**Final Technical Support Document**

North Dakota
Area Designations for the 2010 $SO_2$ Primary National Ambient Air Quality Standard


Summary

Pursuant to section 107(d) of the Clean Air Act (CAA), the U.S. Environmental Protection Agency (EPA, or the Agency) must designate areas as either "unclassifiable," "attainment," or "nonattainment" for the 2010 1-hour sulfur dioxide ($SO_2$) primary national ambient air quality standard (NAAQS). Section 107(d) of the CAA defines a nonattainment area as one that does not meet the NAAQS or that contributes to a NAAQS violation in a nearby area, an attainment area as any area other than a nonattainment area that meets the NAAQS, and an unclassifiable area as any area that cannot be classified on the basis of available information as meeting or not meeting the NAAQS.

July 2, 2016, is the deadline established by the U.S. District Court for the Northern District of California for the EPA to designate certain areas. This deadline is the first of three deadlines established by the court for the EPA to complete area designations for the 2010 $SO_2$ NAAQS. This deadline applies to certain areas in North Dakota because 3 emission sources meet the conditions of the court's order.

North Dakota submitted updated recommendations on September 16, 2015. Table 1 below lists North Dakota's recommendations and identifies the counties in North Dakota that the EPA is designating in order to meet the July 2, 2016 court-ordered deadline. These final designations are 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.


**Table 1 – North Dakota's Recommended and the EPA's Final Designations**

| Area | State's Recommended Area Definition | State's Recommended Designation | EPA's Final Area Definition | EPA's Final Designation |
|---|---|---|---|---|
| McLean County/Eastern Mercer County, North Dakota | Unspecified (Area around source) | Attainment | McLean Co., North Dakota (full county),<br><br>Within Mercer Co.:<br>Area east of CR-37/ND 31, east/north of ND 200 ALT, west of the eastern border of Mercer County/Missouri River, south of the | Unclassifiable/ Attainment |

| | | | | |
|---|---|---|---|---|
| | | | Knife River National Historic Site. (McLean County/Eastern Mercer County, ND) | |
| Central Mercer County, North Dakota | Unspecified (Area around source) | Attainment | Within Mercer Co.: Area west of ND 49/61st Ave SW, north of – Co. Rd 15/17th St. SW, east of Co. Rd 13, south and east of the town Zap, south of 8th St. SW/ND 200 (Central Mercer County, ND) | Unclassifiable/ Attainment |

## Background

On June 3, 2010, the EPA revised the primary (health based) $SO_2$ NAAQS by establishing a new 1-hour standard at a level of 75 parts per billion (ppb) which is met at an ambient air quality monitoring site when the 3-year average of the 99th percentile of 1-hour daily maximum concentrations does not exceed 75 ppb. This NAAQS was published in the *Federal Register* on June 22, 2010 (75 FR 35520), and is codified at 40 CFR 50.17. The EPA determined this is the level necessary to protect public health with an adequate margin of safety, especially for children, the elderly, and those with asthma. These groups are particularly susceptible to the health effects associated with breathing $SO_2$. The two prior primary standards of 140 ppb evaluated over 24 hours, and 30 ppb evaluated over an entire year, codified at 40 CFR 50.4, remain applicable.[1] However, the EPA is not currently designating areas on the basis of either of these two primary standards. Similarly, the secondary standard for $SO_2$, set at 500 ppb evaluated over 3 hours, codified at 40 CFR 50.5, has not been revised, and the EPA is also not currently designating areas on the basis of the secondary standard.

## General Approach and Schedule

[1] 40 CFR 50.4(e) provides that the two prior primary NAAQS will no longer apply to an area 1 year after its designation under the 2010 NAAQS, except that for areas designated nonattainment under the prior NAAQS as of August 22, 2010, and areas not meeting the requirements of a SIP Call under the prior NAAQS, the prior NAAQS will apply until that area submits and EPA approves a SIP providing for attainment of the 2010 NAAQS. North Dakota contains no such areas.

Section 107(d) of the CAA requires that not later than 1 year after promulgation of a new or revised NAAQS, state governors must submit their recommendations for designations and boundaries to EPA. Section 107(d) also requires the EPA to provide notification to states no less than 120 days prior to promulgating an initial area designation that is a modification of a state's recommendation. If a state does not submit designation recommendations, the EPA may promulgate the designations that it deems appropriate without prior notification to the state, although it is our intention to provide such notification when possible. If a state or tribe disagrees with the EPA's intended designations, it is given an opportunity within the 120-day period to demonstrate why any proposed modification is inappropriate. The EPA is required to complete designations within 2 years after promulgation of a new or revised NAAQS, unless EPA determines that sufficient information is not available, in which case the deadline is extended to 3 years. The 3-year deadline for the revised $SO_2$ NAAQS was June 2, 2013.

On August 5, 2013, the EPA published a final rule establishing air quality designations for 29 areas in the United States for the 2010 $SO_2$ NAAQS, based on recorded air quality monitoring data from 2009 - 2011 showing violations of the NAAQS (78 FR 47191). In that rulemaking, the EPA committed to address, in separate future actions, the designations for all other areas for which the Agency was not yet prepared to issue designations.

