

## Draft Technical Support Document (TSD)

### **Montana Area Designations For the 2010 SO<sub>2</sub> Primary National Ambient Air Quality Standard**

#### **Summary**

Pursuant to section 107(d) of the Clean Air Act (CAA), EPA must initially designate areas as either “unclassifiable”, “attainment”, or “nonattainment” for the 2010 1-hour sulfur dioxide (SO<sub>2</sub>) primary national ambient air quality standard (NAAQS). The CAA defines a nonattainment area as one that does not meet the NAAQS or that contributes to poor air quality in a nearby area that does not meet the NAAQS. Areas that cannot be classified based on available information as meeting or not meeting the NAAQS will be deferred. Table 1 below identifies the counties or portions of counties (or areas of Indian country) in Montana that EPA intends to designate “nonattainment” based on monitored violations.

**Table 1. Nonattainment Area Designations for Montana**

Area	Montana’s Recommended Designation of Counties	EPA’s Intended Designation of Counties
Yellowstone County Yellowstone County: excluding Crow Tribe of Montana	Unclassifiable	Nonattainment

#### **Background**

On June 2, 2010, EPA revised the primary SO<sub>2</sub> NAAQS (75 FR 35520, June 22, 2010) by establishing a new 1-hour standard at a level of 75 parts per billion (ppb) which is attained when the 3-year average of the 99<sup>th</sup> percentile of the daily maximum 1-hour average concentration at each monitor in an area does not exceed 75 ppb. EPA has determined that this is the level necessary to provide protection of 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<sub>2</sub>. The Agency is revoking the two prior primary standards of 140 ppb evaluated over 24-hours, and 30 ppb evaluated over an entire year because the standards will not add additional public health protection given a 1-hour standard at 75 ppb. Accordingly, EPA is not designating areas in this process on the basis of either of these two prior primary standards. Similarly, the secondary standard for SO<sub>2</sub> has not been revised, so EPA is not designating areas in this process on the basis of the secondary standard.

#### **EPA’s SO<sub>2</sub> Designation Approach**

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. This deadline was in June 2011. Section 107(d) also requires EPA to provide a notification to states of no less than 120-days prior to promulgating an initial area designation that is a modification of a state’s recommendation. EPA has reviewed the State’s recommendations and has notified the State through a

letter signed by the Regional Administrator on February 6, 2013, of any intended modifications. [While language in section 107 specifically addresses states, we intend to follow the same process for tribes, pursuant to section 301(d) of the CAA and Tribal Authority Rule (40 CFR Part 49). Therefore, we intend to designate areas of Indian country, in consultation with the tribes, on the same schedule as state designations.] If a State or Tribe did not submit designation recommendations, EPA will promulgate the designations that it deems appropriate. If a state or Tribe disagrees with EPA's intended area designations, they have an opportunity to demonstrate why any proposed modification is inappropriate.

The Crow Tribe of Montana's area of Indian country is located adjacent to the intended Yellowstone county nonattainment area. This area of Indian country does not contain any sources that are contributing to the violating monitor in Yellowstone County. Therefore, EPA intends to exclude Crow Tribe of Montana's area of Indian country from the Yellowstone County nonattainment area and defer designations for the area of Indian country.

Designations guidance was issued by EPA through a March 24, 2011, 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. This memorandum identifies factors EPA intends to evaluate in determining boundaries for areas designated nonattainment. These 5 factors include: 1) Air quality data; 2) Emissions and emissions-related data (location of sources and potential contribution to ambient SO<sub>2</sub> concentrations); 3) Meteorology (weather/transport patterns); 4) Geography/topography (mountain ranges or other air basin boundaries); and 5) Jurisdictional boundaries (e.g., counties, air districts, pre-existing nonattainment areas, reservations, metropolitan planning organization), among any other information deemed relevant to establishing appropriate area designations and boundaries for the 1-hour SO<sub>2</sub> NAAQS.

The March 24, 2011, memo recommended that area boundaries be defaulted to the county boundary unless additional provided information justifies a larger or smaller boundary than that of the county. EPA believes it is appropriate to evaluate each potential area on a case-by-case basis, and to recognize that area-specific analyses conducted by states, tribes and/or EPA may support a different boundary than a default county boundary.

In this TSD, EPA discusses its review and technical analysis of the recommendations submitted by the states and/or tribes for designations of the 1-hour SO<sub>2</sub> standard and any modifications from these recommendations.

***Definition of important terms used in this document:***

1) **Designated "nonattainment" area** – an area which EPA has determined, based on a state recommendation and/or on the technical analysis included in this document, has violated the 2010 SO<sub>2</sub> NAAQS, based on the most recent three years of air quality monitoring data, or contributes to a violation in a nearby area.

2) **Recommended nonattainment area** – an area a State or Tribe has recommended to EPA be designated as nonattainment.

3) **Violating monitor** – an ambient air monitor meeting all methods, quality assurance and citing criteria and requirements whose valid design value exceeds 75 ppb, as described in Appendix T of 40 CFR part 50.

4) **2010 SO<sub>2</sub> NAAQS** - 75 ppb, national ambient air quality standard for SO<sub>2</sub> promulgated in 2010. Based on the 3-year average of the 99<sup>th</sup> percentile of the annual distribution of daily maximum 1-hour average concentrations

5) **Design Value** – a statistic that describes the air quality status of a given area relative to the level of the NAAQS.

