons):	30,000.00
Turnovers:	195.23
Net Throughput(gal/yr):	5,856,833.00
Is Tank Heated (y/n):	Y
Is Tank Underground (y/n):	N
Paint Characteristics	
Shell Color/Shade:	Aluminum/Diffuse
Shell Condition	Good
Breather Vent Settings	
Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Roswell, New Mexico (Avg Atmospheric Pressure = 12.73 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

MVHMAAC1 - Horizontal Tank
Roswell, New Mexico

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Asphalt Cement	All	350.00	350.00	350.00	350.00	0.0347	0.0347	0.0347	105.0000			1,000.00	Option 3: A=75350, B=9.00346

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

MVHMAAC1 - Horizontal Tank
Roswell, New Mexico

Annual Emission Calculations	
Standing Losses (lb):	0.0000
Vapor Space Volume (cu ft):	2,601.3188
Vapor Density (lb/cu ft):	0.0004
Vapor Space Expansion Factor:	0.0000
Vented Vapor Saturation Factor:	0.9909
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	2,601.3188
Tank Diameter (ft):	10.0000
Effective Diameter (ft):	25.7375
Vapor Space Outage (ft):	5.0000
Tank Shell Length (ft):	52.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0004
Vapor Molecular Weight (lb/lb-mole):	105.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0347
Daily Avg. Liquid Surface Temp. (deg. R):	809.6700
Daily Average Ambient Temp. (deg. F):	60.8167
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	809.6700
Tank Paint Solar Absorptance (Shell):	0.6000
Daily Total Solar Insulation Factor (Btu/sqft day):	1,810.0000
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0000
Daily Vapor Temperature Range (deg. R):	0.0000
Daily Vapor Pressure Range (psia):	0.0000
Breather Vent Press. Setting Range(psia):	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0347
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0347
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0347
Daily Avg. Liquid Surface Temp. (deg R):	809.6700
Daily Min. Liquid Surface Temp. (deg R):	809.6700
Daily Max. Liquid Surface Temp. (deg R):	809.6700
Daily Ambient Temp. Range (deg. R):	29.8333
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9909
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0347
Vapor Space Outage (ft):	5.0000
Working Losses (lb):	122.1586
Vapor Molecular Weight (lb/lb-mole):	105.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0347
Annual Net Throughput (gal/yr.):	5,856,833.0000
Annual Turnovers:	195.2278
Turnover Factor:	0.3203
Tank Diameter (ft):	10.0000
Working Loss Product Factor:	0.7500
Total Losses (lb):	122.1586

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

MVHMAAC1 - Horizontal Tank
Roswell, New Mexico

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Asphalt Cement	122.16	0.00	122.16

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification	
User Identification:	MVHMAAC2
City:	Roswell
State:	New Mexico
Company:	Mesa Verde Enterprises
Type of Tank:	Horizontal Tank
Description:	Mesa Verde Enterprises Astec Asphalt Cement Tank
Tank Dimensions	
Shell Length (ft):	52.00
Diameter (ft):	10.00
Volume (gallons):	30,000.00
Turnovers:	195.23
Net Throughput(gal/yr):	5,856,833.00
Is Tank Heated (y/n):	Y
Is Tank Underground (y/n):	N
Paint Characteristics	
Shell Color/Shade:	Aluminum/Diffuse
Shell Condition	Good
Breather Vent Settings	
Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Roswell, New Mexico (Avg Atmospheric Pressure = 12.73 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

MVHMAAC1 - Horizontal Tank
Roswell, New Mexico

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Asphalt Cement	All	350.00	350.00	350.00	350.00	0.0347	0.0347	0.0347	105.0000			1,000.00	Option 3: A=75350, B=9.00346

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

MVHMAAC1 - Horizontal Tank
Roswell, New Mexico

Annual Emission Calculations	
Standing Losses (lb):	0.0000
Vapor Space Volume (cu ft):	2,601.3188
Vapor Density (lb/cu ft):	0.0004
Vapor Space Expansion Factor:	0.0000
Vented Vapor Saturation Factor:	0.9909
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	2,601.3188
Tank Diameter (ft):	10.0000
Effective Diameter (ft):	25.7375
Vapor Space Outage (ft):	5.0000
Tank Shell Length (ft):	52.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0004
Vapor Molecular Weight (lb/lb-mole):	105.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0347
Daily Avg. Liquid Surface Temp. (deg. R):	809.6700
Daily Average Ambient Temp. (deg. F):	60.8167
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	809.6700
Tank Paint Solar Absorptance (Shell):	0.6000
Daily Total Solar Insulation Factor (Btu/sqft day):	1,810.0000
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0000
Daily Vapor Temperature Range (deg. R):	0.0000
Daily Vapor Pressure Range (psia):	0.0000
Breather Vent Press. Setting Range(psia):	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0347
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0347
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0347
Daily Avg. Liquid Surface Temp. (deg R):	809.6700
Daily Min. Liquid Surface Temp. (deg R):	809.6700
Daily Max. Liquid Surface Temp. (deg R):	809.6700
Daily Ambient Temp. Range (deg. R):	29.8333
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9909
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0347
Vapor Space Outage (ft):	5.0000
Working Losses (lb):	122.1586
Vapor Molecular Weight (lb/lb-mole):	105.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0347
Annual Net Throughput (gal/yr.):	5,856,833.0000
Annual Turnovers:	195.2278
Turnover Factor:	0.3203
Tank Diameter (ft):	10.0000
Working Loss Product Factor:	0.7500
Total Losses (lb):	122.1586

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

MVHMAAC1 - Horizontal Tank
Roswell, New Mexico

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Asphalt Cement	122.16	0.00	122.16

Section 8

Map(s)

A map such as a 7.5 minute topographic quadrangle showing the exact location of the source. The map shall also include the following:

The UTM or Longitudinal coordinate system on both axes	An indicator showing which direction is north
A minimum radius around the plant of 0.8km (0.5 miles)	Access and haul roads
Topographic features of the area	Facility property boundaries
The name of the map	The area which will be restricted to public access
A graphical scale	

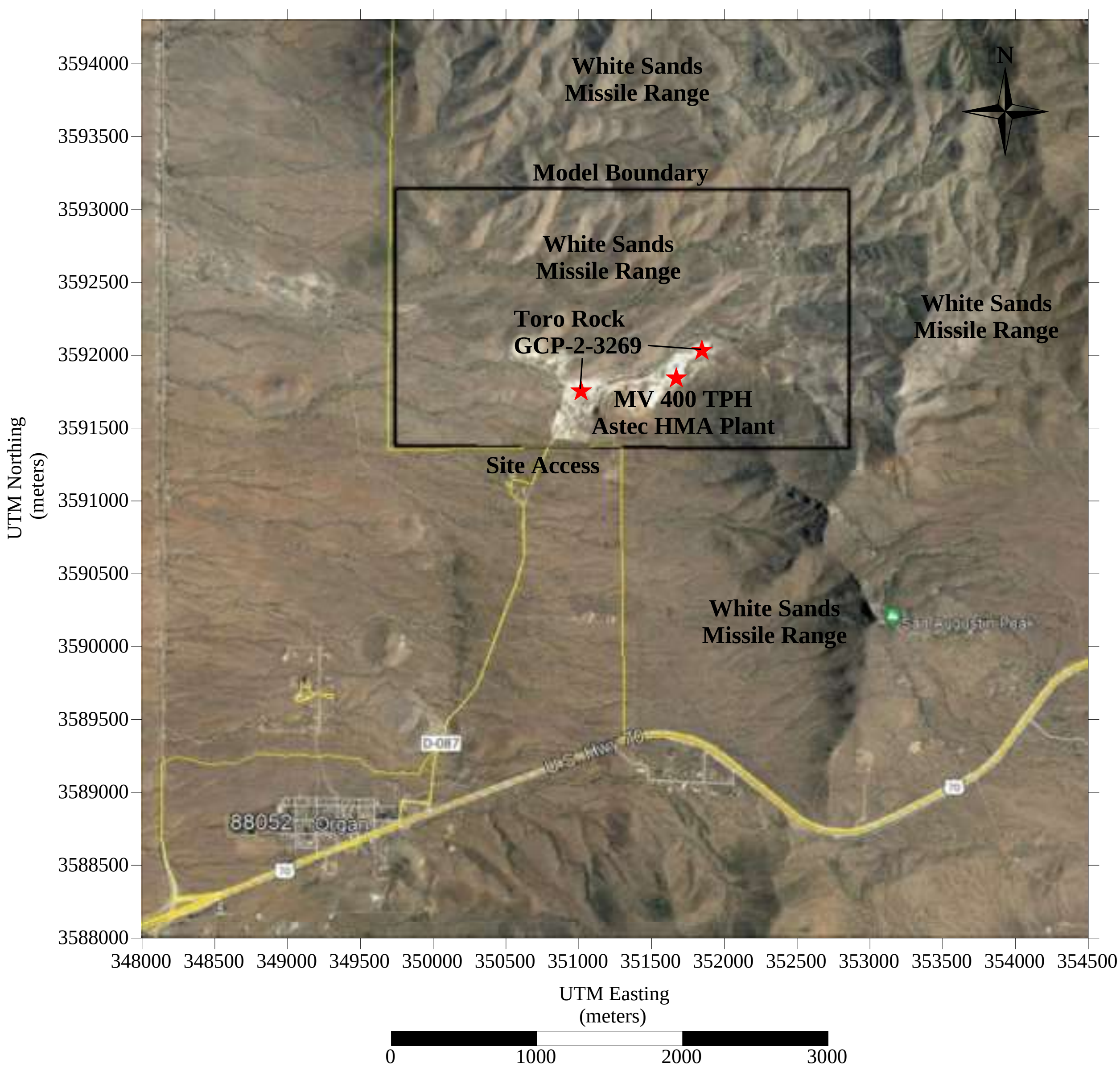

Figure 8-1: MV 400 TPH Astec HMA Plant Location and Surrounding Terrain

Section 9

Proof of Public Notice

(for NSR applications submitting under 20.2.72 or 20.2.74 NMAC)

(This proof is required by: 20.2.72.203.A.14 NMAC "Documentary Proof of applicant's public notice")

☐ **I have read the AQB "Guidelines for Public Notification for Air Quality Permit Applications"**
This document provides detailed instructions about public notice requirements for various permitting actions. It also provides public notice examples and certification forms. Material mistakes in the public notice will require a re-notice before issuance of the permit.

Unless otherwise allowed elsewhere in this document, the following items document proof of the applicant's Public Notification. Please include this page in your proof of public notice submittal with checkmarks indicating which documents are being submitted with the application.

New Permit and **Significant Permit Revision** public notices must include all items in this list.

Technical Revision public notices require only items 1, 5, 9, and 10.

Per the Guidelines for Public Notification document mentioned above, include:

1. X A copy of the certified letter receipts with post marks (20.2.72.203.B NMAC)
2. X A list of the places where the public notice has been posted in at least four publicly accessible and conspicuous places, including the proposed or existing facility entrance. (e.g: post office, library, grocery, etc.)
3. X A copy of the property tax record (20.2.72.203.B NMAC).
4. X A sample of the letters sent to the owners of record.
5. X A sample of the letters sent to counties, municipalities, and Indian tribes.
6. X A sample of the public notice posted and a verification of the local postings.
7. X A table of the noticed citizens, counties, municipalities and tribes and to whom the notices were sent in each group.
8. X A copy of the public service announcement (PSA) sent to a local radio station and documentary proof of submittal.
9. X A copy of the classified or legal ad including the page header (date and newspaper title) or its affidavit of publication stating the ad date, and a copy of the ad. When appropriate, this ad shall be printed in both English and Spanish.
10. X A copy of the display ad including the page header (date and newspaper title) or its affidavit of publication stating the ad date, and a copy of the ad. When appropriate, this ad shall be printed in both English and Spanish.
11. X A map with a graphic scale showing the facility boundary and the surrounding area in which owners of record were notified by mail. This is necessary for verification that the correct facility boundary was used in determining distance for notifying land owners of record.

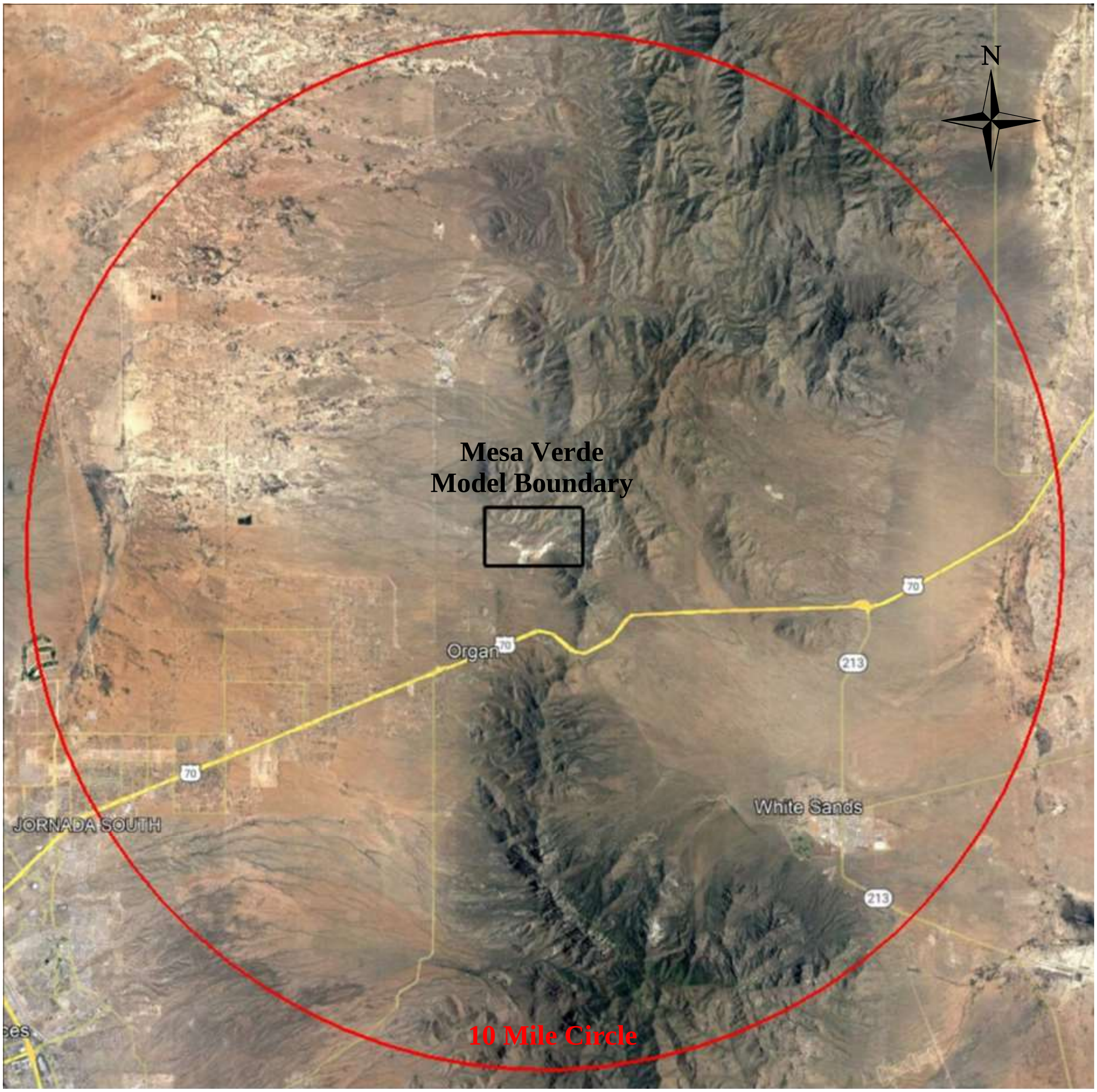

Figure 9-1: Ten-Mile Radius around Site

Government List within 10 Miles

Dona Ana County	Amanda López Askin, County Clerk	845 N Motel Blvd	Las Cruces	NM	88007