Following the initial August 5, 2013, designations, three lawsuits were filed against the EPA in different U.S. District Courts, alleging the Agency had failed to perform a nondiscretionary duty under the CAA by not designating all portions of the country by the June 2, 2013 deadline. In an effort intended to resolve the litigation in one of those cases, plaintiffs Sierra Club and the Natural Resources Defense Council and the EPA filed a proposed consent decree with the U.S. District Court for the Northern District of California. On March 2, 2015, the court entered the consent decree and issued an enforceable order for the EPA to complete the area designations according to the court-ordered schedule.

According to the court-ordered schedule, the EPA must complete the remaining designations by three specific deadlines. By no later than July 2, 2016 (16 months from the court's order), the EPA must designate two groups of areas: (1) areas that have newly monitored violations of the 2010 $SO_2$ NAAQS and (2) areas that contain any stationary sources that had not been announced as of March 2, 2015, for retirement and that according to the EPA's Air Markets Database emitted in 2012 either (i) more than 16,000 tons of $SO_2$ or (ii) more than 2,600 tons of $SO_2$ with an annual average emission rate of at least 0.45 pounds of $SO_2$ per one million British thermal units (lbs $SO_2$/mmBTU). Specifically, a stationary source with a coal-fired unit that as of January 1, 2010, had a capacity of over 5 megawatts and otherwise meets the emissions criteria, is excluded from the July 2, 2016, deadline if it had announced through a company public announcement, public utilities commission filing, consent decree, public legal settlement, final state or federal permit filing, or other similar means of communication, by March 2, 2015, that it will cease burning coal at that unit.

The last two deadlines for completing remaining designations are December 31, 2017, and December 31, 2020. The EPA has separately promulgated requirements for state and other air agencies to provide additional monitoring or modeling information on a timetable consistent with these designation deadlines. We expect this information to become available in time to help

inform these subsequent designations. These requirements were promulgated on August 21, 2015 (80 FR 51052), in a rule known as the $SO_2$ Data Requirements Rule (DRR), codified at 40 CFR part 51 subpart BB.

Updated designations guidance was issued by the EPA through 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 1-10. This memorandum supersedes earlier designation guidance for the 2010 $SO_2$ NAAQS, issued on March 24, 2011, and it identifies factors that the EPA intends to evaluate in determining whether areas are in violation of the 2010 $SO_2$ NAAQS. The guidance also contains the factors the EPA intends to evaluate in determining the boundaries for all remaining areas in the country, consistent with the court's order and schedule. 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. This guidance was supplemented by two non-binding technical assistance documents intended to assist states and other interested parties in their efforts to characterize air quality through air dispersion modeling or ambient air quality monitoring for sources that emit $SO_2$. Notably, the EPA's documents titled, "$SO_2$ NAAQS Designations Modeling Technical Assistance Document" (Modeling TAD) and "$SO_2$ NAAQS Designations Source-Oriented Monitoring Technical Assistance Document" (Monitoring TAD), were available to states and other interested parties. Both of these TADs were most recently updated in February 2016.

Based on complete, quality assured and certified ambient air quality data collected between 2013 and 2015, no violations of the 2010 $SO_2$ NAAQS have been recorded at ambient air quality monitors in any undesignated part of North Dakota. However, there are three sources in the State meeting the emissions criteria of the consent decree for which the EPA must complete designations by July 2, 2016. In this final technical support document, the EPA discusses its review and technical analysis of North Dakota's updated recommendations for the areas that we must designate. The EPA also discusses any intended and final modifications from the State's recommendations based on all available data before us.

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

1) 2010 $SO_2$ NAAQS – the primary NAAQS for $SO_2$ 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) Attaining monitor – an ambient air monitor meeting all methods, quality assurance, and siting criteria and requirements whose valid design value is less than or equal to 75 ppb, based on data analysis conducted in accordance with Appendix T of 40 CFR part 50.
3) 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.
4) Designated nonattainment area – an area which the EPA has determined has violated the 2010 $SO_2$ NAAQS or contributed to a violation in a nearby area. A nonattainment designation reflects considerations of the state's recommendations and all of the information discussed in this document. The EPA's decision is based on all available

information including the most recent 3 years of air quality monitoring data, available modeling analyses, and any other relevant information.

5) Designated unclassifiable area – an area for which the EPA cannot determine based on all available information whether or not it meets the 2010 $SO_2$ NAAQS.
6) Designated unclassifiable/attainment area – an area which the EPA has determined to have sufficient evidence to find either is attaining or is likely to be attaining the NAAQS. The EPA's decision is based on all available information including the most recent 3 years of air quality monitoring data, available modeling analyses, and any other relevant information.
7) Modeled violation – a violation based on air dispersion modeling.
8) Recommended attainment area – an area a state or tribe has recommended that the EPA designate as attainment.
9) Recommended nonattainment area – an area a state or tribe has recommended that the EPA designate as nonattainment.
10) Recommended unclassifiable area – an area a state or tribe has recommended that the EPA designate as unclassifiable.
11) Recommended unclassifiable/attainment area – an area a state or tribe has recommended that the EPA designate as unclassifiable/attainment.
12) Violating monitor – an ambient air monitor meeting all methods, quality assurance, and siting criteria and requirements whose valid design value exceeds 75 ppb, based on data analysis conducted in accordance with Appendix T of 40 CFR part 50.