### **Nonattainment Designations**

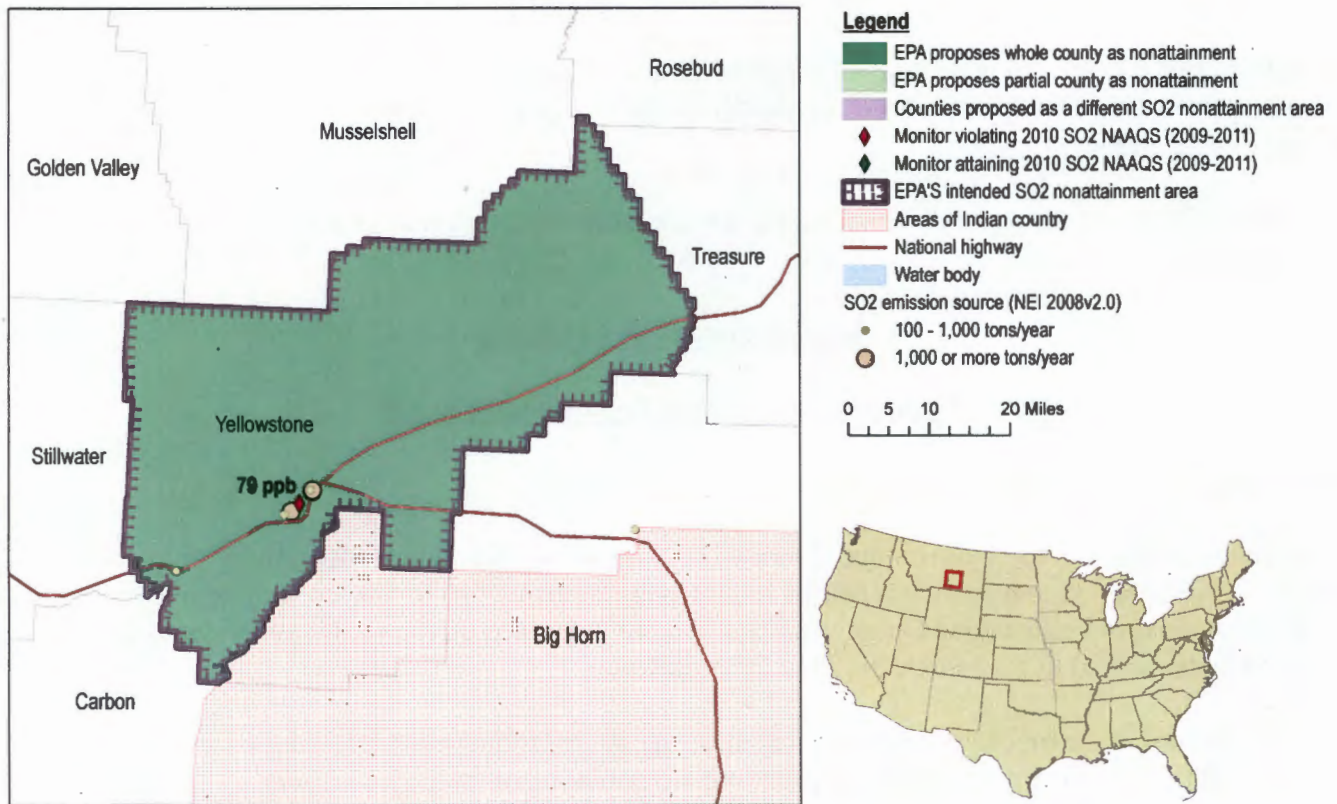
#### **Technical analysis for Yellowstone County**

##### **Introduction**

This technical analysis for Yellowstone County identifies the whole county with a monitor that violates the 2010 SO<sub>2</sub> NAAQS and evaluates nearby counties for contributions to SO<sub>2</sub> concentrations in the area. EPA has evaluated Yellowstone County and nearby counties based on the weight of evidence of the factors recommended in the March 24, 2011 EPA guidance.

Figure 1, below, is a map of the area analyzed showing the locations and design values of air quality monitors in the area, and the counties surrounding any violating air quality monitors.

**Figure 1. Map of the Analyzed Area with Design Values at the Monitoring Sites.  
Yellowstone County, MT**



From Figure 1 above, all of the facilities that emit SO<sub>2</sub> are located within the Southern part of Yellowstone County. These facilities are located within the Laurel/Billings area. The major SO<sub>2</sub> emitting industries in the Billings area are the ConocoPhillips and ExxonMobil Petroleum Refineries; Western Sugar Company (sugarbeet processing plant); PPL Montana, LLC – J.E. Corette (PPL – Corette) coal-fired electrical generating station; Montana Sulphur Chemical Company (MSCC) (gas processing plant, sulfur recovery and sulfur products); and Yellowstone Energy Limited Partnership (YELP) (petroleum coke-fired electrical/steam co-generation facility.) The major SO<sub>2</sub> emitting industry in the Laurel area is the Cenex Harvest States, Inc. (CHS) Petroleum Refinery. Although Laurel and Billings are 15 miles apart, the industries in Billings have some impact on the air quality in Laurel and the industry in Laurel has some impact on the air quality in Billings.

On May 27, 2011, Richard Opper, Director of Montana’s Department of Environmental Quality, recommended that Yellowstone County be designated as “unclassifiable” for the 2010 SO<sub>2</sub> NAAQS based primarily on a Consent Decree between ExxonMobil and EPA Region 8. The State discusses an emission increase from 2009 to 2010 being a direct result of ExxonMobil’s performance under an SO<sub>2</sub> additive testing schedule pursuant to an EPA consent decree. The State believes that consideration of 2010 monitoring data for initial designation purposes is inappropriate. Montana further states that they believe EPA should initially designate Yellowstone County as “unclassifiable” until such time as representative data is available. Montana discusses using, in lieu of using 2010 data, either 2009, 2011, and 2012 data or 2011-2013 data to determine a design value for comparisons to the NAAQS. Letter

and supporting analysis from Mr. Opper, to James B. Martin, Regional Administrator, USEPA, Region 8 (May 27, 2011) is on file with EPA Region 8 Air Program Unit.

Additionally, Montana discusses implementation of future regulations. These include: the EPA Refinery Initiative and Associated Consent Decrees, Utility MACT Implementation, Existing FIP Implementation, Regional Haze/BART Implementation, Boiler Maximum Achievable Control Technology (MACT) Implementation, New Source Performance Standards (NSPS) – 40 CFR 60 Subpart Ja, and EPA Flare Initiative. These will be discussed below.

Based on EPA's technical analysis of the State's TSD described below and based on this analysis EPA is intending to designate one county in Montana as nonattainment. For the 2010 SO<sub>2</sub> NAAQS, Yellowstone County will be designated as a nonattainment area, based upon currently available information. This county is listed above in Table 1.

### **Detailed Assessment**

#### ***Air Quality Data***

The Air Quality data factor considers SO<sub>2</sub> air quality monitoring data, including the design values (in ppb) calculated for all air quality monitors in the Yellowstone County and the surrounding area. The factor considered monitoring data for the 2008-2010 period.

The Director's recommendation was based on data from the Coburn Road (Monitor ID: 30-111-0066), a Federal Equivalent Method (FEM) monitor located in Yellowstone County. The Coburn Road monitor is classified as a State and Local Air Monitoring Station (SLAMS).

