**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: |  |
| 2 | Name of company: |  |
| 3 | Current Permit number: |  |
| 4 | Name of applicant’s modeler: |  |
| 5 | Phone number of modeler: |  |
| 6 | E-mail of modeler: |  |

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| 16-B: Brief | | | | |
| 1 | Was a modeling protocol submitted and approved? | | Yes | No |
| 2 | Why is the modeling being done? | | Choose an item. | |
| 3 | Describe the permit changes relevant to the modeling. | | | |
|  | | | |
| 4 | What geodetic datum was used in the modeling? | | Choose an item. | |
| 5 | How long will the facility be at this location? | |  | |
| 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 | | Choose an item. | |
| 8 | List the PSD baseline dates for this region (minor or major, as appropriate). | | | |
| NO2 |  | | |
| SO2 |  | | |
| PM10 |  | | |
| PM2.5 |  | | |
| 9 | Provide the name and distance to Class I areas within 50 km of the facility (300 km for PSD permits). | | | |
|  | | | |
| 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. | | | |
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| 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 |  |  |  |
| NO2 |  |  |  |
| SO2 |  |  |  |
| H2S |  |  |  |
| PM2.5 |  |  |  |
| PM10 |  |  |  |
| Lead |  |  |  |
| Ozone (PSD only) |  |  |  |
| NM Toxic Air Pollutants (20.2.72.402 NMAC) |  |  |  |

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| 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 |  |  |  |  |  |
| NO2 |  |  |  |  |  |
| SO2 |  |  |  |  |  |
| H2S |  |  |  |  |  |
| PM2.5 |  |  |  |  |  |
| PM10 |  |  |  |  |  |
| Lead |  |  |  |  |  |
| Ozone |  |  |  |  |  |
| State air toxic(s) (20.2.72.402 NMAC) |  |  |  |  |  |

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| 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 |
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| 16-F: Modeling options | | | |
| 1 | Was the latest version of AERMOD used with regulatory default options? If not explain below. | Yes | No |
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| 16-G: Surrounding source modeling | | | |
| 1 | Date of surrounding source retrieval | |  |
| 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 | |
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| 16-H: Building and structure downwash | | | | |
| 1 | How many buildings are present at the facility? |  | | |
| 2 | How many above ground storage tanks are present at the facility? |  | | |
| 3 | Was building downwash modeled for all buildings and tanks? If not explain why below. | | Yes | No |
|  | | | |
| 4 | Building comments |  | | |

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| 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. | | | | | | | |
|  | | | | | | | |
| 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 | | |
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|  |  |  |  |  |  | | |
| 5 | Describe receptor spacing along the fence line. | | | | | | | |
|  | | | | | | | |
| 6 | Describe the PSD Class I area receptors. | | | | | | | |
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| 16-J: 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). | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | |
| 2 | Which scenario produces the highest concentrations? Why? | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | |
| 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 | 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 | |
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| 16-K: NO2 Modeling | | | | |
| 1 | Which types of NO2 modeling were used?  Check all that apply. | | | |
|  | ARM2 | | |
|  | 100% NOX to NO2 conversion | | |
|  | PVMRM | | |
|  | OLM | | |
|  | Other: | | |
| 2 | Describe the NO2 modeling. | | | |
|  | | | |
| 3 | Were default NO2/NOX 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: Choose an item.  Annual Choose an item.: | | | |

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| 16-L: Ozone Analysis | | | | | | | |
| 1 | NMED has performed a generic analysis that demonstrates sources that are minor with respect to PSD do not cause or contribute to any violations of ozone NAAQS. The analysis follows.  The basis of the ozone SIL is documented in [*Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program*](https://www.epa.gov/nsr/significant-impact-levels-ozone-and-fine-particles), EPA, April 17, 2018 and associated documents. NMED accepts this SIL basis and incorporates it into this permit record by reference. Complete documentation of the ozone concentration analysis using MERPS is included in the New Mexico Air Quality Bureau Air Dispersion Modeling Guidelines. | | | | | | |
| 2 | The MERP values presented in Table 10 and Table 11 of the NM AQB Modeling Guidelines that produce the highest concentrations indicate that facilities emitting no more than 250 tons/year of NOX and no more than 250 tons/year of VOCs will cause less formation of O3 than the O3 significance level.  =1.546 µg/m3, which is below the significance level of 1.96 µg/m3.  Sources that produce ozone concentrations below the ozone SIL do not cause or contribute to air contaminant levels exceeding the ozone NAAQS. | | | | | | |
| 3 | Does the facility emit at least 250 tons per year of NOX or at least 250 tons per year of VOCs? Sources that emit at least 250 tons per year of NOX or at least 250 tons per year of VOCs are covered by the analysis above and require an individual analysis. | | | | Yes | | No |
| 5 | For new PSD Major Sources or PSD major modifications, if MERPs were used to account for ozone fill out the information below. If another method was used describe below. | | | | | | |
| NOX (ton/yr) | MERPNOX | VOCs (ton/yr) | MERPVOC | | [O3]8-hour | |
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| 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. | | | | | | |
|  | | | | | | |
| 3 | Does the facility emit at least 40 tons per year of NOX or at least 40 tons per year of SO2? Sources that emit at least 40 tons per year of NOX or at least 40 tons per year of SO2 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. | | | | | | |
| Pollutant | | NOX | SO2 |  | [PM2.5]24-hour | |
| MERPannual | |  |  |  | |
| MERP24-hour | |  |  | [PM2.5]annual | |
| Emission rate (ton/yr) | |  |  |  | |
|  | | | | | | |

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| 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. |
|  |
| 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. |
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| **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 | | | | |
|  | | |  | | | | |
|  | | |  | | | | |
| 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 |
|  | | | | | | | |
| 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 | NO2 | SO2 | | PM10 | | PM2.5 | |
|  |  |  | |  | |  | |
|  |  |  | |  | |  | |
| 5 | PSD increment description for sources.  (for unusual cases, i.e., baseline unit expanded emissions after 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 |
|  | | | | | | | |

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| 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) |
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| 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. | | |
|  | | |
| 3 | Describe how the volume sources are related to unit numbers.  Or say they are the same. | | |
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| 4 | Describe any open pits. | | |
|  | | |
| 5 | Describe emission units included in each open pit. | | |
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| 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: Choose an item. | | | |
| NO2: Choose an item. | | | |
| PM2.5: Choose an item. | | | |
| PM10: Choose an item. | | | |
| SO2: Choose an item. | | | |
| Other: | | | |
| Comments: |  | | |
| 2 | Were background concentrations refined to monthly or hourly values? If so describe below. | | Yes | No |
|  | | | |

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| 16-S: Meteorological Data | | | |
| 1 | Was NMED provided meteorological data used? If so select the station used.  Choose an item. | 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. | | |
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| 16-T: Terrain | | | |
| 1 | Was complex terrain used in the modeling? If not, describe why below. | Yes | No |
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| 2 | What was the source of the terrain data? | | |
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| 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) |
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| 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. | | |
|  | | |
| 4 | Describe the additional impacts analysis required at 20.2.74.304 NMAC. | | |
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| 5 | If required, have ozone and secondary PM2.5 ambient impacts analyses been completed? If so describe below. | Yes | No |
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| 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) |
|  |  |  |  |  |  |  |  |  |  |  |
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| 16-X: Summary/conclusions | |
| 1 | A statement that modeling requirements have been satisfied and that the permit can be issued. |
|  |