## Technical Analysis for the McLean County/Eastern Mercer County Area

Introduction

The area in North Dakota including McLean County and the eastern portion of Mercer County contains two stationary sources that according to the EPA's Air Markets Database emitted in 2012 either more than 16,000 tons of $SO_2$ or more than 2,600 tons of $SO_2$ and had an annual average emission rate of at least 0.45 pounds of $SO_2$ per one million British thermal units (lbs $SO_2$/mmBTU). As of March 2, 2015, this stationary source had not met the criteria for being "announced for retirement." Specifically, in 2012, the Coal Creek Station emitted 16,273 tons of $SO_2$, and had an emissions rate of 0.34 lbs $SO_2$/mmBTU. Also in 2012, the Leland Olds Station emitted 38,323 tons of $SO_2$, and had an emissions rate of 2.06 lbs $SO_2$/mmBTU. Pursuant to the March 2, 2015 court-ordered schedule, the EPA must designate the area surrounding these facilities by July 2, 2016.

In its September 16, 2015 submission, North Dakota recommended that the area surrounding both the Coal Creek and Leland Olds Stations be designated as attainment based on an assessment and characterization of air quality from the facilities and other nearby sources (specifically, the Stanton Station near Leland Olds) which may have a potential impact in the area of analysis where maximum concentrations of $SO_2$ are expected. This assessment and characterization was performed using air dispersion modeling software, i.e., AERMOD, analyzing both actual emissions (for Stanton Station) and allowable emissions (for Leland Olds Station).

On February 16, 2016, the EPA notified North Dakota that the Agency intended to designate the McLean County/Eastern Mercer County area as unclassifiable. Additionally, we informed the state that our intended boundaries for the unclassifiable area consisted of the entirety of McLean County, and within Mercer County: the area east of CR-37/ND 31, east/north of ND 200 ALT, west of the eastern border of Mercer County/Missouri River, and south of the Knife River National Historic Site. Our intended designation and associated boundaries were based on the fact that the Leland Olds allowable emissions rate was not adequate to demonstrate attainment for the 2010 $SO_2$ NAAQS. Detailed rationale, analyses, and other information supporting our intended designation for this area can be found in the preliminary technical support document for North Dakota, and this document along with all others related to this rulemaking can be found in Docket ID EPA-HQ-OAR-2014-0464.

Assessment of New Information

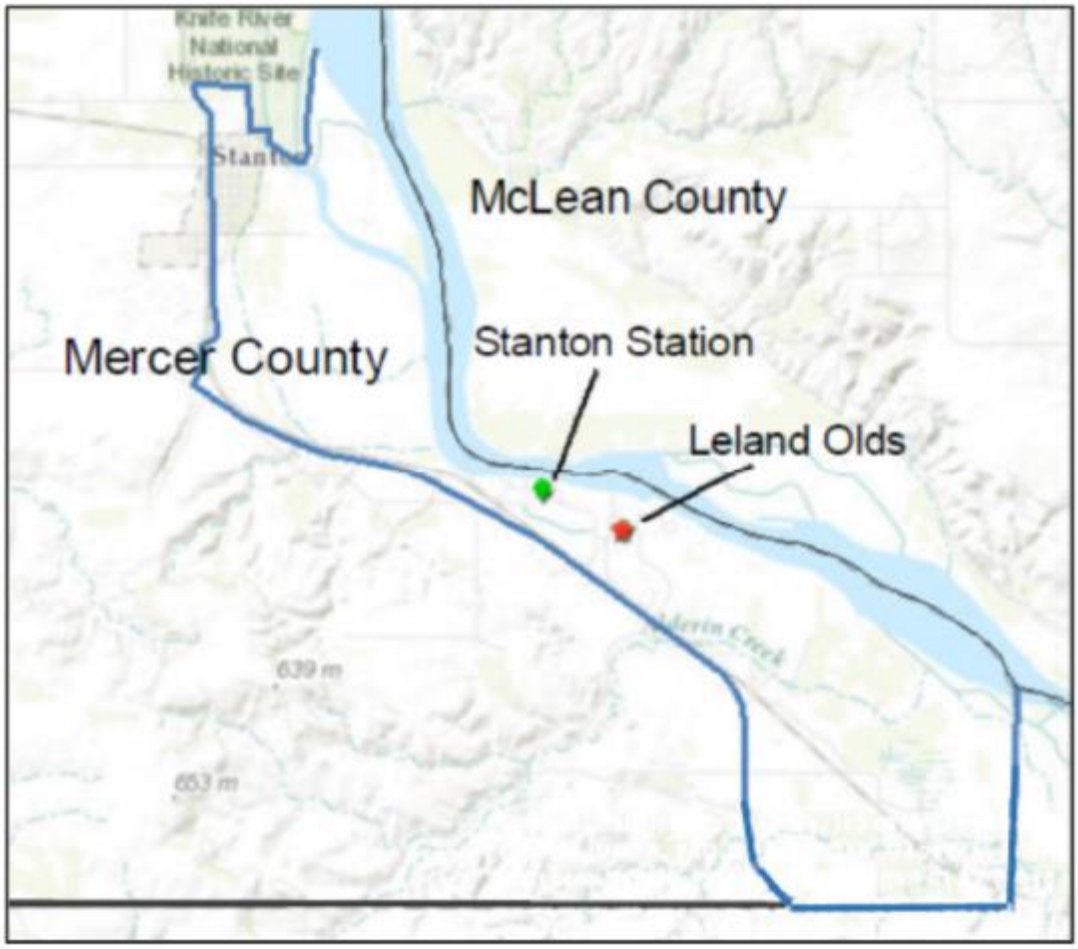
In our February 16, 2016 notification to North Dakota regarding our intended unclassifiable designation for the McLean County/Eastern Mercer County area, the EPA requested that any additional information that the Agency should consider prior to finalizing the designation should be submitted by April 19, 2016. On March 1, 2016, the EPA also published a notice of availability and public comment period in the *Federal Register*, inviting the public to review and provide input on our intended designations by March 31, 2016 (81 FR 10563).