The majority of the monitored data in Table 2, below, was provided by the State in their recommendation letter and TSD. The table shows a summary of monitored NAAQS exceedances by quarter during the 2008-2010 time period. The EPA extended the table to include 2011 exceedances. The majority of exceedances occurred during the third and fourth calendar quarters of the 2008-2011 monitoring period.

**Table 2. Coburn Road SLAMS Monitored NAAQS Exceedances 2008-2011**

Calendar Year	Calendar Quarter	Number of Exceedances (> 75 ppb)
2008	1	0
	2	1
	3	2
	4	3
<b>2008 Total Exceedances</b>		<b>6</b>
2009	1	1
	2	0
	3	2
	4	0
<b>2009 Total Exceedances</b>		<b>3</b>
2010	1	1
	2	0
	3	4
	4	4
<b>2010 Total Exceedances</b>		<b>9</b>
2011	1	0
	2	0
	3	0
	4	4
<b>2011 Total Exceedances</b>		<b>3</b>
<b>2008-2011 Total Exceedances</b>		<b>21</b>

The State provided Table 3, below, in their recommendation letter and TSD. The EPA extended the table to include 2011 1-hour daily maximums. The table shows 1-hour daily maximum SO<sub>2</sub> values and these values were used to calculate the annual 99<sup>th</sup> percentile. The annual 99<sup>th</sup> percentile is highlighted in the table for each of the years 2008 through 2011.

The average of the 99<sup>th</sup> percentiles for 2008-2010 is 84 ppb and the average for 2009-2011 is 79 ppb. The averages are presented in Table 4 and show that using either of these time periods results in a violation of the 2010 SO<sub>2</sub> NAAQS at Coburn Road SLAMS. The data supports EPA's decision of designating Yellowstone County as a nonattainment area. The three year average 99<sup>th</sup> percentile for 2006 through 2008 and 2007 through 2009 are included in Table 4 and provide the perspective that that 1-hour SO<sub>2</sub> values have been generally consistent in the Billings area since 2008.

The State discussed with EPA that the increased SO<sub>2</sub> values in 2010 may have been the result of control measures taken at the ExxonMobil refinery. In 2010, the refinery installed and tested a SO<sub>2</sub> reducing catalyst. Testing the catalyst resulted in a brief period of higher SO<sub>2</sub> emissions than expected while the equipment under went the tests. The State pointed out that it was a temporary situation and that the catalyst is now operating correctly. Lower SO<sub>2</sub> emissions at ExxonMobil are now the result of the equipment operating correctly.

The State asked EPA to delay its decision of nonattainment status for the Billings area until more monitoring data could be collected while the catalyst was operating correctly. However, additional exceedances occurred during 2011 after ExxonMobil had implemented the catalyst controls and the catalyst was working correctly. As a result, EPA was not persuaded by the State's request. The NAAQS violations at the Coburn Road monitor after the installation of the catalyst supported EPA's preliminary decision to designate the area as nonattainment. The exceedances at the Coburn Road monitor appear to be a result of emissions from all facilities in the Billings/Laurel area, not just ExxonMobil.

**Table 3. Coburn Road SLAMS 1-Hour Daily Maximum SO<sub>2</sub> Values 2008-2011.**

2008		2009		2010		2011	
Date	ppb	Date	ppb	Date	ppb	Date	ppb
8/24	119	9/22	107	7/8	111	9/5	142
10/28	112	2/5	83	12/24	101	9/11	113
10/27	95	9/25	83	7/9	92	10/30	85
6/14	89*	1/20	72*	2/10	91*	9/30	74*
10/1	77	8/12	69	10/22	89	11/20	66

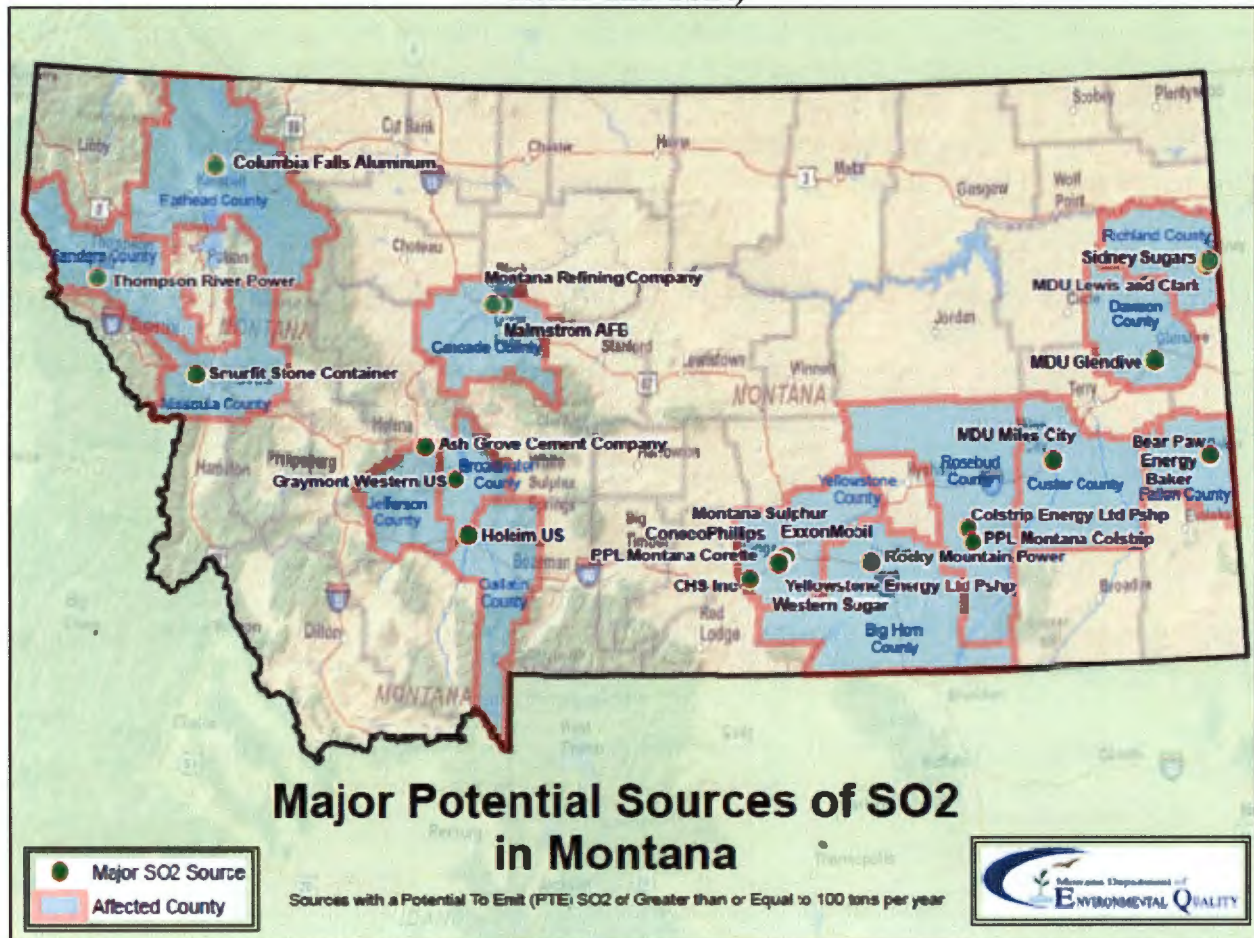
The 2006-2008, 2007-2009, 2008-2010, and 2009-2011 SO<sub>2</sub> NAAQS design values for Yellowstone County are shown in Table 4.

