

Technical Support Document:

Chapter 28

Intended Round 3 Area Designations for the 2010 1-Hour SO₂ Primary National Ambient Air Quality Standard for New Mexico

1. Summary

Pursuant to section 107(d) of the Clean Air Act (CAA), the U.S. Environmental Protection Agency (the EPA, we, or us) must designate areas as either “nonattainment,” “attainment,” or “unclassifiable” for the 2010 1-hour sulfur dioxide (SO₂) primary national ambient air quality standard (NAAQS) (2010 SO₂ NAAQS). The CAA defines a nonattainment area as an area that does not meet the NAAQS or that contributes to a nearby area that does not meet the NAAQS. An attainment area is defined by the CAA as any area that meets the NAAQS and does not contribute to a nearby area that does not meet the NAAQS. Unclassifiable areas are defined by the CAA as those that cannot be classified on the basis of available information as meeting or not meeting the NAAQS. In this action, the EPA has defined a nonattainment area as an area that the EPA has determined violates the 2010 SO₂ NAAQS or contributes to a violation in a nearby area, based on the most recent 3 years of air quality monitoring data, appropriate dispersion modeling analysis, and any other relevant information. An unclassifiable/attainment area is defined by the EPA as an area that either: (1) based on available information including (but not limited to) appropriate modeling analyses and/or monitoring data, the EPA has determined (i) meets the 2010 SO₂ NAAQS, and (ii) does not contribute to ambient air quality in a nearby area that does not meet the NAAQS; or (2) was not required to be characterized under 40 CFR 51.1203(c) or (d) and the EPA does not have available information including (but not limited to) appropriate modeling analyses and/or monitoring data that suggests that the area may (i) not be meeting the NAAQS, or (ii) contribute to ambient air quality in a nearby area that does not meet the NAAQS¹. An unclassifiable area is defined by the EPA as an area that either: (1) was required to be characterized by the state under 40 CFR 51.1203(c) or (d), has not been previously designated, and on the basis of available information cannot be classified as either: (i) meeting or not meeting the 2010 SO₂ NAAQS, or (ii) contributing or not contributing to ambient air quality in a nearby area that does not meet the NAAQS; or (2) was not required to be characterized under 40 CFR 51.1203(c) or (d) and the EPA does have available information including (but not limited to) appropriate modeling analyses and/or monitoring data that suggests that the area may (i) not be meeting the NAAQS, or (ii) contribute to ambient air quality in a nearby area that does not meet the NAAQS.

This technical support document (TSD) addresses designations for all areas in New Mexico for the 2010 SO₂ NAAQS. In previous final actions, the EPA has issued designations for the 2010 SO₂

¹ The term “attainment area” is not used in this document because the EPA uses that term only to refer to a previous nonattainment area that has been redesignated to attainment as a result of the EPA’s approval of a state-submitted maintenance plan.

NAAQS for selected areas of the country.² No areas in New Mexico were designated. The EPA is under a December 31, 2017, deadline to designate the areas addressed in this TSD as required by the U.S. District Court for the Northern District of California.³ We are referring to the set of designations being finalized by the December 31, 2017, deadline as “Round 3” of the designations process for the 2010 SO₂ NAAQS. After the Round 3 designations are completed, the only remaining undesignated areas will be those where a state has installed and begun timely operating a new SO₂ monitoring network meeting EPA specifications referenced in the EPA’s Data Requirements Rule (DRR) (80 FR 51052). The EPA is required to designate those remaining undesignated areas by December 31, 2020. There is no area in New Mexico where the State has begun operation of a new SO₂ monitoring network.

New Mexico submitted its recommendation regarding designations for the 2010 1-hour SO₂ NAAQS on June 6, 2011. The State recommended that all portions of the State within the jurisdiction of the New Mexico Environment Division be designated unclassifiable. This recommendation did not address Bernalillo County. It is not clear from the State’s letter whether the State’s intention is that each county other than Bernalillo County be designated as a separate area, or that all such counties be combined into one designated area. On May 24, 2011, the state recommended that Bernalillo County be designated unclassifiable. The State has not otherwise modified or supplemented its June 6, 2011, recommendation. In our intended designations, we have considered this submission from the State.

For the areas in New Mexico that are part of the Round 3 designations process, Table 1 identifies the EPA’s intended designations and the counties or portions of counties to which they would apply. It also lists New Mexico’s current recommendation. The EPA’s final designation for these areas will be based on an assessment and characterization of air quality through ambient air quality data, air dispersion modeling, other evidence and supporting information, or a combination of the above.

The intended designation of areas in New Mexico belonging to Navajo Nation is addressed in Chapter 24 of this TSD.

Table 1. Summary of the EPA’s Intended Designations and the Designation Recommendations by New Mexico

Area/County	New Mexico’s Recommended Area Definition	New Mexico’s Recommended Designation	EPA’s Intended Area Definition	EPA’s Intended Designation
San Juan County	Not Specified	Unclassifiable	San Juan County, New Mexico, excluding all areas belonging to Navajo Nation but including areas belonging Ute Mountain Tribe	Unclassifiable/Attainment

² A total of 94 areas throughout the U.S. were previously designated in actions published on August 5, 2013 (78 FR 47191), July 12, 2016 (81 FR 45039), and December 13, 2016 (81 FR 89870).

³ *Sierra Club v. McCarthy*, No. 3-13-cv-3953 (SI) (N.D. Cal. Mar. 2, 2015).

Area/County	New Mexico's Recommended Area Definition	New Mexico's Recommended Designation	EPA's Intended Area Definition	EPA's Intended Designation
Bernalillo County	The area under the jurisdiction of the Albuquerque-Bernalillo County Air Quality Control Board (i.e., Bernalillo County)	Unclassifiable	Bernalillo County#	Unclassifiable/Attainment
All remaining counties*	Not Specified	Unclassifiable	Each remaining county as a separate designated area#	Unclassifiable/Attainment

Our intended designated areas would include all tribal lands within these counties. EPA is not determining the boundaries of any area of Indian country in this document, including any area of Indian country located in a larger designation area. The inclusion of any Indian country in the designation area is not a determination that the state has regulatory authority under the Clean Air Act for such Indian country.

* The EPA intends to designate the remaining undesignated counties (or portions of counties) in New Mexico as separate “unclassifiable/attainment” areas as these areas were not required to be characterized by the state under the DRR and the EPA does not have available information including (but not limited to) appropriate modeling analyses and/or monitoring data that suggests that the areas may (i) not be meeting the NAAQS, or (ii) contribute to ambient air quality in a nearby area that does not meet the NAAQS. These areas that we intend to designate as unclassifiable/attainment (those to which this row of this table is applicable) are identified more specifically in Section 4 of this New Mexico chapter of this TSD.

2. General Approach and Schedule

Updated designations guidance documents were issued by the EPA through a July 22, 2016, memorandum and a March 20, 2015, memorandum from Stephen D. Page, Director, U.S. EPA, Office of Air Quality Planning and Standards, to Air Division Directors, U.S. EPA Regions I-X. These memoranda supersede earlier designation guidance for the 2010 SO₂ NAAQS, issued on March 24, 2011, and identify factors that the EPA intends to evaluate in determining whether areas are in violation of the 2010 SO₂ NAAQS. The documents also contain the factors that the EPA intends to evaluate in determining the boundaries for designated areas. These factors include: 1) air quality characterization via ambient monitoring or dispersion modeling results; 2) emissions-related data; 3) meteorology; 4) geography and topography; and 5) jurisdictional boundaries.

To assist states and other interested parties in their efforts to characterize air quality through air dispersion modeling for sources that emit SO₂, the EPA released its most recent version of a draft

document titled, “SO₂ NAAQS Designations Modeling Technical Assistance Document” (Modeling TAD) in August 2016.⁴

Readers of this chapter of this TSD should refer to the additional general information for the EPA’s Round 3 area designations in Chapter 1 (Background and History of the Intended Round 3 Area Designations for the 2010 1-Hour SO₂ Primary National Ambient Air Quality Standard) and Chapter 2 (Intended Round 3 Area Designations for the 2010 1-Hour SO₂ Primary National Ambient Air Quality Standard for States with Sources Not Required to be Characterized). The intended designation of areas in New Mexico belonging to Navajo Nation is addressed in Chapter 24 of this TSD.

As specified by the March 2, 2015, court order, the EPA is required to designate by December 31, 2017, all “remaining undesignated areas in which, by January 1, 2017, states have not installed and begun operating a new SO₂ monitoring network meeting EPA specifications referenced in EPA’s” DRR. Pursuant to the DRR, the EPA will designate by December 31, 2017, areas of the country that are not timely-operating EPA-approved and valid monitoring networks. The New Mexico areas to be designated by December 31, 2017, include the area associated with one source in New Mexico meeting DRR emissions criteria that the State has chosen to be characterized using air dispersion modeling (San Juan Generating Station in San Juan County) and other areas not specifically required to be characterized by the State under the DRR.

Section 3 addresses San Juan County. Section 4 addresses the remainder of the State.

The EPA does not plan to revise this TSD after consideration of state and public comment on our intended designation. A separate TSD will be prepared as necessary to document how we have addressed such comments in the final designations.

The following are definitions of important terms used in this document:

- 1) 2010 SO₂ NAAQS – The primary NAAQS for SO₂ promulgated in 2010. This NAAQS is 75 ppb, based on the 3-year average of the 99th percentile of the annual distribution of daily maximum 1-hour average concentrations. *See* 40 CFR 50.17.
- 2) Design Value - a statistic computed according to the data handling procedures of the NAAQS (in 40 CFR part 50 Appendix T) that, by comparison to the level of the NAAQS, indicates whether the area is violating the NAAQS.
- 3) Designated nonattainment area – an area that, based on available information including (but not limited to) appropriate modeling analyses and/or monitoring data, the EPA has determined either: (1) does not meet the 2010 SO₂ NAAQS, or (2) contributes to ambient air quality in a nearby area that does not meet the NAAQS.
- 4) Designated unclassifiable/attainment area – an area that either: (1) based on available information including (but not limited to) appropriate modeling analyses and/or monitoring data, the EPA has determined (i) meets the 2010 SO₂ NAAQS, and (ii) does not contribute

² <https://www.epa.gov/sites/production/files/2016-06/documents/so2modelingtad.pdf>. In addition to this TAD on modeling, the EPA also has released a technical assistance document addressing SO₂ monitoring network design, to advise states that have elected to install and begin operation of a new SO₂ monitoring network. *See* Draft SO₂ NAAQS Designations Source-Oriented Monitoring Technical Assistance Document, February 2016, <https://www.epa.gov/sites/production/files/2016-06/documents/so2monitoringtad.pdf>.

to ambient air quality in a nearby area that does not meet the NAAQS; or (2) was not required to be characterized under 40 CFR 51.1203(c) or (d) and the EPA does not have available information including (but not limited to) appropriate modeling analyses and/or monitoring data that suggests that the area may (i) not be meeting the NAAQS, or (ii) contribute to ambient air quality in a nearby area that does not meet the NAAQS.⁵

- 5) Designated unclassifiable area – an area that either: (1) was required to be characterized by the state under 40 CFR 51.1203(c) or (d), has not been previously designated, and on the basis of available information cannot be classified as either: (i) meeting or not meeting the 2010 SO₂ NAAQS, or (ii) contributing or not contributing to ambient air quality in a nearby area that does not meet the NAAQS; or (2) was not required to be characterized under 40 CFR 51.1203(c) or (d) and the EPA does have available information including (but not limited to) appropriate modeling analyses and/or monitoring data that suggests that the area may (i) not be meeting the NAAQS, or (ii) contribute to ambient air quality in a nearby area that does not meet the NAAQS.
- 6) Modeled violation – a violation of the SO₂ NAAQS demonstrated by air dispersion modeling.
- 7) Recommended attainment area – an area that a state, territory, or tribe has recommended that the EPA designate as attainment.
- 8) Recommended nonattainment area – an area that a state, territory, or tribe has recommended that the EPA designate as nonattainment.
- 9) Recommended unclassifiable area – an area that a state, territory, or tribe has recommended that the EPA designate as unclassifiable.
- 10) Recommended unclassifiable/attainment area – an area that a state, territory, or tribe has recommended that the EPA designate as unclassifiable/attainment.
- 11) Violating monitor – an ambient air monitor meeting 40 CFR parts 50, 53, and 58 requirements whose valid design value exceeds 75 ppb, based on data analysis conducted in accordance with Appendix T of 40 CFR part 50.
- 12) We, our, and us – these refer to the EPA.

