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**2018 Annual Report**  
**SO<sub>2</sub> Emissions for the San Juan Generating Station**  
**Ongoing Requirements for the 2015 Data Requirements Rule**

Prepared by the New Mexico Environment Department

Air Quality Bureau

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## **Introduction**

Pursuant to Section 1205 of the Data Requirements Rule for the 2010 1-Hour Sulfur Dioxide (SO<sub>2</sub>) Primary National Ambient Air Quality Standard (NAAQS), air agencies are required to submit an annual report to their respective EPA Regional Administrator for areas which demonstrated attainment for the 2010 SO<sub>2</sub> NAAQS by modeling of actual emissions. This report shall document the annual SO<sub>2</sub> emissions of each applicable source and provide an assessment of the cause of any emissions increase from the previous year. The first report is due by July 1 of the calendar year after the effective date of the area's initial designation.

All areas of New Mexico have been designated attainment/unclassifiable through three rounds of designations by the U.S. Environmental Protection Agency (EPA). As part of the round 3 designation process, the 2015 Data Requirements Rule stipulated that, for areas surrounding sources emitting 2,000 tons per year (TPY) or more of sulfur dioxide, states must characterize air quality in one of three ways: (1) ambient air monitoring; (2) modeling of either actual or allowable emissions; or (3) demonstration of enforceable emissions limitations below the 2,000 TPY threshold.

In New Mexico, the only source emitting above the 2,000 TPY threshold was the San Juan Generating Station (SJGS). This source, working with the Air Quality Bureau, decided to characterize that area's air quality by modeling actual emissions. Modeling submitted to EPA in January 2017 demonstrated that this area met the 2010 SO<sub>2</sub> Primary NAAQS, using quality-assured data from the SJGS' continuous emissions monitoring system (CEMS) for the years 2013 - 2015. EPA designated this area as attainment/unclassifiable in December 2017.

This is the first annual report required by the 2015 Data Requirements Rule. The New Mexico Environment Department (NMED) has assessed the 2016 and 2017 emissions data generated by the SJGS CEMS. Since emissions for both years have decreased from 2015 levels and 3-year averages also show an emissions decrease, NMED recommends that no new modeling for this source be required. In addition, because two of the four generating units have now been permanently shut down, NMED anticipates that this source will emit less than the 2,000 TPY threshold in the future.

## **Emissions Data Summary – San Juan Generating Station**

SO<sub>2</sub> emissions from SJGS are recorded by the station's continuous emissions monitoring system (CEMS). Data is quality assured by the source and submitted annually to NMED. A summary of the main trends in SO<sub>2</sub> data is shown in Table 1, below.

**Table 1:** Trends in SO<sub>2</sub> emissions from San Juan Generating Station by year.

Year	Annual 1-hour average SO <sub>2</sub> emissions (lbs./hr.)	Annual 1-hour maximum SO <sub>2</sub> emissions (lbs./hr.)	99 <sup>th</sup> percentile of 1-hour daily maximum SO <sub>2</sub> emissions (lbs./hr.)
2013	1627.41	5170.16	4191.17
2014	1112.82	5654.98	3826.12
2015	772.98	5373.22	4565.88
2016	649.47	5121.94	3637.60
2017	703.71	3515.77	2997.42

In 2017, the annual 1-hour average SO<sub>2</sub> emissions increased from 2016, due to increased unit operational efficiencies. During 2016, all four units experienced more downtime due to maintenance issues or other unexpected malfunctions. However, in 2017, all four units maintained a higher operational efficiency which resulted in less downtime and therefore, increased loads (2016 average load 372.4 MW/day; 2017 average load 383.6 MW/day) and emissions. Both amounts (for 2016 and 2017) show a decrease from the modeled years of 2013-2015. Also, the annual maxima for 2016 and 2017 and the 99<sup>th</sup> percentile of daily maxima for 2016 and 2017 show significant decreases from the modeled years of 2013-2015.

In addition to annual trends shown by the CEMS data, total SO<sub>2</sub> emissions data submitted to NMED and EPA annually show a similar trend. 2017 shows a slight increase from 2016 emissions, due to increased operations; however, both 2016 and 2017 are below 2015 levels, the lowest levels in the modeled years. This trend is shown in Table 2, below.

**Table 2:** Total annual SO<sub>2</sub> emissions by year<sup>1</sup>.

Year	Total SO <sub>2</sub> emissions (tons)	Change in Total SO <sub>2</sub> emissions from previous year (tons)
2013	5493	
2014	4508	<985>
2015	3161	<1347>
2016	2643	<518>
2017	2923 <sup>2</sup>	280

<sup>1</sup> 2013 – 2016 data from Energy Information Administration, plant level data.