**Table 4. Air Quality Data for Nonattainment Designations in Montana**

County	State Recommended Nonattainment?	Monitor Name & System ID	Monitor Location	SO <sub>2</sub> Design Value, 2006-2008 (ppb)	SO <sub>2</sub> Design Value, 2007-2009 (ppb)	SO <sub>2</sub> Design Value, 2008-2010 (ppb)	SO <sub>2</sub> Design Value, 2009-2011 (ppb)
Yellowstone County, Montana	No	Coburn Road, 30-111-0066	½ mile south of I-94 Interchange on Coburn Road	73	73	84	79

Since Yellowstone County shows a violation of the 2010 SO<sub>2</sub> NAAQS; reviews of the surrounding counties were also undertaken and completed. The adjacent counties to Yellowstone County are: Musselshell, Rosebud, Treasure, Big Horn, Carbon, Stillwater, and Golden Valley. Of these seven adjacent counties, only Rosebud County had a regulatory industrial SO<sub>2</sub> monitor. There were no exceedances found at the SO<sub>2</sub> monitor in Rosebud. Additionally, due to the geography/topography of the surrounding area around the Billings/Laurel area where the violating monitor is located, there is only a very small possibility of emissions from the facilities in Rosebud County reaching the Coburn Road SLAMS monitor (see geographical/topographical section for discussion on geography and topography of Billings/Laurel area). The EPA also reviewed the five factors found in the March 24, 2011 guidance, for each of the seven counties and finds that it is appropriate to not designate any of these counties as nonattainment related to the violating monitor in Yellowstone County.

**Figure 2. Map of Major Potential Sources of SO<sub>2</sub> in Montana (Ref.: Montana Recommendation Letter and TSD.)**



***Emissions and Emissions-Related Data***

Evidence of SO<sub>2</sub> emissions sources in the vicinity of a violating monitor is an important factor for determining whether a nearby area is contributing to a monitored violation. For this factor, EPA evaluated county level emissions data for SO<sub>2</sub> and any growth in SO<sub>2</sub> emitting activities since the date represented by those emissions data.

**Emissions**

In Table 5 below, EPA calculated the average emissions in tpy for each source for the periods 2006-2008, 2007-2009, 2008-2010 and 2009-2011.



**Table 5. Billings/Laurel Area SO<sub>2</sub> Average Emissions. (Ref.: Montana's May 27, 2011 Recommendation Letter & TSD)**

County	Facility	Facility Location	2006-2008 SO <sub>2</sub> Average Emissions (tons/yr)	2007-2009 SO <sub>2</sub> Average Emissions (tons/yr)	2008-2010 SO <sub>2</sub> Average Emissions (tons/yr)	2009-2011 SO <sub>2</sub> Average Emissions (tons/yr)
Yellowstone County, Montana	PPL Montana – Corette	301 Charlene St. P.O. Box 30495 Billings, MT 59107	3,307	3,076	2,663	2,411
	ExxonMobil	700 Exxonmobil Rd, Billings, MT 59101	2,203	1,458	1,617	1,287
	*YELP	2215 N. Frontage Rd. Billings, MT 59101-7303	1,645	1,750	1,823	1,995
	**MSCC	627 Exxonmobil Rd. Billings, MT 59101	1,282	1,390	1,421	1,623
	***CHS	803 US Highway 212 S. Laurel, MT 59044	404	309	241	227
	Western Sugar	3020 State Ave. Billings, MT 59101	122	139	123	104
	ConocoPhilips	401 S. 23 <sup>rd</sup> St. Billings, MT 59101	201	169	103	86

\*Yellowstone Energy Limited Partnership (YELP)

\*\*Montana Sulphur & Chemical Company (MSCC)

\*\*\*Cenex Harvest States, Inc (CHS)

In Table 6 below, Montana provided information on total emissions of SO<sub>2</sub> (given in tons per year) that were from 2008 through 2011 for sources in Yellowstone County (Billings/Laurel area). Represented in the table are ExxonMobil's emissions for 2008, 2009, 2010, and 2011 which are 1,765; 696; 2,389; and 775 tons/year, respectively. This table shows that 2009 emissions for ExxonMobil were low compared to emissions in 2008 and 2010.