⁵ The term “designated attainment area” is not used in this document because the EPA uses that term only to refer to a previous nonattainment area that has been redesignated to attainment as a result of the EPA’s approval of a state-submitted maintenance plan.

3. Technical Analysis for San Juan County, New Mexico

3.1. Introduction

The EPA must designate San Juan County, New Mexico, by December 31, 2017, because no portion of the county has been previously designated and New Mexico has not installed and begun timely operation of a new, approved SO₂ monitoring network to characterize air quality in the vicinity of any source in San Juan County, New Mexico.

A portion of western San Juan County is land that belongs to the Navajo Nation and a portion of northern San Juan County also has land that belongs to the Ute Mountain Tribe. This specific SO₂ area designation for San Juan County excludes any portion of Navajo Nation but includes Ute Mountain Tribe territory. The intended designation of areas in New Mexico belonging to Navajo Nation is addressed in Chapter 24 of this TSD.

3.2. Air Quality Monitoring Data for San Juan County, New Mexico

The State included SO₂ air quality monitoring data in the area of San Juan County, New Mexico, from the following monitor. (We present here the latest data from this monitor.)

- Air Quality System monitor #35-045-1005 is located in San Juan County (36.69727 Latitude, -97.08130 Longitude). The San Juan County monitor is located 3.5 km west of San Juan Generating Station and is impacted by both the San Juan Generating Station and Four Corners Power Plant. The San Juan County monitor indicates a 2014-2016 design value (8 ppb) well below the level of the NAAQS (75 ppb), but based on air quality modeling we do not consider it to represent the location of the highest 1-hour SO₂ concentrations in the vicinity of San Juan Generating Station. This monitor was used by the State to represent hourly background concentrations for the air quality characterization summarized and assessed in this section since it provides the design concentration of the closest monitoring site to the area of analysis.

There is also an operating SO₂ air quality monitor in Bloomfield in San Juan County (AQS # 35-045-0009), more distant from San Juan Generating Station with an even lower 2014-2016 design value (3 ppb). This monitor clearly does not represent the highest 1-hour SO₂ concentrations in the vicinity of San Juan Generating Station.

The EPA confirmed that there is no additional relevant data in AQS that could inform the intended designation action. Please reference the relevant data file posted at <https://www.epa.gov/air-trends/air-quality-design-values>.

3.3. Air Quality Modeling Analysis for San Juan County, New Mexico, Addressing the San Juan Generating Station

3.3.1. Introduction

This section presents all the available air quality modeling information for the portion of San Juan County, New Mexico, that includes the San Juan Generating Station. For this area, the EPA received and considered one modeling assessment from the State and zero assessments from other parties. It

was received on January 11, 2017, and provides an assessment for the San Juan Generating Station for the 1-hour SO₂ NAAQS located in San Juan County New Mexico utilizing AERMOD.

The State's modeling domain was centered over the facility since it is one of the largest sources of SO₂ emissions located in the area and the focus of this DRR assessment. This area contains the following SO₂ sources, principally the sources around which New Mexico is required by the DRR to characterize SO₂ air quality, or alternatively to establish an SO₂ emissions limitation of less than 2,000 tons per year (tpy):

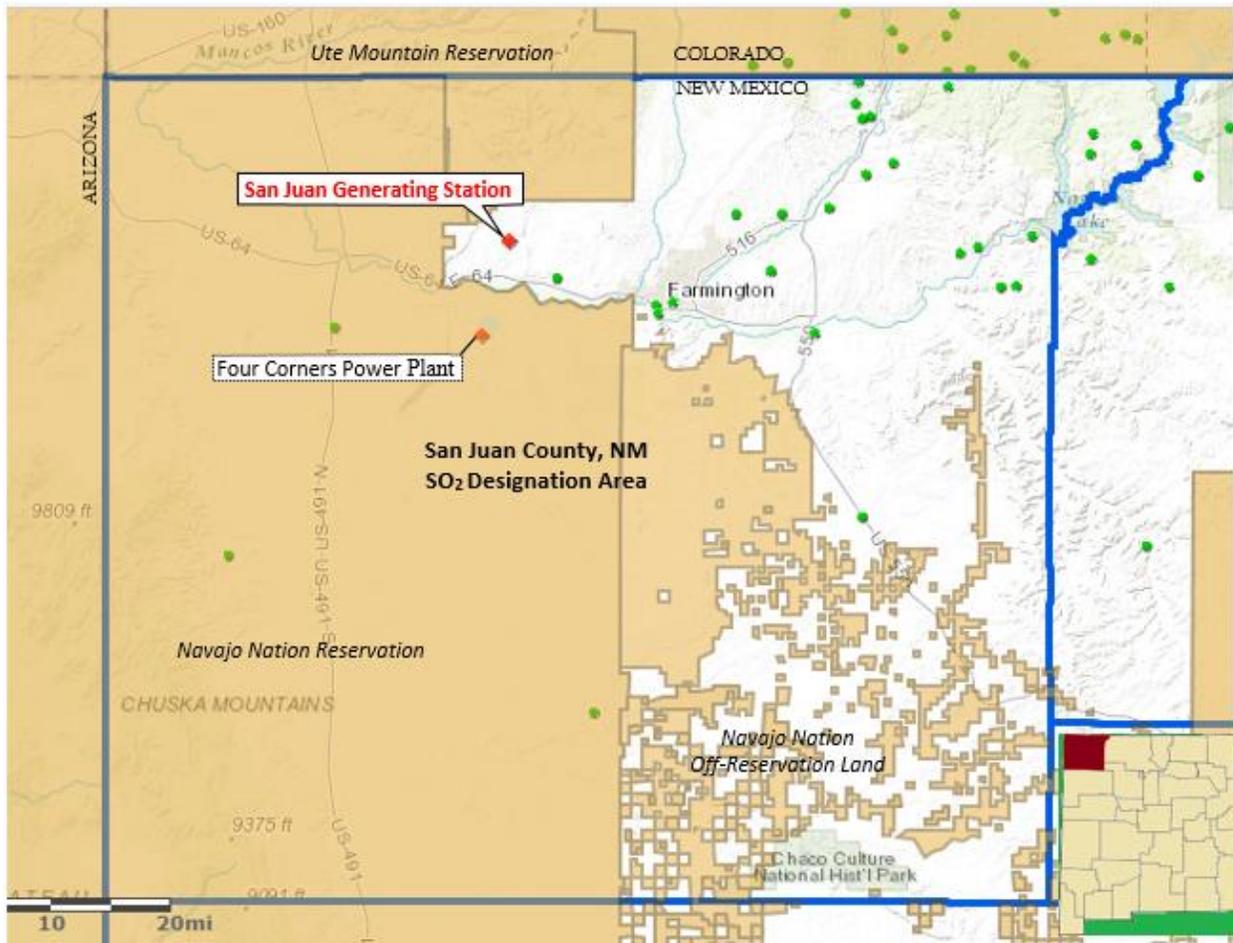
- The San Juan Generating Station emitted 2,000 tons SO₂ or more annually. Specifically, the San Juan Generating Station emitted 3,499 tons of SO₂ in 2015. This source meets the DRR criteria and therefore is on the SO₂ DRR Source list for Round 3. New Mexico has chosen to characterize this facility via modeling.
- 21 sources in the New Mexico Environment Department (NMED) Air Quality Bureau (AQB) database were used in the analysis as contributing sources. Only one of these sources, the Arizona Public Service Electric Company Four Corners Power Plant, is required to be characterized on the SO₂ DRR source list. Specifically, the power plant emitted 6,317 tons of SO₂ in 2014. The plant is located 13 km south of the San Juan Generating Station in a portion of western San Juan County that is Navajo Nation.

In its submission, New Mexico provided an assessment and characterization of air quality impacts from this facility where the 2010 SO₂ NAAQS may be exceeded. This characterization was performed using AERMOD air dispersion modeling software to analyze the actual emissions. After careful review of the State's assessment, supporting documentation, and all available data, the EPA intends to designate the area as unclassifiable/attainment. The State did not stipulate the borders that it recommended specifically for its designation around the San Juan Generating Station. The EPA intends to designate San Juan County, including the area belonging to the Ute Mountain Tribe areas but excluding the area belonging to Navajo Nation, within San Juan County as a separate unclassifiable/attainment area. Our reasoning for this intention is explained in section 3.6 of this TSD, after all the available information is presented.

The State assessed an area within 50 km of the San Juan Generating Station by air quality modeling.

The San Juan Generating Station is located in northwestern New Mexico in the north-central portion of San Juan County. The facility is located approximately 7 miles north of the center of Morgan Lake in Waterflow, New Mexico. The EPA's intended boundary for the designated unclassifiable/attainment area around the San Juan Generating Station and including other portions of San Juan County can be seen in Figure 1 below. Included in the figure are the other emitters of SO₂. All nearby contributors were less than 100 tpy SO₂ (green dots in Figure 1) except one source, Arizona Public Service Electric Company Four Corners Power Plant.

Figure 1. Map of San Juan County - The EPA’s Intended Designation (excluding Navajo Nation shown in the shaded area) for a Portion of San Juan County Including the San Juan Generating Station



The discussion and analysis that follows below will reference the Modeling TAD and the factors for evaluation contained in the EPA’s July 22, 2016, guidance and March 20, 2015, guidance, as appropriate.

3.3.2. Modeling Analysis Provided by the State

3.3.2.1. Model Selection and Modeling Components

The EPA’s Modeling TAD notes that for area designations under the 2010 SO₂ NAAQS, the AERMOD modeling system should be used, unless use of an alternative model can be justified. The AERMOD modeling system contains the following components:

- AERMOD: the dispersion model
- AERMAP: the terrain processor for AERMOD
- AERMET: the meteorological data processor for AERMOD
- BPIPPRM: the building input processor

- AERMINUTE: a pre-processor to AERMET incorporating 1-minute automated surface observation system (ASOS) wind data
- AERSURFACE: the surface characteristics processor for AERMET
- AERSCREEN: a screening version of AERMOD

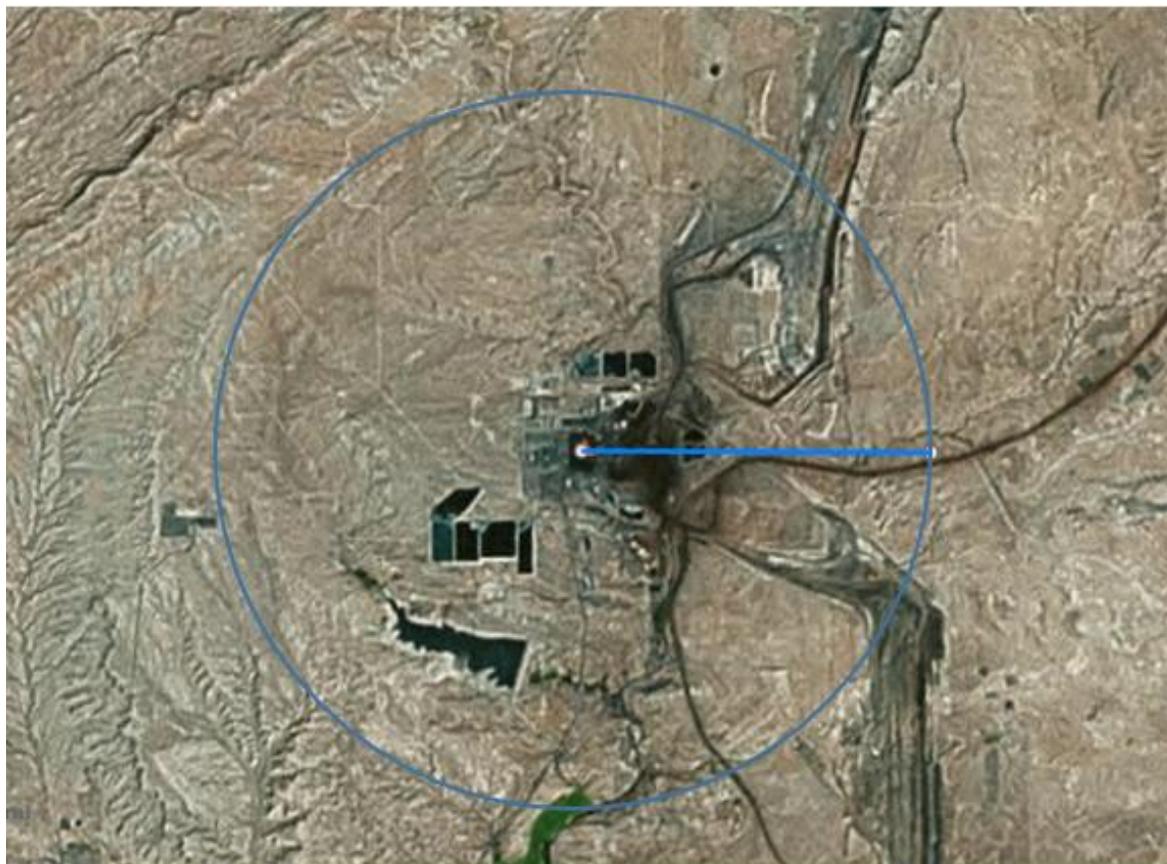
The State used AERMOD version 14134 with regulatory default options. This is an earlier version of AERMOD, but we would not expect significant changes if the current version of AERMOD was used, version 16216r since the regulatory defaults were used. A discussion of the State's approach to the individual components is provided in the corresponding discussion that follows, as appropriate. While the analysis uses this older version of AERMOD, we think the older version is acceptable for use in supporting our designation of the area.

