# Universal Application 4

## Air Dispersion Modeling Report

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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.

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| 16-A: Identification | | |
|---|---|---|
| 1 | Name of facility: | Alto Concrete Batch Plant |
| 2 | Name of company: | Roper Construction, Inc |
| 3 | Current Permit number: | New Permit #9295 |
| 4 | Name of applicant's modeler: | Paul Wade |
| 5 | Phone number of modeler: | (505) 830-9680 ext6 |
| 6 | E-mail of modeler: | pwade@montrose-env.com |

| 16-B: Brief | | | |
|---|---|---|---|
| 1 | Was a modeling protocol submitted and approved?<br>Original Submitted 04/18/2021; No Approval; This is revised modeling for site layout change. | Yes☒ | No☐ |
| 2 | Why is the modeling being done? | Moving Equipment | |
| 3 | Describe the permit changes relevant to the modeling. | | |
| | Revised modeling will address reduction in daily throughput and reduction in daily operation hours. | | |
| 4 | What geodetic datum was used in the modeling? | NAD83 | |
| 5 | How long will the facility be at this location? | Permanent | |
| 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). | | |
| | White Mountain Wilderness Area, 1.91 kilometers | | |
| 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. | | |
| | None | | |

## 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 | | | New Permit – No Previous Modeling |
| $NO_2$ | | | New Permit – No Previous Modeling |
| $SO_2$ | | | New Permit – No Previous Modeling |
| $H_2S$ | | | Not Emitted |
| PM2.5 | | | New Permit – No Previous Modeling |
| PM10 | | | New Permit – No Previous Modeling |
| Lead | | | None |
| Ozone (PSD only) | | | Not a PSD Permit |
| NM Toxic Air Pollutants (20.2.72.402 NMAC) | | | Not Emitted |

## 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.<br>None |
| 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 |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

## 16-F: Modeling options

| | | | |
|---|---|---|---|
| 1 | Was the latest version of AERMOD used with regulatory default options? If not explain below. | Yes☒ | No☐ |
| | For volume sources were processed in flat terrain mode. | | |

## 16-G: Surrounding source modeling

| | | |
|---|---|---|
| 1 | Date of surrounding source retrieval | March 16, 2021 |
| 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. | |

| AQB Source ID | Description of Corrections |
|---|---|
| | |
| | |

## 16-H: Building and structure downwash

| | | |
|---|---|---|
| 1 | How many buildings are present at the facility? | 1 - Office |
| 2 | How many above ground storage tanks are present at the facility? | 1 – Cement/Fly Ash Storage Silo |

| | | | |
|---|---|---|---|
| 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.<br><br>Describe the fence or other physical barrier at the facility that defines the restricted area. | | |
| | Site is fenced on all sides of the facility with gates at entrances. | | |
| 2 | Receptors must be placed along publicly accessible roads in the restricted area.<br>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 | 25 | 0 | 250 meters | |
| Very fine | Cartesian | 50 | 250 | 500 meters | |
| Fine | Cartesian | 100 | 500 meters | 1000 meters | |
| Course | Cartesian | 250 | 1000 meters | 3000 meters | |

| | |
|---|---|
| 5 | Describe receptor spacing along the fence line. |
| | 25 meters |
| 6 | Describe the PSD Class I area receptors. |
| | 100 meters spacing across east side of White Mountain Wilderness Area |

## 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).

The concrete batch plant will limit hourly processing rate to 125 cubic yard per hour and 500,000 cubic yard per year. The hours of operation are presented below in Table 1. Seasonal daily throughputs are presented in Table 2.

**TABLE 1: CBP Plant Hours of Operation (MST)**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 AM | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| 6:00 AM | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 |
| 7:00 AM | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 8:00 AM | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 9:00 AM | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 10:00 AM | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 11:00 AM | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 12:00 PM | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1:00 PM | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2:00 PM | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 3:00 PM | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 4:00 PM | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 5:00 PM | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 |
| 6:00 PM | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| 7:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 10 | 10 | 12 | 14 | 14 | 14 | 14 | 14 | 14 | 12 | 10 | 10 |

**TABLE 2: HMA Daily Production Rates and Corresponding Max Hours of Production**

| Month | Cubic Yards Per Day | At Max Hourly Throughput – Hours per Day |
|---|---|---|
| November - February | 750 | 6 |
| March, October | 750 | 6 |
| April - September | 750 | 6 |

Table 3 presents the 3 model scenarios modeled hours for showing compliance with the worst-case operating scenario.