The EPA is explicitly incorporating and relying upon the analyses and information presented in the preliminary technical support document for the purposes of our final designation for this area, except to the extent that any new information submitted to the EPA or conclusions presented in this final technical support document and our response to comments document (RTC), available in the docket, supersede those found in the preliminary document.

After carefully considering all available data and information, specifically the updated March 29, 2016 modeling conducted with an adequately conservative allowable emission rate for the Leland Olds Station, the EPA determines that the McLean County/Eastern Mercer County area is meeting the 2010 $SO_2$ NAAQS, and is designating the area as unclassifiable/attainment. The boundaries for this unclassifiable/attainment area still consist of the entirety of McLean County, and within Mercer County: the area east of CR-37/ND 31, east/north of ND 200 ALT, west of the eastern border of Mercer County/Missouri River, and south of the Knife River National Historic Site, and are shown in Figure 1 below, along with the locations of Coal Creek and Leland Olds. Figure 2 below provides an enhanced view of the Mercer County portion of the area, and includes the nearby emitter of $SO_2$ considered in this analysis, Stanton Station.

Figure 1. The EPA's final unclassifiable/attainment area: McLean County/Eastern Mercer County, North Dakota


Figure 2: Close up of the Mercer County portion of EPA's McLean and Mercer County combined designation.




As previously noted, the EPA is explicitly incorporating and relying upon the analyses and information presented in the preliminary technical support document for the purposes of our final designation for this area, except to the extent that any new information submitted to the EPA and our responses, or conclusions presented in this final technical support document.

Subsequent to our February 16, 2016 notification to the State, the EPA received additional information from the State regarding our intended unclassifiable designation for the McLean County/Eastern Mercer County, North Dakota area.

Specifically, the State submitted documentation including air dispersion modeling conducted by AECOM, Inc., which was contracted by Basin Electric Power Cooperative, to the EPA on March 29, 2016 asserting that this area should be designated attainment. This information was submitted to support a modification to our proposed designation. The discussion and analysis of this new information that follow reference the Modeling TAD, Monitoring TAD, and the factors for evaluation contained in the EPA's March 20, 2015 guidance, as appropriate and applicable.

*Model Selection and Modeling Components*

The EPA's Modeling TAD notes that for area designations under the 2010 $SO_2$ NAAQS, the AERMOD modeling system should be used, unless use of an alternative model can be justified. In some instances the recommended model may be a model other than AERMOD, such as the BLP model for buoyant line sources. 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
- BPIPPRIME: 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

In its September 16, 2015 designation recommendation, the State assessed AECOM modeling which utilized both the default options recommended by EPA in the modeling TAD, and non-default or beta configuration options for treating low-wind conditions. These non-default options include adjustments to the computation of the friction velocity (ADJ_U*) in the AERMET meteorological pre-processor and lateral wind speed standard deviation computations incorporated into AERMOD ("LOWWIND3" option). As noted in our February 16, 2016 technical support document, these analyses were not evaluated or approved by EPA prior to the utilization of these options in the modeling. For that reason, the EPA only reviewed the modeling analyses that used the current regulatory defaults to characterize $SO_2$ concentrations.

In its March 29, 2016, updated modeling demonstration, the State again utilized both the default and beta configuration options. The default options were not modified from the September 16, 2015, initial modeling demonstration, which the EPA determined to be appropriate with the exception of Leland Olds PTE emissions. Specifically, in the initial modeling demonstration AECOM modeled a federally enforceable PTE limit as the emissions for the Leland Olds Station to account for the wet scrubbers recently installed at the facility, but did not adjust this emission rate (0.15 lb/MMBtu on a 30-day rolling average) upward to account for emissions spikes that would be smoothed out over the longer term average.[2] As the EPA has already reviewed all other aspects of the default option-based modeling and found them to be appropriate, the EPA is only reviewing the change to the Leland Olds PTE emissions, and the impact of that change on the overall default option-based modeling demonstration, in this document. For EPA's review of and concurrence on all aspects (aside from the Leland Olds emission rate) of the state's default option-based modeling, please see the preliminary technical support document at pages 9-22. As discussed further below, the EPA considers the update to the Leland Olds emission rate to correct the problem with the initial modeling, making the March 29, 2016, modeling demonstration appropriate for the purposes of demonstrating attainment of and designation under the 2010 $SO_2$ NAAQS. The EPA did not review the portion of the state's modeling which utilized beta configuration options presented in its March 29, 2016 modeling demonstration, since, as for the use of these beta options in the original modeling, the State has not requested or received alternative model approval of these beta options from the respective Regional Office with concurrence from the EPA's Model Clearinghouse. The necessity for this EPA approval of

[2] See the preliminary technical support document at 14.

any regulatory application of AERMOD beta options was described in a December 10, 2015 clarification memorandum.[3] The EPA has determined that the model selection and components are appropriate.