3.3.2.2. *Modeling Parameter: Rural or Urban Dispersion*

For any dispersion modeling exercise, the "urban" or "rural" determination of a source is important in determining the boundary layer characteristics that affect the model's prediction of downwind concentrations. For SO₂ modeling, the urban/rural determination is important because AERMOD invokes a 4-hour half-life for urban SO₂ sources. Section 6.3 of the Modeling TAD details the procedures used to determine if a source is urban or rural based on land use or population density.

For the purpose of performing the modeling for the area of analysis, the State determined that it was most appropriate to run the model in rural mode. The determination for this domain was not specifically mentioned in the report or protocol but is clearly valid based on land-use (the preferred method). An aerial photo showing land use, obtained by the EPA, can be seen in Figure 2 below.

Figure 2. Aerial Map with 3 km Radius Around San Juan Generating Station



The EPA concludes that using a rural determination by the State was appropriate. When using the land-use method, to be considered urban, 50% or more of the area within the 3 km radius circle should be considered residential or industrial. Since the aerial photo shows that nearly all of the land-use within 3 km of the plant is void of residential and industrial, then classifying the San Juan Generating Station as a rural source is fitting.

3.3.2.3. Modeling Parameter: Area of Analysis (Receptor Grid)

The TAD recommends that the first step towards characterization of air quality in the area around a source or group of sources is to determine the extent of the area of analysis and the spacing of the receptor grid. Considerations presented in the Modeling TAD include but are not limited to: the location of the SO₂ emission sources or facilities considered for modeling; the extent of significant concentration gradients due to the influence of nearby sources; and sufficient receptor coverage and density to adequately capture and resolve the model predicted maximum SO₂ concentrations.

The sources of SO₂ emissions subject to the DRR in this area are described in the introduction to this section. For the San Juan County, New Mexico, area, the State included 21 other emitters of SO₂ within 50 km the San Juan Generating Station in any direction. The State determined that this was the appropriate distance to adequately characterize air quality through modeling to include the potential extent of any SO₂ NAAQS exceedances in the area of analysis and any potential impact on SO₂ air quality from other sources in nearby areas. In addition to the San Juan Generating Station,

the other emitters of SO₂ included in the area of analysis were the Four Corners Power Plant and 20 other facilities with a total of 37 sources, that were mostly less than 100 tpy and not mentioned in the State's modeling report specifically but provided in a spreadsheet that is in the docket.⁶ No other sources beyond 50 km were determined by the State to have the potential to cause concentration gradient impacts within the area of analysis.

The nested receptor grid spacing for the area of analysis chosen by the State is as follows:

- Receptors spaced at 50 m along the fence line of San Juan Generating Station;
- Receptors spaced at 100 m from fence line out to 2.5 km; and
- Receptors spaced at 1 km from 2.5 km out to 20 km (the edge of the domain).

Figures 3 and 4, provided by the EPA, show the State's chosen area of analysis surrounding the San Juan Generating Station fence line, as well as the edge of the receptor grid domain for the area of analysis. Blue dots are sources included in the modeling.

⁶ See 'NM_SJGS_Neighboring_Sources.xlsx' in the docket.

Figure 3. Receptor Grid (to edge of the Domain) for the San Juan Generating Station

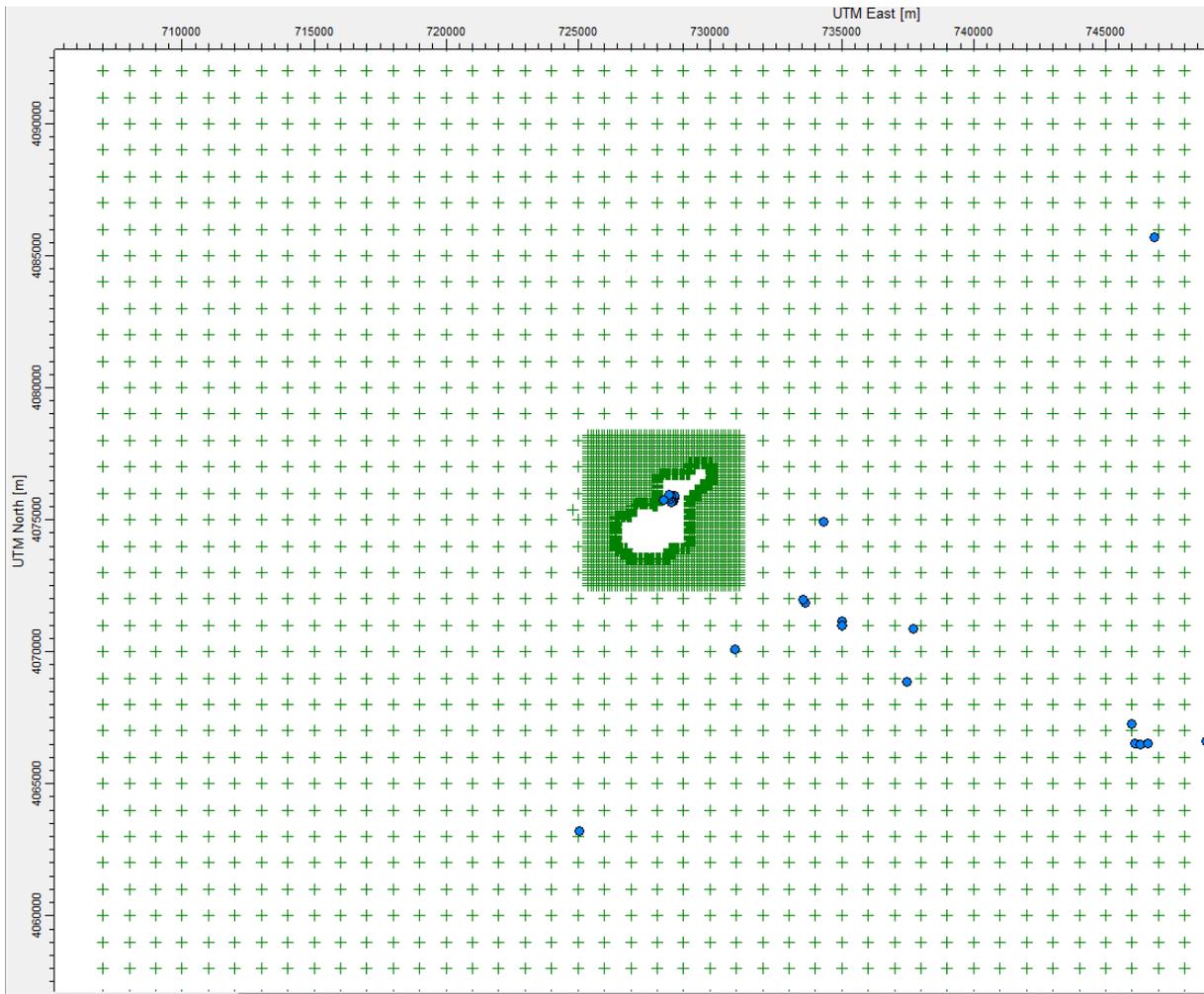
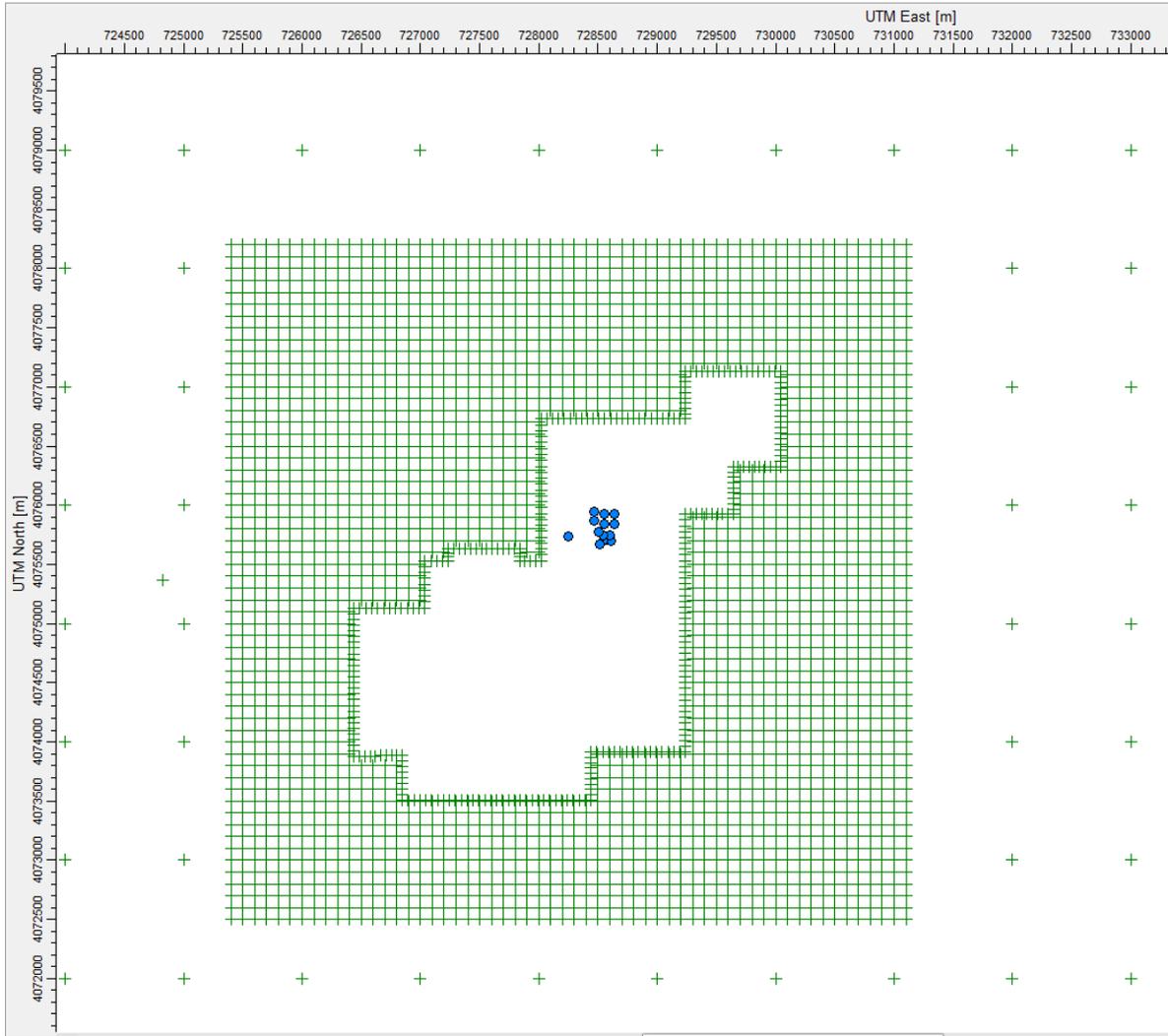


Figure 4. Receptor Grid with Modeled Fence Line for the San Juan Generating Station



Consistent with the Modeling TAD, the State placed receptors in locations that would be considered ambient air relative to San Juan Generating Station, including other modeled facilities' property. The State excluded receptors within the fence line of San Juan Generating Station and placed receptors along the fence line of the facility. From discussions with NMED, the fencing along with access control does prohibit the public from access within the fence line without approval of San Juan Generating Station. No other receptor locations were excluded.