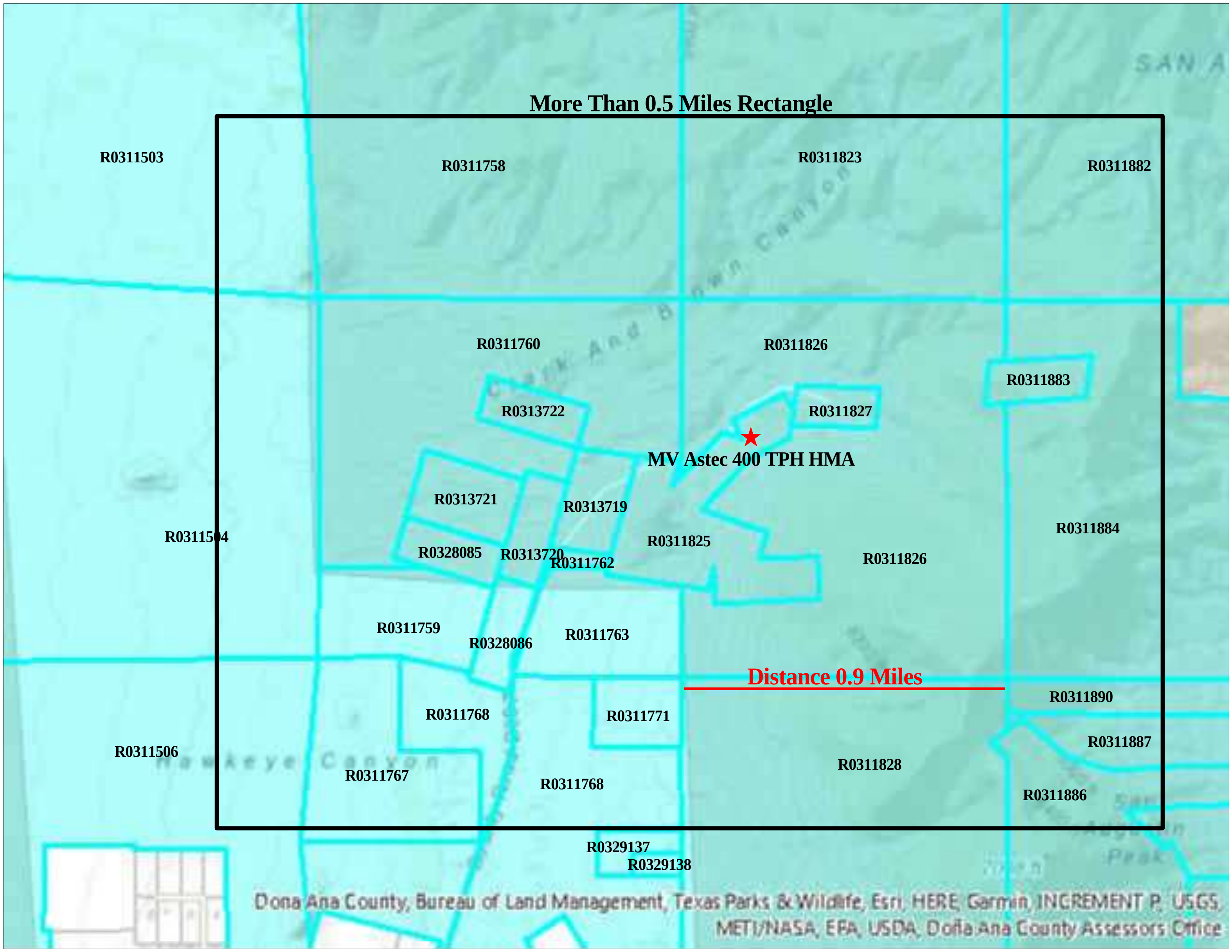

Figure 9-2: Half Mile Radius around Site

Acct_No	OWNNAME	MAILADD	MCITY	STATE	ZIP
R0328086	LEE BONNIE JO	3077 STATE HIGHWAY 252	MCALISTER	NM	88427
R0311825	NEW ORGAN MOUNTAIN RESOURCES LLC	1155 COMMERCE DR STE E	LAS CRUCES	NM	88011-8257
R0313719	ORANGE MINING PROPERTIES LLC	1155 COMMERCE DR STE E	LAS CRUCES	NM	88011
R0313721	ORANGE MINING PROPERTIES LLC	1155 COMMERCE DR STE E	LAS CRUCES	NM	88011
R0313722	ORANGE MINING PROPERTIES LLC	1155 COMMERCE DR STE E	LAS CRUCES	NM	88011
R0313720	SILVERCHIP LLC	1155 COMMERCE DR STE E	LAS CRUCES	NM	88011
R0328085	SILVERCHIP LLC	1155 COMMERCE DR STE E	LAS CRUCES	NM	88011
R0311759	STATE OF NEW MEXICO	310 OLD SANTA FE TRL	SANTA FE	NM	87501
R0311763	STATE OF NEW MEXICO	310 OLD SANTA FE TRL	SANTA FE	NM	87501
R0311767	STATE OF NEW MEXICO	310 OLD SANTA FE TRL	SANTA FE	NM	87501
R0311771	STATE OF NEW MEXICO	310 OLD SANTA FE TRL	SANTA FE	NM	87501
R0311503	UNITED STATES OF AMERICA	1800 MARQUESS	LAS CRUCES	NM	88005-3371
R0311504	UNITED STATES OF AMERICA	1800 MARQUESS	LAS CRUCES	NM	88005-3371
R0311506	UNITED STATES OF AMERICA	1800 MARQUESS	LAS CRUCES	NM	88005-3371
R0311758	UNITED STATES OF AMERICA	1800 MARQUESS	LAS CRUCES	NM	88005-3371
R0311760	UNITED STATES OF AMERICA	1800 MARQUESS	LAS CRUCES	NM	88005-3371
R0311768	UNITED STATES OF AMERICA	1800 MARQUESS	LAS CRUCES	NM	88005-3371
R0311823	UNITED STATES OF AMERICA	1800 MARQUESS	LAS CRUCES	NM	88005-3371
R0311826	UNITED STATES OF AMERICA	1800 MARQUESS	LAS CRUCES	NM	88005-3371
R0311827	UNITED STATES OF AMERICA	1800 MARQUESS	LAS CRUCES	NM	88005-3371
R0311828	UNITED STATES OF AMERICA	1800 MARQUESS	LAS CRUCES	NM	88005-3371
R0311882	UNITED STATES OF AMERICA	1800 MARQUESS	LAS CRUCES	NM	88005-3371
R0311883	UNITED STATES OF AMERICA	1800 MARQUESS	LAS CRUCES	NM	88005-3371
R0311884	UNITED STATES OF AMERICA	1800 MARQUESS	LAS CRUCES	NM	88005-3371
R0311886	UNITED STATES OF AMERICA	1800 MARQUESS	LAS CRUCES	NM	88005-3371
R0311887	UNITED STATES OF AMERICA	1800 MARQUESS	LAS CRUCES	NM	88005-3371
R0311890	UNITED STATES OF AMERICA	1800 MARQUESS	LAS CRUCES	NM	88005-3371

January 2, 2024

CERTIFIED MAIL XXXX XXXX XXXX XXXX

Dear **[Neighbor/Environmental Director/county or municipal official]**

Mesa Verde Enterprises, Inc. announces its application to the New Mexico Environment Department for an air quality permit for the construction of its hot mix asphalt facility. The expected date of application submittal to the Air Quality Bureau is January 5,2024.

The exact location for the proposed facility known as, MV 400 TPH Astec HMA Plant, is latitude 32.45395 decimal degree North and longitude -106.57758 decimal degree West. The approximate location of this facility is 2.5 miles northeast of Organ, NM in Dona Ana county.

The proposed construction consists of a 400 ton per hour (TPH) HMA plant that presently operates under GCP-3-9079.

The estimated maximum quantities of any regulated air contaminants will be as follows in pound per hour (pph) and tons per year (tpy). These reported emissions could change slightly during the course of the Department's review:

Pollutant:	Pounds per hour	Tons per year
PM_{10}	19.4 pph	23.3 tpy
$PM_{2.5}$	11.9 pph	15.2 tpy
Sulfur Dioxide (SO_2)	23.8 pph	29.4 tpy
Nitrogen Oxides (NO_x)	32.7 pph	50.2 tpy
Carbon Monoxide (CO)	57.3 pph	72.2 tpy
Volatile Organic Compounds (VOC)	26.6 pph	33.1 tpy
Total sum of all Hazardous Air Pollutants (HAPs)	4.3 pph	4.7 tpy
Toxic Air Pollutant (TAP)	5.1 pph	6.1 tpy
Green House Gas Emissions as Total CO_2e	n/a	20641 tpy

The standard operating schedule of the facility will be daylight hours, seven days a week, and a maximum of 43.2 weeks per year for the months of February through November. The maximum operating schedule will be 24 hours per day, seven days a week, and a maximum of 43.2 weeks per year for the months of February through November.

The owner and/or operator of the Facility is: Mesa Verde Enterprises, Inc., P.O. Box 907, Alamogordo, New Mexico 88311-0907, Phone: (575) 437-2995

If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to this address: Permit Programs Manager; New Mexico Environment Department; Air Quality Bureau; 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816. Other comments and questions may be submitted verbally. (505) 476-4300; 1 800 224-7009.

With your comments, please refer to the company name and facility name, or send a copy of this notice along with your comments. This information is necessary since the Department may have not yet received the permit application. Please include a legible return mailing address. Once the Department has completed its preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.

Atención
Este es un aviso de la oficina de Calidad del Aire del Departamento del Medio Ambiente de Nuevo México, acerca de las emisiones producidas por un establecimiento en esta área. Si usted desea información en español, por favor comuníquese con esa oficina al teléfono 505-629-3395.

Notice of Non-Discrimination
NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Part 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non-discrimination programs, policies or procedures, or if you believe that you have been discriminated against with respect to a NMED program or activity, you may contact: Non-Discrimination Coordinator, NMED, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@env.nm.gov. You may also visit our website at https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination.

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Santa Fe, NM 87501-2708

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1155 Commerce Dr. Ste "E"
Las Cruces, NM 88011-8257

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Resources, LLC
1155 Commerce Dr. Ste "E"
Las Cruces, NM 88011-8257

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Total Postage and Fees $ 4.98

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Las Cruces, NM 88011-8257

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Postage $ 0.63

Total Postage and Fees $ 4.98

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McCalister, NM 88427

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Extra Services & Fees *(check box, add fee as appropriate)*	
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☐ Return Receipt (electronic)	$
☐ Certified Mail Restricted Delivery	$
☐ Adult Signature Required	$
☐ Adult Signature Restricted Delivery	$
Postage	$ 0.63
Total Postage and Fees	$ 4.98

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ALBUQUERQUE

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Street and
Amanda Lopez Askin, Clerk
845 N. Motel Blvd.
City, State
Las Cruces, NM 88005-3424

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Extra Services & Fees *(check box, add fee as appropriate)*	
☐ Return Receipt (hardcopy)	$
☐ Return Receipt (electronic)	$
☐ Certified Mail Restricted Delivery	$
☐ Adult Signature Required	$
☐ Adult Signature Restricted Delivery	$
Postage	$ 0.63
Total Postage and Fees	$ 4.98

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JAN -3 2024
ALBUQUERQUE, NM

Sent
Stree
KXPC Radio
101 Perkins Drive
City,
Las /cruces, NM 88005-3424

PS Form 3800, January 2023 PSN 7530-02-000-9047 **See Reverse for Instructions**

NOTICE OF AIR QUALITY PERMIT APPLICATION

Mesa Verde Enterprises, Inc. announces its application to the New Mexico Environment Department for an air quality permit for the construction of its hot mix asphalt facility. The expected date of application submittal to the Air Quality Bureau is December 22,2023.

The exact location for the proposed facility known as, MV 400 TPH Astec HMA Plant, is latitude 32.45395 decimal degree North and longitude -106.57758 decimal degree West. The approximate location of this facility is 2.5 miles northeast of Organ, NM in Dona Ana county.

The proposed construction consists of a 400 ton per hour (TPH) HMA plant that presently operates under GCP-3-9079.

The estimated maximum quantities of any regulated air contaminants will be as follows in pound per hour (pph) and tons per year (tpy). These reported emissions could change slightly during the course of the Department's review:

Pollutant:	**Pounds per hour**	**Tons per year**
PM_{10}	19.4 pph	23.3 tpy
$PM_{2.5}$	11.9 pph	15.2 tpy
Sulfur Dioxide (SO_2)	23.8 pph	29.4 tpy
Nitrogen Oxides (NO_x)	32.7 pph	50.2 tpy
Carbon Monoxide (CO)	57.1 pph	71.9 tpy
Volatile Organic Compounds (VOC)	26.6 pph	33.1 tpy
Total sum of all Hazardous Air Pollutants (HAPs)	4.3 pph	4.7 tpy
Toxic Air Pollutant (TAP)	5.1 pph	6.1 tpy
Green House Gas Emissions as Total CO_2e	n/a	20641 tpy

The standard operating schedule of the facility will be daylight hours, seven days a week, and a maximum of 43.2 weeks per year for the months of February through November. The maximum operating schedule will be 24 hours per day, seven days a week, and a maximum of 43.2 weeks per year for the months of February through November.

The owner and/or operator of the Facility is: Mesa Verde Enterprises, Inc., P.O. Box 907, Alamogordo, New Mexico 88311-0907, Phone: (575) 437-2995

If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to this address: Permit Programs Manager; New Mexico Environment Department; Air Quality Bureau; 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816. Other comments and questions may be submitted verbally. (505) 476-4300; 1 800 224-7009.

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Las Cruces Sun News.
PART OF THE USA TODAY NETWORK

RECEIVED
DEC 28 2023
By MGS/ACQ

Affidavit of Publication

Ad # 0005867696

This is not an invoice

MONTROSE AIR QUALITY SERV.
3500 COMANCHE RD. N.E. BLDG. G

ALBUQUERQUE, NM 87107-4546

I, a legal clerk of the **Las Cruces Sun News**, a newspaper published daily at the county of Dona Ana, state of New Mexico and of general paid circulation in said county; that the same is a duly qualified newspaper under the laws of the State wherein legal notices and advertisements may be published; that the printed notice attached hereto was published in the regular and entire edition of said newspaper and not in supplement thereof in editions dated as follows:

12/22/2023

Despondent further states this newspaper is duly qualified to publish legal notice or advertisements within the meaning of Sec. Chapter 167, Laws of 1937.

Legal Clerk

Subscribed and sworn before me this December 22, 2023:

State of WI, County of Brown
NOTARY PUBLIC

1-7-25

My commission expires

KATHLEEN ALLEN
Notary Public
State of Wisconsin

Ad # 0005867696
PO #: NOTICE OF AIR QUALITY PERMIT APPLICATION
# of Affidavits 1

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LAS CRUCES SUN-NEWS

AFFIDAVIT OF PUBLICATION

Ad No.
GCI1127197

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3500 COMANCHE RD NE BLDG G
ALBUQUERQUE, NM 87107
ATTN KATHY BIERLY FARNER

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Legal Clerk
STATE OF WISCONSIN
County of Brown SS.
Subscribed and sworn before me this
22nd of December, 2023

Kathleen Allen

NOTARY PUBLIC in and for
Brown County, Wisconsin

1-7-25

My Commission Expires

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# of Affidavits 1

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TX-GCI1127107-01

PEOPLE IN THE NEWS

Gerwig and Baumbach
EVAN AGOSTINI/INVISION/AP

After 12 years together, Gerwig, Baumbach quietly marry

Greta Gerwig and Noah Baumbach are officially married, their representative told The Associated Press Wednesday.

The two filmmakers have been together for 12 years, have two children and collaborated on many films, including "Barbie," which they co-wrote and Gerwig directed. They met on Baumbach's "Greenberg" and went on to work together on films like "Mistress America" and "Frances Ha," which they co-wrote, Baumbach directed and Gerwig acted in.

Baumbach was previously married to and shares a child with Jennifer Jason Leigh.