[https://www.eia.gov/beta/electricity/data/browser/#/topic/1?agg=2,0,1&fuel=vtvv&sec=g&geo=g&freq=A&datecode=2016&tab=annual\\_emissions&start=200101&end=201710&ctype=linechart&ltype=pin&maptype=0&rse=0&p.in](https://www.eia.gov/beta/electricity/data/browser/#/topic/1?agg=2,0,1&fuel=vtvv&sec=g&geo=g&freq=A&datecode=2016&tab=annual_emissions&start=200101&end=201710&ctype=linechart&ltype=pin&maptype=0&rse=0&p.in). Accessed 28 February 2018.

<sup>2</sup> 2017 data from the New Mexico Environment Department's Emissions Analysis Tool.

<https://eatool.air.net.env.nm.gov/aqbeatool/facility-report?sourceData=NMED&year=2016&facilityId=1421>. Accessed 27 March 2018.

The initial attainment demonstration, modeling actual emissions, used an average of the years 2013-2015. The tables above show that annual emissions, average hourly emissions, maximum emissions and 99<sup>th</sup> percentile daily maxima of hourly emissions for 2016 and 2017 are lower than each year modeled. To compare trends since the modeling, Table 3, below, summarizes the 3-year averages for each of these parameters.

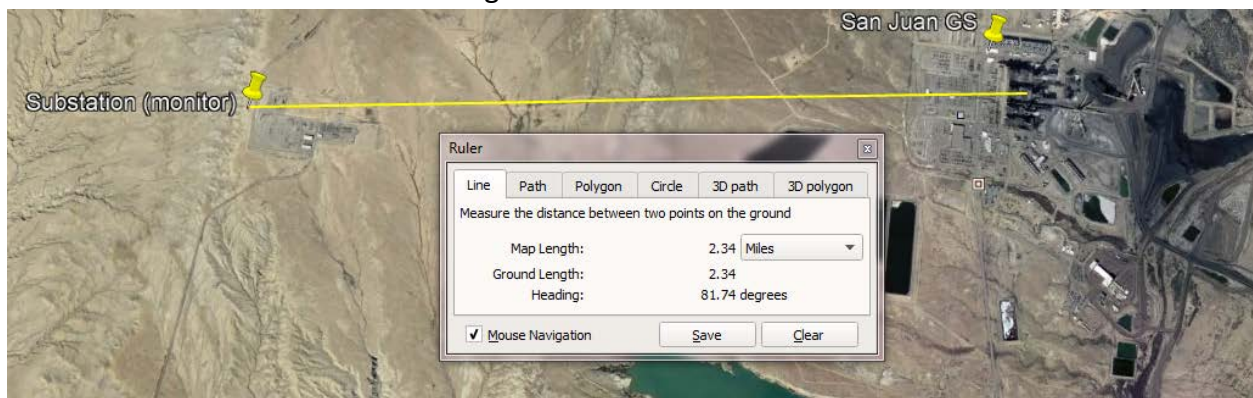
**Table 3:** Trends in 3-year averages. Note that 2014-2016 and 2015-2017 averages are significantly below the modeled years' (2013-2015) average.

Years	Average 1-hr SO <sub>2</sub> (lbs./hr.)	Maximum daily 1-hr SO <sub>2</sub> (lbs./hr.)	99 <sup>th</sup> percentile maximum 1-hr SO <sub>2</sub> (lbs./hr.)	Total SO <sub>2</sub> (tons/year)
2013-2015	1171.07	5732.79	4194.39	4387
2014-2016	845.09	5383.38	4009.87	3437
2015-2017	708.72	4670.31	3733.63	2909

### Monitoring Data Summary – San Juan Substation, NMED Monitor 1H

NMED operates an ambient air monitoring station (1H San Juan Substation, 35-045-1005), located at 36.79667 degrees latitude and -108.47250 degrees longitude, approximately 2.34 miles nearly due west of the San Juan Generating Station. This monitor is the nearest ambient air monitor to SJGS. See Figure 1, below.

**Figure 1:** Google Earth image calculating the distance between the San Juan Substation monitor and the stacks at San Juan Generating Station.