This is adequate information provided by the State for the EPA to conclude that the receptor network properly covers the modeling domain for the purpose of modeling an SO₂ designation for the San Juan Generator. The receptor placement is of sufficient density to provide the resolution needed to detect significant gradients in the concentrations. The receptors were placed close enough together near the source and receptor spacing at greater distances was adequate to provide sufficient detail to estimate the highest concentrations and possible violations of a NAAQS. Receptors were well-placed at the fence line which will help define the ambient air boundary at the San Juan Generating Station.

3.3.2.4. *Modeling Parameter: Source Characterization*

The San Juan Generating Station is located in an area of complex terrain. The terrain surrounding the San Juan Generating Station was reviewed and was determined to have hills with an elevation at or above the stack height. Based on EPA guidance, the general guideline for determining the distance between an affected source and where the maximum ground level concentration will occur is generally ten times the stack height in flat terrain. Since there is elevated terrain it is possible to get plume impacts on elevated receptors. Based on our evaluation of the modeling results, New Mexico's modeling domain extending out 20 km from the facility is of sufficient size to determine the maximum ambient air impacts including any potential terrain impacts. Extending the receptor grid further would not be expected to yield any concentrations near the standard.

In determining which nearby sources should be included in the modeling domain, the modeling conservatively included all sources within 50 km of San Juan Generating Station. The inclusion of all these sources is conservative, since many of these sources are small and likely have some of their impacts also included in the background monitor data, thus double counting some of the sources.

For the 2010 1-hour SO₂ NAAQS air quality characterizations, modeling of sources with intermittent emissions, such as emergency generators and limited intermittent startup/shutdown emissions were not included based on the recommendations in the March 1, 2011, memorandum "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO₂ National Ambient Air Quality Standards." As a general guidance, sources that operated less than 100 hours per year may be excluded.

The modeling was based on the most recent 3 years of actual emissions data that were concurrent with the meteorological dataset. CEMS data was used to generate hourly emissions files for the San Juan Generating Station for the years 2013 to 2015. These data are for the four main power plant stacks. The State also used actual CEMS data for 2013 and 2014 for the Four Corners Power Plant. However, 2015 data for Four Corners Power Plant was not available at the time of the modeling, so 2014 data was duplicated and used in the state's modeling for the 2015 dataset for the Four Corners Power Plant. We evaluate the appropriateness of this approach further below. All other emissions were taken from the latest permit allowable emissions. NMED did modeling that included the generators (Source group 'All') and also modeling that did not include emergency generators (ALLNO6). Following our guidance, we are evaluating the modeling conducted for the Group 'ALLNO6' which includes all sources other than emergency generators and does include background.

Consistent with the Modeling TAD guidance, the state used actual stack heights with actual emissions. Where allowable emissions were used for the other nearby sources, the actual stack heights were found to all be below the GEP stack height of 65m, and thus were modeled at actual height. Stack height and other parameters for the modeled sources are included in the spreadsheet provided by the state.⁷ The EPA finds stack height and other parameters for the modeled sources to be acceptable.

The modeling included building downwash and was implemented using BPIPPRM. The San Juan Generating Station submitted information to the State regarding buildings located on their property

⁷ See NM_SJGS_Neighboring_Sources.xlsx in the docket.

and those parameters were used as inputs into BPIPPRM to calculate building downwash parameters for input into AERMOD.

The EPA concludes that the State provided adequate information to determine the source configuration and source type for the San Juan Generating Station. Accurate stack parameters (*see* Table 2) were provided and the physical plant layout was documented suitably for the modeling. Exit temperatures, diameters, and exit velocities reflected the actual emissions being modeled. The stack locations were documented well with corresponding UTM coordinates for each stack. That provided accurate orientation of the stacks and the input parameters needed for BPIPPRM. Therefore, the building locations and downwash were accurately accounted for.

Table 2. Modeled Stack Parameters for EGU Contributing Sources in Area of Analysis for San Juan Generating Station

Source	Description	UTMH (m)	UTMV (m)	Elevation (m)	Height (m)	Temp (K)	ExitVel (m/s)	Dia (m)	SO2 (lbs/hr)
E301	Unit 1	728606	407569	1614	121.92	CEM data	20.24	6.48	CEM data
E302	Unit 2	728603	407575	1614	121.92	CEM data	21.49	6.71	CEM data
E303	Unit 3	728639	407583	1613	121.92	CEM data	17.68	8.89	CEM data
E304	Unit 4	728639	407592	1612	121.92	CEM data	17.68	8.89	CEM data
E501	Unit 1 Duct Leaks	728540	407569	1616	22.86	644.3	8.47	0.17	1.10
E502	Unit 2 Duct Leaks	728540	407575	1616	22.86	644.3	8.88	0.17	1.10
E503	Unit 3 Duct Leaks	728551	407583	1617	22.86	644.3	9.30	0.17	1.10
E504	Unit 4 Duct Leaks	728551	407592	1616	22.86	644.3	10.79	0.17	1.20
STACK 4&5	Four Corners Power Plant	725050	406320	1631	115.82	CEM data	CEM data	8.69	CEM data

3.3.2.5. *Modeling Parameter: Emissions*

The EPA’s Modeling TAD notes that for the purpose of modeling to characterize air quality for use in designations, the recommended approach is to use the most recent 3 years of actual emissions data and concurrent meteorological data. However, the TAD also indicates that it would be acceptable to use allowable emissions in the form of the most recently permitted (referred to as PTE or allowable) emissions rate that is federally enforceable and effective.

The EPA concludes that continuous emissions monitoring systems (CEMS) data provide acceptable historical emissions information, when they are available. These data are available for many electric generating units. In the absence of CEMS data, the EPA’s Modeling TAD highly encourages the use of AERMOD’s hourly varying emissions keyword HOUREMIS, or through the use of AERMOD’s variable emissions factors keyword EMISFACT. When choosing one of these methods, the EPA recommends using detailed throughput, operating schedules, and emissions information from the impacted source(s).

In certain instances, states and other interested parties may find that it is more advantageous or simpler to use PTE rates as part of their modeling runs. For example, where a facility has recently adopted a new federally enforceable emissions limit or implemented other federally enforceable mechanisms and control technologies to limit SO₂ emissions to a level that indicates compliance with the NAAQS, the state may choose to model PTE rates. These new limits or conditions may be used in the application of AERMOD for the purposes of modeling for designations, even if the source has not been subject to these limits for the entirety of the most recent 3 calendar years. In these cases, the Modeling TAD notes that a state should be able to find the necessary emissions information for designations-related modeling in the existing SO₂ emissions inventories used for permitting or SIP planning demonstrations. In the event that these short-term emissions are not readily available, they may be calculated using the methodology in Table 8-1 of Appendix W to 40 CFR Part 51 titled, “Guideline on Air Quality Models.”

As previously noted, the State included the San Juan Generating Station, Four Corners Power Plant, and 20 other emitters of SO₂ within 50 km in the area of analysis. The State has chosen to model the two EGU facilities using actual hourly emissions. The facilities in the State’s analysis that were modeled with actual hourly emissions and their associated annual actual SO₂ emissions between 2013 to 2015 are summarized below in Table 3.

Table 3. Actual SO₂ Emissions Between 2011 – 2015 from Facilities in the Area of Analysis of San Juan County, New Mexico

Facility Name	SO ₂ Emissions (tpy)		
	2013	2014	2015
San Juan Generating Station	6,076	4,989	3,499
Four Corners Power Plant	10,705	6,317	--

NOTE: The 20 sources modeled based on allowable emissions add up to 2,112.4 tpy using permit allowables.

For San Juan Generating Station, the EPA concludes that the CEMS-based 2013-2015 actual hourly emissions were appropriate to represent modeling that simulated a monitor. The set of hourly emission rates represented 3 years of recent actual emissions data and coincided well with the meteorological data.

For Four Corners Power Plant, the EPA concludes that the CEMS-based 2013-2014 actual hourly emissions were appropriate to represent modeling that simulated a monitor. The set of hourly emission rates represented 2 years of recent actual emissions data and coincided well with the meteorological data.

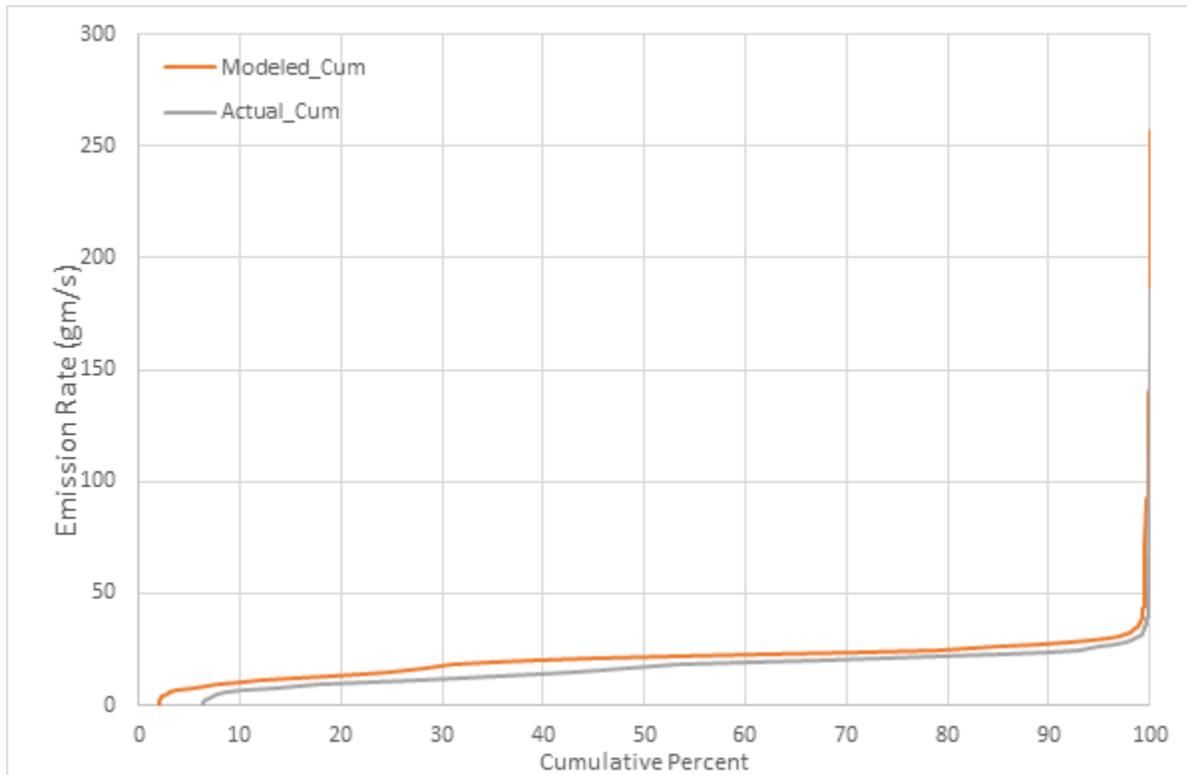
Regarding emission inputs for 2015 from the single stack at Four Corners Power Plant, we investigated the available information to better assess the reasonableness of the State's use of 2014 hourly emissions to represent 2015 emissions. Some 2015 CEMS data were available for Four Corners Power Plant, but as of the date of the state's modeling these data not been quality assured/quality controlled, so it was not final data and the state did not use it in the modeling. We ranked the 2014 hourly data and this 2015 data and graphed the distribution for each data set. Our evaluation indicates that for all but a few outlier hourly values at the upper end of the distribution, the Nth-ranked modeled emission rate (g/s) based on 2014 is higher than the Nth-ranked 2015 emission rate. *See* Figure 5. The only points that are higher are on the tail end of the graph and represent only a small number of hourly values when the Nth-ranked 2015 preliminary emission data was higher than the Nth-ranked 2014 actual data. Given the small number of such hourly values and that for most of the hours the 2014 data is slightly higher than 2015, it is highly unlikely that use of preliminary 2015 actual hourly emissions values would result in higher modeled concentrations. As further discussed below, the highest modeled concentrations are to the west of San Juan Generating Station, which is not likely a transport condition where the Four Corners Power Plant would be contributing. Given all this information, using the 2014 data for the Four Corners plant to substitute for unavailable 2015 data is reasonable and potentially conservative in estimating concentrations in the area.

