

Air Quality Dispersion Modeling Protocol - Revised

Project: San Juan Generating Station

Location: Township: 30N Range: 15W Section: 16-21 County: San Juan

UTM Coordinates: 728550m East, 407600 m North Zone: 12

Datum: NAD 83 Elevation: 5300 feet

Brief:

This protocol is in support of the SO₂ attainment modeling project for PNM's San Juan Generating Station (SJGS) coal-fired power plant, approx. 3 miles NNE of Waterflow in the Four Corners region of New Mexico.

Model(s) Used:

The AERMOD modeling system will be used for all modeling in this project.

Permit Conditions and Stack Parameters:

The facility may operate 24 hours/day, 7 days/week, 52 weeks/year or a total of 8760 hours/year. Actual stack velocity data is unavailable from the facility. The velocity used in the model will be the mid-point stack velocities from previous permit applications for SJGS. Hourly stack temperatures used will be from SJGS CEM data.

Modeling Parameters:

All regulatory default options in AERMOD will be used for these model runs. The use of stack-tip downwash, the calms and missing data processing routines, and default wind profile exponents will be used. Building downwash produced by buildings at the facility will also be considered. The rural dispersion land use option will be used.

Complex Terrain Data:

Both simple and complex types of terrain will be used to model the facility. Elevations of receptors were obtained from the National Elevation Dataset available from the USGS website.

Receptor Grid:

A nested grid of 50 m spacing along the fenceline, 100 m spacing out to 2.5 km, and 1000 m spacing out to 20 km will be used for the initial modeling run. A subset of this grid using only the significant receptors will be used for the cumulative impact analysis. The receptor grid includes areas, such as along cliff walls and at the top of ridges, where high concentrations are expected. A topological map

with the receptor grid overlaid is included. The areas with the most rugged terrain are virtually inaccessible to the public. Because of the rugged terrain and the inaccessibility of the areas to the north of the facility, we will determine whether that data may be excluded based on the Modeling Technical Assistance Document.

MET Data:

Meteorology data from the New Mexico Air Quality Bureau weather station (Substation) located 3.5 km west of the facility along with NWS data from the Four Corners Airport and upper air data from the Albuquerque Airport will be used for this analysis. The Substation MET data is the main data set used with the NWS data used to fill in any missing data. The Substation MET data was at least 97% complete for all years. All data will be processed with AERMET processor. The data years will cover 2013- 2015.

Adjacent Sources:

All 21 surrounding sources, (including the Four Corners Power Plant) in the AQB database out to 25 km will be used in this analysis. Data from the Four Corners Power Plant is based on actual data for the years 2013-2014. 2015 data from this facility was unavailable, so the most recent year's data (2014) was used as an approximation for 2015.

NAAQS – Background Data:

Hourly SO₂ monitoring data from the nearby Substation monitoring site (350451005) for the years 2013-2015 will be used as the background concentration to add to the modeled result. In addition, CEM data from the Four Corners Power Plant (FCPP) for 2013 and 2014 will be added to the model. The Substation monitor records some SO₂ from the Four Corners Power Plant, so using this monitor for background adds some of that source's emissions twice, making this a conservative method for estimating background.

Modeling Procedures:

The San Juan Generating Station will be modeled using the actual SO₂ CEM data received from the facility for the years 2013 - 2015. These data are for the 4 main power plant stacks and will be formatted to be read by the model. The remainder of the facility's SO₂ emissions will be taken from the latest permit on file and modeled as the allowable emissions in that permit. (See Table 1 below.)

Table 1: Table of Point Emissions and Stack Parameters

Source	Description	UTM-Hor (m)	UTM-Vert (m)	Elevation (m)	Height (m)	Temp (K)	Exit Velocity (m/s)	Diameter (m)	SO ₂ (lb/hr)
E301	Unit 1	728606	407569	1620	121.92	CEM data	20.24	6.48	CEM data
E302	Unit 2	728603	407575	1620	121.92	CEM data	21.49	6.71	CEM data
E303	Unit 3	728639	407583	1620	121.92	CEM data	17.68	8.89	CEM data
E304	Unit 4	728639	407592	1620	121.92	CEM data	17.68	8.8.89	CEM data
E501	Unit 1 Duct Leaks	728540	407569	1620	22.86	644.3	8.47	0.17	1.10
E502	Unit 2 Duct Leaks	728540	407575	1620	22.86	644.3	8.88	0.17	1.10
E503	Unit 3 Duct Leaks	728551	407583	1620	22.86	644.3	9.30	0.17	1.10
E504	Unit 4 Duct Leaks	728551	407592	1620	22.86	644.3	10.79	0.17	1.20
E602	Unit 1 Emerg Gen	728517	407566	1620	3.35	672.0	30.48	0.25	0.20
E603	Unit 2 Emerg Gen	728508	407577	1620	7.62	672.0	30.48	0.25	0.20
E604	Unit 3 Emerg Gen	728465	407586	1620	7.62	724.8	61.04	0.30	0.40
E605	Unit 4 Emerg Gen	728465	407594	1620	7.62	724.8	61.04	0.30	0.40
E606	Switchyard Emerg Gen	728250	407574	1628	3.35	672.0	30.48	0.25	1.40