**TABLE 3: HMA Model Scenario Time Segments - Particulate**

| Model Scenario | Time Segments 10-Hour Blocks November - February | Time Segments 12-Hour Blocks March & October | Time Segments 14-Hour Blocks April - September |
|---|---|---|---|
| 1 | 7 AM to 1 PM | 6 AM to 12 PM | 5 AM to 11 AM |
| 2 | 9 AM to 3 PM | 8 AM to 2 PM | 7 AM to 1 PM |
| 3 | 11 AM to 5 PM | 10 AM to 4 PM | 9 AM to 3 PM |
| 4 | 11 AM to 5 PM | 12 PM to 6 PM | 11 AM to 5 PM |
| 5 | 11 AM to 5 PM | 12 PM to 6 PM | 1 PM to 7 PM |

| | | | |
|---|---|---|---|
| 2 | Which scenario produces the highest concentrations? Why? | | |
| | PM10 – Scenario 1 – Year 2019, low wind speed.<br>PM2.5 - Scenario 1 – Year 2016, low wind speed. | | |
| 3 | Were emission factor sets used to limit emission rates or hours of operation?<br>(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.)<br>Sources: | | |

5

| Hour of Day | Factor | Hour of Day | Factor | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 13 | | | | | | | | | |
| 2 | | 14 | | | | | | | | | |
| 3 | | 15 | | | | | | | | | |
| 4 | | 16 | | | | | | | | | |
| 5 | | 17 | | | | | | | | | |
| 6 | | 18 | | | | | | | | | |
| 7 | | 19 | | | | | | | | | |
| 8 | | 20 | | | | | | | | | |
| 9 | | 21 | | | | | | | | | |
| 10 | | 22 | | | | | | | | | |
| 11 | | 23 | | | | | | | | | |
| 12 | | 24 | | | | | | | | | |

| | | | |
|---|---|---|---|
| | If hourly, variable emission rates were used that were not described above, describe them below. | | |
| | | | |
| 6 | Were different emission rates used for short-term and annual modeling? If so describe below. | Yes☒ | No☐ |
| | An hourly factor was used for the PM2.5 annual averaging period. If based on all hours of operation the maximum annual production rate would be 273,750 cubic yards. Since the annual throughput will be limited to 50,000 cubic yards a factor of 0.18 for all hours of operations will reduce the annual modeled emissions to proposed maximum annual emission rates. (50,000 cy/yr / 273,750 cy/yr = 0.18) | | |

## 16-L: $NO_2$ Modeling

| | | | | |
|---|---|---|---|---|
| 1 | Which types of $NO_2$ modeling were used?<br>Check all that apply. | | | |
| | ☒ | ARM2 | | |
| | ☐ | 100% $NO_X$ to $NO_2$ conversion | | |
| | ☐ | PVMRM | | |
| | ☐ | OLM | | |
| | ☐ | Other: | | |
| 2 | Describe the $NO_2$ modeling. | | | |
| | ARM2 for both 1-hour and annual averaging period modeling. All ARM2 default values were used. | | | |
| 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<br>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. | |
| | Representative average particle densities were obtained from NMED accepted values. | |

| Material | Density ($g/cm^3$) | Reference |
|---|---|---|
| Road Dust – Roper Construction | 2.5 | NMED Value |
| Cement – Roper Construction | 3.3 | NMED Value |

| | | |
|---|---|---|
| Fly Ash – Roper Construction | 1.04 | NMED Value |
| Combustion – Roper Construction and Neighbor | 1.5 | NMED Value |
| Fugitive Dust – Roper Construction and Neighbor | 2.5 | NMED Value |

The densities and size distribution for $PM_{10}$ emission sources are presented in Tables 4 - 8.