Gerwig and Baumbach wrote "Barbie" during the pandemic, not knowing if it would ever actually get made. In a "60 Minutes" interview from earlier this year, Baumbach said that Gerwig signed them up to write it without telling him and he even tried to get out of it. His attempts, he laughed, were unsuccessful because "Greta was persistent and Greta saw something," he said.

The film became a cultural phenomenon and the highest grosser of the year, with more than $1.4 billion in ticket sales, as well as a presumed Oscar contender.

Gosling reimagines his 'Barbie' power ballad, shares new EP

On Wednesday, Ryan Gosling – the Ken to Margot Robbie's "Barbie" in the film – released the "I'm Just Ken" EP alongside collaborators Mark Ronson and Andrew Wyatt.

Gosling

It features the original Grammy-nominated, 1980s-style power ballad from the movie, also titled "I'm Just Ken," as well as three remixes: the stripped down "I'm Just Ken (In My Feelings Acoustic)," the dance floor ready "I'm Just Ken (Purple Disco Machine Remix)," and the festive "I'm Just Ken (Merry Kristmas Barbie)."

The latter was released with an official music video, where Gosling, Wyatt and Ronson are seen working on the holiday remix of the song in a studio drenched in Christmas lights with an impressive live band, bantering with one another.

The trio are joined by a full band as well by two cellists, four violinists and a glockenspiel. Gosling's vocals are run through reverb – adding to the triumphant and whimsical reimagining. "Merry Christmas, Barbie," he ends the song. "Wherever you are."

"I'm Just Ken" is up for best song written for visual media at the 2024 Grammy Awards as well as and the Golden Globe for best original song.

WHAT TO WATCH | CONTENT BY TV WEEKLY

Network broadcasting shows are listed in Eastern/Pacific Time, unless noted otherwise. Shows air one hour earlier in Central/Mountain Time. Cable broadcasting shows are listed in Eastern Time.

What If... ?

Disney+ • Season Premiere

The Watcher is back for Season 2 of this Marvel animated series that takes viewers through the multiverse and introduces new and familiar faces as it questions, revisits and twists classic Marvel Cinematic Universe moments. Beginning today, one new episode will be available each day through Dec. 30.

Rebel Moon – Part One: A Child of Fire

Netflix • Original Film

Zack Snyder (**Man of Steel**) cowrote and directed this epic science-fantasy event. When a peaceful settlement on a moon in the furthest reaches of the universe finds itself threatened by the armies of a tyrant, Kora (Sofia Boutella), a mysterious stranger living among the villagers, becomes their best hope for survival. Tasked with finding trained fighters who will unite with her in making an impossible stand against the Motherworld, Kora assembles a small band of warriors from different worlds who share a common need for redemption and revenge.

Saltburn

Prime Video • Feature Film Exclusive

In this wicked tale of privilege and desire, Barry Keoghan plays Oliver Quick, an Oxford University student struggling to find his place. He ends up drawn into the world of charming and aristocratic Felix Catton (Jacob Elordi), who invites him to Saltburn, his eccentric family's sprawling estate, for a summer never to be forgotten.

The 25th Annual A Home for the Holidays

CBS, 8 p.m.

The 25th anniversary of this entertainment special features uplifting stories of adoption from foster care and raises awareness of this important social issue, enhanced with music from some of today's top artists.

"Saltburn" PRIME VIDEO

Dolly Parton's Christmas of Many Colors: Circle of Love

NBC, 8 p.m.

This 2016 film is the second production based on the life and works of Dolly Parton. It finds Dolly's beloved daddy (Ricky Schroder) scheming to surprise Mama (Jennifer Nettles) with a Christmas gift that he could never afford. Young Dolly (Alyvia Alyn Lind) and her siblings excitedly join in the scrimping and saving in a selfless act of love.

Fit for Christmas

CBS, 9 p.m. • Original Film

In this 2022 holiday film, Audrey (Amanda Kloots) is a fitness instructor at a beloved but financially struggling community center in Mistletoe, Montana. Things get complicated when she strikes up a holiday romance with a charming businessman who wants to turn the center into a profitable resort property.

Homes That Make You Go WOW

HGTV, 9 p.m.

Host David Bromstad puts on his diamonds and tours the biggest, most eye-popping and jaw-dropping homes in HGTV history.

Bering Sea Gold

Discovery Channel, 9:05 p.m. • Season Finale

The reality docuseries concludes Season 17 tonight.

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General Posting of Notices – Certification

I, Allister G Gunn Jr, the undersigned, certify that on **18 December 2023,** posted a true and correct copy of the attached Public Notice in the following publicly accessible and conspicuous places in the **Organ** of **Dona Ana** County, State of New Mexico on the following dates:

1. Toro Rock Products LLC, 711 Badger Rd, Organ, NM 88052
2. Organ Community Center, 5880 2nd St, Organ, NM 88052
3. Organ NM Post Office, 15770 Padre La Rue, Organ, NM, 88052
4. Intersection of US-70 and Badger Rd, Organ, NM 88052

Signed this 18th day of December, 2023.

Allister G Gunn Jr
Signature

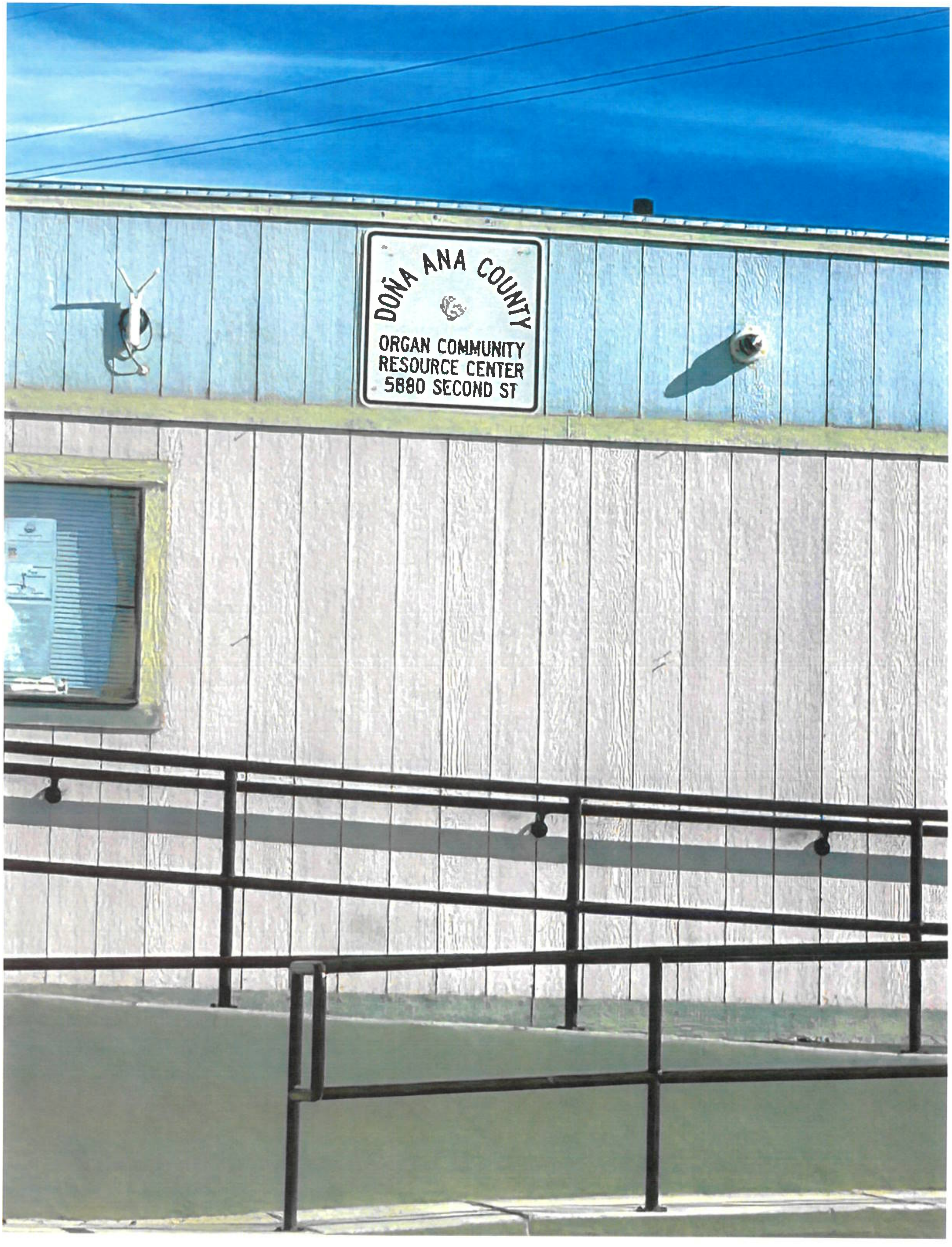
12/18/2023
Date

ALLISTER G GUNN JR
Printed Name

COMPLIANCE OFFICER
Title

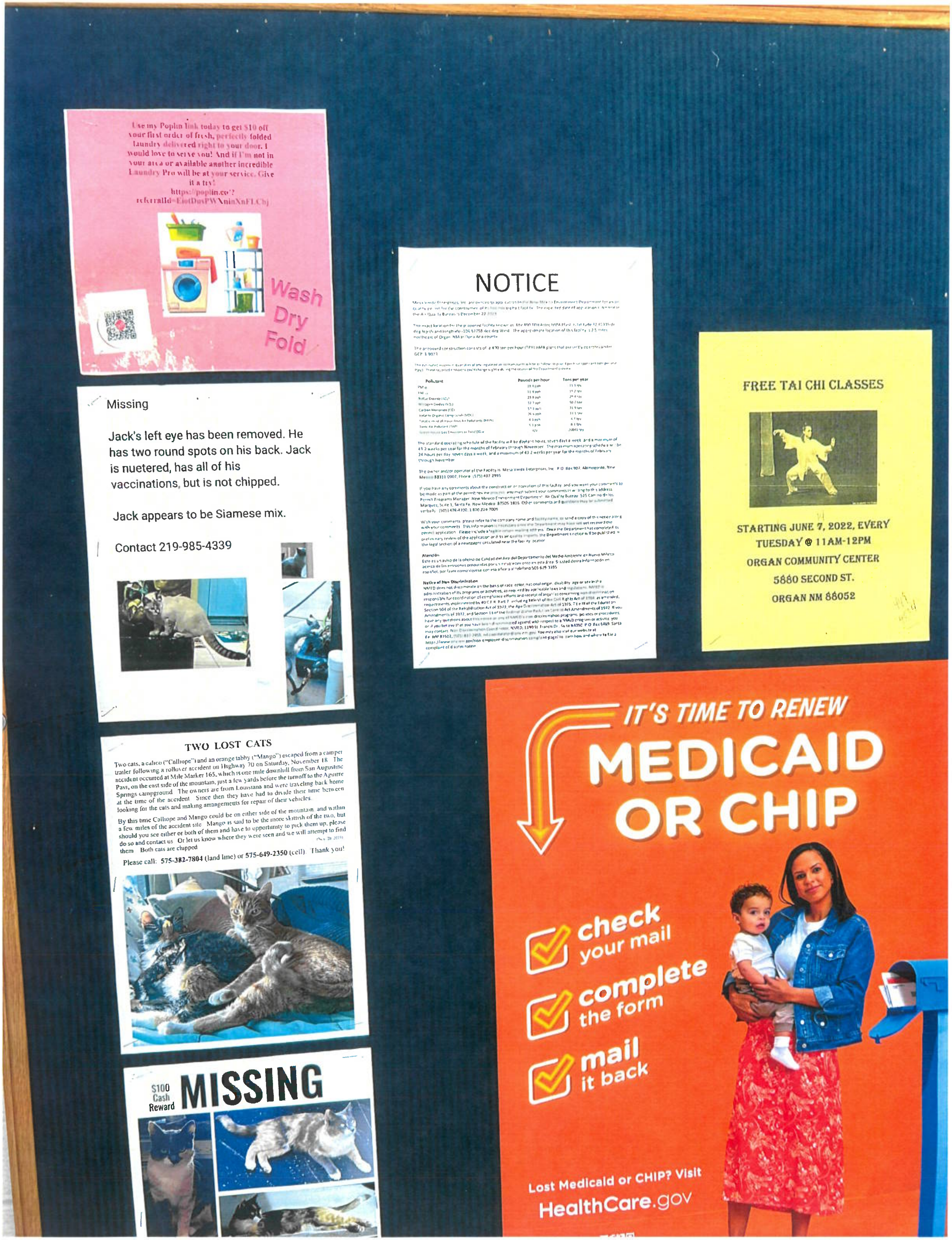

24 HOUR
TORO
ROCK
PRODUCTS!
575.382.4555


DANGER
OPEN PIT MINING
PRIVATE
PROPERTY
KEEP OUT!
NOTICE


DOÑA ANA COUNTY
ORGAN COMMUNITY
RESOURCE CENTER
5880 SECOND ST


NOTICE
Mesa Verde Enterprises, Inc. announces its application to the New Mexico Environment Department for an air quality permit for the construction of its hot mix asphalt facility. The expected date of application submittal to the Air Quality Bureau is December 22, 2023.
The proposed construction consists of a 400 ton per hour (TPH) HMA
Pollutant:
Pounds per hour
Tons per year
The owner and/or operator of the Facility is: Mesa Verde Enterprises, Inc., P.O. Box 907, Alamogordo, New Mexico
Atención
Notice of Non-Discrimination
CRISIS CARE NOW
DOÑA ANA COUNTY CRISIS TRIAGE CENTER
1850 B Copper Loop Drive
Las Cruces, NM 88005
(575) 449-8159
CRISIS SERVICES
ASSESMENT & CARE
CONNECTIONS
Be A Part of the Organ Volunteer Fire Department
Organ Volunteer Fire Department
NEED HELP REPLACING YOUR MEDICAID COVERAGE?
be well nm
STAY COVERED FOR AS LITTLE AS $10 A MONTH
FREE CLASS
Fall Semester 2023
Classes begin September 7th
MONEY & ME
When:
Every Thursday
12:00 pm – 1:00pm
Where:
Organ Community Center
5880 2nd St.
Organ, NM 88052
Health & Human Services
DOÑA ANA COUNTY GOVERNMENT CENTER
Follow our NEW PAGES
@DAC_HHS
www.facebook.com/HHSDAC/
Help & Hope in New Mexico
988
Reasons to Call 988
988 SUICIDE & CRISIS LIFELINE
EMERGENCY LIGHTING TEST RECORD
Fire Tech LLC


UNITED STATES POST OFFICE
ORGAN NEW MEXICO 88052
RESERVED PARKING
VAN ACCESSIBLE
With out our Military freedom


Use my Poplin link today to get $10 off your first order of fresh, perfectly folded laundry delivered right to your door. I would love to serve you! And if I'm not in your area or available another incredible Laundry Pro will be at your service. Give it a try!
Wash Dry Fold
Missing
Jack's left eye has been removed. He has two round spots on his back. Jack is nuetered, has all of his vaccinations, but is not chipped.
Jack appears to be Siamese mix.
Contact 219-985-4339
TWO LOST CATS
Two cats, a calico ("Calliope") and an orange tabby ("Mango") escaped from a camper trailer following a rollover accident on Highway 70 on Saturday, November 18. The accident occurred at Mile Marker 165, which is one mile downhill from San Augustine Pass, on the east side of the mountain, just a few yards before the turnoff to the Aguirre Springs campground. The owners are from Louisiana and were traveling back home at the time of the accident. Since then they have had to divide their time between looking for the cats and making arrangements for repair of their vehicles.
By this time Calliope and Mango could be on either side of the mountain, and within a few miles of the accident site. Mango is said to be the more skittish of the two, but should you see either or both of them and have to opportunity to pick them up, please do so and contact us. Or let us know where they were seen and we will attempt to find them. Both cats are chipped.
Please call: 575-382-7804 (land line) or 575-649-2350 (cell). Thank you!
$100 Cash Reward
MISSING
NOTICE
FREE TAI CHI CLASSES
STARTING JUNE 7, 2022, EVERY TUESDAY @ 11AM-12PM
ORGAN COMMUNITY CENTER
5880 SECOND ST.
ORGAN NM 88052
IT'S TIME TO RENEW
MEDICAID OR CHIP
check your mail
complete the form
mail it back
Lost Medicaid or CHIP? Visit
HealthCare.gov


C125748
NOTICE


C125748
NOTICE
CK
CTS LLC

PUBLIC SERVICE ANNOUNCEMENT

Mesa Verde Enterprises, Inc. announces its application to the New Mexico Environment Department for an air quality permit for the construction of its hot mix asphalt facility. The expected date of application submittal to the Air Quality Bureau is January 5, 2023.