**Table 6. Billings/Laurel Area SO<sub>2</sub> Emissions (Ref.: Montana's May 27, 2011 Recommendation Letter & TSD)**

County	Facility	Facility Location	2008 SO <sub>2</sub> Emissions (tons/yr)	2009 SO <sub>2</sub> Emissions (tons/yr)	2010 SO <sub>2</sub> Emissions (tons/yr)	2011 SO <sub>2</sub> Emissions (tons/yr)	Total SO <sub>2</sub> Emissions (tons)
Yellowstone County, Montana	PPL Montana – Corette	301 Charlene St. P.O. Box 30495 Billings, MT 59107	2,929	2,788	2,271	2,174	10,162
	ExxonMobil	700 Exxonmobil Rd, Billings, MT 59101	1,765	696	2,389	775	5,625
	*YELP	2215 N. Frontage Rd. Billings, MT 59101-7303	1,590	2,062	1,816	2,106	7,574
	**MSCC	627 Exxonmobil Rd. Billings, MT 59101	1,320	1,559	1,383	1,927	6,189
	***CHS	803 US Highway 212 S. Laurel, MT 59044	268	231	225	226	950
	Western Sugar	3020 State Ave. Billings, MT 59101	138	133	98	80	449
	ConocoPhilips	401 S. 23 <sup>rd</sup> St. Billings, MT 59101	108	127	73	57	365

\*Yellowstone Energy Limited Partnership (YELP)

\*\*Montana Sulphur & Chemical Company (MSCC)

\*\*\*Cenex Harvest States, Inc (CHS)

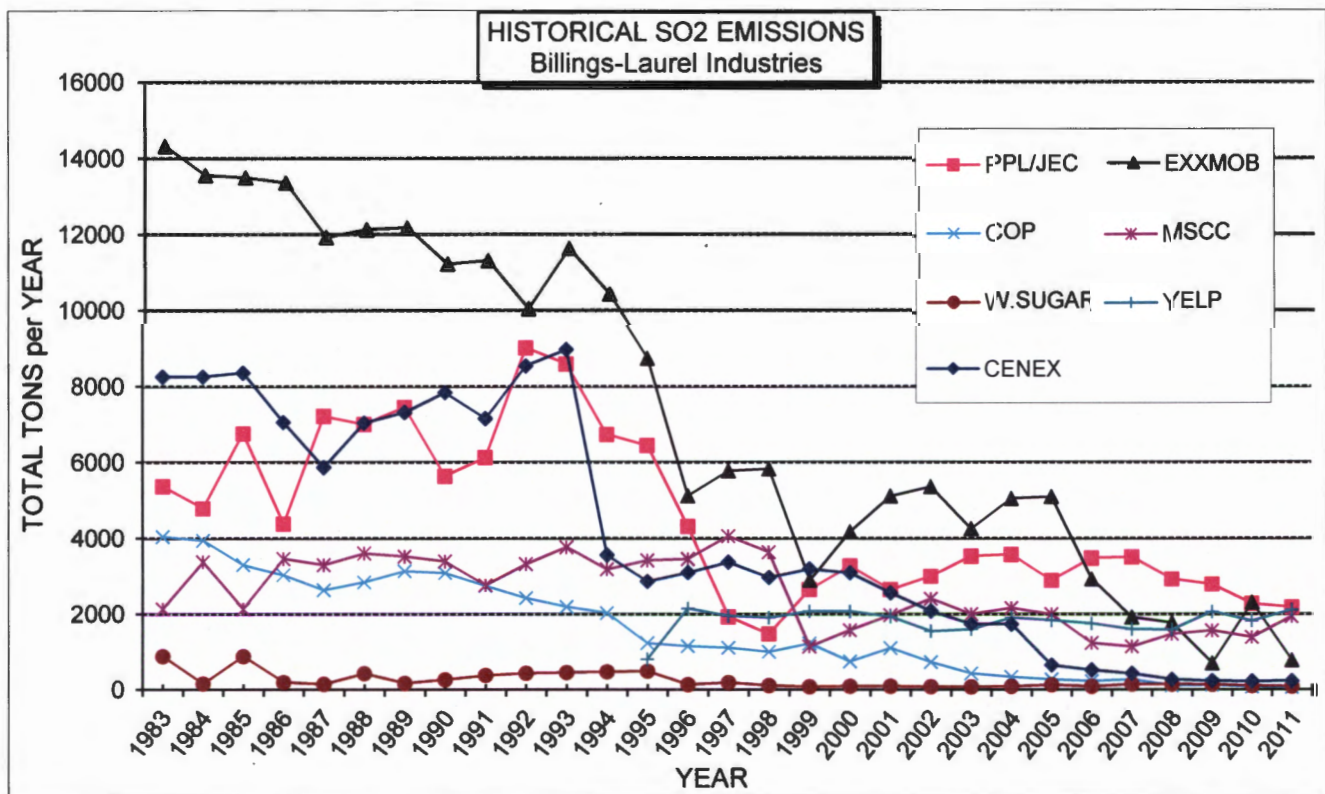
In Table 7 below, the State provided total SO<sub>2</sub> emissions (given in tons per year) for the years 2008, 2009, and 2010 and total emissions for all three years combined for sources within Yellowstone County emitting (or anticipated to contribute) greater than 100 tons per year of SO<sub>2</sub> according to the State's emissions inventories for 2008, 2009, and 2010. EPA provided total SO<sub>2</sub> emissions (given in tons per year) for 2011 and added the emissions to the total the State provided in their TSD. From these data, and from Figure 3, the 2009 emissions, and in addition 2011 data, appear to be low compared to past emissions and 2010. This is in contrast to what the State concluded, which is that the abnormal year was 2010 and that the monitored data from 2010 was inappropriate to use for initial designations. However, from the emissions and monitored data provided by the State in their TSD and as stated above, the 2010 emissions appear representative of normal emissions and thus the 2010 monitored data is appropriate to use for initial designations.

**Table 7. Billings/Laurel Area Combined Industrial SO<sub>2</sub> Emissions (Ref.: Montana Recommendation Letter & TSD)**

Emissions Year	Total SO <sub>2</sub> Emissions (tons/year)
2008	8,118
2009	7,595
2010	8,254
2011	7,345
<b>Total Emissions 2008-2011</b>	<b>31,312 tons</b>