**TABLE 4: Unpaved Road Vehicle Fugitive Dust Depletion Parameters**

| Particle Size Category (µm) | Mass Mean Particle Diameter (µm) | Mass Weighted Size Distribution (%) | Density (g/cm³) |
|---|---|---|---|
| **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

**TABLE 5: Cement Baghouse Source Depletion Parameters**

| Particle Size Category (µm) | Mass Mean Particle Diameter (µm) | Mass Weighted Size Distribution (%) | Density (g/cm³) |
|---|---|---|---|
| **PM10** | | | |
| 0-2.5 | 1.57 | 25 | 3.3 |
| 2.5-10 | 6.91 | 75 | 3.3 |

Parameters based on baghouse exhaust capture percentages.

**TABLE 6: Fly Ash Baghouse Source Depletion Parameters**

| Particle Size Category (µm) | Mass Mean Particle Diameter (µm) | Mass Weighted Size Distribution (%) | Density (g/cm³) |
|---|---|---|---|
| **PM10** | | | |
| 0-2.5 | 1.57 | 25 | 3.3 |
| 2.5-10 | 6.91 | 75 | 3.3 |

Parameters based on baghouse exhaust capture percentages

**TABLE 7: Combustion Source Depletion Parameters**

| Particle Size Category (µm) | Mass Mean Particle Diameter (µm) | Mass Weighted Size Distribution (%) | Density (g/cm³) |
|---|---|---|---|
| **PM10** | | | |
| 0 - 2.5 | 1.57 | 100 | 1.5 |

Based on NMED Particle Size Distribution Spreadsheet – April 25, 2007

**TABLE 8: Fugitive Dust Source Depletion Parameters**

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

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

| | | | |
|---|---|---|---|
| 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) | $[PM2.5]_{annual}$ | $[PM2.5]_{24\text{-}hour}$ |
| | | | | |
| | | | | |

## 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. |
| | Permanent Site |
| 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. |
| | N/A |

## 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 | | |
| | Concrete Plant Truck Load Baghouse (Unit 7,8) | TMBH | | |
| | Concrete Plant Cement Silo Baghouse (Unit 9) | CSBH | | |
| | Concrete Plant Fly Ash Baghouse (Unit 10) | FASBH | | |

| | | |
|---|---|---|
| | Concrete Batch Plant Heater (Unit 12) | CBPH |
| | Feed Hopper Loading (Unit 2) | FH |
| | Feed Hopper Unloading to Conveyor (Unit 3) | TP |
| | Aggregate Bin Loading (Unit 4) | AB |
| | Aggregate Weigh Batcher and Conveyor (Unit 5,6) | WH |
| | Storage Piles (Aggregate) (Unit 11) | SP1 |
| | Storage Piles (Aggregate) (Unit 11) | SP2 |
| | Storage Piles (Aggregate) (Unit 11) | SP3 |
| | Storage Piles (Sand) (Unit 11) | SP4 |
| | Storage Piles (Sand) (Unit 11) | SP5 |
| | Storage Piles (Sand) (Unit 11) | SP6 |
| | Aggregate Haul Trucks Volume 1 (Unit 1) | AGG_0001 – 25 One Way |
| | Concrete Cement Fly Ash Haul Trucks Volume1 (Unit 1) | CON_0001 – 7 Round Trip |

| | | | |
|---|---|---|---|
| 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 Ruidoso 1996 - 2006. Mineral filler silo modeled emission rate is based on the hourly usage (3 tons/hr) times the silo baghouse particulate emission factor.