The approximate location of the proposed facility known as, MV 400 TPH Astec HMA Plant, is 2.5 miles northeast of Organ, NM in Dona Ana county.

The proposed construction consists of a 400 ton per hour (TPH) HMA plant that presently operates under GCP-3-9079.

Public notices have been posted in the following locations for review by the public:

1. At the main entrance to Toro Rock Products LLC, 711 Badger Rd, Organ, NM 88052;
2. At Organ Community Center, 5880 2nd St., Organ, NM 88052;
3. At Organ NM Post Office, 15770 Padre La Rue, Organ, NM 88052; and
4. At the intersection of US-70 and Badger Rd., Organ, NM 88052

The owner and/or operator of the Facility is:

Mesa Verde Enterprises, Inc.
P.O. Box 907
Alamogordo, New Mexico 88311-0907
Phone: (575) 437-2995

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

Permit Programs Manager
New Mexico Environment Department
Air Quality Bureau
525 Camino de los Marquez, Suite 1
Santa Fe, New Mexico; 87505-1816
Telephone Number (505) 476-4300 or 1 800 224-7009

MONTROSE
ENVIRONMENTAL

January 2, 2024

KXPC Radio
101 Perkins Dr.
Las Cruces, NM 88005

CERTIFIED MAIL

Dear KXPC Radio:

SUBJECT: PSA Request - Proposed Air Quality Construction Permit Application for Mesa Verde Enterprises' MV Astec 400 TPH HMA Plant. The approximate location of this facility is 2.5 miles northeast of Organ, NM in Dona Ana county.

Attached is a copy of a public service announcement regarding a proposed air quality construction permit application for Mesa Verde Enterprises' MV Astec 400 TPH HMA Plant. This announcement is being submitted by Montrose Environmental Solutions, Inc., Albuquerque, NM on behalf of Mesa Verde Enterprises, Inc.

The announcement request is being made to fulfill the requirements of the New Mexico Environmental Department air quality permitting regulations. Please consider reading the attached announcement as a public service message.

If you have any questions or need additional information, please contact me at (505) 830-9680 ext 6 (voice), (505) 830-9678 (fax) or email at pwade@montrose-env.com. You may also contact Mr. Allister Gunn, Mesa Verde Enterprises, Inc. at (575) 437-2995.

Thank you.

Sincerely,

Paul Wade

Paul Wade
Principal/Senior Associate Engineer

Montrose Environmental Solutions, Inc.
9100 2nd St., Suite 200
Albuquerque, NM 87114-1664

T: 505.830.9680 ext. 6
F: 505.830.9678
Pwade@montrose-env.com
www.montrose-env.com

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- ☐ Return Receipt (electronic) $
- ☐ Certified Mail Restricted Delivery $
- ☐ Adult Signature Required $
- ☐ Adult Signature Restricted Delivery $

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ALAMEDA STATION
JAN - 3 2024
ALBUQUERQUE, NM

Postage
$ 0.63

Total Postage and Fees
$ 4.98

Sent To
Dona Ana County

Street and
Amanda Lopez Askin, Clerk
845 N. Motel Blvd.

City, State
Las Cruces, NM 88005-3424

PS Form 3800, January 2023 PSN 7530-02-000-9047 **See Reverse for Instructions**

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- ☐ Return Receipt (electronic) $
- ☐ Certified Mail Restricted Delivery $
- ☐ Adult Signature Required $
- ☐ Adult Signature Restricted Delivery $

Postmark Here

ALAMEDA STATION
JAN - 3 2024
ALBUQUERQUE, NM

Postage
$ 0.63

Total Postage and Fees
$ 4.98

Sent

Street
KXPC Radio
101 Perkins Drive

City,
Las /cruces, NM 88005-3424

PS Form 3800, January 2023 PSN 7530-02-000-9047 **See Reverse for Instructions**

Submittal of Public Service Announcement – Certification

I, Paul Wade, the undersigned, certify that on 01/02/2024, submitted a public service announcement to KXPZ Radio that serves Organ, Dona Ana County, New Mexico, in which the source is or is proposed to be located and that KXPZ Radio DID NOT RESPOND THAT IT WOULD AIR THE ANNOUNCEMENT.

Signed this 2 day of January, 2024.

Paul Wade
Signature

1/2/2024
Date

Paul Wade
Printed Name

Air Quality Consultant – Montrose Environmental Solutions, Inc.
Title {APPLICANT OR RELATIONSHIP TO APPLICANT}

Section 10

Written Description of the Routine Operations of the Facility

---

A written description of the routine operations of the facility. Include a description of how each piece of equipment will be operated, how controls will be used, and the fate of both the products and waste generated. For modifications and/or revisions, explain how the changes will affect the existing process. In a separate paragraph describe the major process bottlenecks that limit production. The purpose of this description is to provide sufficient information about plant operations for the permit writer to determine appropriate emission sources.

The MV 400 TPH Astec HMA Plant produces hot mix asphalt concrete. The operation is typical to a continuous drum mix HMA operation. Aggregate in loaded into the Cold Aggregate Feed Bins (Unit 1), where it is metered onto the Aggregate Feed Bin Collection Conveyor (Unit 2). From the Aggregate Feed Bin Collection Conveyor the aggregate is sent to the Scalping Screen and conveyor (Units 3 and 4) and Pug Mill (Unit 5). The Mineral Filler Silo and Augur (Unit 13) meters mineral filler into the Pug Mill. The Pug Mill mixes the aggregate and mineral filler together and empties onto the Pug Mill Conveyor (Unit 6). The Pug Mill Conveyor transfers the material onto the Slinger Conveyor (Unit 7) and sends the aggregate/mineral filler to the Drum Dryer (Unit 14). RAP is loaded into the RAP Feed Bin (Unit 8), where it is metered onto the RAP Feed Bin Conveyor (Unit 9) and then transferred to the RAP Screen (Unit 10). The RAP Transfer Conveyor (Unit 11) transports RAP to the RAP Scale Transfer Conveyor (Unit 12). The RAP Scale Conveyor transports RAP to the Drum Dryer/Mixer (Unit 12a). There the material is dried and asphalt cement is added to make asphalt concrete. From the Drum Dryer/Mixer the asphalt concrete is sent by the Incline Conveyor (Unit 15) to the Asphalt Silo (Unit 16).

For warm mix asphalt instead of mineral filler Evotherm is added to the drum. The use of Evotherm reduces the temperature of the mix and concurrently reduces the amount of emissions generated making the asphalt cement.

Control Units include a Drum Dryer/Mixer Dust Collector (C5) that captures particulates generated at the Drum Dryer/Mixer and Mineral Filler Silo Dust Collector (C4) that captures particulates generated during loading of the Mineral Filler Silo. Controlled particulates exhaust the Drum Dryer/Mixer Dust Collector Stack (Stack 2) and Mineral Filler Silo Dust Collector Stack (Stack 1).

Fugitive dust is controlled when material exits the Cold Aggregate to the Cold Aggregate Collection Conveyor with enclosures to reduce the chance that wind will blow any generated fugitive dust away and/or water sprays, as needed, at the exit of the feed bins.

Fugitive dust is controlled when material enters and exits the Scalping Screen (Unit 3), and Pug Mill (Unit 4) with the addition of water, as needed, on the material at the Scalping Screen and/or Pug Mill.

Baghouse fines that are captured in the Drum Dryer/Mixer Dust Collector (Unit 14) are recycled back to the Drum Dryer using an enclosed loop with no visible emissions. During baghouse maintenance or relocation the remaining fines are removed from the baghouse and routed to a pit where a water truck controls any fugitive dust by adding additional moisture to the fines making it a slurry.

Baghouse fines that are captured in the Mineral Filler Silo Dust Collector (Unit 8) are recycled back to the Mineral Filler Silo.

There are no pollution controls for the RAP Storage Piles (Unit AGGPILE), RAP Feed Bins (Units 1, 8), RAP feeder collection conveyor (Unit 9), RAP Screen (Unit 10), RAP Screen Conveyor (Unit 11), and RAP Transfer Conveyor (Unit 12 and 12a). These source emission rates are reduced to account for the inherent properties of RAP with a coating of asphalt which captures small particles within the material. Based on EPA documents "EIIP – Preferred and Alternative Methods for Estimating Air Emissions from Hot-Mix-Asphalt Plants, Final Report, July 1996, Table 3.2-1 Fugitive Dust – Crushed RAP material" the inherent typical efficiency of the material is 70% (see Section 7).

The plant will be powered by a 1430 horsepower (1000 kW) diesel-fired generator (Unit 17) operating a maximum of 4380 hours per year. During no production operations when the main generator is off (Unit 17), the plant will be powered by a 153 horsepower (114 kW) standby diesel-fired generator (Unit 18) operating a maximum of 4380 hours per year. A 1.2 MMBtu asphalt heater (Unit 19) will maintain an asphalt cement temperature of no more than 350° F.

There are no pollution controls for the Aggregate Storage Piles (Unit AGGPILE), Aggregate Feed Bins (Unit 1), Incline Belt (Unit 15), Asphalt Silo (Units 16), Main Plant Generator (Unit 17), Standby Plant Generator (Unit 18), Asphalt Heater (Unit 19), or Hot Oil Asphalt Storage Tanks (2 total) (Unit 20).

All truck traffic (Unit TRCK) travels to the HMA Plant on the Main Entrance road. The road is controlled with asphalt millings, surfactants, and watering to the HMA Plant. All truck traffic leaves the same way. Aggregate materials, supplied by aggregate trucks, come from the aggregate plant onsite or existing onsite stockpiles.

Annual emissions are controlled by permit limits on annual production for processing equipment and hours of operation for generators and asphalt heater.

Section 11

Source Determination

Source submitting under 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC

Sources applying for a construction permit, PSD permit, or operating permit shall evaluate surrounding and/or associated sources (including those sources directly connected to this source for business reasons) and complete this section. Responses to the following questions shall be consistent with the Air Quality Bureau's permitting guidance, Single Source Determination Guidance, which may be found on the Applications Page in the Permitting Section of the Air Quality Bureau website.

Typically, buildings, structures, installations, or facilities that have the same SIC code, that are under common ownership or control, and that are contiguous or adjacent constitute a single stationary source for 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC applicability purposes. Submission of your analysis of these factors in support of the responses below is optional, unless requested by NMED.

A. Identify the emission sources evaluated in this section (list and describe)**:** Hot Mix Asphalt Plant - produce asphalt concrete, co-located Toro Rock GCP2 aggregate crushing and screening plant

B. Apply the 3 criteria for determining a single source:

SIC Code: Surrounding or associated sources belong to the same 2-digit industrial grouping (2-digit SIC code) as this facility, OR surrounding or associated sources that belong to different 2-digit SIC codes are support facilities for this source.

☐ **Yes** **X No**

Common Ownership or Control: Surrounding or associated sources are under common ownership or control as this source.

☐ **Yes** **X No**

Contiguous or Adjacent: Surrounding or associated sources are contiguous or adjacent with this source.

X Yes ☐ **No**

C. Make a determination:

X The source, as described in this application, constitutes the entire source for 20.2.70, 20.2.72, 20.2.73, or 20.2.74 NMAC applicability purposes. If in "A" above you evaluated only the source that is the subject of this application, all "**YES**" boxes should be checked. If in "A" above you evaluated other sources as well, you must check **AT LEAST ONE** of the boxes "**NO**" to conclude that the source, as described in the application, is the entire source for 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC applicability purposes.

☐ The source, as described in this application, **does not** constitute the entire source for 20.2.70, 20.2.72, 20.2.73, or 20.2.74 NMAC applicability purposes (A permit may be issued for a portion of a source). The entire source consists of the following facilities or emissions sources (list and describe):

Section 12

Section 12.A

PSD Applicability Determination for All Sources

(Submitting under 20.2.72, 20.2.74 NMAC)

A PSD applicability determination for all sources. For sources applying for a significant permit revision, apply the applicable requirements of 20.2.74.AG and 20.2.74.200 NMAC and to determine whether this facility is a major or minor PSD source, and whether this modification is a major or a minor PSD modification. It may be helpful to refer to the procedures for Determining the Net Emissions Change at a Source as specified by Table A-5 (Page A.45) of the EPA New Source Review Workshop Manual to determine if the revision is subject to PSD review.

A. This facility is:

- X **a minor PSD source before and after this modification (if so, delete C and D below).**
- ☐ **a major PSD source before this modification. This modification will make this a PSD minor source.**
- ☐ **an existing PSD Major Source that has never had a major modification requiring a BACT analysis.**
- ☐ **an existing PSD Major Source that has had a major modification requiring a BACT analysis**
- ☐ **a new PSD Major Source after this modification.**

B. **This facility is not one of the listed 20.2.74.501 Table I – PSD Source Categories:**

a. **NOx: 50.2 TPY**
b. **CO: 72.2 TPY**
c. **VOC: 33.1 TPY**
d. **SOx: 29.4 TPY**
e. **PM: 50.5 TPY**
f. **PM10: 23.1 TPY**
g. **PM2.5: 15.2 TPY**
h. **Fluorides: <0.01 TPY**
i. **Lead: 0.0070 TPY**
j. **Sulfur compounds (listed in Table 2): NA**
k. **GHG: 20498 TPY**

Section 13

Determination of State & Federal Air Quality Regulations

This section lists each state and federal air quality regulation that may apply to your facility and/or equipment that are stationary sources of regulated air pollutants.

Not all state and federal air quality regulations are included in this list. Go to the Code of Federal Regulations (CFR) or to the Air Quality Bureau's regulation page to see the full set of air quality regulations.

Required Information for Specific Equipment:
For regulations that apply to specific source types, in the 'Justification' column **provide any information needed to determine if the regulation does or does not apply**. **For example**, to determine if emissions standards at 40 CFR 60, Subpart IIII apply to your three identical stationary engines, we need to know the construction date as defined in that regulation; the manufacturer date; the date of reconstruction or modification, if any; if they are or are not fire pump engines; if they are or are not emergency engines as defined in that regulation; their site ratings; and the cylinder displacement.

Required Information for Regulations that Apply to the Entire Facility:
See instructions in the 'Justification' column for the information that is needed to determine if an 'Entire Facility' type of regulation applies (e.g. 20.2.70 or 20.2.73 NMAC).

Regulatory Citations for Regulations That Do Not, but Could Apply:
If there is a state or federal air quality regulation that does not apply, but you have a piece of equipment in a source category for which a regulation has been promulgated, you must **provide the low level regulatory citation showing why your piece of equipment is not subject to or exempt from the regulation. For example** if you have a stationary internal combustion engine that is not subject to 40 CFR 63, Subpart ZZZZ because it is an existing 2 stroke lean burn stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, your citation would be 40 CFR 63.6590(b)(3)(i). **We don't want a discussion of every non-applicable regulation, but if it is possible a regulation could apply, explain why it does not. For example,** if your facility is a power plant, you do not need to include a citation to show that 40 CFR 60, Subpart OOO does not apply to your non-existent rock crusher.

Regulatory Citations for Emission Standards:
For each unit that is subject to an emission standard in a source specific regulation, such as 40 CFR 60, Subpart OOO or 40 CFR 63, Subpart HH, include the low level regulatory citation of that emission standard. Emission standards can be numerical emission limits, work practice standards, or other requirements such as maintenance. **Here are examples:** a glycol dehydrator is subject to the general standards at 63.764C(1)(i) through (iii); an engine is subject to 63.6601, Tables 2a and 2b; a crusher is subject to 60.672(b), Table 3 and all transfer points are subject to 60.672(e)(1)

Federally Enforceable Conditions:
All federal regulations are federally enforceable. All Air Quality Bureau State regulations are federally enforceable except for the following: affirmative defense portions at 20.2.7.6.B, 20.2.7.110(B)(15), 20.2.7.11 through 20.2.7.113, 20.2.7.115, and 20.2.7.116; 20.2.37; 20.2.42; 20.2.43; 20.2.62; 20.2.63; 20.2.86; 20.2.89; and 20.2.90 NMAC. Federally enforceable means that EPA can enforce the regulation as well as the Air Quality Bureau and federally enforceable regulations can count toward determining a facility's potential to emit (PTE) for the Title V, PSD, and nonattainment permit regulations.

