

## Modeling Checklist for Minor NSR Permits

This checklist provides assistance to the Permittee required to perform modeling analyses for a minor NSR permit. While ADEQ has attempted to address as many issues as possible, each case is unique and individual demonstrations may require more or less information depending on the complexity of the circumstances. It is recommended but not required that the Permittee attaches a completed modeling checklist to a modeling report when submitting a permit application.

### 1. General Information

- Company and facility name
- Permit number and type of permit
- Facility location (datum, UTM zone and coordinates)
- Overview of the project and general brief description of facility operations
- Facility layout map
- Description of local topography, climatology and meteorology
- Attainment status classification of criteria pollutants for the source location

### 2. Model Selection and Option

#### A. What criterial pollutants are modeled?

- PM<sub>2.5</sub>       PM<sub>10</sub>       SO<sub>2</sub>       NO<sub>2</sub>       CO       Pb

#### B. Which model is used?

- AERSCREEN (most recent version)
- AERMOD (most recent version)
- Other model    *Provide justification for the selection of other models.*

#### C. Are the default options used?

- Yes
- No    *Provide justification for the selection of non-default option.*

#### D. Urban vs. Rural

Which method is used for urban/rural classification?

- Land use procedure
- Population density procedure

Is urban option used?

- Yes    *Provide discussions on the population determination.*
- No

#### E. NO<sub>2</sub> modeling if applicable

- Tier 1-full conversion
- Tier 2-ARM2    *Provide justification if non-default ambient ratios are used.*
- Tier 3- OLM
- Tier 3-PVMRM

*If Tier 3 is used, provide justification for the selection of ozone background and in-stack ratio.*

### 3. Source Information

#### A. Source types modeled

- Point source
- Volume source *Provide assumptions and calculations of  $\sigma_y$ ,  $\sigma_z$ , and release height.*
- Area source
- Line source
- Buoyant line source *Provide assumptions and calculations of average buoyancy parameter*
- Open-pit source
- Others

#### B. Emissions

- Description of emission generation processes for each source (or source category)
- Selection and justification of modeling scenario if multiple emission scenarios are involved
- Load analysis if applicable
- Table of maximum short-term emission rates for all modeled pollutants
- Table of maximum long-term emission rates for all modeled pollutants
- Modeled emission rates are consistent with emission inventory in the Application

#### C. Intermittent Sources

Are there any intermittent sources within the facility?

- Yes
- No

If yes, were the intermittent sources modeled for 1-hour NO<sub>2</sub> and SO<sub>2</sub> standards?

- Yes *Provide justification if specialized technique is utilized (i.e., annualized emission rate, Monte Carlo simulation, etc.)*
- No *Provide justification for the exemption*

#### D. Buildings

- Building dimensions and location included for downwash consideration
- Hyperbolic cooling towers or lattice structures included if applicable
- Discussion of GEP Stack Height

### 4. Meteorological Data

#### A. Meteorology used

- Screening meteorology generated by MAKEMET
- ADEQ pre-processed NWS meteorology
- Site-specific meteorology
- Prognostic Meteorology

#### B. If use site-specific meteorology

- At least 1 year of site-specific data satisfying 90-percent completeness requirement
- Description of siting and exposure of meteorological instruments
- Description of data recording, processing, reporting and QA/QC procedures

- Consult with ADEQ if Bulk Richardson scheme is used
- Turbulence parameters are not included if adjusted  $u^*$  is used

C. If use prognostic meteorology

- At least three consecutive years of representative prognostic meteorological data satisfying 90-percent completeness requirement
- Selection of grid cell and grid resolution
- Diagnostic and statistical performance evaluations
- Description of MMIF options

D. Representativeness and surface characteristics

- Discussion of meteorological site representativeness based on Appendix W Section 8.4.2(b)  
*This applies to all types of data (site-specific, NWS, or prognostic)*
- AERSURFACE used to calculate surface characteristics for site-specific or NWS data  
*Consult with ADEQ regarding month-to-season assignments*

5. **Modeling Domain and Receptors**

- Modeling domain includes all areas where emissions may cause a significant ambient impact
- Determination of ambient air boundary
- Scaled maps of nearby terrain showing areas of complex terrain
- Plot of receptor grid(s) with corresponding coordinates
- Ambient air boundary receptors with appropriately representative spacing (no greater than 25m)
- Receptors extended beyond AAB (i.e., 0-1 km, 1-5 km, 5-10 km, etc.)
- NED elevation data information (1 arc-second, 1/3rd arc-second, etc.)

6. **Background Concentrations**

- Discussion of monitored value(s) used for background, including location(s) and time period
- Discussion of representativeness of monitored values used
- Method used to calculate background value(s)
- Table listing background value(s) for all modeled pollutants for short-term and long-term
- Inclusion of nearby sources in the modeling if the ambient contributions from the nearby sources are not adequately represented by ambient monitoring data

7. **Assessment for Ozone and Secondarily Formed Particulate Matter if Applicable**

- First-tier demonstration using existing technical information (results from existing photochemical grid modeling, published empirical estimates of source specific impacts, or reduced-form models)
- The “offset ratio” method as specified in the ADEQ’s Modeling Guidance Section 7.3.8

8. **Compliance Demonstration and Results**

A. Compliance demonstration

- Below SILs
- Below NAAQS

B. Results

- Tables listing maximum impacts based on the corresponding form of each NAAQS
- Concentration plots of maximum impacts overlaid on previous source location maps

9. **Electronic Modeling Files**

If use AERSCREEN

- AERSCREEN input/output files

If use AERMOD

- AERMOD input/output files
- AERMET input/output files
- AERSURFACE input/output files
- AERMAP input/output files
- BPIPPRIME input/output files

- Emission calculations spreadsheets
- Background determinations spreadsheets if applicable
- Other supporting documents