| Emission Point # | Process Unit Description | PM10 lbs/hr | PM2.5 lbs/hr |
|---|---|---|---|
| FH | Feed Hopper Loading (Unit 2) | 0.27369 | 0.04144 |
| SP1 | Storage Piles (Aggregate) (Unit 11) | 0.05970 | 0.00904 |
| SP2 | Storage Piles (Aggregate) (Unit 11) | 0.05970 | 0.00904 |
| SP3 | Storage Piles (Aggregate) (Unit 11) | 0.05970 | 0.00904 |
| SP4 | Storage Piles (Sand) (Unit 11) | 0.05970 | 0.00904 |
| SP5 | Storage Piles (Sand) (Unit 11) | 0.05970 | 0.00904 |
| SP6 | Storage Piles (Sand) (Unit 11) | 0.05970 | 0.00904 |
| CSBH | Concrete Plant Cement Silo Baghouse (Unit 9) | 0.01436 | 0.00331 |
| FASBH | Concrete Plant Fly Ash Baghouse (Unit 10) | 0.00908 | 0.00209 |

| | | | |
|---|---|---|---|
| 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?

| Unit ID | $NO_2$ | $SO_2$ | PM10 | PM2.5 |
|---|---|---|---|---|
| TMBH | | | X | |
| CSBH | | | X | |
| FASBH | | | X | |
| CBPH | X | | X | |
| FH | | | X | |
| TP | | | X | |
| AB | | | X | |
| WH | | | X | |
| SP1 | | | X | |

| | | | | | |
|---|---|---|---|---|---|
| | SP2 | | | X | |
| | SP3 | | | X | |
| | SP4 | | | X | |
| | SP5 | | | X | |
| | SP6 | | | X | |
| | AGG_0001 - 25 | | | X | |
| | CON_0001 - 7 | | | X | |

| | | |
|---|---|---|
| 5 | PSD increment description for sources.<br>(for unusual cases, i.e., baseline unit expanded emissions after baseline date). | Baseline unit expanded emissions after minor baseline date |

| | | | |
|---|---|---|---|
| 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☒ |
| | Facility has not been installed. Is a new facility that will consume increment for $NO_2$ and $PM_{10}$ | | |

## 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?<br><br>If not please explain how increment consumption status is determined for the missing installation dates below. | Yes☐ | No☒ |
| | Volume sources for storage piles are based on 8 feet release height and 50 feet width. | | |
| 2 | Describe the determination of sigma-Y and sigma-Z for fugitive sources. | | |
| | For storage piles, the model inputs were based on the size (50 feet) of the pile/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.<br>Or say they are the same. | | |

| Model ID | Source Description |
|---|---|
| TMBH | Concrete Plant Truck Load Baghouse (Unit 7,8) |
| CSBH | Concrete Plant Cement Silo Baghouse (Unit 9) |
| FASBH | Concrete Plant Fly Ash Baghouse (Unit 10) |
| CBPH | Concrete Batch Plant Heater (Unit 12) |

| | | |
|---|---|---|
| | FH | Feed Hopper Loading (Unit 2) |
| | TP | Feed Hopper Unloading to Conveyor (Unit 3) |
| | AB | Aggregate Bin Loading (Unit 4) |
| | WH | Aggregate Weigh Batcher and Conveyor (Unit 5,6) |
| | SP1 | Storage Piles (Aggregate) (Unit 11) |
| | SP2 | Storage Piles (Aggregate) (Unit 11) |
| | SP3 | Storage Piles (Aggregate) (Unit 11) |
| | SP4 | Storage Piles (Sand) (Unit 11) |
| | SP5 | Storage Piles (Sand) (Unit 11) |
| | SP6 | Storage Piles (Sand) (Unit 11) |
| | AGG_0001-0025 | Aggregate Haul Trucks (Unit 1) |
| | CON_0001-0007 | Concrete Cement Fly Ash Haul Trucks (Unit 1) |
| 4 | Describe any open pits. | |
| | None | |
| 5 | Describe emission units included in each open pit. | |
| | None | |