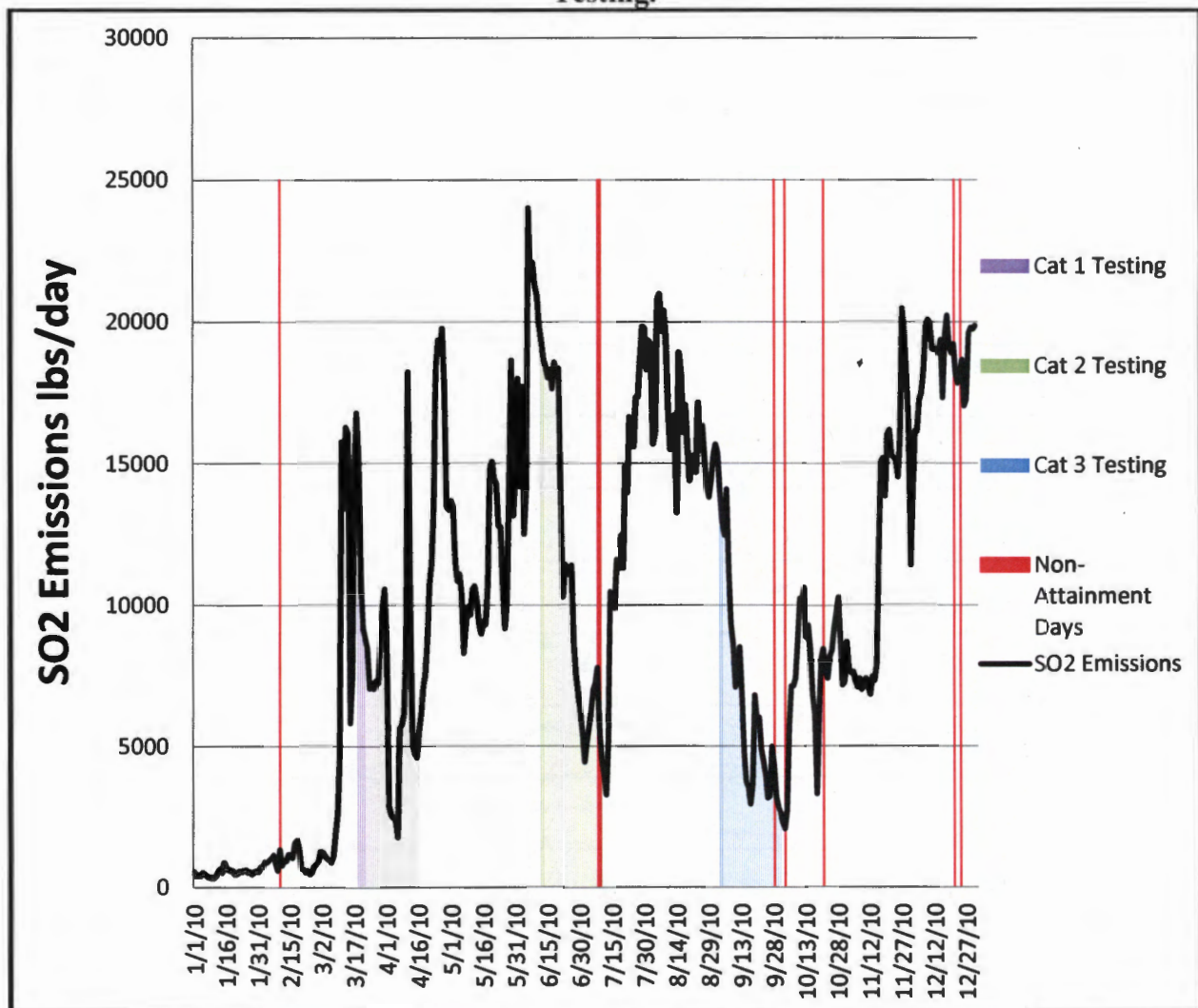
The State additionally concluded that performance testing for catalysts at ExxonMobil was the primary issue for the 1,700 ton/year increase from 696 tons/year in 2009 to 2,389 tons/year in 2010. Though when the emissions for ExxonMobil are shown in extended years, from 2008 through 2011, the 2008 and 2010 years are more representative of normal emissions and the 2009, and possibly 2011, emissions appear low (Table 6). Figure 3 shows historical SO<sub>2</sub> emissions for industries in the Billings/Laurel area using continuous emissions monitor (CEMs) data. In Figure 3 it shows a general decrease in emissions from ExxonMobil from 1995 through 2011. The 2009 data in Figure 3, from ExxonMobil is low compared to the last 15 years of CEMs data. Additionally, other facilities show almost uniform emissions from 2000 to 2010, which could have an impact on monitored data and possible exceedances in the 2008-2010 and 2009-2011 data sets.

**Figure 3. Historical SO<sub>2</sub> Emissions for Billings/Laurel Industries using CEMS data.**



In the Air Quality Data section of this TSD, ExxonMobil installation of a catalyst was discussed. In Figure 4, below, the 2010 SO<sub>2</sub> CEMs data is shown for the ExxonMobil refinery. Specifically, the figure shows the daily SO<sub>2</sub> emissions (in lbs/day) and the days where catalyst testing occurred. The highlight of purple is the timeframe when the first catalyst was tested, the green highlight is representative of the second catalyst testing, and blue shows the third and last catalyst tested. Days when exceedances were monitored of the 75 ppb standard are shown as the red lines in the figure. This graph represents the relationship between the exceedances and the catalyst testing at ExxonMobil. Even when the new catalysts were being tested, the exceedances occurred towards the end of the testing phase when it appears the company had broken in the catalyst and dialed in the conditions, which were the best for SO<sub>2</sub> control. From this observation the exceedances occurred during the lower, controlled emissions rates that were achieved by the catalysts. ExxonMobil indicated in a memo that they intended to go with the catalyst represented by the green highlighted area in the graph. So even with the new catalyst, emission conditions at the facility will exist that can result in NAAQS exceedances. While the new controls at the refinery will result in a reduction of SO<sub>2</sub>, it appears that others sources contribute to the exceedances in addition to the refinery and must be addressed to bring the area into attainment.

**Figure 4. CEMS SO<sub>2</sub> Data for ExxonMobil with Overlay of Exceedances in 2010 and Catalyst Testing.**



The State mentions that the Clean Air Act does not expect states to revise SIPs when federal requirements in the consent decree interfere with attainment of the NAAQS (42 USC §7410(a)(3)(C)). EPA believes that from Figure 4 above that the SO<sub>2</sub> reduction catalyst testing did not interfere with attainment of the 2010 SO<sub>2</sub> NAAQS since most of the exceedances were found when ExxonMobil had the catalysts working at their optimal capacity. Therefore, EPA believes that the CAA 42 USC §7410(a)(3)(C), does not apply to this instance.

Additionally, the State discusses 40 CFR 52.21(b)(48)(iii), which provides a definition of “Baseline actual emissions” with the inclusion of the following sentence: “The Administrator shall allow the use of a different time period upon a determination that it is more representative of normal source operation.” From the figures and tables presented in this TSD EPA believes that the 2009-2011 time period is representative of normal emissions.