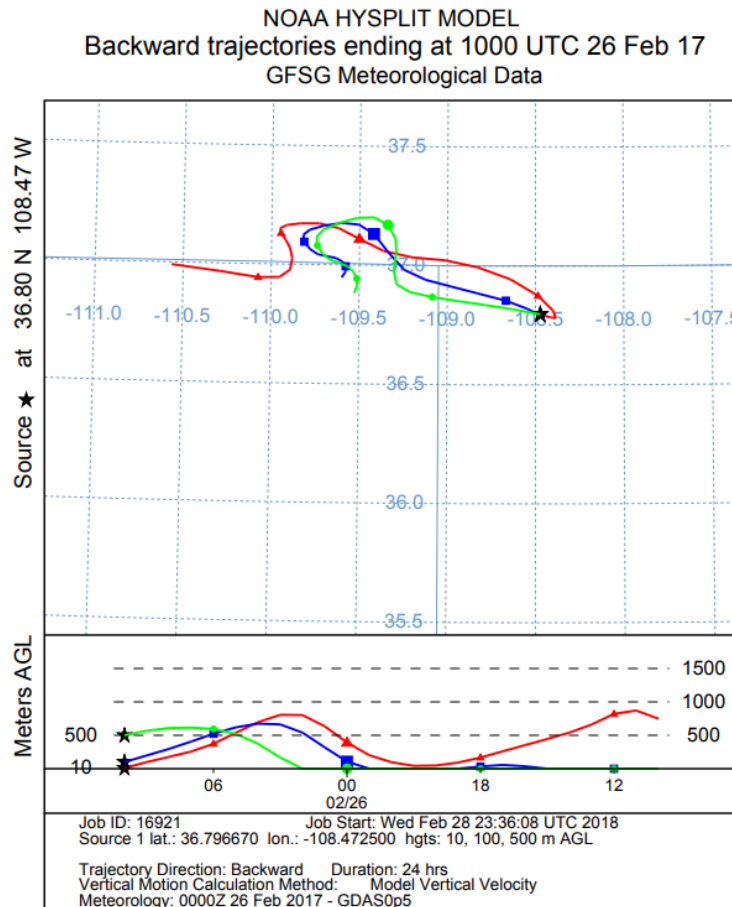
This monitor is not located near enough to SJGS to be used for regulatory purposes related to the Data Requirements Rule. However, an overview of the monitoring data indicates that SO<sub>2</sub> concentrations in the ambient air are regularly well below the SO<sub>2</sub> standard. The form of the standard, the 99<sup>th</sup> percentile daily 1-hr maximum concentration (ppb), is shown in column 4 of Table 4, below.

**Table 4:** San Juan Substation SO<sub>2</sub> monitor data summary, 2013 – 2017.

Year	Mean SO <sub>2</sub> concentration (ppb)	Maximum SO <sub>2</sub> concentration (ppb)	99 <sup>th</sup> percentile concentration (ppb)	Number of hours exceeding 75 ppb
2013	0	32	5	0
2014	0	18	2	0
2015	0	1	1	0
2016	0	16	3	0
2017	0	85	8	1

Except for 2017, no hourly concentration exceeded 75 ppb. The maximum concentration in 2017 of 85 ppb was recorded on February 26, 2017 at 3:00 am. A Hysplit 24-hour back trajectory indicates that the source of this concentration spike was not due to San Juan Generating Station. The likely source of the pollution was west of the monitor. SJGS is east of the monitor. See Figure 2, below.

**Figure 2:** Hysplit 24-hour back trajectory for San Juan Substation monitor, ending at 1000 UTC (0300 MST).



## **Discussion and Recommendation**

The above summary tables show that for all parameters, SO<sub>2</sub> emissions from the San Juan Generating Station have decreased since the 2013-2015 modeling, which showed the area in attainment of the 2010 1-hour primary SO<sub>2</sub> standard. Although 2017 showed a slight increase in the average hourly emissions and the annual emissions from the previous year, this trend is not expected to continue since two of the four units at the facility have permanently shut down as of December 2017. Further, all other emissions trends have steadily decreased since the modeling years, which showed the area in attainment of the 2010 primary 1-hr SO<sub>2</sub> NAAQS.

Monitoring data near SJGS also show that ambient air quality meets the 2010 1-hour primary SO<sub>2</sub> standard for all years, 2013 – 2017, of 75 ppb.

Since emissions are decreasing and are expected to be significantly lower in future years, and since monitoring data near SJGS show acceptable SO<sub>2</sub> concentrations for 2013 – 2017, NMED recommends that EPA not require re-modeling for either 2014-2016 or 2015-2017.