INCLUDE ANY OTHER INFORMATION NEEDED TO COMPLETE AN APPLICABILITY DETERMINATION OR THAT IS RELEVENT TO YOUR FACILITY'S NOTICE OF INTENT OR PERMIT.

EPA Applicability Determination Index for 40 CFR 60, 61, 63, etc: http://cfpub.epa.gov/adi/

Table for STATE REGULATIONS:

STATE REGULATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION: (You may delete instructions or statements that do not apply in the justification column to shorten the document.)
20.2.1 NMAC	General Provisions	Yes	Facility	General Provisions apply to Notice of Intent, Construction, and Title V permit applications.
20.2.3 NMAC	Ambient Air Quality Standards NMAAQS	Yes	Facility	20.2.3 NMAC is a SIP approved regulation that limits the maximum allowable concentration of Sulfur Compounds, Carbon Monoxide and Nitrogen Dioxide.
20.2.7 NMAC	Excess Emissions	Yes	Facility	This facility is subject to 20.2.7 NMAC.
20.2.11 NMAC	Asphalt Process Equipment	Yes	13 (C4), 14 (C5)	These sources are subject to 20.2.11.108 NMAC and 20.2.11.109 NMAC.
20.2.61.109 NMAC	Smoke & Visible Emissions	Yes	17, 18, 19	Engines and heaters are Stationary Combustion Equipment. Specify units subject to this regulation. The facility stationary combustion equipment are subject to a 20 percent opacity limit.
20.2.70 NMAC	Operating Permits	No	Facility	This facility is not a Title V Operating Permit source. The facility consists of aggregate processing plants and HMA plants. Aggregate processing falls under 2-digit SIC Code Group 14 and HMA plants falls under 2-digit SIC Code Group 29. While aggregate material from aggregate processing plants is used in the HMA plant, since they are operating under different SIC Codes they are separate facilities for major source determination.
20.2.71 NMAC	Operating Permit Fees	No	Facility	This facility is not a Title V Operating Permit source.
20.2.72 NMAC	Construction Permits	Yes	Facility	Potential emission rate (PER) for the facility is greater than 10 pph or greater than 25 tpy for any pollutant subject to a state or federal ambient air quality standard.
20.2.73 NMAC	NOI & Emissions Inventory Requirements	Yes	Facility	**NOI:** 20.2.73.200 NMAC applies (requiring a NOI application) **Emissions Inventory Reporting:** 20.2.73.300 NMAC applies.
20.2.74 NMAC	Permits – Prevention of Significant Deterioration (PSD)	No	Facility	This facility is not a PSD major source.
20.2.75 NMAC	Construction Permit Fees	Yes	Facility	This facility is subject to 20.2.72 NMAC and is in turn subject to 20.2.75 NMAC.
20.2.77 NMAC	New Source Performance	Yes	Units subject to 40 CFR 60	This is a stationary source, which is subject to the requirements of 40 CFR Part 60.
20.2.78 NMAC	Emission Standards for HAPS	No	Units Subject to 40 CFR 61	This facility doesn't emit hazardous air pollutants which are subject to the requirements of 40 CFR Part 61.
20.2.79 NMAC	Permits – Nonattainment Areas	No	Facility	This facility is located in an Attainment Area.
20.2.80 NMAC	Stack Heights	Yes	13 (C4), 14 (C5), 17, 18, 19	The objective of this Part is to establish requirements for the evaluation of stack heights and other dispersion techniques in permitting decisions. The Department shall give no credit for reductions in emissions due to the length of a source's stack height that exceeds good engineering practice or due to any other dispersion technique. The facility will meet all requirements of good engineering practices.

STATE REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION: (You may delete instructions or statements that do not apply in the justification column to shorten the document.)
20.2.82 NMAC	MACT Standards for source categories of HAPS	Yes	17, 18	This regulation applies to all sources emitting hazardous air pollutants, which are subject to the requirements of 40 CFR Part 63.

Table for Applicable FEDERAL REGULATIONS:

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
40 CFR 50	NAAQS	Yes	Facility	This is a 20.2.72 NMAC permit application.
NSPS 40 CFR 60, Subpart A	General Provisions	Yes	Units subject to 40 CFR 60	Subparts IIII and I in 40 CFR 60 applies.
NSPS 40 CFR60.40, Subpart I	Subpart I, Performance Standards for **Hot Mix Asphalt Facilities**	Yes	13 (C4), 14 (C5)	The affected facility, that commences construction or modification after June 11, 1973, to which the provisions of this subpart apply is each hot mix asphalt facility. For the purpose of this subpart, a hot mix asphalt facility is comprised only of any combination of the following: dryers; systems for screening, handling, storing, and weighing hot aggregate; systems for loading, transferring, and storing mineral filler, systems for mixing hot mix asphalt; and the loading, transfer, and storage systems associated with emission control systems.
NSPS 40 CFR 60, Subpart Kb	Standards of Performance for **Volatile Organic Liquid Storage Vessels** (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced **After** July 23, 1984	No		This facility does not have storage vessels with a capacity greater than or equal to 75 cubic meters (m^3) that is used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984.
NSPS 40 CFR Part 60 Subpart OOO	Standards of Performance for **Nonmetallic Mineral Processing Plants**	No		NSPS standards for non-metallic minerals apply to applicable crushers, screens, and conveyors.
NSPS 40 CFR 60 Subpart IIII	Standards of performance for Stationary Compression Ignition Internal Combustion Engines	Yes	17, 18	The provisions of this subpart are applicable to manufacturers, owners, and operators of stationary compression ignition (CI) internal combustion engines (ICE). Units 17 and 18 are applicable to 60.4202(a) and Subpart IIII Table 1 emission standards for its year and size category if they are located at the same location for a period of 12 months.
NSPS 40 CFR Part 60 Subpart JJJJ	Standards of Performance for Stationary Spark Ignition Internal Combustion Engines	No		See 40 CFR 60.4230 and EPA Region 1's Reciprocating Internal Combustion Guidance website.
NESHAP 40 CFR 61 Subpart A	General Provisions	No	Units Subject to 40 CFR 61	Applies if any other Subpart in 40 CFR 61 applies.
MACT 40 CFR 63, Subpart A	General Provisions	Yes	Units Subject to 40 CFR 63	Applies if any other Subpart in 40 CFR 63 applies.

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
MACT 40 CFR 63 Subpart ZZZZ	National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (**RICE MACT**)	Yes	17, 18	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. Applicable if the units are located at the same location for a period of 12 months.

Section 14

Operational Plan to Mitigate Emissions

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

☐ **Title V Sources** (20.2.70 NMAC)**:** By checking this box and certifying this application the permittee certifies that it has developed an **Operational Plan to Mitigate Emissions During Startups, Shutdowns, and Emergencies** defining the measures to be taken to mitigate source emissions during startups, shutdowns, and emergencies as required by 20.2.70.300.D.5(f) and (g) NMAC. This plan shall be kept on site to be made available to the Department upon request. This plan should not be submitted with this application.

☒ **NSR** (20.2.72 NMAC)**, PSD** (20.2.74 NMAC) **& Nonattainment** (20.2.79 NMAC) **Sources:** By checking this box and certifying this application the permittee certifies that it has developed an **Operational Plan to Mitigate Source Emissions During Malfunction, Startup, or Shutdown** defining the measures to be taken to mitigate source emissions during malfunction, startup, or shutdown as required by 20.2.72.203.A.5 NMAC. This plan shall be kept on site to be made available to the Department upon request. This plan should not be submitted with this application.

☒ **Title V** (20.2.70 NMAC)**, NSR** (20.2.72 NMAC)**, PSD** (20.2.74 NMAC) **& Nonattainment** (20.2.79 NMAC) **Sources:** By checking this box and certifying this application the permittee certifies that it has established and implemented a Plan to Minimize Emissions During Routine or Predictable Startup, Shutdown, and Scheduled Maintenance through work practice standards and good air pollution control practices as required by 20.2.7.14.A and B NMAC. This plan shall be kept on site or at the nearest field office to be made available to the Department upon request. This plan should not be submitted with this application.

Operational Plan to Mitigate Emissions and **Plan of Work Practices**

Startup

Prior to the production of asphalt, the drum mixer dust collector will be operational and functioning correctly per 20.2.11.108.A, 20.2.11.109, and applicable permit conditions.

Prior to loading of mineral filler, the mineral filler silo dust collector will be operational and functioning correctly per 20.2.11.108.A, 20.2.11.109, and applicable permit conditions.

Prior to the production of asphalt, feeder bin exit enclosures or other control measures will be functioning correctly to control fugitive emissions to an opacity limit of 20 percent per EPA Reference Method 9.

Prior to the production of asphalt, water sprays, or other control measures, for the scalping screen and pug mill will be functioning correctly and used as needed, to control fugitive emissions to an opacity limit of 20 percent per EPA Reference Method 9.

Upon visual inspection, all unpaved haul roads will be controlled with surfactants or other equivalent control methods, to minimize fugitive dust as required under applicable permit conditions.

Shutdown

All required control equipment will operate until all asphalt production ceases.

<u>Maintenance</u>

The feeder bin exit enclosures, asphalt drum mixer, drum mixer dust collector, equipment water sprays, and mineral filler silo dust collector will be maintained to prevent excess emissions during startup or shutdown. This facility will not have excess emissions during any maintenance procedures.

<u>Malfunction</u>

Upon malfunction where excess particulate emissions are observed from the feeder bin exit enclosures, asphalt drum mixer, drum mixer dust collector, scalping screen and pug mill water sprays, mineral filler silo dust collector, and baghouse loadout enclosure and watering, all asphalt production will cease until repairs to control equipment are made.

Upon malfunction where excess particulate emissions are observed from the feeder bin exit enclosures, and equipment water sprays, all aggregate processing will cease until repairs to control equipment are made.

Section 15

Alternative Operating Scenarios

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

Alternative Operating Scenarios: Provide all information required by the department to define alternative operating scenarios. This includes process, material and product changes; facility emissions information; air pollution control equipment requirements; any applicable requirements; monitoring, recordkeeping, and reporting requirements; and compliance certification requirements. Please ensure applicable Tables in this application are clearly marked to show alternative operating scenario.

Construction Scenarios: When a permit is modified authorizing new construction to an existing facility, NMED includes a condition to clearly address which permit condition(s) (from the previous permit and the new permit) govern during the interval between the date of issuance of the modification permit and the completion of construction of the modification(s). There are many possible variables that need to be addressed such as: Is simultaneous operation of the old and new units permitted and, if so for example, for how long and under what restraints? In general, these types of requirements will be addressed in Section A100 of the permit, but additional requirements may be added elsewhere. Look in A100 of our NSR and/or TV permit template for sample language dealing with these requirements. Find these permit templates at: www.env.nm.gov/air-quality/permitting-section-procedures-and-guidance/. Compliance with standards must be maintained during construction, which should not usually be a problem unless simultaneous operation of old and new equipment is requested.

In this section, under the bolded title "Construction Scenarios", specify any information necessary to write these conditions, such as: conservative-realistic estimated time for completion of construction of the various units, whether simultaneous operation of old and new units is being requested (and, if so, modeled), whether the old units will be removed or decommissioned, any PSD ramifications, any temporary limits requested during phased construction, whether any increase in emissions is being requested as SSM emissions or will instead be handled as a separate Construction Scenario (with corresponding emission limits and conditions, etc.

No alternative operating scenarios

Section 16

Air Dispersion Modeling

1) Minor Source Construction (20.2.72 NMAC) and Prevention of Significant Deterioration (PSD) (20.2.74 NMAC) ambient impact analysis (modeling): Provide an ambient impact analysis as required at 20.2.72.203.A(4) and/or 20.2.74.303 NMAC and as outlined in the Air Quality Bureau's Dispersion Modeling Guidelines found on the Planning Section's modeling website. If air dispersion modeling has been waived for one or more pollutants, attach the AQB Modeling Section modeling waiver approval documentation.
2) SSM Modeling: Applicants must conduct dispersion modeling for the total short term emissions during routine or predictable startup, shutdown, or maintenance (SSM) using realistic worst case scenarios following guidance from the Air Quality Bureau's dispersion modeling section. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) for more detailed instructions on SSM emissions modeling requirements.
3) Title V (20.2.70 NMAC) ambient impact analysis: Title V applications must specify the construction permit and/or Title V Permit number(s) for which air quality dispersion modeling was last approved. Facilities that have only a Title V permit, such as landfills and air curtain incinerators, are subject to the same modeling required for preconstruction permits required by 20.2.72 and 20.2.74 NMAC.

What is the purpose of this application?	Enter an X for each purpose that applies
New PSD major source or PSD major modification (20.2.74 NMAC). See #1 above.	
New Minor Source or significant permit revision under 20.2.72 NMAC (20.2.72.219.D NMAC). See #1 above. **Note:** Neither modeling nor a modeling waiver is required for VOC emissions.	**X**
Reporting existing pollutants that were not previously reported.	
Reporting existing pollutants where the ambient impact is being addressed for the first time.	
Title V application (new, renewal, significant, or minor modification. 20.2.70 NMAC). See #3 above.	
Relocation (20.2.72.202.B.4 or 72.202.D.3.c NMAC)	
Minor Source Technical Permit Revision 20.2.72.219.B.1.d.vi NMAC for like-kind unit replacements.	
Other: i.e. SSM modeling. See #2 above.	
This application does not require modeling since this is a No Permit Required (NPR) application.	
This application does not require modeling since this is a Notice of Intent (NOI) application (20.2.73 NMAC).	
This application does not require modeling according to 20.2.70.7.E(11), 20.2.72.203.A(4), 20.2.74.303, 20.2.79.109.D NMAC and in accordance with the Air Quality Bureau's Modeling Guidelines.	

Check each box that applies:

☐ See attached, approved modeling **waiver for all** pollutants from the facility.
☐ See attached, approved modeling **waiver for some** pollutants from the facility.
☒ Attached in Universal Application Form 4 (UA4) is a **modeling report for all** pollutants from the facility.
☐ Attached in UA4 is a **modeling report for some** pollutants from the facility.
☐ No modeling is required.

Universal Application 4

Air Dispersion Modeling Report

Refer to and complete Section 16 of the Universal Application form (UA3) to assist your determination as to whether modeling is required. If, after filling out Section 16, you are still unsure if modeling is required, e-mail the completed Section 16 to the AQB Modeling Manager for assistance in making this determination. If modeling is required, a modeling protocol would be submitted and approved prior to an application submittal. The protocol should be emailed to the modeling manager. A protocol is recommended but optional for minor sources and is required for new PSD sources or PSD major modifications. Fill out and submit this portion of the Universal Application form (UA4), the "Air Dispersion Modeling Report", only if air dispersion modeling is required for this application submittal. This serves as your modeling report submittal and should contain all the information needed to describe the modeling. No other modeling report or modeling protocol should be submitted with this permit application.

16-A: Identification		
1	Name of facility:	MV 400 TPH Astec HMA Plant
2	Name of company:	Mesa Verde Enterprises, Inc.
3	Current Permit number:	New Permit
4	Name of applicant's modeler:	Paul Wade
5	Phone number of modeler:	(505) 830-9680 x6
6	E-mail of modeler:	pwade@montrose-env.com

16-B: Brief			
1	Was a modeling protocol submitted and approved? Submitted 11/30/2023, but not approved	Yes☒	No☐
2	Why is the modeling being done?	New Facility	
3	Describe the permit changes relevant to the modeling.		
	New NSR Permit. Presently operates under GCP-3-9079. Allow night time operations.		
4	What geodetic datum was used in the modeling?	NAD83	
5	How long will the facility be at this location?	No more than a year	
6	Is the facility a major source with respect to Prevention of Significant Deterioration (PSD)?	Yes☐	No☒

7	Identify the Air Quality Control Region (AQCR) in which the facility is located	153

8	List the PSD baseline dates for this region (minor or major, as appropriate).	
	NO2	08/02/1995
	SO2	N/A
	PM10	06/16/2000
	PM2.5	N/A

9	Provide the name and distance to Class I areas within 50 km of the facility (300 km for PSD permits).
	No Class I area within 50 km.