*Modeling Parameter: Emissions*

The EPA's Modeling TAD notes that for the purposes 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 provides for the flexibility of using allowable emissions in the form of the most recently permitted (referred to as PTE or allowable) emissions rate.

The EPA believes that continuous emissions monitoring systems (CEMS) data provide acceptable historical emissions information when it is available and that 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 believes that detailed throughput, operating schedules, and emissions information from the impacted source should be used.

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. Specifically, a facility may have recently adopted a new federally enforceable emissions limit, been subject to a federally enforceable consent decree, or implemented other federally enforceable mechanisms and control technologies to limit $SO_2$ emissions to a level that indicates compliance with the NAAQS. These new limits or conditions may be used in the application of AERMOD. In these cases, the Modeling TAD notes that the existing $SO_2$ emissions inventories used for permitting or SIP planning demonstrations should contain the necessary emissions information for designations-related modeling. 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 noted, the original modeling relied upon by the State utilized PTE emissions from Leland Olds. North Dakota submitted its initial designation recommendation in September of 2015, meaning that the most recent the year of emissions data to be modeled at the time were 2012 – 2014. Basin Electric recently installed wet scrubbers on the facility (June 2013 for unit 1 and October 2012 for unit 2), and the State utilized PTE so that these controls would be taken into account. The modeled PTE rate for the facility in the State's initial recommendation was 1162.8 lbs/hr, which was based on continuous operation at the facility's SIP-approved maximum allowable 30-day rolling average rate of 0.15 lb/mmBTU. However, to properly account for short-term emissions spikes that can impact a one-hour rate but be smoothed out over a 30-day rate, the EPA recommends that an adjustment factor be applied to the modeled hourly emissions rate (see EPA's April 23, 2014 $SO_2$ Nonattainment Area Guidance at 25-37, and Appendices B, C and D). AECOM did not apply such a factor when modeling Leland Olds. Therefore, EPA found that the AECOM modeling analysis could not be relied upon for the purposes of

[3] https://www3.epa.gov/ttn/scram/guidance/clarification/AERMOD_Beta_Options_Memo-20151210.pdf

designating the area of McLean County (full) and Mercer County (partial) as attainment of the 1-hour standard, as the State recommended.

In the state's March 29, 2016 updated designation recommendation, the modeling demonstration retained all of the previous inputs, but adjusted the emission rate at Leland Olds to account for the 30-day rolling average emission rate. The State indicated in its cover letter that 1,430.3 lb/hr would be the appropriate emission rate after adjustment. However, Basin Electric elected to use an especially conservative emissions rate of 3,876 lb/hr, which is greater than three times the BART limit. This number was derived by multiplying 0.5 lb/MMBtu by three times the full-load heat input rate. Table 2 summarizes the $SO_2$ emissions assumed for each source in the modeling analysis. The only values in this table which have changed from the State's September 2015 designation recommendation are those for Leland Olds. In that analysis, the $SO_2$ emissions for each year were 5,093.075 tons/$SO_2$.

Table 3: $SO_2$ Emissions for 2012-2014 from Coal Creek and Stanton stations, and assumed PTE for Leland Olds station.

| Facility Name | Units | Type of Emissions | $SO_2$ Emissions (tons per year) | | |
|---|---|---|---|---|---|
| | | | 2012 | 2013 | 2014 |
| Coal Creek Station | Unit 1 | Actuals | 8030.85 | 8241.61 | 7713.68 |
| | Unit 2 | Actuals | 8240.38 | 7340.04 | 7900.64 |
| Stanton Station | Unit 1/Unit 10 Modeled as Single Unit | Actuals | 2379.36 | 2061.10 | 2573.12 |
| Leland Olds Station[1] | Unit 1/Unit 2 Modeled as Single Unit | PTE | 16976.88 | 16976.88 | 16976.88 |

[1] BART Permit $SO_2$ Limit – 0.15 lb/mmBTU: Unit 1 rated at 2662 mmBTU/hr and Unit 2 rated at 5130 mmBTU/hr.

The EPA considers the actual emissions based on CEMS data used for the Coal Creek and Stanton to be accurate and appropriate. The EPA considers the PTE emissions used for the Leland Olds Station to have been adjusted to account for short-term emission spikes that can be smoothed out over a 30-day rolling rate, and indeed to have gone far beyond that adjustment. Though the EPA considers the PTE rate for Leland Olds to be quite conservative,[4] we find that this is acceptable as this rate errs on the side of overestimation of impacts from the Leland Olds facility. The EPA has therefore determined that these emissions are acceptable.

*Summary of Modeling Results*

The AERMOD modeling parameters for the Leland Olds, Coal Creek, and Stanton stations modeling analysis are summarized below in Table 4.