From Figure 1, above, the map shows SO<sub>2</sub> emission sources in Yellowstone County and their relation to the air quality monitors. In addition, it shows EPA’s recommendation of the entire county of Yellowstone being the nonattainment area, which is circled in gray with a distance scale. EPA is recommending the entire county of Yellowstone as the nonattainment area due to the March 24, 2011 guidance, which discusses that area boundaries be defaulted to the county boundary unless provided information justifies a larger or smaller boundary than that of the county.

### Emissions Controls

The emissions data used by EPA in this technical analysis and provided in Table 6 represent emissions levels, taking into account any control strategies implemented on stationary sources in Yellowstone County up to and including 2008. Additionally, ExxonMobil will have SO<sub>2</sub> reducing catalysts implemented in 2011. EPA has received additional information on emissions reductions resulting from controls put into place after 2008 for ExxonMobil for their consent decree. These controls will be a SO<sub>2</sub> reducing catalyst that had the largest reduction in SO<sub>2</sub>. The addition of this SO<sub>2</sub> reducing catalyst could possibly lower the SO<sub>2</sub> monitored values at Coburn Road but due to the fact that since implementation of the catalyst in 2011 and Coburn Road monitor is still monitoring exceedances there seems to be a need for additional controls for facilities in the Billings/Laurel area.

### ***Meteorology (weather/transport patterns)***

For this factor, EPA considered meteorological data from the Billings Airport for six years (2006-2011). This data consisted of wind direction and wind speed which corresponded with the exceedance at Coburn Road monitor. Meteorology data is shown in the wind rose in the docket and Tables 8, 9, 10, and 11. The data may provide evidence of the potential for SO<sub>2</sub> emissions sources located upwind of a violating monitor to contribute to ambient SO<sub>2</sub> levels at the violation location.

Billings and Laurel are situated in the Yellowstone River Valley, which runs from the southwest to northeast. Wind roses for the area reflect the valley orientation with southwest winds being the most common.

According to the available data from the Billings International Airport, it appears that the exceedances shown in Tables 8, 9, 10, and 11 are primarily driven from emissions blown from the southwest, the predominate wind direction. Exceedances follow the trend as well, occurring mostly when the wind is blowing from the southwest. It should be noted that the Billings Airport is located on the opposite side of the valley as the Coburn Road Monitor, but both are on the northeast side of Billings and located above the valley floor. Additionally, ExxonMobil is located northeast of the Coburn Road Monitor and the Airport while the other facilities are located to the southwest of the monitor.

**Table 8. 2008 Exceedances (from AQS) with Wind Direction and Wind Speed.**

<b>Date and Time (Military)</b>	<b>Value (ppb)</b>	<b>Wind Direction (degrees)</b>	<b>Wind Speed (Meters/s)</b>
8/24 1:00	119	127	0.9
10/28 8:00	112	240	7.8
10/27 1:00	95	119	0.8
6/14 6:00	89	238	4.8
10/01 8:00	77	243	5.3

**Table 9. 2009 Design Values (from AQS) with Wind Direction and Wind Speed.**

<b>Date and Time (Military)</b>	<b>Value (ppb)</b>	<b>Wind Direction (degrees)</b>	<b>Wind Speed (Meters/s)</b>
9/22 9:00	107	Poor Quality Assurance Results	3.0
2/5 2:00	83	240	8.8
9/25 9:00	83	Poor Quality Assurance Results	4.1
1/20 5:00	72	238	12

**Table 10. 2010 Exceedances (from AQS) with Wind Direction and Wind Speed.**

<b>Date and Time (Military)</b>	<b>Value (ppb)</b>	<b>Wind Direction (degrees)</b>	<b>Wind Speed (Meters/s)</b>
2/10 4:00	91	Poor Quality Assurance Results	7.2
7/8 6:00	111	Machine Malfunction	3.7
7/9 6:00	92	Machine Malfunction	4.2
9/28 8:00	83	235	5.9
10/3 9:00	87	242	4.8
10/22 9:00	89	241	5.0
12/21 9:00	86	232	3.0
12/24 9:00	101	242	5.4

**Table 11. 2011 Exceedances (from AQS) with Wind Direction and Wind Speed.**

<b>Date and Time (Military)</b>	<b>Value (ppb)</b>	<b>Wind Direction (degrees)</b>	<b>Wind Speed (Meters/s)</b>
9/5 8:00	142	248	14.2
9/11 7:00	113	242	12.7
10/30	85	238.6	12.1

***Geography/Topography (mountain ranges or other air basin boundaries)***

The dominant topographical feature to influence airflow in the Billings and Laurel areas is the Yellowstone River Valley. The terrain in the vicinity of Billings and Laurel is upland bench which is steeply cut by the Yellowstone River and its tributaries. The bench lies at an elevation of 4,000 feet while the valley in Billings is approximately 3,000 feet above sea level and Laurel is approximately 3,300 feet above sea level. A constriction in the Yellowstone Valley occurs between central Billings and the Lockwood area located to the east. The valley is generally 3 or 4 miles wide but narrows to a little over a mile wide at the constriction. Nearby terrain, such as the Sacrifice Cliff to the southeast of Billings and the Rimrocks to the north, rises abruptly and is often higher than the tallest smoke stack. Laurel is located within the Yellowstone Valley approximately 15 miles southwest of Billings. The valley near Laurel is 3 or 4 miles wide. Nearby terrain to the northwest and southeast of Laurel rises abruptly and is often higher than the tallest smoke stack.

The geography/topography of the area has the possibility to restrict air flow and cause stagnation of an air mass. However, from Tables 8, 9, and 10 above, they show that even though the terrain signifies that there could be stagnation of air flow and inversion of the air mass, the wind speed does not stagnate and shows that there is continuous movement. However, this should not be interpreted to signify that the Billings/Laurel area has no inversion or stagnation occurrences.

***Jurisdictional Boundaries***

Yellowstone County has a nonattainment area for the 1971 24-hour primary SO<sub>2</sub> NAAQS at 0.14 ppm. This area is found within the Laurel area and the area is a 2 km radius around CHS. From the information presented above the Laurel nonattainment area could possibly be contributing to the exceedances and ultimately the violation at the Coburn Road SLAMS Monitor. Additionally, the information above shows that the industries in the Billings area are possibly contributing to the exceedances and the violation at the Coburn Road SLAMS Monitor. Since the Billings area is not included in the nonattainment area for the 1971 24-hour primary SO<sub>2</sub> NAAQS, EPA is recommending the entire county of Yellowstone be designated as the nonattainment area due to the March 24, 2011 guidance which discusses that area boundaries be defaulted to the county boundary unless provided information justifies a larger or smaller boundary than that of the county.