10	Is the facility located in a non-attainment area? If so describe below	Yes☐	No☒

11	Describe any special modeling requirements, such as streamline permit requirements.

16-C: Modeling History of Facility

1. Describe the modeling history of the facility, including the air permit numbers, the pollutants modeled, the National Ambient Air Quality Standards (NAAQS), New Mexico AAQS (NMAAQS), and PSD increments modeled. (Do not include modeling waivers).

Pollutant	Latest permit and modification number that modeled the pollutant facility-wide.	Date of Permit	Comments
CO	N/A	N/A	New Permitted Facility
NO_2	N/A	N/A	New Permitted Facility
SO_2	N/A	N/A	New Permitted Facility
H_2S	N/A	N/A	New Permitted Facility
PM2.5	N/A	N/A	New Permitted Facility
PM10	N/A	N/A	New Permitted Facility
Lead	N/A	N/A	Not a significant facility pollutant
Ozone (PSD only)	N/A	N/A	Not a PSD Source
NM Toxic Air Pollutants (20.2.72.402 NMAC)	N/A	N/A	New Permitted Facility

16-D: Modeling performed for this application

1. For each pollutant, indicate the modeling performed and submitted with this application.
Choose the most complicated modeling applicable for that pollutant, i.e., culpability analysis assumes ROI and cumulative analysis were also performed.

Pollutant	ROI	Cumulative analysis	Culpability analysis	Waiver approved	Pollutant not emitted or not changed.

	CO	☒	☐	☐	☐	☐
	NO_2	☒	☒	☐	☐	☐
	SO_2	☒	☒	☐	☐	☐
	H_2S	☒	☐	☐	☐	☐
	PM2.5	☒	☒	☐	☐	☐
	PM10	☒	☒	☐	☐	☐
	Lead	☐	☐	☐	☐	☒
	Ozone	☐	☐	☐	☐	☒
	State air toxic(s) (20.2.72.402 NMAC)	☒	☐	☐	☐	☐

16-E: New Mexico toxic air pollutants modeling

1	List any New Mexico toxic air pollutants (NMTAPs) from Tables A and B in 20.2.72.502 NMAC that are modeled for this application.					
2	List any NMTAPs that are emitted but not modeled because stack height correction factor. Add additional rows to the table below, if required.					
	Pollutant	Emission Rate (pounds/hour)	Emission Rate Screening Level (pounds/hour)	Stack Height (meters)	Correction Factor	Emission Rate/ Correction Factor
	Asphalt Fumes	5.01	0.333	9.14	1	5.01
	Calcium Hydroxide	0.18	0.333	18.3	5	0.036

16-F: Modeling options

1	Was the latest version of AERMOD used with regulatory default options? If not explain below.	Yes☒	No☐
	AERMOD Version 23132		

16-G: Surrounding source modeling

1	Date of surrounding source retrieval	11/13/2023
2	If the surrounding source inventory provided by the Air Quality Bureau was believed to be inaccurate, describe how the sources modeled differ from the inventory provided. If changes to the surrounding source inventory were made, use the table below to describe them. Add rows as needed.	
	PM10 and PM2.5 GCP emission sources were set to 71.25 tpy and 17.875 tpy, respectively. GCP2 and GCP3 hours of operation were limited to daylight hours only.	
	AQB Source ID	Description of Corrections

16-H: Building and structure downwash

1	How many buildings are present at the facility?	4		
2	How many above ground storage tanks are present at the facility?	2		
3	Was building downwash modeled for all buildings and tanks? If not explain why below.		Yes☒	No☐
4	Building comments			

16-I: Receptors and modeled property boundary

1	"Restricted Area" is an area to which public entry is effectively precluded. Effective barriers include continuous fencing, continuous walls, or other continuous barriers approved by the Department, such as rugged physical terrain with a steep grade that would require special equipment to traverse. If a large property is completely enclosed by fencing, a restricted area within the property may be identified with signage only. Public roads cannot be part of a Restricted Area. A Restricted Area is required in order to exclude receptors from the facility property. If the facility does not have a Restricted Area, then receptors shall be placed within the property boundaries of the facility. Describe the fence or other physical barrier at the facility that defines the restricted area.		
	Facility will be located within White Sand Missile Range. The White Sands Missile Range is fenced. Co-located at the site is Toro Rock Products, LLC's Organ Quarry aggregate plant operating under GCP-2-3269 that will be providing the aggregate for the Facility. At the gate to the site is no trespassing signs for Toro Rock. No White Sands Missile Range personnel are located or allowed in the area. A modeling property boundary was created following south and west fencing around the White Sands Missile Range and an east and north modeling boundary created within the White Sands Missile Range.		
2	Receptors must be placed along publicly accessible roads in the restricted area. Are there public roads passing through the restricted area?	Yes☐	No☒
3	Are restricted area boundary coordinates included in the modeling files?	Yes☒	No☐

4 Describe the receptor grids and their spacing. The table below may be used, adding rows as needed.

Grid Type	Shape	Spacing	Start distance from restricted area or center of facility	End distance from restricted area or center of facility	Comments
Very Fine	Cartesian	50 meters	Border	500 Meters	
Very Fine	Cartesian	100 meters	500 Meters	1 Kilometers	
Fine	Cartesian	250 meters	1 Kilometers	3 Kilometers	
Course	Cartesian	500 meters	3 Kilometers	7 Kilometers	
Course	Cartesian	1000 meters	7 Kilometers	50 Kilometers	

5	Describe receptor spacing along the fence line.
	25 meters
6	Describe the PSD Class I area receptors.
	N/A

16-J: Sensitive areas

1	Are there schools or hospitals or other sensitive areas near the facility? If so describe below. This information is optional (and purposely undefined) but may help determine issues related to public notice.	Yes☐	No☒
3	The modeling review process may need to be accelerated if there is a public hearing. Are there likely to be public comments opposing the permit application?	Yes☐	No☒

16-K: Modeling Scenarios

1	Identify, define, and describe all modeling scenarios. Examples of modeling scenarios include using different production rates, times of day, times of year, simultaneous or alternate operation of old and new equipment during transition periods, etc. Alternative operating scenarios should correspond to all parts of the Universal Application and should be fully described in Section 15 of the Universal Application (UA3).		
	For HMA Plant, they will limit model hours to the equivalent of 10 hours per day if operating at maximum to account for the requested permit daily production rate. For particulate modeling, 12 scenarios were run beginning with February - November months operating daily limits starting at 12:00 AM. Scenario 2 modeling hours for February - November months two hours from 2 AM. This trend continues for all 12 scenarios. For December and January months, the facility will not operate. NO2 modeling was run for all hours of operation in February – November months.		
2	Which scenario produces the highest concentrations? Why?		
	PM10 24 hour – Scenario 1, operating nighttime hours with low winds and low boundary layer PM10 24 hour Inc – Scenario 2, Year 2018, operating nighttime hours with low winds and low boundary layer PM10 Annual Inc – Scenario 1, Year 2015, operating nighttime hours with low winds and low boundary layer PM2.5 24 hour – Scenario 2, operating nighttime hours with low winds and low boundary layer PM2.5 annual – Scenario 12, operating nighttime hours with low winds and low boundary layer		
3	Were emission factor sets used to limit emission rates or hours of operation? (This question pertains to the "SEASON", "MONTH", "HROFDY" and related factor sets, not to the factors used for calculating the maximum emission rate.)	Yes☒	No☐
4	If so, describe factors for each group of sources. List the sources in each group before the factor table for that group. (Modify or duplicate table as necessary. It's ok to put the table below section 16-K if it makes formatting easier.) Sources:		
5	For the MV 400 TPH Astec HMA plant, the following hours lists the maximum hours of operation.		

HMA Production Hours of Operation (MST)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12:00 AM	0	1	1	1	1	1	1	1	1	1	1	0
1:00 AM	0	1	1	1	1	1	1	1	1	1	1	0
2:00 AM	0	1	1	1	1	1	1	1	1	1	1	0
3:00 AM	0	1	1	1	1	1	1	1	1	1	1	0
4:00 AM	0	1	1	1	1	1	1	1	1	1	1	0
5:00 AM	0	1	1	1	1	1	1	1	1	1	1	0

6:00 AM	0	1	1	1	1	1	1	1	1	1	1	0
7:00 AM	0	1	1	1	1	1	1	1	1	1	1	0
8:00 AM	0	1	1	1	1	1	1	1	1	1	1	0
9:00 AM	0	1	1	1	1	1	1	1	1	1	1	0
10:00 AM	0	1	1	1	1	1	1	1	1	1	1	0
11:00 AM	0	1	1	1	1	1	1	1	1	1	1	0
12:00 PM	0	1	1	1	1	1	1	1	1	1	1	0
1:00 PM	0	1	1	1	1	1	1	1	1	1	1	0
2:00 PM	0	1	1	1	1	1	1	1	1	1	1	0
3:00 PM	0	1	1	1	1	1	1	1	1	1	1	0
4:00 PM	0	1	1	1	1	1	1	1	1	1	1	0
5:00 PM	0	1	1	1	1	1	1	1	1	1	1	0
6:00 PM	0	1	1	1	1	1	1	1	1	1	1	0
7:00 PM	0	1	1	1	1	1	1	1	1	1	1	0
8:00 PM	0	1	1	1	1	1	1	1	1	1	1	0
9:00 PM	0	1	1	1	1	1	1	1	1	1	1	0
10:00 PM	0	1	1	1	1	1	1	1	1	1	1	0
11:00 PM	0	1	1	1	1	1	1	1	1	1	1	0
Total	0	24	24	24	24	24	24	24	24	24	24	0

Since the HMA plant daily hours of operation running at maximum hourly production rate is less than the total hours of operation, twelve (12) PM modeling scenarios will be performed for each averaging period. For each scenario the hours of operation are shifted by two hours.

HMA Model Scenario Time Segments

Model Scenario	Time Segments 5-Hour Blocks February, March, November	Time Segments 8-Hour Blocks April, September, and October	Time Segments 10-Hour Blocks May - August
1	12 AM to 5 AM	12 AM to 8 AM	12 AM to 10 AM
2	2 AM to 7 AM	2 AM to 10 AM	2 AM to 12 PM
3	4 AM to 9 AM	4 AM to 12 PM	4 AM to 2 PM
4	6 AM to 11 AM	6 AM to 2 PM	6 AM to 4 PM
5	8 AM to 1 PM	8 AM to 4 PM	8 AM to 6 PM
6	10 AM to 3 PM	10 AM to 6 PM	10 AM to 8 PM
7	12 PM to 5 AM	12 PM to 8 PM	12 PM to 10 PM
8	2 PM to 7 PM	2 PM to 10 PM	2 PM to 12 AM
9	4 PM to 9 PM	4 PM to 12 AM	4 PM to 2 AM
10	6 PM to 11 PM	6 PM to 2 AM	6 PM to 4 AM
11	8 PM to 1 AM	8 PM to 4 AM	8 PM to 6 AM
12	10 PM to 3 AM	10 PM to 6 AM	10 PM to 8 AM

6	Were different emission rates used for short-term and annual modeling? If so describe below.	Yes☒	No☐
	For setback modeling, the annual particulate matter modeling included hourly factors based on limitations on annual production.		

16-L: NO_2 Modeling

1	Which types of NO_2 modeling were used? Check all that apply.			
	☒	ARM2		
	☐	100% NO_X to NO_2 conversion		
	☐	PVMRM		
	☐	OLM		
	☐	Other:		
2	Describe the NO_2 modeling.			
	NO2 modeling included neighboring sources and no background concentrations.			
3	Were default NO_2/NO_X ratios (0.5 minimum, 0.9 maximum or equilibrium) used? If not describe and justify the ratios used below.		Yes☒	No☐
4	Describe the design value used for each averaging period modeled.			
	1-hour: 98th percentile as calculated by AERMOD Annual: One Year Annual Average			

16-M: Particulate Matter Modeling

1	Select the pollutants for which plume depletion modeling was used.	
	☐	PM2.5
	☒	PM10
	☐	None
2	Describe the particle size distributions used. Include the source of information.	
	PM_{10} emissions may be modeled using plume deposition. 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. Particle size distribution for fugitive dust during material handling, fugitive road dust on unpaved roads; lime silo baghouse exhaust; HMA asphalt particulate emissions; and combustion will use the particle size distribution found in the NMED Modeling Section approved values.	

The mass-mean particle diameters were 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 were obtained from NMED accepted values.

Material	Density (g/cm^3)	Reference
Road Dust	2.5	NMED Value
Lime	3.3	NMED Value
HMA Asphalt	1.5	NMED Value
Combustion	1.5	NMED Value
Fugitive Dust	2.5	NMED Value

The size distribution for PM_{10} emission sources are presented in Tables below.

Road Vehicle Fugitive Dust Deposition 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	6.91	75.0	2.5

Based on NMED Particle Size Distribution Spreadsheet – April 25, 2007 (Vehicle Fugitive)

Lime Baghouse Source Deposition 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	3.3
2.5-10	6.91	75	3.3

Parameters based on baghouse exhaust capture percentages. (Lime Silo)

Combustion Source Deposition Parameters

Particle Size Category (μm)	Mass Mean Particle Diameter (μm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
PM10			
0 - 2.5	1.57	100	1.5

Based on NMED Particle Size Distribution Spreadsheet – April 25, 2007 (Combustion)

Asphalt Baghouse and Stack Source Deposition 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

Based on NMED Particle Size Distribution Spreadsheet – April 25, 2007 (Asphalt Baghouse Stack)

Fugitive Dust Source Deposition Parameters

Particle Size Category (μm)	Mass Mean Particle Diameter (μm)	Mass Weighted Size Distribution (%)	Density (g/cm^3)
PM10			
0 - 2.5	1.57	7.8	2.5
2.5 – 5	3.88	27.0	2.5
5 – 10	7.77	65.2	2.5

Based on NMED Particle Size Distribution Spreadsheet – April 25, 2007 (Coal Handling).

3	Does the facility emit at least 40 tons per year of NO_X or at least 40 tons per year of SO_2? Sources that emit at least 40 tons per year of NO_X or at least 40 tons per year of SO_2 are considered to emit significant amounts of precursors and must account for secondary formation of PM2.5.	Yes☒	No☐
4	Was secondary PM modeled for PM2.5?	Yes☒	No☐

5 If MERPs were used to account for secondary PM2.5 fill out the information below. If another method was used describe below.

NO_X (ton/yr)	SO_2 (ton/yr)	$[PM2.5]_{annual}$	$[PM2.5]_{24\text{-hour}}$
50.3	29.4	0.0002	0.005

The $PM_{2.5}$ secondary emission concentration analysis will follow EPA and NMED AQB guidelines. Following recent EPA guidelines for conversion of NO_X and SO_2 emission rates to secondary $PM_{2.5}$ emissions, Mesa Verde emissions are compared to appropriate western MERPs values (NO_X 24-Hr – 42498 tpy; NO_X Annual – 130260 tpy; SO_2 24-Hr – 9753 tpy; SO_2 Annual – 53898 tpy). The following equation, found in NMED AQB modeling guidance document on MERPs, will be added to determine if secondary emission would cause violation with $PM_{2.5}$ NAAQS.