Table 4: AERMOD Modeling Parameters for the McLean County and Eastern Mercer County Area of Analysis

[4] In EPA's April 23, 2014 $SO_2$ Nonattainment Area Guidance, Appendix D, the EPA calculates the average ratio of a 30-day average SO2 emission limit to be roughly 0.71 times as stringent as the same 1-hour limit for a unit with wet scrubbers. Basin Electric's 30-day average SO2 emission limit was adjusted as though it was .3 times as stringent as the same 1-hour limit.

| | |
|---|---|
| AERMOD Version | 15181 |
| Dispersion Characteristics | Rural |
| Modeled Sources | 3 |
| Modeled Stacks | 4 |
| Modeled Structures | 4 |
| Modeled Fence lines | 0 |
| Total receptors | 30,163 |
| Emissions Type | Coal Creek: Actual<br>Stanton: Actual<br>Leland Olds: PTE |
| Emissions Years | Actuals: 2012-2014 (Coal Creek and Stanton)<br>PTE: Unit 1 2013/ Unit 2 2012 (Leland Olds) |
| Meteorology Years | 2012-2014 |
| Surface Meteorology Station | Beulah, North Dakota |
| Upper Air Meteorology Station | Bismarck, North Dakota |
| Methodology for Calculating Background $SO_2$ Concentration | Temporal Varying |
| Calculated Background $SO_2$ Concentration | 0.80 ppb to 4.07 ppb |

The State's updated modeling indicates that the predicted 99$^{th}$ percentile of daily 1-hour average concentration within the selected modeling domain is 167.3 $\mu g/m^3$. This modeled concentration included the background concentration of $SO_2$, and is based on actual emissions from the Coal Creek and Stanton stations, and PTE emissions from the Leland Olds Station. The results presented below in Table 4 show the magnitude and geographic location of the highest predicted modeled concentration from the modeling analysis.

Table 4. Maximum Predicted 99th Percentile 1-Hour $SO_2$ Concentration

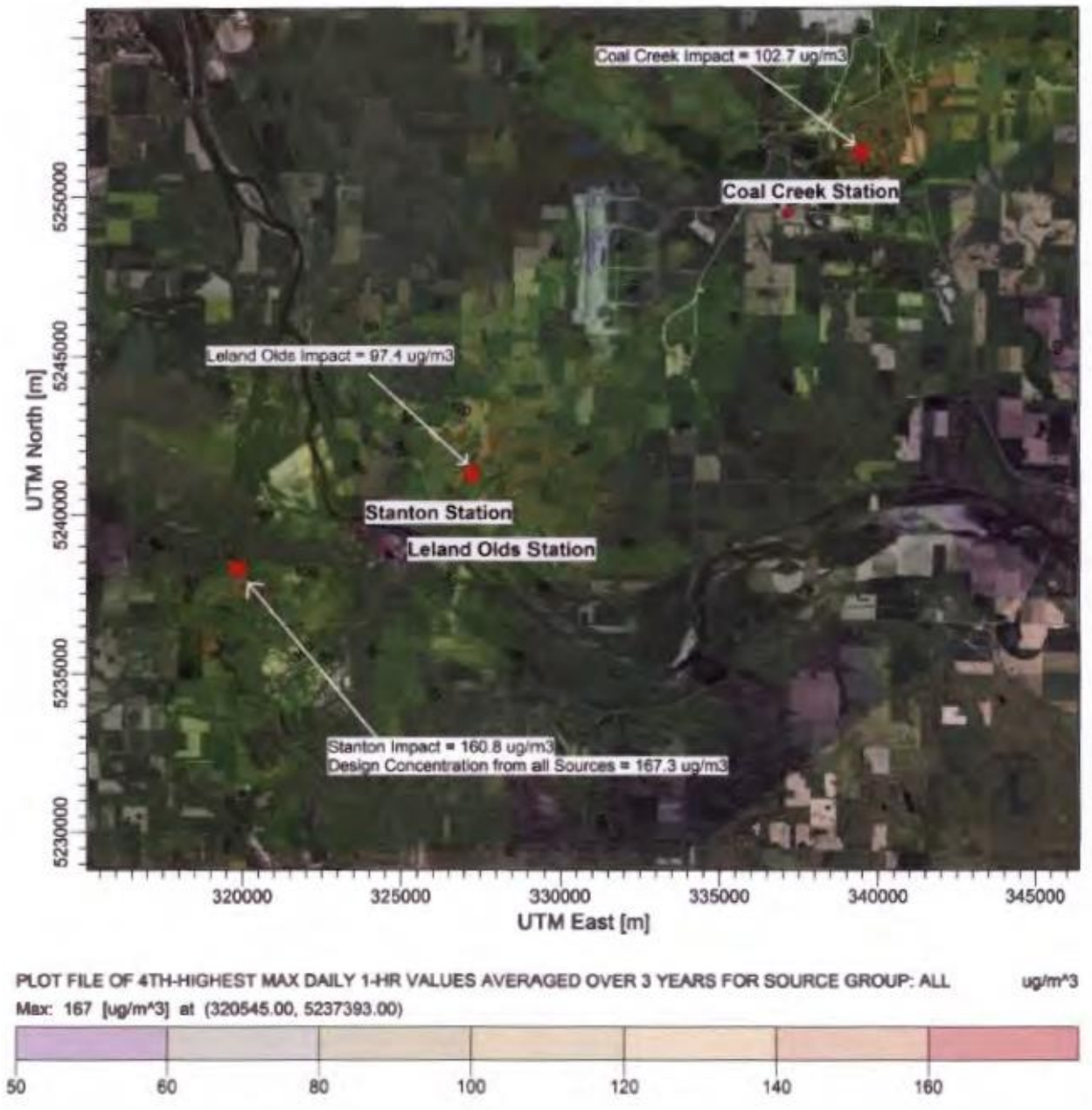
| | | Receptor Location | | $SO_2$ Concentration ($\mu g/m^3$) | |
|---|---|---|---|---|---|
| Averaging Period | Data Period | UTM/Latitude | UTM/Longitude | Modeled (including background) | NAAQS |
| 99th Percentile 1-Hour Average | 2012-2014 | 320545.00 | 5237393.00 | 167.3 | 196.5* |