## 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) | | |
| | $NO_2$: Outside Carlsbad (350151005) | | |
| | PM2.5: Las Cruces Distric Office (350130025) | | |
| | PM10: Las Cruces City Well #46 (350130024) | | |
| | $SO_2$: Bloomfield( 350450009) | | |
| | Other: | | |
| | Comments: | | |
| 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. | 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. | | |
| | Dispersion model meteorological input files were created from meteorological data collected at Holloman AFB, NM for the years 2016 - 2020, about 45 miles south-southwest from the site. The similar elevation, topography, terrain, vegetation, and | | |

| | |
|---|---|
| | climate of both sites make this meteorological data representative of the model area. Figure 3 shows wind rose diagram of the meteorological wind speed versus direction data that has been collected for the years 2016 - 2020.<br><br>AERMET wind speed threshold for surface data is 0.5 meters per second.<br><br>Santa Teresa Airport 2016-2020 data was used for upper air.<br><br>Since the meteorological input data does not include turbulence data, the adjust U* option in AERMET was used during processing of the meteorological data.<br><br>AERMET/AERMOD requires that several additional parameters be input during data processing in AERMET:<br><br>• Surface roughness length (m)<br>• Albedo<br>• Bowen Ratio<br><br>The surface roughness length influences the surface shear stress and is an important factor in determining the magnitude of mechanical turbulence and the stability of the boundary layer. The albedo is the fraction of total incident solar radiation reflected by the surface back to space without absorption. The daytime Bowen ratio, an indicator of surface moisture, is the ratio of sensible heat flux to latent heat flux and, together with albedo and other meteorological observations, is used for determining planetary boundary layer parameters for convective conditions driven by the surface sensible heat flux.<br><br>These parameters would be obtained using AERSURFACE (*Version 20060*). AERSURFACE requires the input of land cover data from the U.S. Geological Survey (USGS) National Land Cover Data (NLCD) 2016 archives, which it uses to determine the land cover types for the Alamogordo airport-specified location. AERSURFACE matches the 2016 NLCD land cover categories to seasonal values of albedo, Bowen ratio, and surface roughness. Values of surface characteristics are calculated based on the land cover data for the study area and output in a format for input into AERMET Stage 3.<br><br>Site descriptive questions required by AERSURFACE include:<br><br>• Meteorological data from airport<br>• Continuous snowcover for a month in winter<br>• Arid climate<br>• Dry climate<br><br>For the Holloman AFB meteorological data, YES was checked for airport data, NO was checked for continuous snowcover in winter, YES was checked for arid climate, and YES was checked for dry climate. For each parameter, data was extracted from land cover data for each month of the year and 12 equal sectors radiating from the Alamogordo Airport.<br><br>The meteorological data was processed using AERMET (*Version 19191)* and upper air from Santa Teresa Airport for the same time period. The upper air and surface data are considered to be representative and comparable with both the Holloman AFB and Roper Construction's Alto CBP site. The Holloman AFB meteorological data files, Santa Teresa upper air files, and Holloman AFB surface air file are submitted to the NMED-AQB Modeling Section for review with this modeling protocol.<br><br>No missing hours were substituted. |

## 16-T: Terrain

| | | | |
|---|---|---|---|
| 1 | Was complex terrain used in the modeling? If not, describe why below. | Yes☒ | No☐ |

| | |
|---|---|
| | |
| 2 | What was the source of the terrain data? |
| | NED |

## 16-U: Modeling Files

| | | | |
|---|---|---|---|
| 1 | Describe the modeling files: | | |
| | File name (or folder and file name) | Pollutant(s) | Purpose (ROI/SIA, cumulative, culpability analysis, other) |
| | RoperAltaCombustionROI | CO, NO2, SO2 | ROI |
| | RoperAltaPMROIS1-5 | PM10, PM2.5 | ROI |
| | RoperAltaCIANO21Hr | NO2 | Cumulative |
| | RoperAltaCIAPM10dS1-5 | PM10 24 Hour and Annual Increment | Cumulative, PSD Class II Increment |
| | RoperAltaCIAPM25_24S1-5 | PM2.5 24 Hour | Cumulative |
| | RoperAltaCIAPM25_YrS1-5 | PM2.5 Annual | Cumulative |
| | RoperAltaNO2IncSIL | NO2 | Class I Increment SIL |
| | RoperAltaPM10dS1IncSIL – S5 | PM10 | Class I Increment SIL |
| | RoperAltaPM10dS1Inc – S5 | PM10 24 Hour and Annual | Class I Increment Cumulative |