	$PM_{2.5}$ annual = ((NO_X emission rate (tpy)/130260 + (SO_2 emission rate (tpy)/53898)) x 0.2 µg/m^3 $PM_{2.5}$ annual = ((50.3/130260) + (29.4/53898)) x 0.2 µg/m^3 = **0.0002 µg/m^3** $PM_{2.5}$ 24 hour = ((NO_X emission rate (tpy)/42498 + (SO_2 emission rate (tpy)/9753)) x 1.2 µg/m^3 $PM_{2.5}$ 24 hour = ((50.3/42498) + (29.4/9753)) x 1.2 µg/m^3 = **0.005 µg/m^3**

16-N: Setback Distances

1	Portable sources or sources that need flexibility in their site configuration requires that setback distances be determined between the emission sources and the restricted area boundary (e.g. fence line) for both the initial location and future locations. Describe the setback distances for the initial location.
	At the initial location they will be operating no more than one year. Any relocations back will be to the same location.

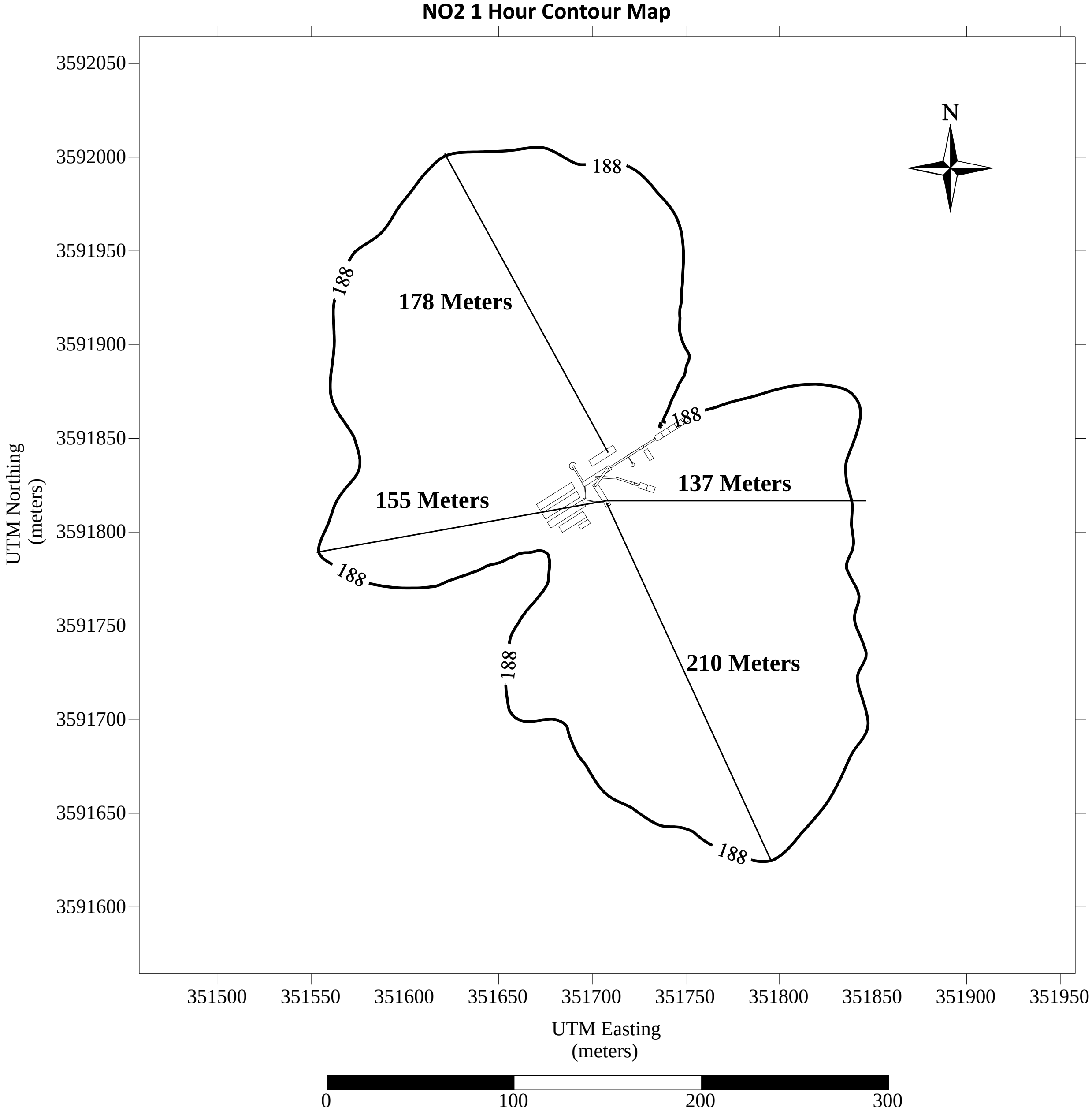
2	Describe the requested, modeled, setback distances for future locations, if this permit is for a portable stationary source. Include a haul road in the relocation modeling.

The most likely future location will be near Alamogordo. Meteorological data from Holloman Air Force Base was used in the relocation modeling. For the relocation modeling all truck traffic was run from the plant to the exit on a single haul road. All modeling was run with no elevations. For PM10, Scenario 11 produced the largest setback. For PM2.5, Scenario 10 produced the largest setback. For the setback modeling, NO2 1 hour produced the furthest setback distance of 210 meters.

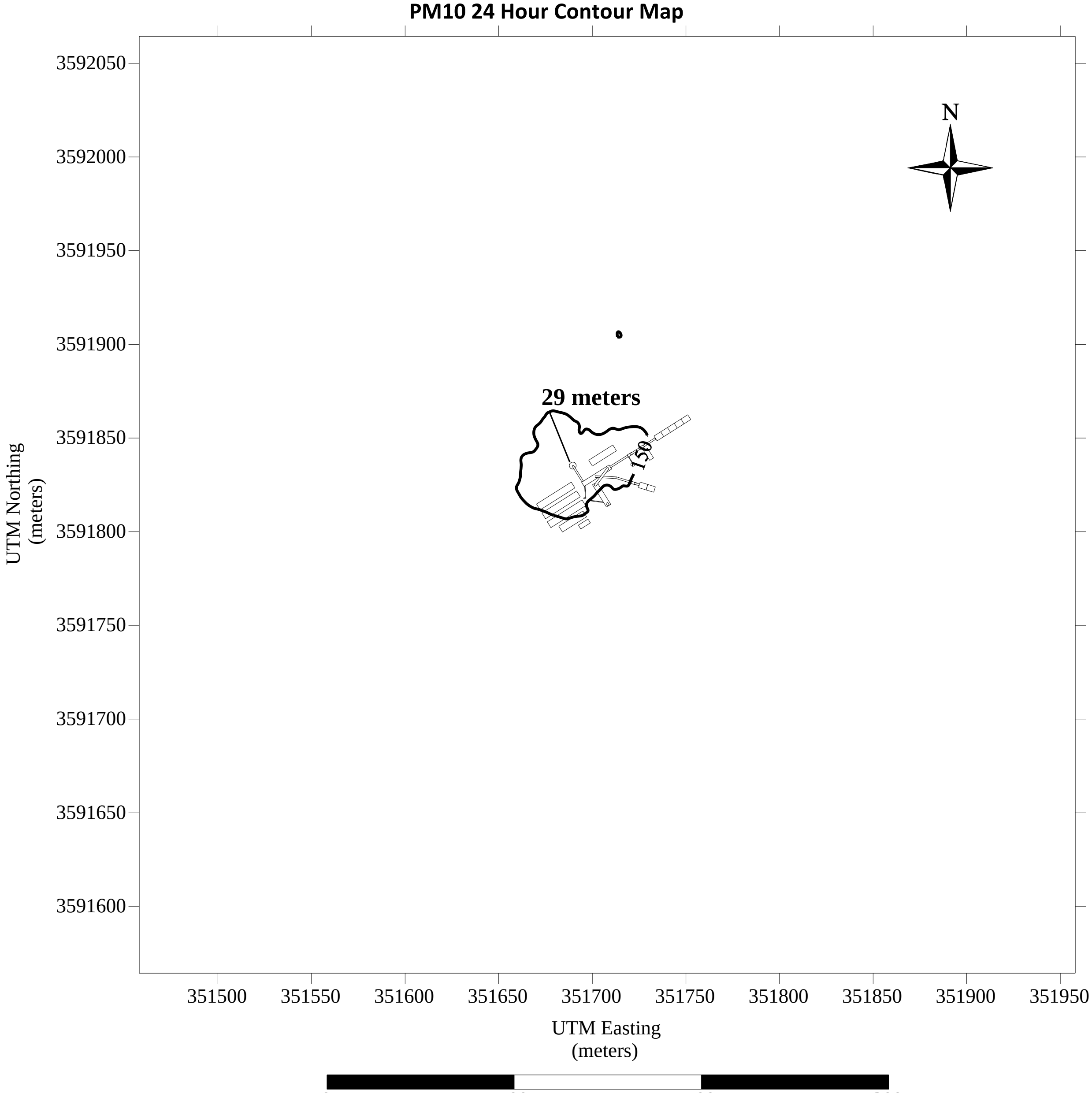
Setback Distance in Meters

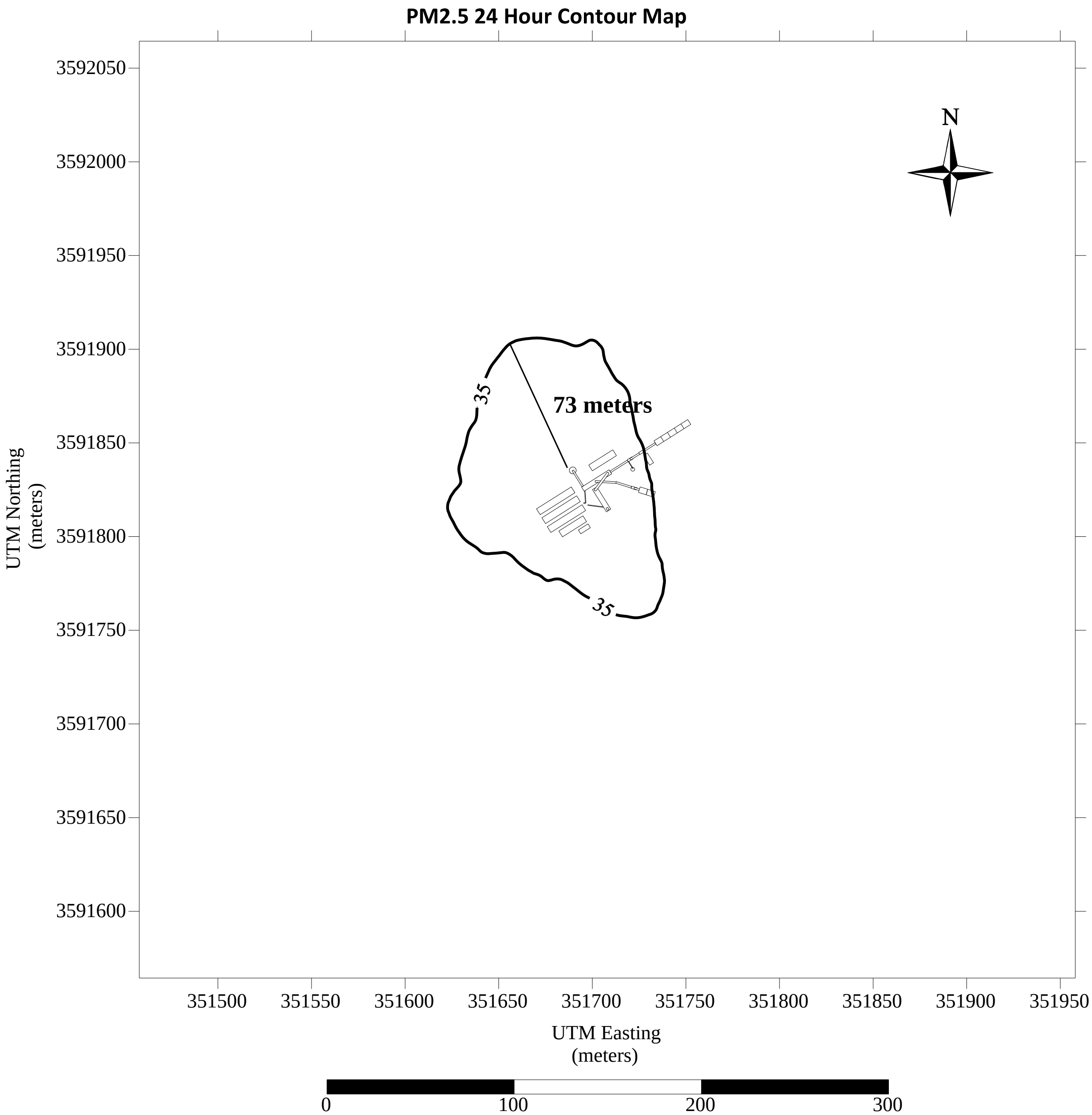
North	East	South	West
178	137	210	155

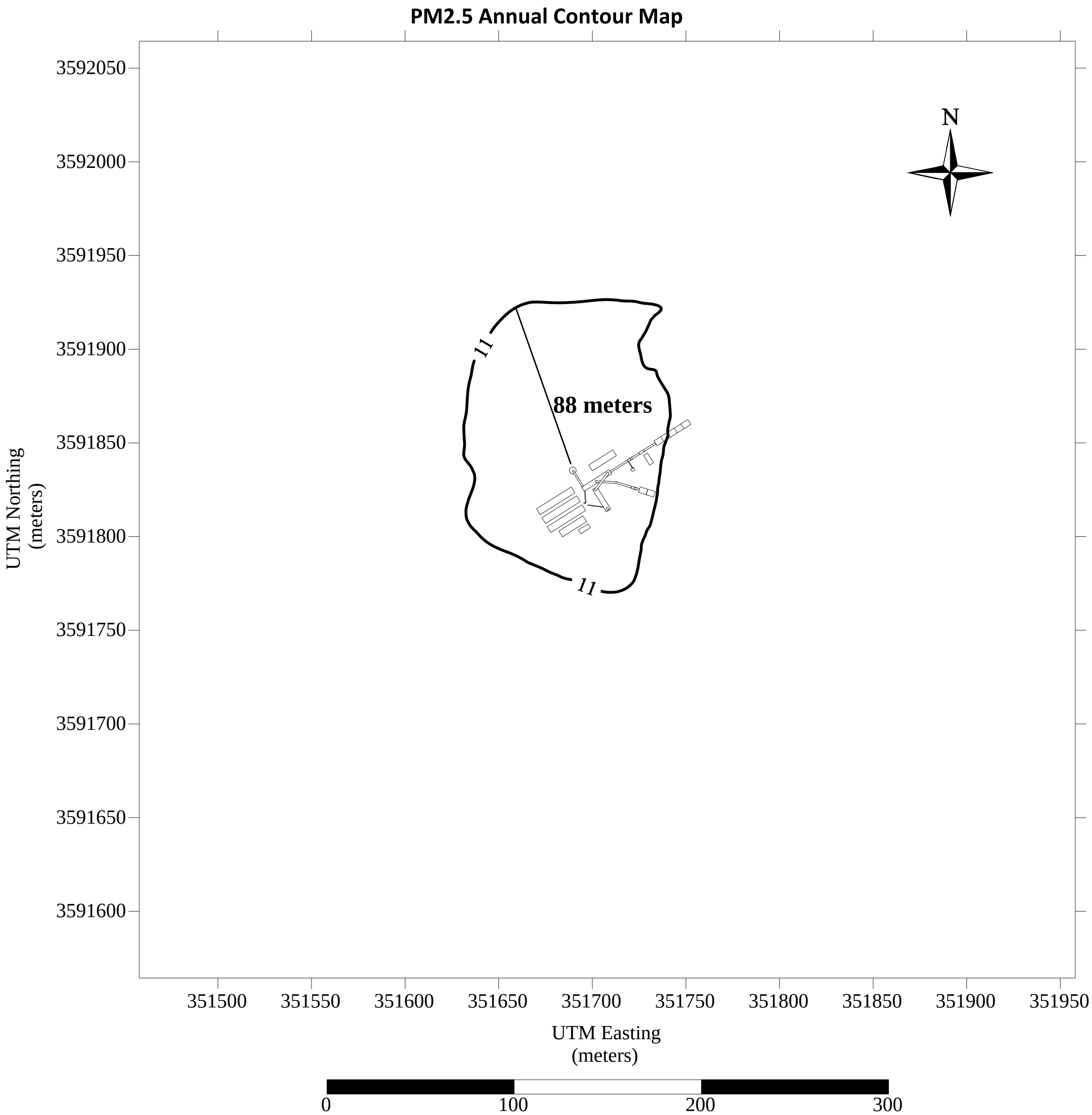
NO2 1 Hour Contour Map



PM10 24 Hour Contour Map




PM2.5 24 Hour Contour Map
N
73 meters
35
35
3592050
3592000
3591950
3591900
3591850
3591800
3591750
3591700
3591650
3591600
UTM Northing
(meters)
351500
351550
351600
351650
351700
351750
351800
351850
351900
351950
UTM Easting
(meters)
0
100
200
300



16-O: PSD Increment and Source IDs

1	The unit numbers in the Tables 2-A, 2-B, 2-C, 2-E, 2-F, and 2-I should match the ones in the modeling files. Do these match? If not, provide a cross-reference table between unit numbers if they do not match below.	Yes☐	No☒
	Unit Number in UA-2	Unit Number in Modeling Files	
	TRCK	UHR_1-158	

		AGG_1-20
	YARD	UHR_76-158

2	The emission rates in the Tables 2-E and 2-F should match the ones in the modeling files. Do these match? If not, explain why below.	Yes☐	No☒

Hourly model emission rates for material handling sources (Emissions calculated using AP-42 Section 13.2.4) are calculated using annual average windspeed for Moriarty.