*Equivalent to the 2010 $SO_2$ NAAQS set at 75 ppb.

Figure 3 below was included as part of the State's March 29, 2016 updated recommendation, and indicates that the predicted value occurred northwest of the Coal Creek station. The State also provided updated modeling analyses that were based on modeling that used non-default or beta configuration options for treating low-wind conditions. These non-default options include adjustments to the computation of the friction velocity (ADJ_U*) in the AERMET meteorological pre-processor and lateral wind speed standard deviation computations incorporated into AERMOD ("LOWWIND3" option). While the state provided these additional

analyses, these analyses were not evaluated or approved by the EPA prior to utilization of these options in the modeling. At this time, the EPA will only support the modeling analyses that used the current regulatory defaults to characterize $SO_2$ concentrations for the designations due July 2, 2016, unless a state has sought and obtained approval to use an alternative model from the respective Regional Office with concurrence from the EPA's Model Clearinghouse. Since the State did not request or receive such approval of its use of the beta options, the EPA is not relying upon them for this particular designations.

Figure 3: Maximum Predicted 99th Percentile 1-Hour $SO_2$ Concentrations from the Modeling Analysis



*Jurisdictional Boundaries:*

Once the geographic area of analysis associated with the Coal Creek, Leland Olds, Stanton stations, and background concentration is determined, existing jurisdictional boundaries are considered for the purpose of informing our unclassifiable/attainment area, specifically with respect to clearly defined legal boundaries.

The EPA notes that our unclassifiable/attainment area extends into only a portion of Mercer County. This is due to the fact that the consent decree also obligates us to designate the area around another source in Mercer County, i.e., Coyote Station, discussed below. Aside from Coal Creek Station, there are no other sources within McLean County that according to the 2011 NEI, emit at or above 100 tpy of $SO_2$. As a result, the EPA believes that a county-wide designation of unclassifiable/attainment is reasonable, as sources within McLean County are unlikely to cause or contribute to a violation of the NAAQS within the county or its neighboring areas.

The EPA believes that our unclassifiable/attainment area, consisting of the entirety of McLean County, North Dakota, and a portion of Mercer County as described in Table 1, is comprised of clearly defined legal boundaries, and we find these boundaries to be a suitably clear basis for defining our unclassifiable/attainment area.

*Other Relevant Information*

EPA did not receive any additional information on this designation aside from that submitted by the State.

Conclusion

After careful evaluation of the State's updated recommendation and supporting information, as well as all available relevant information, the EPA determines that the area around the Coal Creek, Leland Olds and Stanton stations is meeting the 2010 $SO_2$ NAAQS, and is designating the area as unclassifiable/attainment for the NAAQS. Specifically, the boundaries are comprised of McLean County, and within Mercer County: the area east of CR-37/ND 31, east/north of ND 200 ALT, west of the eastern border of Mercer County/Missouri River, and south of the Knife River National Historic Site (see Figure 1).

## Technical Analysis for Central Mercer County, North Dakota (Area Surrounding Coyote Station)

Introduction

The central portion of Mercer County, North Dakota contains a stationary source that according to the EPA's Air Markets Database emitted in 2012 either more than 16,000 tons of $SO_2$ or more than 2,600 tons of $SO_2$ and had an annual average emission rate of at least 0.45 pounds of $SO_2$ per one million British thermal units (lbs $SO_2$/mmBTU). As of March 2, 2015, this stationary source had not met the criteria for being "announced for retirement." Specifically, in 2012, the Coyote Station emitted 10,639 tons of $SO_2$, and had an emissions rate of 0.79 lbs $SO_2$/mmBTU.

Pursuant to the March 2, 2015 court-ordered schedule, the EPA must designate the area surrounding the facility by July 2, 2016.

As discussed in the preliminary technical support document, in its September 16, 2015 submission, North Dakota recommended that the area surrounding the Coyote Station be designated as attainment based on an assessment and characterization of air quality from the facility and other nearby sources which may have a potential impact in the area of analysis where maximum concentrations of $SO_2$ are expected. This assessment and characterization was performed using air dispersion modeling software, i.e., AERMOD, analyzing actual emissions. The EPA determined that this modeling demonstration was conducted consistent with the recommendations in the modeling TAD. After careful review of the state's assessment, supporting documentation, and all available data, the EPA agreed that the area is attaining the NAAQS, and in the EPA's February 16, 2016 notification to the State indicated the Agency's intent to designate it as unclassifiable/attainment.