Besides these two power plants the state included 20 other facilities with a total of 37 sources in the modeling. Most of these facilities had potential (allowables) and actuals that were less than 100 tpy and not mentioned in the State's modeling report specifically but provided in a spreadsheet that is in the docket.⁸ Many of these sources were at least 10-20 km from San Juan Generating Station with annual actual emissions less than 20 tpy of SO₂. Instead of using actuals for these other 20 facilities, the modeling was done using short term pounds per hour allowable emissions that the state pulled from permits, which is conservative (i.e., tending to overestimate ambient concentrations) for several reasons. The amount modeled for these facilities was 2,116 tpy while their longer term annual permit allowable tpy value is 1,043 tpy. Even modeling longer term annual allowables is conservative as most sources had 2014 actuals (2014 NEI) significantly less than their annual allowables.⁹ Since the background monitoring data is from this area, the impacts from these contributing sources are conservative (i.e., tending to overestimate ambient concentrations) since their impacts are also included to some extent in the background monitor data.

⁸ See NM_SJGS_Neighboring_Sources.xlsx in the docket.

⁹ Ibid.

Figure 5. Unpaired-in-time hourly emission rate (g/s) 2014 surrogate data (Modeled Cumulative) compared to preliminary (not quality assured/quality controlled) 2015 data (Actual Cumulative) for the Four Corners Power Plant



3.3.2.6. Modeling Parameter: Meteorology and Surface Characteristics

As noted in the Modeling TAD, the most recent 3 years of meteorological data (concurrent with the most recent 3 years of emissions data) should be used in designations efforts. The selection of data should be based on spatial and climatological (temporal) representativeness. The representativeness of the data is determined based on: 1) the proximity of the meteorological monitoring site to the area under consideration, 2) the complexity of terrain, 3) the exposure of the meteorological site, and 4) the period of time during which data are collected. Sources of meteorological data include National Weather Service (NWS) stations, site-specific or onsite data, and other sources such as universities, Federal Aviation Administration (FAA), and military stations.

For the area of analysis for the San Juan County, New Mexico, area, the State selected meteorological data from the New Mexico Air Quality Bureau weather station (Substation-1H (EPA-350451005)) located 3.5 km west of the San Juan Generating Station along with the NWS data from the Four Corners Airport (# 23090) and upper air data from the Albuquerque Airport (station #23050) were used for the analysis. The substation meteorological data is the main data set used with the NWS data used to fill in any missing data and to provide cloud cover data. The substation meteorological data was 97% complete for all years. All data was processed with the AERMET processor. The State used AERSURFACE using data from surface station # 23090 to estimate the surface characteristics of the area of analysis. Albedo is the fraction of solar energy reflected from

the earth back into space, the Bowen ratio is the method generally used to calculate heat lost or heat gained in a substance, and the surface roughness is sometimes referred to as “z_o” The state estimated surface roughness values for twelve, 30° spatial sectors out to 1 km at a monthly temporal resolution for average conditions. The data covers the years 2013 to 2015. In the Figure 6 below, generated by the EPA, the location of the AQS monitoring station is shown 3.5 km southwest of the San Juan Generating Station. There is limited upper air data in this part of the U.S. and the Albuquerque data was the most reasonable/acceptable data available. The Albuquerque Airport upper air station is located approximately 250 km to the southeast of the San Juan Generating Station.

Figure 6. Area of Analysis and the NWS stations in San Juan County

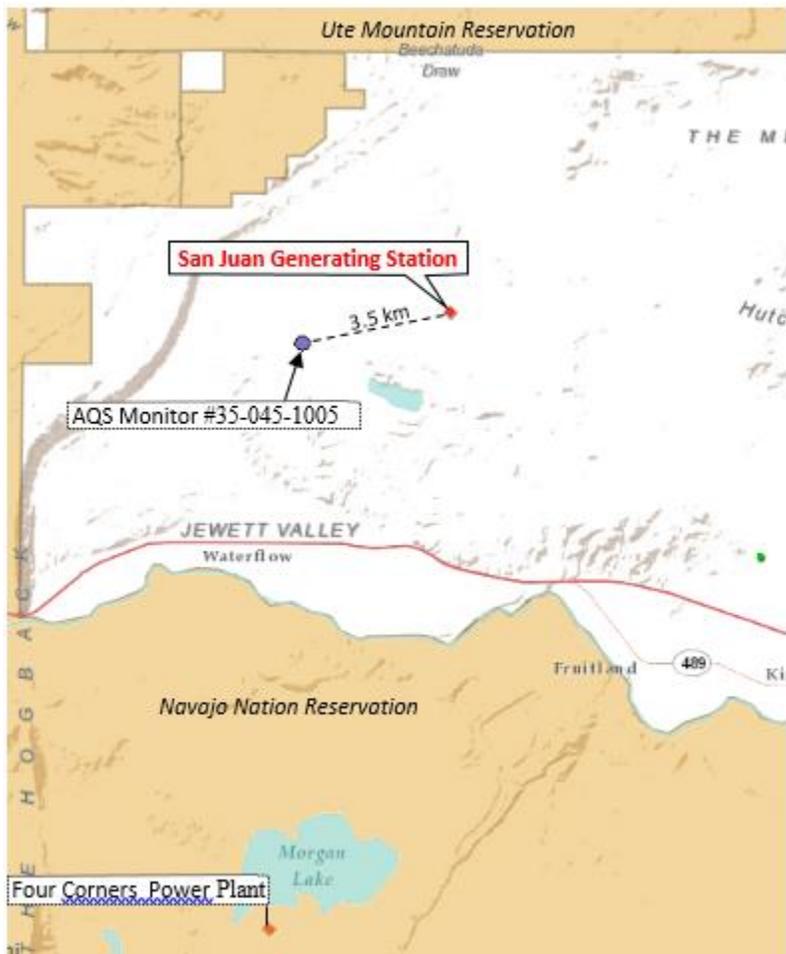


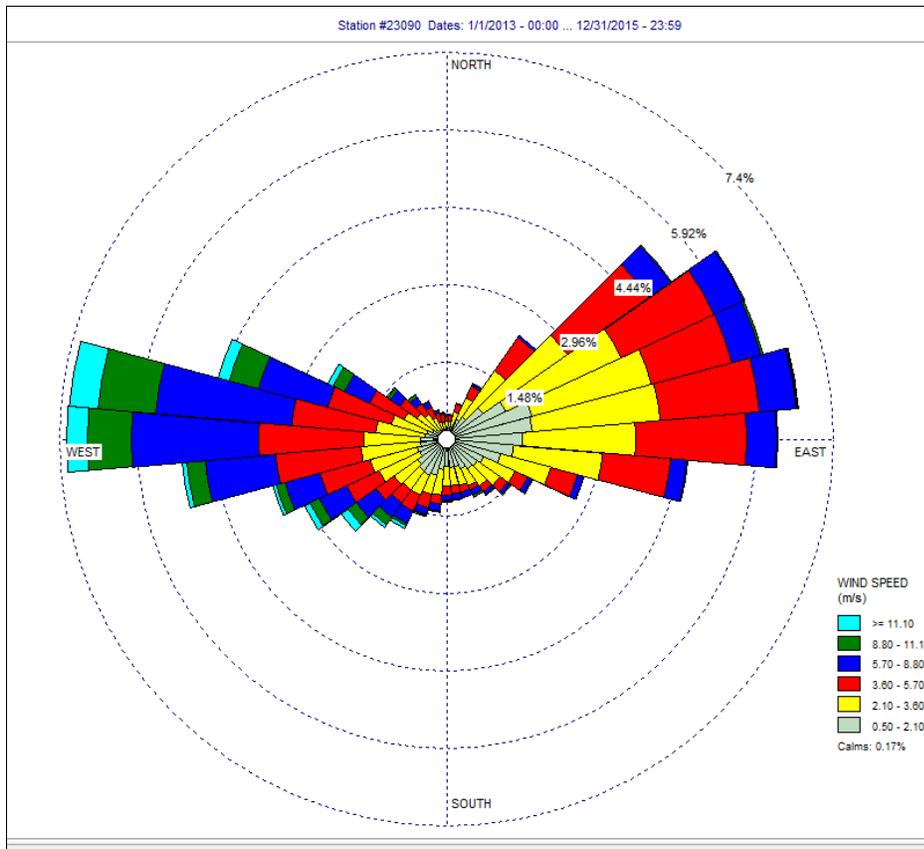
Table 4 below shows a summary of the first 24 hours of the surface characteristics associated with each NWS station.

Table 4. Surface Characteristics in the Area of Analysis for San Juan County, New Mexico

Surface station no.: 23090										Upper air station no.: 23050												
Name: UNKNOWN										Name: ALBUQUERQUE, NM												
Year: 2013										Year: 2013												
First 24 hours of scalar data																						
YR	MO	DY	JDY	HR	HO	U*	W*	DI/DZ	ZICNV	ZIMCH	M-O	LEN	ZO	BOWEN	ALBEDO	REF	WS	WD	HT	REF	TA	HT
13	01	01	1	01	-22.1	0.225	-9.000	-9.000	-999.	256.	38.2	0.15	7.02	1.00	3.10	266.	10.0	266.9	10.0			
13	01	01	1	02	-7.1	0.095	-9.000	-9.000	-999.	83.	9.0	0.15	7.02	1.00	2.00	253.	10.0	265.1	10.0			
13	01	01	1	03	-29.5	0.296	-9.000	-9.000	-999.	387.	65.9	0.14	7.02	1.00	3.70	278.	10.0	264.9	10.0			
13	01	01	1	04	-1.8	0.048	-9.000	-9.000	-999.	175.	4.5	0.15	7.02	1.00	1.00	226.	10.0	263.9	10.0			
13	01	01	1	05	-1.1	0.038	-9.000	-9.000	-999.	50.	3.6	0.15	7.02	1.00	0.80	216.	10.0	263.0	10.0			
13	01	01	1	06	-5.5	0.082	-9.000	-9.000	-999.	57.	7.6	0.13	7.02	1.00	1.80	57.	10.0	261.5	10.0			
13	01	01	1	07	-2.4	0.054	-9.000	-9.000	-999.	30.	5.0	0.12	7.02	1.00	1.20	80.	10.0	260.9	10.0			
13	01	01	1	08	-0.5	0.028	-9.000	-9.000	-999.	11.	3.4	0.14	7.02	1.00	0.60	98.	10.0	260.8	10.0			
13	01	01	1	09	-3.4	0.114	-9.000	-9.000	-999.	93.	32.7	0.12	7.02	0.46	1.70	83.	10.0	261.9	10.0			
13	01	01	1	10	82.2	0.250	0.892	0.005	259.	301.	-14.3	0.14	7.02	0.33	2.10	104.	10.0	263.2	10.0			
13	01	01	1	11	193.3	0.306	1.790	0.005	889.	406.	-11.1	0.12	7.02	0.29	2.60	82.	10.0	266.0	10.0			
13	01	01	1	12	231.2	0.235	2.085	0.006	1173.	275.	-4.2	0.15	7.02	0.27	1.60	136.	10.0	268.9	10.0			
13	01	01	1	13	233.0	0.299	2.172	0.005	1317.	392.	-8.6	0.15	7.02	0.27	2.30	254.	10.0	271.4	10.0			
13	01	01	1	14	202.6	0.674	2.114	0.005	1395.	1327.	-112.6	0.14	7.02	0.28	6.70	280.	10.0	271.0	10.0			
13	01	01	1	15	135.0	0.734	1.887	0.005	1488.	1507.	-219.1	0.14	7.02	0.30	7.50	278.	10.0	271.4	10.0			
13	01	01	1	16	43.4	0.645	1.300	0.005	1513.	1255.	-461.0	0.14	7.02	0.37	6.70	275.	10.0	271.8	10.0			
13	01	01	1	17	-46.8	0.623	-9.000	-9.000	-999.	1183.	386.7	0.14	7.02	0.57	6.80	284.	10.0	270.9	10.0			
13	01	01	1	18	-64.0	0.657	-9.000	-9.000	-999.	1276.	331.0	0.14	7.02	1.00	7.20	288.	10.0	268.9	10.0			
13	01	01	1	19	-46.0	0.467	-9.000	-9.000	-999.	803.	165.9	0.14	7.02	1.00	5.30	285.	10.0	268.0	10.0			
13	01	01	1	20	-45.1	0.457	-9.000	-9.000	-999.	743.	158.4	0.14	7.02	1.00	5.20	274.	10.0	267.4	10.0			
13	01	01	1	21	-10.3	0.114	-9.000	-9.000	-999.	308.	10.8	0.15	7.02	1.00	2.40	247.	10.0	265.9	10.0			
13	01	01	1	22	-5.7	0.085	-9.000	-9.000	-999.	93.	8.0	0.14	7.02	1.00	1.80	278.	10.0	264.8	10.0			
13	01	01	1	23	-5.8	0.086	-9.000	-9.000	-999.	60.	8.1	0.15	7.02	1.00	1.80	265.	10.0	264.5	10.0			
13	01	01	1	24	-19.8	0.197	-9.000	-9.000	-999.	210.	29.0	0.13	7.02	1.00	3.00	39.	10.0	263.6	10.0			