## 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.<br>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. | | |
| | NA | | |
| 4 | Describe the additional impacts analysis required at 20.2.74.304 NMAC. | | |
| | NA | | |
| 5 | If required, have ozone and secondary PM2.5 ambient impacts analyses been completed? If so describe below. | Yes☐ | No☒ |
| | Total facility emissions of NO2, SO2, and VOC are all less than <1.0 tons per year | | |

## 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. | | |

| 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) |
| $NO_2$ 1 Hour H8H | 16.1 | - | - | 38.7 | 54.8 | 188.03 | 29.1 | 438227.4 | 3697886.7 | 2209.64 |
| $NO_2$ Annual H1H | 0.96 | - | - | - | - | SIL-1 | 96.0 | 438323.1 | 3697946.9 | - |
| $NO_2$ Annual Class II | 0.96 | - | - | - | - | SIL-1 | 96.0 | 438323.1 | 3697946.9 | - |
| $NO_2$ Annual Class I | 0.0052 | - | - | - | - | SIL-0.1 | 52.0 | 437055.0 | 3699583.7 | - |
| CO 1 Hour H1H | 41.4 | - | - | - | - | SIL-2000 | 2.1 | 438160.0 | 3697961.5 | - |
| CO 8 Hour H1H | 8.69 | - | - | - | - | SIL-500 | 1.7 | 438150.0 | 3697950.0 | - |
| $SO_2$ 1 Hour H1H | 0.53 | - | - | - | - | SIL-7.8 | 6.8 | 438160.0 | 3697961.5 | - |
| $SO_2$ 3 Hour H1H | 0.20 | - | - | - | - | SIL-25 | 0.8 | 438325.0 | 3697950.0 | - |
| $SO_2$ 24 Hour H1H | 0.07 | - | - | - | - | SIL-5 | 1.4 | 438251.6 | 3697885.1 | - |
| $SO_2$ Annual H1H | 0.01 | - | - | - | - | SIL-1 | 1.0 | 438209.9 | 3698032.4 | - |
| $PM_{2.5}$ 24 Hour H8H | 3.2 | 3.4 | - | 14.9 | 18.3 | 35 | 52.3 | 438232.3 | 3698033.1 | 2208.8 |

| 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) |
| $PM_{2.5}$ Annual H1H | 0.42 | 0.44 | - | 5.1 | 5.54 | 12 | 46.2 | 438232.3 | 3698033.1 | 2208.8 |
| $PM_{10}$ 24 Hour H2H | 29.1 | 29.3 | - | 94.7 | 124.0 | 150 | 82.7 | 438209.9 | 3698032.4 | 2209.71 |
| $PM_{10}$ 24 Hour Class II | 29.1 | 29.3 | - | - | 29.3 | 30 | 97.7 | 438209.9 | 3698032.4 | 2209.71 |
| $PM_{10}$ Annual Class II | 9.19 | 9.23 | - | - | 9.23 | 17 | 54.3 | 438232.3 | 3698033.1 | 2208.8 |
| $PM_{10}$ 24 Hour Class I | 0.32 | 0.58 | - | - | 0.58 | 8 | 7.3 | 437142.4 | 3699642.1 | 2195.77 |
| $PM_{10}$ Annual Class I | 0.0083 | - | - | - | - | SIL-0.2 | 4.2 | 437055.0 | 3699583.7 | 2222.57 |

| 16-X: Summary/conclusions | |
|---|---|
| | A statement that modeling requirements have been satisfied and that the permit can be issued. |
| 1 | Dispersion modeling was performed for all regulated sources at Roper Construction's Alto CBP. All facility pollutants with ambient air quality standards were modeled to show compliance with those standards. All results of this modeling analysis showed the facility is in compliance with applicable ambient air quality standards and $PM_{10}$ and $NO_2$ PSD Class I and Class II increment limits. Based on the dispersion modeling analysis, the permit can be issued. |