Assessment and Conclusion

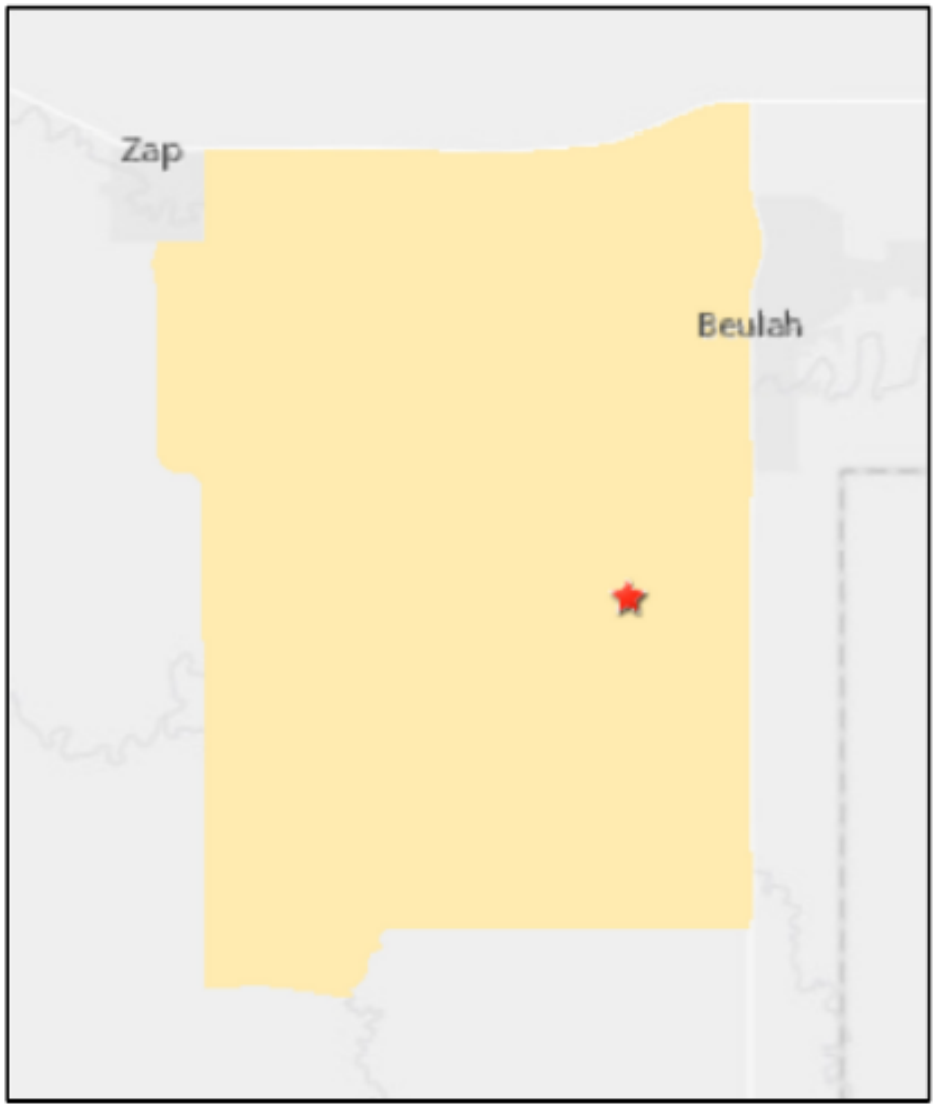
In the EPA's February 16, 2016, notification to North Dakota regarding our intended unclassifiable/attainment designation for the Coyote area, the EPA requested that any additional information that the Agency should consider prior to finalizing the designation should be submitted by April 19, 2016. On March 1, 2016, the EPA also published a notice of availability and public comment period in the *Federal Register,* inviting the public to review and provide input on our intended designations by March 31, 2016 (81 FR 10563).

The EPA is explicitly incorporating and relying upon the analyses and information presented in the preliminary technical support document for the purposes of our final designation for this area, except to the extent that any new information submitted to the EPA or conclusions presented in this final technical support document and our response to comments document (RTC), available in the docket, supersede those found in the preliminary document.

The EPA did not receive any additional information from North Dakota, nor did we receive any public comments regarding our intended unclassifiable/attainment designation for the Central Mercer County area.

Therefore, based on the information available to the EPA at this time including the analyses performed for the purposes of the preliminary technical support document and in the absence of any new information that would otherwise lead to a different conclusion regarding air quality in the area or any new information that would otherwise lead to a different conclusion regarding the area boundaries, the EPA is determining that the Central Mercer County area is meeting the 2010 $SO_2$ NAAQS, and is designating the area as unclassifiable/attainment for the NAAQS. The boundaries for this unclassifiable/attainment, nonattainment area consist of the area west of ND 49/61st Ave SW, north of Co. Rd 15/17th St. SW, east of Co. Rd 13, south and east of the town Zap, and south of 8th St. SW/ND 200.

Figure 5. The EPA's final unclassifiable/attainment area: Central Mercer County, North Dakota




At this time, our final designations for the State only apply to this area and the McLean County/Eastern Mercer County, North Dakota area discussed earlier in this document. Consistent with the court-ordered schedule, the EPA will evaluate and designate all remaining undesignated areas in North Dakota by either December 31, 2017, or December 31, 2020.