The EPA provided the 3-year surface wind rose for the station #23090. In Figure 7, the frequency, magnitude, speed and direction of the wind are defined in terms of where the wind is blowing from. The station indicates a 4.05 m/s average wind speed that blows predominantly from the west and also from the northeast, with the winds from the west being much higher velocity than winds from the east. The angle from San Juan to the Four Corners plant is about 200 degrees (four Corners is a little west of due south), so the wind very rarely blows from San Juan toward Four Corners and somewhat more frequently (but still <2% of the time) from Four Corners toward San Juan.

Figure 7: San Juan County Cumulative Annual Wind Rose for Years 2013 – 2015



Meteorological data from the above stations were used in generating AERMOD-ready files with the AERMET processor. The output meteorological data created by the AERMET processor is suitable for being applied with AERMOD input files for AERMOD modeling runs. The State followed the methodology and settings presented in the User’s Guide for the AERMOD Meteorological Data Preprocessor (AERMET) in the processing of the raw meteorological data into an AERMOD-ready format, and used AERSURFACE to best represent surface characteristics.

Hourly surface meteorological data records are read by AERMET, and include all the necessary elements for data processing. However, wind data taken at hourly intervals may not always portray wind conditions for the entire hour, which can be variable in nature. Hourly wind data may also be overly prone to indicate calm conditions, which are not modeled by AERMOD. In order to better represent actual wind conditions at the meteorological tower, wind data of 1-minute duration was provided from surface station # 23090, but in a different formatted file to be processed by a separate preprocessor, AERMINUTE. These data were subsequently integrated into the AERMET processing to produce final hourly wind records of AERMOD-ready meteorological data that better estimate actual hourly average conditions and that are less prone to over-report calm wind conditions. This

allows AERMOD to apply more hours of meteorology to modeled inputs, and therefore produce a more complete set of concentration estimates.

3.3.2.7. *Modeling Parameter: Geography, Topography (Mountain Ranges or Other Air Basin Boundaries) and Terrain*

The terrain in the area of analysis is best described as complex. However, both simple and complex types of terrain were used to model the facility. To account for these terrain changes, the AERMAP (Version 11103) terrain program within AERMOD was used to specify terrain elevations for all the receptors. The source of the elevation data incorporated into the model is from the USGS National Elevation Database Datum 83 dataset. We believe this approach is appropriate given the location and geographic features of the area surrounding San Juan Generating Station.

The EPA concludes that the receptors were well placed for the type of terrain around the plant. The uniform receptor grid was used and supplemented with some additional receptors along a sharp/steep ridgeline that was not fully captured by the uniform receptor grid. From a spatial standpoint, the surface meteorological data should not be affected by large distance or complex terrain due to the close proximity of the weather stations and the nearby topography.

3.3.2.8. *Modeling Parameter: Background Concentrations of SO₂*

The Modeling TAD offers two mechanisms preferred for most facilities for characterizing background concentrations of SO₂ that are ultimately added to the modeled design values: 1) a “tier 1” approach, based on a monitored design value, or 2) a temporally varying “tier 2” approach, based on the 99th percentile monitored concentrations by hour of day and season or month. For this area of analysis, the State used a third method discussed in the NO₂ memo¹⁰ as applicable for special rare cases, the hourly monitored background concentration. According to the memo, hourly concentrations could be used for background in a rare situation where the modeled emission inventory clearly represents the majority of emissions that could potentially contribute to the cumulative impact assessment and where inclusion of the monitored background concentration is intended to conservatively represent the potential contribution from minor sources and natural or regional background levels not reflected in the modeled inventory. In this case, the key aspect which may justify the hour-by-hour pairing of modeled and monitored values is a demonstration of the overall conservatism of the cumulative assessment based on the combination of modeled and monitored impacts. In the case of the modeling for the San Juan Generating Station, the cumulative emissions inventory clearly includes the majority of the emissions (all sources within 50 km in a rural area of the country) which could contribute to the impacts (Table 3). For example, by including actual emissions for both of the major sources in the area, San Juan Generating Station and Four Corners Power Plant, in 2015, 82% of the total emissions within the area are included and the remaining 20 sources are conservatively modeled at allowable rates making up the remaining 18% of the modeled inventory.

New Mexico has a monitor (AQS# 35-045-1005) near the San Juan Generating Station (about 3 km west of the facility) called USBR Shiprock Substation. New Mexico used 2013-2015 hourly data from the monitor to represent background. The hourly values ranged from 0 to 83 µg/m³. The USBR Shiprock Substation monitor is located such that it does often pick up impacts from the San Juan Generating Station in the monitoring data, so for modeled impacts on the west side of the San Juan Generating Station there is some double counting of San Juan Generating Station impacts in the State’s analysis because westerly winds would transport emissions to the monitor as well. In fact, the design value in the modeling analysis occurred at the fence line to the west of the plant where this double counting could occur. The hourly values of the Substation monitor background concentration for this area of analysis were incorporated into the final AERMOD results.

Given the cumulative inventory and the remoteness of this area, the only other option for background would likely have been to use a value deemed as representative of continental background, which likely would be too low to represent this area of the country. The EPA concludes that this alternate approach for background, though recommended only in special limited circumstances, is acceptable and conservative (tending to result in higher estimates of overall ambient concentrations) compared to using a representative continental background. We also believe it will most likely overestimate the true background SO₂ concentration. The USBR Shiprock Substation air quality monitor has the possibility of picking up either the San Juan Generating Station or the Four Corners facility depending on transport wind directions in the area in its data, but

¹⁰ Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO₂ National Ambient Air Quality Standard, March 1, 2011. https://www.epa.gov/sites/production/files/2015-07/documents/appwno2_2.pdf

is a conservative monitor (tends to overestimate overall concentrations) to use in the modeling to represent the background for purposes of modeling attainment of the 2010 1-hour SO₂ NAAQS.

3.3.2.9. *Summary of Modeling Inputs and Results*

The AERMOD modeling input parameters for the San Juan County, New Mexico, area of analysis are summarized below in Table 5.

Table 5: Summary of AERMOD Modeling Input Parameters for San Juan County, New Mexico

Input Parameter	Value
AERMOD Version	14134 (regulatory defaults)
Dispersion Characteristics	Rural
Modeled Sources	21
Modeled Stacks	52
Modeled Structures	Yes – San Juan Generating Station
Modeled Fence lines	Yes
Total receptors	4594
Emissions Type	Actual
Emissions Years	2013-2015
Meteorology Years	2013-2015
Station for Surface Meteorology	Air Quality System monitor #35-045-1005, 3.5 km southwest of San Juan Generating Station
NWS Station Upper Air Meteorology	Albuquerque Airport (station #23050)
NWS Station for Calculating Surface Characteristics	Four Corners Airport (#23090)
Methodology for Calculating Background SO ₂ Concentration	2013-2015 Hourly monitored value paired with same hour of modeling
Calculated Background SO ₂ Concentration	0 – 83 µg/m ³ (0 – 32 ppb)

The results presented below in Table 6 show the magnitude and geographic location of the highest predicted modeled concentration based on the input parameters.

Table 6. Maximum Predicted 99th Percentile Daily Maximum 1-Hour SO₂ Concentration Averaged Over 3 Years for the Area of Analysis for San Juan County, New Mexico

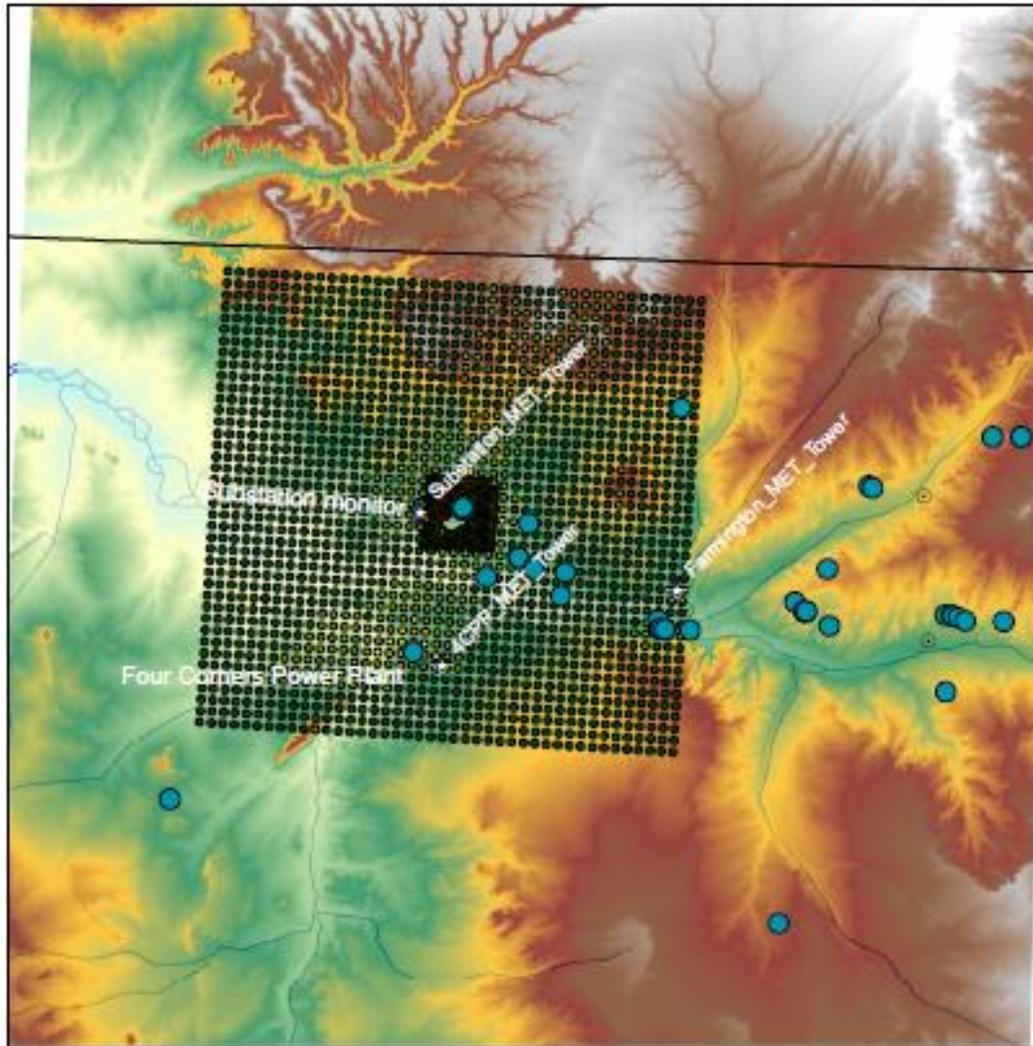
Averaging Period	Data Period	Receptor Location UTM zone 12		99 th percentile daily maximum 1-hour SO ₂ Concentration (µg/m ³)	
		UTM	UTM	Modeled concentration (including background)	NAAQS Level
99 th Percentile 1-Hour Average	2013-2015	4075880.40 E	728020.00 N	195.17	196.4*

*Equivalent to the 2010 SO₂ NAAQS of 75 ppb using a 2.619 µg/m³ conversion factor.