***Other Relevant Information***

Montana submitted in their recommendation letter and TSD a discussion of currently implemented SO<sub>2</sub> reducing requirements and future rules for implementation that the State believes will help reduce SO<sub>2</sub> further. These include: EPA Refinery Initiative and Associated Consent Decrees; Utility MACT Implementation; Existing Federal Implementation Plan (FIP) Implementation; Regional Haze/Best

Available Retrofit Technology (BART) Implementation; Boiler Maximum Achievable Control Technology (MACT) Implementation; New Source Performance Standards (NSPS) – 40 CFR 60, Subpart Ja; and EPA's Flare Initiative.

Montana's discussion on the EPA Refinery Initiative and Associated Consent Decree includes the SO<sub>2</sub> reduction additives in the fluidized catalytic cracker unit (FCCU), the treatment of sour water stripper overhead gas, enhanced flare gas recovery, and elimination of routine and continuous flaring of sour gas. The SO<sub>2</sub> reduction additives in the FCCU are discussed more fully in the previous sections and the 2008-2010 data appears representative of normal emissions. Additionally, the 2011 data is continuing to show exceedances and possibly will show a violation of the 2010 SO<sub>2</sub> NAAQS after the data is QA/QC. The treatment of sour water stripper overhead gas became effective in October 2009 and the SO<sub>2</sub> reductions from this treatment is representative in the 2008-2010 time period and also in the 2011 data, which still shows a violation at the Coburn Road monitor. For the enhanced flare gas recovery and elimination of routine and continuous flaring of sour gas, they became effective in September 2010 and the SO<sub>2</sub> reductions from these enhancements are representative in the 2008-2010 time period, and also in the 2011 data, which still shows a violation of the 2010 SO<sub>2</sub> NAAQS. Since the 2009-2011 design value still shows a violation of the 2010 SO<sub>2</sub> NAAQS, Yellowstone County should be designated as a nonattainment area and the use of any other time periods are irrelevant.

For the utility MACT implementation, the State discusses that the rule was finalized in February 16, 2012, and the options that subject facilities may choose from for meeting compliance. Since a facility is allowed to choose a control strategy that may not reduce SO<sub>2</sub> emissions, it is most appropriate to consider SO<sub>2</sub> reductions in this initial designation process.

The existing FIP has not been implemented due to ongoing litigation. Though the FIP has not been implemented, the State discusses aspects of the FIP as if it has been. One of these is that MSCC installed (in 2008) duplicate/redundant SuperClaus<sup>TM</sup> to allow either unit to carry on tail gas processing tasks while the other is out of service. Since this unit was installed in 2008 the SO<sub>2</sub> emissions reduction should already be realized and thus the 2008-2010 time period is representative of normal emissions. Additionally, Lockwood, MSCC, and ExxonMobil worked together to bring about a functional enhanced flare recovery system serving the refinery flare system and using the MSCC facilities for gas treating. This project became operational in 2010.

For EPA's Regional Haze Program/BART implementation, Montana is required to develop a program to assure reasonable progress toward meeting the national goal of protecting, and preventing, visibility impairment in mandatory Class I areas. Montana declined to submit a Regional Haze State Implementation Plan; and thus, EPA developed a FIP for Montana's Regional Haze Program. As BART controls for SO<sub>2</sub> were not required for any sources in Billings, EPA believes it is premature to use this as a basis on SO<sub>2</sub> emissions reductions for the initial designations process.

Montana discusses in their TSD the Boiler MACT Implementation, which was finalized and published as 40 CFR 63, Subpart DDDDD in the Federal Register on March 21, 2011. On May 18, 2011, EPA published an indefinite delay of the implementation of the major source Boiler MACT rules. Since this rule has not been implemented and is on an indefinite delay, reductions in SO<sub>2</sub> emissions cannot be properly quantified for the initial 1-hour SO<sub>2</sub> designations. When or if implemented, the Boiler MACT rule could have possible SO<sub>2</sub> reductions, but the reductions for SO<sub>2</sub> are expected to be minimal for this



rule and for this area. Additionally, even if the rule were to be implemented in the near future, SO<sub>2</sub> reductions would not have a significant impact on the attainment status of the area.

The New Source Performance Standards (NSPS) – 40 CFR Part 60, subpart Ja gives a new set of regulations that includes new standards and requirements for new, modified, reconstructed FCCUs, fluid coking units, process heaters, and flares. Since this NSPS regulation is only for new, modified, or reconstructed sources, this regulation would not apply to the facilities in the Billings/Laurel area. With the implementation of this regulation, there will be no reduction in SO<sub>2</sub> emissions unless the facilities modify or reconstruct.

The National Flare Initiative is an enforcement initiative. The EPA assumes all facilities to be in compliance with state, local, and federal regulations until shown otherwise, and assumes no emission reductions can be counted on to occur through this initiative.

The regulatory actions stated in Montana's recommendation letter and TSD will have little impact on reducing SO<sub>2</sub> emissions at the violating Coburn Road monitor.

### **Conclusion**

EPA has reviewed the information above and is determining that it is appropriate to designate the counties listed in Table 1 as "nonattainment" for the 2010 SO<sub>2</sub> NAAQS.

After considering the factors described above, EPA is determining that it is appropriate to designate Yellowstone County as a nonattainment area for the 2010 SO<sub>2</sub> NAAQS, also found in Table 1.

The air quality monitor in Yellowstone County shows a violation of the 2010 SO<sub>2</sub> NAAQS, based on 2009-2011 air quality data. The nearby counties of Musselshell, Rosebud, Treasure, Big Horn, Carbon, Stillwater, and Golden Valley, do not contribute to the violations of Coburn Road SLAMS monitor in Yellowstone County, and thus will not be included in the nonattainment area. The EPA is deferring designations on these and all other areas in Montana. Based on the consideration of all the relevant and available information, as described above, the boundaries described herein encompass the entire area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the 2010 SO<sub>2</sub> NAAQS.

Additionally, while the new controls at the ExxonMobil refinery will result in a reduction of SO<sub>2</sub>, others sources contribute to the exceedances, in addition to the refinery, and these sources must be addressed to bring the area into attainment.