Date

Air Dispersion Modeling Protocol
for Compressor Station
Company Name
Facility Name

Introduction

Purpose of Modeling

Name of the Company is preparing a construction permit application to modify operations at *Name and location of the Facility*. This facility is currently permitted (permit no.) for the following equipment: two *Type of Engines* and two *Type of Dehydrators*.

The proposed modification will include installation of one (1) new compressor engine and one (1) new glycol dehydrator. As the modification results in an increase of Nitrogen Oxides (NOx) and Carbon Monoxide (CO) emissions from all processes in the facility, Nitrogen Dioxide (NO_2) and CO modeling are required to demonstrate compliance with ambient air quality standards. *Name of the Company* seeks to demonstrate compliance with the New Mexico Ambient Air Quality Standards (NMAAQS) for NO_2 and CO and the National Ambient Air Quality Standards (NAAQS) for NO_2 and CO as well as the PSD Standards for NO_2 because the facility is located in the Air Quality Control Region *XYZ* where the PSD minor source baseline data has been triggered for NO_2.

Facility Description

Name of Facility will be equipped to compress and dehydrate pipeline quality natural gas. Upon permit modification, the following sources will be permitted to operate at the facility:

- Two (2) Existing *Type of Engine* rated at 1380 hp;
- One (1) Proposed *Type of Engine* rated at 1380 hp (Scenario 1) with catalytic control for CO or one (1) *Type of Engine* rated at 1214 hp (Scenario 2);
- One (1) *A Type of Dehydrator*, one (1) *B Type of Dehydrator* and one (1) *C Type of Dehydrator*; and
- Product tanks and waste water tanks

Facility Identification and Location

Name of the Facility is located approximately *00* miles east of *nearest ABC town or land mark*, *XYZ* County New Mexico. The UTM Coordinates of the facility are *000,000 meters* East and *0,000,000 meters* North with NAD83 datum at an elevation of approximately 0,000 feet above mean sea level.

1. Model Input Options

We will use the latest version of ISCST3 dispersion model for this analysis. The model will be run in Non-regulatory Default mode for most conservative modeling results which specifies the use of the following options:

- Stack-tip downwash – Enabled for combustion emission – reduces effective stack height when plume exit velocity is less than 1.5 times the wind speed.

- Plume buoyancy induced dispersion enabled – Increase the dispersion coefficient to account for the vertical movement of the plume.
- Calms processing.
- Default wind profile exponents.
- Default vertical potential temperature gradients.
- Gradual plume rise.
- Allow missing met data.
- Building downwash-to consider the effect of buildings close to the emission sources
- Rural dispersion coefficients - because land use within the area circumscribed by a three km radius around the facility is greater than 50 percent rural.
- Simple and complex terrain because surrounding terrain is not flat
- No flagpole option – receptor elevations are evaluated at ground level.

We will incorporate terrain into the modeling analysis. As the site is located in a rural area, rural dispersion coefficients will be implemented via the use of the RURAL keyword. A building downwash analysis using the latest version of BPIP will be conducted and incorporated into the modeling analysis to account for potential effluent downwash due to the engine structures, cooling fans, tanks and buildings.

2. Receptor Grid Description

For each pollutant, the radius of significant impact around the facility is established using a Cartesian grid. A 50-meter grid spacing is used for the facility boundary receptors. A 100-meter spacing is extended out to 1-km from the facility boundary in each direction for a very fine grid resolution. Receptors for a fine grid resolution are placed with 250-meter spacing to a distance of 2.5-km from the facility boundary. For intermediate and rough grid resolutions, 500-meter spacing and 1000-meter spacing are extended to 5-km and 10-km beyond the facility boundary, respectively. The elevations of facility sources, receptors and surrounding sources will be determined using the **same method** and most recent 7.5 minute DEM data currently available.

3. Meteorological Data

We will use the one-year Bloomfield met data set, bloom97.is2, collected in 1997 and available on the NMED website. We feel that met station is located in comparable terrain not far from the facility. Therefore, this data is representative of meteorological conditions at the facility.

4. Radius of Impact (ROI) Analysis and Cumulative Impact Analysis (CIA)

We will conduct a significant impact analysis for each pollutant's emissions from the facility sources. If an air pollutant discharged by the facility results in an ambient impact greater than the significance levels mentioned in the NMED/AQB modeling guideline, the maximum extent of the significant impact area will be determined (as measured from the center of the facility to the furthest extent of the significant impact). The maximum

extent will become a Radius of Impact (ROI). The area within the ROI then becomes the modeling domain for the CIA. The CIA will be analyzed including impacts from the facility sources, any sources within 50 km plus the ROI or 65 km of the facility (whichever is greater). An inventory of the surrounding sources will be obtained from the MergeMaster regional sources database available on the NMED website.

5. PSD Increment Analysis

If the results of the ROI for NOx show an exceedance of the significance levels, PSD increment analysis will be conducted because the minor source baseline date has been established in the region. The PSD analysis will be conducted including all PSD increment consuming sources within the surrounding sources within 50 km plus the ROI or 65 km of the facility (whichever is greater). Unlike the CIA, a predicted maximum NO_2 concentration will be compared with the PSD standard.

6. Class I Areas Analysis

Since the nearest Class I area is San Pedro Parks Wilderness Area, at 60.5 km from the facility, the Class I Area analysis is not applicable.