Permit ID	Model ID	Source Description	Permit Emission Rate PM10 Lb/Hr	Permit Emission Rate PM2.5 Lb/Hr	Modeled Emission Rate PM10 Lb/Hr	Modeled Emission Rate PM2.5 Lb/Hr
AGGPILE	AGGPILE1 - 4	Cold Aggregate Storage Pile (combined)	0.59309	0.08981	0.34804	0.05270
AGGPILE	AGGPILE5 – 6	RAP Storage Pile (combined)	0.05057	0.00766	0.02968	0.00449
1	HMABIN	Cold Aggregate Feed Bin Loading	0.59309	0.08981	0.34804	0.05270
8	RAPFEED	RAP Feeder/Hopper	0.05057	0.00766	0.02968	0.00449

3	Have the minor NSR exempt sources or Title V Insignificant Activities" (Table 2-B) sources been modeled?	Yes☐	No☒

4 Which units consume increment for which pollutants?

Model ID	Source Description	NOx	PM10
AGGPILE	Cold Aggregate/RAP Storage Pile		X
1	Feed Bin Loading		X
2	Feed Bin Unloading		X
3	Scalping Screen		X
4	Scalping Screen Unloading		X
5	Pug Mill Load		X
6	Pug Mill Unload		X
7	Conveyor Transfer to Slinger Conveyor		X
8	RAP Bin Loading		X
9	RAP Bin Unloading		X
10	RAP Screen		X
11	RAP Screen Unloading		X
12	RAP Transfer Conveyor		X
12a	RAP Transfer Conveyor to Drum		X
13	Mineral Filler Silo Baghouse		X
14	Drum Dryer Baghouse	X	X
15	Drum Mixer Unloading		X
16	Asphalt Silo Unloading		X
17	Main Plant Generator	X	X
18	Standby Generator	X	X
19	Asphalt Heater	X	X
20	Asphalt Cement Storage Tanks (2)		X
TRCK	Haul Road Traffic		X
YARD	HMA Yard		X

5	PSD increment description for sources. (for unusual cases, i.e., baseline unit expanded emissions after baseline date).	Baseline Consumers	
6	Are all the actual installation dates included in Table 2A of the application form, as required? This is necessary to verify the accuracy of PSD increment modeling. If not please explain how increment consumption status is determined for the missing installation dates below.	Yes☒	No☐

16-P: Flare Modeling

1	For each flare or flaring scenario, complete the following			
	Flare ID (and scenario)	Average Molecular Weight	Gross Heat Release (cal/s)	Effective Flare Diameter (m)
	NA			

16-Q: Volume and Related Sources

1	Were the dimensions of volume sources different from standard dimensions in the Air Quality Bureau (AQB) Modeling Guidelines? If not please explain how increment consumption status is determined for the missing installation dates below.	Yes☒	No☐
2	Describe the determination of sigma-Y and sigma-Z for fugitive sources.		
	For storage piles the model inputs were based on the size of the pile (100 feet)/4.3 (sigma-Y) and a release height of 8 feet or a sigma-Z of 8ft*2/2.15. All others followed standard dimensions from Air Quality Bureau (AQB) Modeling Guidelines.		
3	Describe how the volume sources are related to unit numbers. Or say they are the same.		
	Yes		
4	Describe any open pits.		
	NA		
5	Describe emission units included in each open pit.		
	NA		

16-R: Background Concentrations

1	Were NMED provided background concentrations used? Identify the background station used below. If non-NMED provided background concentrations were used describe the data that was used.	Yes☒	No☐

	CO: Del Norte High School (350010023)			
	NO_2: N/A			
	PM2.5: Las Cruces Distric Office (350130025)			
	PM10: Las Cruces City Well #46 (350130024)			
	SO_2: N/A			
	Other:			
	Comments:	NO2 and SO2 were modeled with neighboring sources only. No H2S neighboring sources were identified.		
2	Were background concentrations refined to monthly or hourly values? If so describe below.		Yes☐	No☒

16-S: Meteorological Data

1	Was NMED provided meteorological data used? If so select the station used.Las Cruces	Yes☒	No☐
2	If NMED provided meteorological data was not used describe the data set(s) used below. Discuss how missing data were handled, how stability class was determined, and how the data were processed.		
	For site modeling: Holloman Rd 2015-2019; For relocation: Alamogordo 2017 - 2021		

16-T: Terrain

1	Was complex terrain used in the modeling? If not, describe why below.	Yes☒	No☐
	Yes, for point sources only. For volume sources, model was run in source selected flat terrain mode. For setback modeling all sources are run in flat terrain mode.		
2	What was the source of the terrain data?		
	USGS National Elevation Data (NED)		

16-U: Modeling Files

1	Describe the modeling files: For PM10 and PM2.5 modeling, the ROI modeling included all discussed operating scenario. For the results of the ROI particulate matter modeling, the highest six model results were used in the CIA modeling		
	File name (or folder and file name)	Pollutant(s)	Purpose (ROI/SIA, cumulative, culpability analysis, other)
	MVWSRCombustROI	NO2, CO, SO2	ROI/SIA
	MVWSRPMROIS1-12	PM10, PM2.5	ROI/SIA
	MVAstecNO2YrCIA	NO2 Annual NAAQS and Increment	Cumulative, Increment
	MVAstecNO21HrCIA	NO2 1 hour	Cumulative
	MVAstecSO21HrCIA	SO2 1 hour NAAQS and Increment	Cumulative, Increment
	MVAstecPM10CIAS1, 2, 3, 9, 10, 1, 12	PM10	Cumulative

	MVAstecPM25CIAS1, 2, 3, 9, 10, 1, 12	PM2.5	Cumulative
	MVAstecPM10INCS1, 2, 3, 9, 10, 1, 12	PM10 Increment	Increment
	MVAstecAF	Asphalt Fumes	TAPs Model
	MVAstecH2S	H2S	ROI/SIA
	MVAstecNO2Relocation	NO2 1 hour	Relocation Setback
	MVAstecPM10RelocationS1, 9, 10, 11, 12	PM10 24 Hour	Relocation Setback
	MVAstecPM24RelocationS1, 9, 10, 11, 12	PM2.5 24 Hour and Annual	Relocation Setback

16-V: PSD New or Major Modification Applications

1	A new PSD major source or a major modification to an existing PSD major source requires additional analysis. Was preconstruction monitoring done (see 20.2.74.306 NMAC and PSD Preapplication Guidance on the AQB website)?	Yes☐	No☒
2	If not, did AQB approve an exemption from preconstruction monitoring?	Yes☐	No☒
3	Describe how preconstruction monitoring has been addressed or attach the approved preconstruction monitoring or monitoring exemption.		
	Not a PSD Source		
4	Describe the additional impacts analysis required at 20.2.74.304 NMAC.		
	Not a PSD Source		
5	If required, have ozone and secondary PM2.5 ambient impacts analyses been completed? If so describe below.	Yes☒	No☐
	Secondary PM2.5 were calculated using Modeling Guideline MERPs		

16-W: Modeling Results

1	If ambient standards are exceeded because of surrounding sources, a culpability analysis is required for the source to show that the contribution from this source is less than the significance levels for the specific pollutant. Was culpability analysis performed? If so describe below.	Yes☐	No☒
2	Identify the maximum concentrations from the modeling analysis. Rows may be modified, added and removed from the table below as necessary. For PM10 24 hour, the maximum scenario was Scenario10. For PM2.5 24 hour, the maximum scenario was Scenario11. For PM2.5 Annual, the maximum scenario was Scenario10. For particulate modeling, the highest receptors were located at the traffic exit to the site. All highest applicable concentrations were on the Mesa Verde/Toro Rock Model boundary.		

Pollutant, Time Period and Standard	Modeled Facility Concentration (µg/m3)	Modeled Concentration with Surrounding Sources (µg/m3)	Secondary PM (µg/m3)	Background Concentration (µg/m3)	Cumulative Concentration (µg/m3)	Value of Standard (µg/m3)	Percent of Standard	Location		
								UTM E (m)	UTM N (m)	Elevation (ft)
Asphalt Fumes – 8 Hr	16.2	NA	NA	NA	NA	50	32.4	351751.1	3591355.2	1705.25
H2S – 1 hr	0.25	NA	NA	NA	NA	SIL – 1.0	25.0	351751.1	3591355.0	1705.25
NOx - Annual	1.65	2.46	NA	NA	2.46	94.0	2.6	351701.5	3591356.3	1686.50
NOx – Annual Inc	1.65	2.07	NA	NA	2.07	25	8.3	351701.5	3591356.3	1686.50
NOx – 1 Hr	95.6	99.0	NA	NA	99.0	188.0	52.7	351726.3	3591355.8	1694.51
CO – 1 hr	627.9	NA	NA	NA	NA	SIL – 2000	31.4	351751.1	3591355.2	1705.25
CO – 8 Hr	176.2	NA	NA	NA	NA	SIL – 500	35.2	351751.1	3591355.2	1705.25
SO_2 – 1 Hr	136.1	136.1	NA	NA	136.1	196.4	69.3	351726.3	3591355.8	1694.51
$PM_{2.5}$ - Annual	0.74	0.74	0.0002	5.2	5.9	12	49.2	351726.3	3591355.8	1694.51
$PM_{2.5}$ – 24 Hr	3.6	3.6	0.005	11.0	14.6	35	41.7	351726.3	3591355.8	1694.51
PM_{10} – 24 Hr	25.6	25.6	NA	121.7	147.3	150	98.2	350882.4	3591373.3	1596.59
PM_{10} – 24 Hr Inc	29.1	29.1	NA	NA	29.1	30	97.0	350882.4	3591373.3	1596.59
PM_{10} – Annual Inc	6.8	6.8	NA	NA	6.8	17	40.0	350907.3	3591372.8	1597.37

16-X: Summary/conclusions	
1	A statement that modeling requirements have been satisfied and that the permit can be issued.
	Dispersion modeling was performed for the new HMA permit application. All facility pollutants with ambient air quality standards and PSD increments were modeled to show compliance with those standards. All results of this modeling showed the facility in compliance with applicable ambient air quality standards and PSD increments.

Section 17

Compliance Test History

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

To show compliance with existing NSR permits conditions, you must submit a compliance test history. The table below provides an example.

The HMA plant has performed a GCP-3 compliance test for the plant operating under GCP-3-9079.

Compliance Test History Table

Unit No.	Test Description	Test Date
13	GCP-3-9079 initial compliance test for Opacity	05/17-18/2021
14	GCP-3-9079 initial compliance test for CO, NO_X, PM Total, $PM_{2.5}$, and Opacity	05/17-18/2021
17	GCP-3-9079 initial compliance test for CO, NO_X, PM Total, $PM_{2.5}$, and Opacity	05/17/2021

Section 20

Other Relevant Information

Other relevant information. Use this attachment to clarify any part in the application that you think needs explaining. Reference the section, table, column, and/or field. Include any additional text, tables, calculations or clarifying information.

Additionally, the applicant may propose specific permit language for AQB consideration. In the case of a revision to an existing permit, the applicant should provide the old language and the new language in track changes format to highlight the proposed changes. If proposing language for a new facility or language for a new unit, submit the proposed operating condition(s), along with the associated monitoring, recordkeeping, and reporting conditions. In either case, please limit the proposed language to the affected portion of the permit.

No other relevant information.

Section 22: Certification

Company Name: Mesa Verde Enterprises, Inc.

I, Allister G Gunn Jr, hereby certify that the information and data submitted in this application are true and as accurate as possible, to the best of my knowledge and professional expertise and experience.

Signed this 2nd day of January, 2024, upon my oath or affirmation, before a notary of the State of New Mexico.

*Signature: Allister G Gunn Jr — Date: 1/2/2024

Printed Name: Allister G Gunn Jr — Title: Compliance Officer

Scribed and sworn before me on this 2nd day of January, 2024.

My authorization as a notary of the State of New Mexico expires on the 19th day of September, 2027.

Notary's Signature: Julie Cypret — Date: 1/2/2024

Notary's Printed Name: JULIE CYPRET

State of New Mexico
Notary Public
Julie Cypret
Commission Number 1104043
Expiration Date 09-19-2027

*For Title V applications, the signature must be of the Responsible Official as defined in 20.2.70.7.AE NMAC.

Air Permit Application
Compliance History Disclosure Form

Pursuant to Subsection 74-2-7(S) of the New Mexico Air Quality Control Act ("AQCA"), NMSA §§ 74-2-1 to -17, the New Mexico Environment Department ("Department") may deny any permit application or revoke any permit issued pursuant to the AQCA if, within ten years immediately preceding the date of submission of the permit application, the applicant met any one of the criteria outlined below. In order for the Department to deem an air permit application administratively complete, or issue an air permit for those permits without an administrative completeness determination process, the applicant must complete this Compliance History Disclosure Form as specified in Subsection 74-2-7(P). An existing permit holder (permit issued prior to June 18, 2021) shall provide this Compliance History Disclosure Form to the Department upon request.

Permittee/Applicant Company Name		**Expected Application Submittal Date**
Mesa Verde Enterprises, Inc		1/8/2024
Permittee/Company Contact	**Phone**	**Email**
Allister Gunn	575-437-2995	allisterg@aggtecllc.com

Within the 10 years preceding the expected date of submittal of the application, has the permittee or applicant:		
1	Knowingly misrepresented a material fact in an application for a permit?	☐ Yes ☒ No
2	Refused to disclose information required by the provisions of the New Mexico Air Quality Control Act?	☐ Yes ☒ No
3	Been convicted of a felony related to environmental crime in any court of any state or the United States?	☐ Yes ☒ No
4	Been convicted of a crime defined by state or federal statute as involving or being in restraint of trade, price fixing, bribery, or fraud in any court of any state or the United States?	☐ Yes ☒ No
5a	Constructed or operated any facility for which a permit was sought, including the current facility, without the required air quality permit(s) under 20.2.70 NMAC, 20.2.72 NMAC, 20.2.74 NMAC, 20.2.79 NMAC, or 20.2.84 NMAC?	☐ Yes ☒ No
5b	If "No" to question 5a, go to question 6. If "Yes" to question 5a, state whether each facility that was constructed or operated without the required air quality permit met at least one of the following exceptions: a. The unpermitted facility was discovered after acquisition during a timely environmental audit that was authorized by the Department; or b. The operator of the facility estimated that the facility's emissions would not require an air permit, **and** the operator applied for an air permit within 30 calendar days of discovering that an air permit was required for the facility.	☐ Yes ☐ No
6	Had any permit revoked or permanently suspended for cause under the environmental laws of any state or the United States?	☐ Yes ☒ No
7	For each "yes" answer, please provide an explanation and documentation.	