The State’s modeling indicates that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain is 195.17 µg/m³, equivalent to 74.52 ppb. This modeled concentration included the background concentration of SO₂, and is based on actual hourly emissions from the two EGU facilities, with the exception of 2014 actual emissions being used in place of actual 2015 emissions for Four Corners Power Plant, and potential emissions from other background facilities. This value was modeled on the west side of the facility and includes background concentrations. Without background, the value is 194.3 µg/m³. Figure 8 and 9 below from New Mexico, and indicates that the predicted value occurs immediately at the fenceline on the west side of San Juan Power Station (Figure 9 was modified by the EPA to label the location of max impact). The State’s receptor grid is also shown in the figures.

Figure 8: Predicted 99th Percentile Daily Maximum 1-Hour SO₂ Concentrations Averaged Over 3 Years for the Area of Analysis for San Juan County, New Mexico

San Juan Generating Station Terrain Features and SO₂ Ambient Impacts



2013-2015 SO₂ Impacts (ug/m³)

Fields

- 37.3 - 50.0
- 50.1 - 75.0
- 75.1 - 100.0
- 100.1 - 150.0
- 150.1 - 195.2
- Sources
- ☆ MET_Towers

Terrain Elevation (meters)

Value

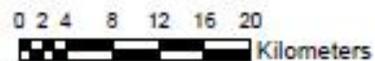
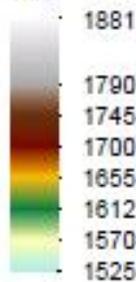
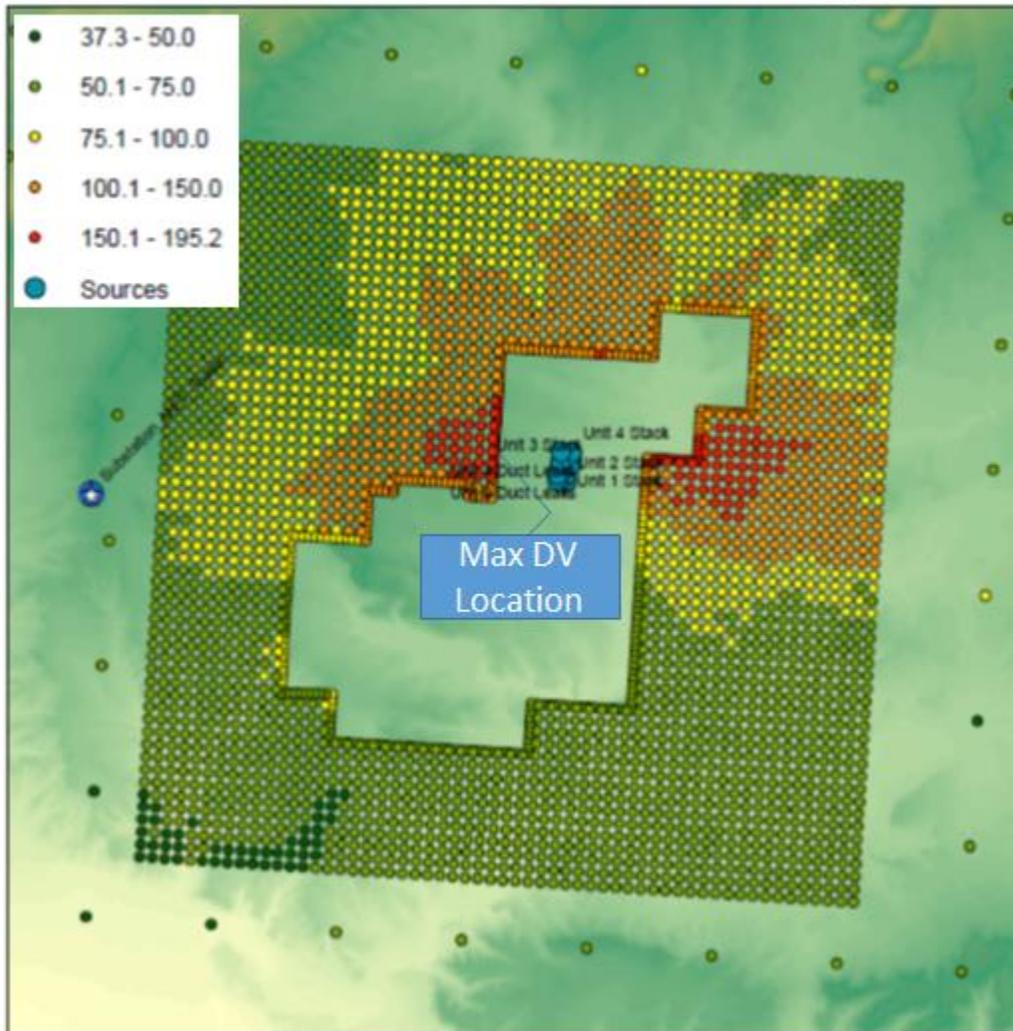


Figure 9: Predicted 99th Percentile Daily Maximum 1-Hour SO₂ Concentrations Averaged Over 3 Years for the Area of Analysis for San Juan County, New Mexico (Near field)



The modeling submitted by the State does not indicate that the 1-hour SO₂ NAAQS is violated at the receptor with the highest modeled concentration. The EPA notes that while the modeled design value for San Juan County is very near the NAAQS, the San Juan Generating Station is subject to Best Available Retrofit Technology (BART) requirements under the Regional Haze Rule and has elected to shut down certain units as an alternative to source-specific BART emission limits. This was approved into New Mexico's regional haze SIP and became federally enforceable and effective on November 10, 2014 (79 FR 60978). While the current modeling for 2013-2015 included actual emissions from all four units, two of the units (Units 2 and 3) must be shut down by the end of 2017. The facility has 4 boilers: Boilers 1 and 2 are approximately same size (350/360 MW); while Boilers 3 and 4 are larger (550 MW). These shutdowns are equivalent to 50% of the facility's maximum generating capacity and should net a reduction of SO₂ emissions on the order of 40-50% in 2018 and

later years. Therefore, the design value from this modeling analysis is likely higher than what is expected after 2017.

3.3.2.10. *The EPA's Assessment of the Modeling Information Provided by the State*

When evaluating the State's modeling, no major issues with the State modeling were identified. The modeling shows attainment, and the modeling generally follows the TAD and EPA guidance and only deviates outside normal TAD recommendations for the way background monitoring data was included. Specifically, when evaluating an issue of the background concentrations used, the EPA determined that the State followed the NO₂ memo's guidance for rare cases.

3.4. Emissions and Emissions-Related Data, Meteorology, Geography, and Topography for the San Juan County, New Mexico, Area

These factors were incorporated into the air quality modeling efforts and the results were discussed above. The EPA gave consideration to these factors by considering whether they were properly incorporated and by considering the air quality concentrations predicted by the modeling.

3.5. Jurisdictional Boundaries in the San Juan County, New Mexico, Area

With the exception of the San Juan Generating Station, whose emissions have been modeled to show compliance with the standard, there are no other sources within San Juan County other than Four Corners Power Plant that emit at or above 100 tpy, based on 2014 NEI. The Four Corners Power Plant, is located 13 km south-southwest of the San Juan Generating Station in a portion of western San Juan County that is Navajo Nation territories, an indigenous tribe that has inherent authority to govern itself. The Four Corners Power Plant emitted 3,499 tons of SO₂ in 2015.

This specific SO₂ area designation for San Juan County excludes the lands of the Navajo Nation but does include Ute Mountain tribal territory within San Juan County borders. Chapter 24 of this TSD addresses the portion of San Juan County that is part of the Navajo Nation, and includes an assessment of the Navajo Nation's modeling analysis of the Four Corners Power Plant. Chapter 24 also explains why we intend to designate the Navajo Nation portions of San Juan County separately from the remainder of San Juan County.

San Juan County's northern border acts as the border between New Mexico and Colorado. Likewise, San Juan County's western border acts as the border between New Mexico and Arizona.

The EPA concludes that our intended unclassifiable/attainment area, consisting of San Juan County, New Mexico, excluding Navajo Nation but including portions of the Ute Mountain Tribal territory within San Juan County is comprised of clearly defined legal boundaries, and we find these boundaries to be a suitably clear basis for defining our intended unclassifiable/attainment area for the 2010 1-hour SO₂ NAAQS.

3.6. Results of Separate Modeling Focusing on Four Corners Power Plant

The EPA's TSD for Navajo Nation provides an assessment of modeling information submitted by the tribe for Four Corners Power Plant. This information includes information on modeled concentrations in some of the portions of San Juan County that are outside Navajo Nation. The modeling results did not indicate any NAAQS violation in these portions of the county, and thus those results support the conclusions reached in this chapter.

3.7. The EPA's Assessment of the Available Information for the San Juan County, New Mexico, Area

When evaluating the modeling submitted by the State, no major issues were identified. The modeling showed attainment, and the modeling generally followed EPA guidance, including the TAD with the exception of the previously discussed background concentrations. We have noted conservative factors (i.e., tending to overestimate concentrations) in the emissions used and in how background concentrations were incorporated that make the modeling analysis conservative. Instead of using actuals for the other 20 facilities, the modeling was done using short term permit allowable emissions, which is conservative. The sum of the allowables (based on short-term permit limits) modeled was over 2,000 tpy, but the 2014 NEI only had one source over 100 tpy and many sources were less than 20 tpy in 2014 and overall 2014 NEI actuals were approximately 50% of the amount modeled. There is some conservatism in the background concentrations that were incorporated into the modeled concentrations. Furthermore, this is a worst case analysis for the area around the San Juan Generating Station as it is required to shut down 2 of the 4 boilers by the end of 2017, through a federally enforceable and effective requirement in New Mexico's approved regional haze plan, that will result in maximum impacts from the facility being reduced by approximately 50%.

The State did not recommend an area boundary for this round of designations. We intend to designate the area within San Juan County as unclassifiable/attainment, excluding Navajo Nation territory but including Ute Mountain Tribal territory within San Juan County. Additionally, the EPA confirmed that there were no other sources in San Juan County or near its borders that were likely to cause or contribute to a violation of the NAAQS within San Juan County or in the surrounding counties. The nearest unmodeled source near San Juan County (Resolute Natural Resources Company – Aneth Unit) is over 90 km from San Juan Power Station and is far enough away that San Juan Power Station is not expected to cause significant concentrations in its area of impact. There are no known areas of nonattainment or near nonattainment in surrounding counties. Based on our review of the 2014 emission inventory in surrounding counties there is no area where nonattainment values could occur where the San Juan Generating Station could contribute. The modeling for Four Corners Power Plant in Navajo Nation, included in Chapter 24 of this TSD, demonstrates that no exceedance of the NAAQS occurs there, so San Juan Generating Station does not contribute to a NAAQS violation in Navajo Nation.

3.8. Summary of Our Intended Designation for the San Juan County, New Mexico, Area

After careful evaluation of the State's recommendation and supporting information, as well as all available relevant information, the EPA intends to designate a portion of San Juan County as a

separate unclassifiable/attainment area for the 2010 SO₂ NAAQS. Specifically, the intended designated area is comprised of San Juan County, New Mexico (excluding Navajo Nation tribal territory within San Juan County, and including Ute Mountain tribal territory within San Juan County). Figure 1 shows the boundary of this intended designated area.

4. Remaining Counties in New Mexico

4.1. Introduction

The state has not installed and begun timely operation of a new, approved SO₂ monitoring network meeting EPA specifications referenced in the EPA’s SO₂ DRR for any sources of SO₂ emissions in the counties identified in Table 7. Accordingly, the EPA must designate these counties by December 31, 2017. At this time, there are no air quality modeling results available to the EPA for these counties. In addition, there are no air quality monitoring data that indicate any violation of the 1-hour SO₂ NAAQS. The EPA intends to designate the counties listed in Table 7 as separate “unclassifiable/attainment” areas since these counties were not required to be characterized under 40 CFR 51.1203(c) or (d) and the EPA does not have available information including (but not limited to) appropriate modeling analyses and/or monitoring data that suggests that the area may (i) not be meeting the NAAQS, or (ii) contribute to ambient air quality in a nearby area that does not meet the NAAQS. Our intended designated areas would include tribal lands within these counties.

Table 7. Counties and Portions of Counties that the EPA Intends to Designate Unclassifiable/Attainment

County	New Mexico’s Recommended Area Definition	New Mexico’s Recommended Designation	EPA’s Intended Area Definition#	EPA’s Intended Designation
Bernalillo	Non-Tribal Lands in Bernalillo County	Unclassifiable	Bernalillo County	Unclassifiable/attainment
Catron	Non-Tribal Lands in Catron County	Unclassifiable	Catron County	Unclassifiable/attainment
Chaves	Chaves County	Unclassifiable	Chaves County	Unclassifiable/attainment
Cibola	Non-Tribal Lands in Cibola County	Unclassifiable	Cibola County	Unclassifiable/attainment
Colfax	Colfax County	Unclassifiable	Colfax County	Unclassifiable/attainment
Curry	Curry County	Unclassifiable	Curry County	Unclassifiable/attainment
De Baca	De Baca County	Unclassifiable	De Baca County	Unclassifiable/attainment
Doña Ana	Dona Ana County	Unclassifiable	Doña Ana County	Unclassifiable/attainment
Eddy	Eddy County	Unclassifiable	Eddy County	Unclassifiable/attainment

County	New Mexico's Recommended Area Definition	New Mexico's Recommended Designation	EPA's Intended Area Definition#	EPA's Intended Designation
Grant	Grant County	Unclassifiable	Grant County	Unclassifiable/attainment
Guadalupe	Guadalupe County	Unclassifiable	Guadalupe County	Unclassifiable/attainment
Harding	Harding County	Unclassifiable	Harding County	Unclassifiable/attainment
Hidalgo	Hidalgo County	Unclassifiable	Hidalgo County	Unclassifiable/attainment
Lea	Lea County	Unclassifiable	Lea County	Unclassifiable/attainment
Lincoln	Lincoln County	Unclassifiable	Lincoln County	Unclassifiable/attainment
Los Alamos	Non-Tribal Lands in Los Alamos County	Unclassifiable	Los Alamos County	Unclassifiable/attainment
Luna	Luna County	Unclassifiable	Luna County	Unclassifiable/attainment
McKinley	Non-Tribal Lands in McKinley County	Unclassifiable	McKinley County	Unclassifiable/attainment
Mora	Mora County	Unclassifiable	Mora County	Unclassifiable/attainment
Otero	Otero County	Unclassifiable	Otero County	Unclassifiable/attainment
Quay	Quay County	Unclassifiable	Quay County	Unclassifiable/attainment
Rio Arriba	Non-Tribal Lands in Rio Arriba County	Unclassifiable	Rio Arriba County	Unclassifiable/attainment
Roosevelt	Roosevelt County	Unclassifiable	Roosevelt County	Unclassifiable/attainment
San Miguel	San Miguel County	Unclassifiable	San Miguel County	Unclassifiable/attainment
Sandoval	Non-Tribal Lands in Sandoval County	Unclassifiable	Sandoval County	Unclassifiable/attainment
Santa Fe	Non-Tribal Lands in Santa Fe County	Unclassifiable	Santa Fe County	Unclassifiable/attainment
Sierra	Sierra County	Unclassifiable	Sierra County	Unclassifiable/attainment
Socorro	Non-Tribal Lands in Socorro County	Unclassifiable	Socorro County	Unclassifiable/attainment
Taos	Non-Tribal Lands in Taos County	Unclassifiable	Taos County	Unclassifiable/attainment

County	New Mexico's Recommended Area Definition	New Mexico's Recommended Designation	EPA's Intended Area Definition#	EPA's Intended Designation
Torrance	Torrance County	Unclassifiable	Torrance County	Unclassifiable/attainment
Union	Union County	Unclassifiable	Union County	Unclassifiable/attainment
Valencia	Non-Tribal Lands in Valencia County	Unclassifiable	Valencia County	Unclassifiable/attainment

Our intended designated areas would include all tribal lands within these counties. EPA is not determining the boundaries of any area of Indian country in this document, including any area of Indian country located in the larger designation area. The inclusion of any Indian country in the designation area is not a determination that the state has regulatory authority under the Clean Air Act for such Indian country.

Table 7 also summarizes New Mexico's recommendations for these areas. Specifically, in its recommendation letters dated May 24 and June 6, 2011, the state recommended that the entirety of all the counties in the state except tribal areas be designated as unclassifiable based on a review of existing monitoring data pending a reclassification to attainment. The tribes with lands within these counties did not offer any designation recommendations. After careful review of the state's assessment, supporting documentation, and all available data, the EPA intends to designate the areas listed in Table 7 as unclassifiable/attainment. Our intended designated areas would include all tribal lands within these counties. Figure 10 shows the locations of these areas within New Mexico relative to San Juan County which is intended to be designated in Round 3 based on the modeling analysis discussed in Section 3 of this chapter.

4.2. Air Quality Monitoring Data for the Remainder of the State

New Mexico operated three SO₂ monitors with sufficient valid data for 2014-2016 to calculate design values and these data indicate that there were no violations of the 2010 SO₂ NAAQS at the monitoring sites in that period (*see* Table 8).

Table 8: SO₂ Monitor Sites in New Mexico with Sufficient Data to Calculate a 2014-2016 Design Value

AQS Site ID #	County	Street Address	2014-2016 Design Value (ppb)
35-001-0023	Bernalillo	4700A SAN MATEO NE	6
35-045-0009	San Juan	162 HWAY 544, BLOOMFIELD NM 87413	3
35-045-1005	San Juan	USBR SHIPROCK SUBSTATION	8

4.3. Jurisdictional Boundaries in the Remainder of the State

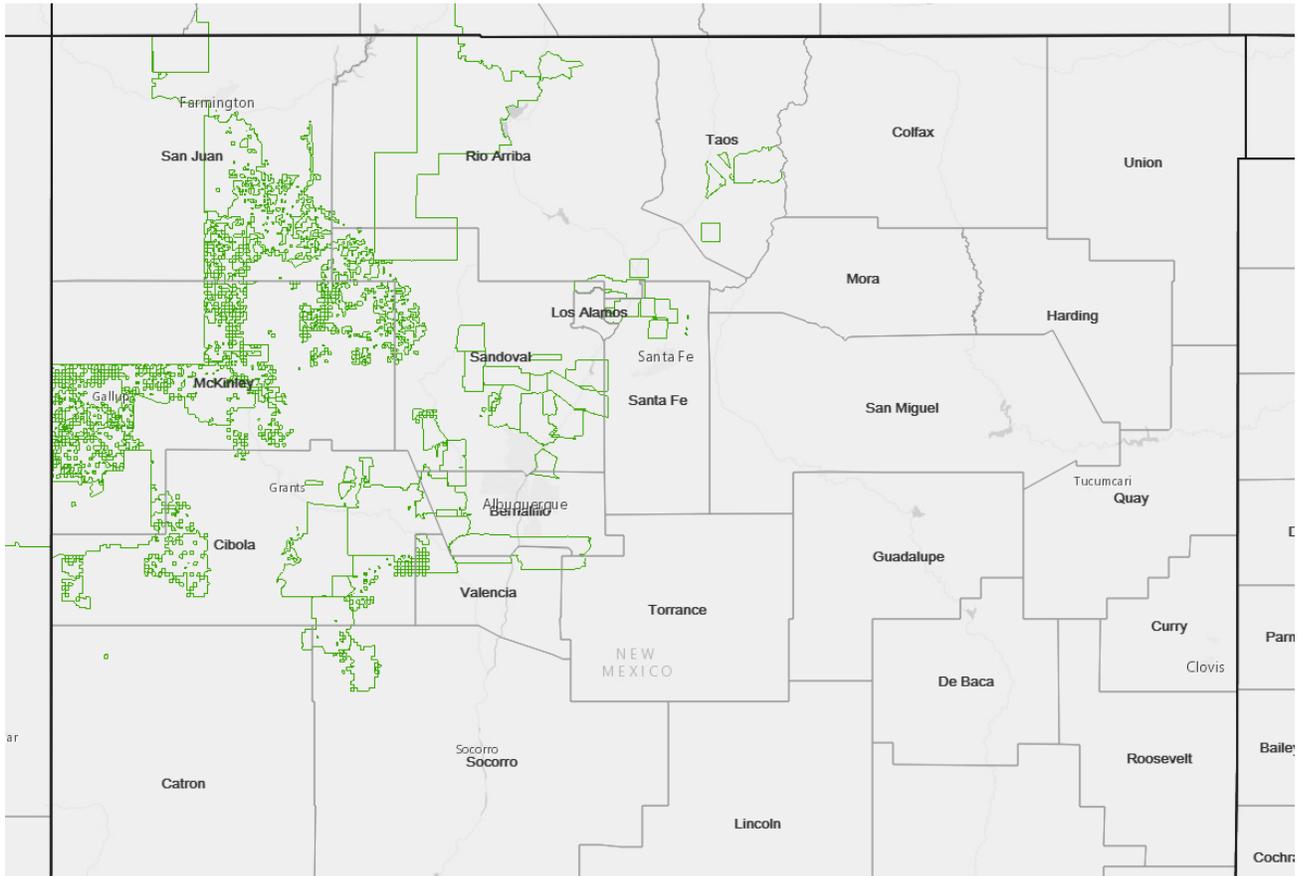
Existing jurisdictional boundaries are considered for the purpose of informing the EPA's designation action for these counties in New Mexico. Our goal is to base designations on clearly defined legal boundaries, and to have these boundaries align with existing administrative boundaries when reasonable.

In its recommendation letter dated May 24, 2011, the state recommended that non-tribal lands in Bernalillo County, New Mexico, be designated as unclassifiable based on a lack of data and pending an anticipated reclassification to attainment based on a newly installed monitor in the county. Bernalillo County is under the jurisdiction of the City of Albuquerque/Bernalillo Air Quality Division.

In its recommendation letter dated June 6 2011, the state recommended that all areas of New Mexico within the jurisdiction of NMED be designated as unclassifiable pending a reclassification to attainment based on the findings of New Mexico's Clean Air Act 110(a)(1) Maintenance Plan for SO₂ sources in the state. The NMED has authority over air quality in all areas of New Mexico except Bernalillo County and tribal lands. The State's recommendation was based on a review of 2008- 2010 ambient monitoring data and a finding that all areas of New Mexico within the jurisdiction of NMED were in compliance.

The tribal lands in New Mexico are shown in Figure 10 below. Portions of 12 counties in New Mexico contain tribal lands: Bernalillo, Catron, Cibola, Los Alamos, McKinley, Rio Arriba, San Juan, Sandoval, Santa Fe, Socorro, Taos, and Valencia. Except for San Juan County as described in section 3, our intended designated areas would include all tribal lands within these counties.

Figure 10. Tribal Lands in New Mexico



The EPA interprets the state’s recommendation letters as intending that the non-tribal lands in each county be designated as a separate area, using county boundaries. We intend to designate the listed counties in New Mexico as separate unclassifiable/attainment areas using county boundaries, including all tribal lands within each county.

4.4. The EPA’s Assessment of the Available Information for the Remainder of the State

After careful evaluation of the state’s recommendation and supporting information, as well as all available relevant information, the EPA intends to designate the counties listed in the above Table 7 as separate unclassifiable/attainment areas for the 2010 SO₂ NAAQS.

Our intended unclassifiable/attainment areas, bounded by the county boundaries, will have clearly defined legal boundaries, and we intend to find these boundaries to be a suitable basis for defining our intended unclassifiable/attainment areas. These areas were not required to be characterized, and while the EPA does not have the information to determine whether these areas are meeting or are not meeting the NAAQS and cannot determine whether the areas contribute to a violation in a nearby area, there is no information available that suggests that either of these is the case for any of these counties.

4.5. Summary of Our Intended Designation for the Remainder of the State

After careful evaluation of the state's recommendation and supporting information, as well as all available relevant information, the EPA intends to designate 32 counties as separate unclassifiable/attainment areas for the 2010 SO₂ NAAQS. Figure 11 shows the location of these areas within New Mexico.

Figure 11. Remaining Counties in New Mexico to be Designated as Unclassifiable/Attainment.

