

**2010 1-Hour Sulfur Dioxide Standard**  
—  
**Proposed Area Boundary Recommendations**  
**December 2017 Designations**

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**Prepared for the  
Missouri Air Conservation Commission**



**Public Hearing  
October 27, 2016**

**Missouri Department of Natural Resources  
Division of Environmental Quality  
Air Pollution Control Program  
Jefferson City, Missouri**

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## **PURPOSE**

The purpose of this document is to provide information on Missouri's proposed recommendations for area designations for the 2010 1-hour sulfur dioxide (SO<sub>2</sub>) standard. This document proposes attainment boundary recommendations for seven parts of the State of Missouri: the areas surrounding the Ameren Meramec Energy Center, Empire District - Asbury plant, Montrose Generating Station, Sibley Generating Station, Sikeston Power Station, City Utilities of Springfield - John Twitty Energy Center, and the Thomas Hill Energy Center Power Division.

In the federal Data Requirements Rule (DRR) for the 2010 SO<sub>2</sub> standard, EPA established a threshold for the evaluation of sources which are located in areas that were not previously designated as nonattainment. Sources that emitted more than 2,000 tons of SO<sub>2</sub> in the most recent emission year [2014] were evaluated. The seven main areas discussed in this document contain sources that exceed the emissions threshold and have elected to characterize the air quality surrounding their facilities through air dispersion modeling. The remaining nine Missouri sources affected by the DRR chose characterization methods other than modeling. These nine sources are also discussed in this document, but EPA is not required to designate these areas until December 31, 2020.

The Missouri Department of Natural Resources' Air Pollution Control Program (air program) intends to submit recommendations to the EPA in December 2016, and EPA will make a final decision on designations for these areas by the court-ordered deadline of December 31, 2017. If the EPA intends to modify the state's recommendations or needs additional technical justification, they will notify the air program 120 days prior to finalizing the designations. Eighteen months after final designations, the air program will be required to submit state implementation plans (SIPs) for any nonattainment areas outlining actions that will be taken to meet the 1-hour SO<sub>2</sub> standard.

## **SUMMARY OF PROPOSED AREA BOUNDARY RECOMMENDATIONS**

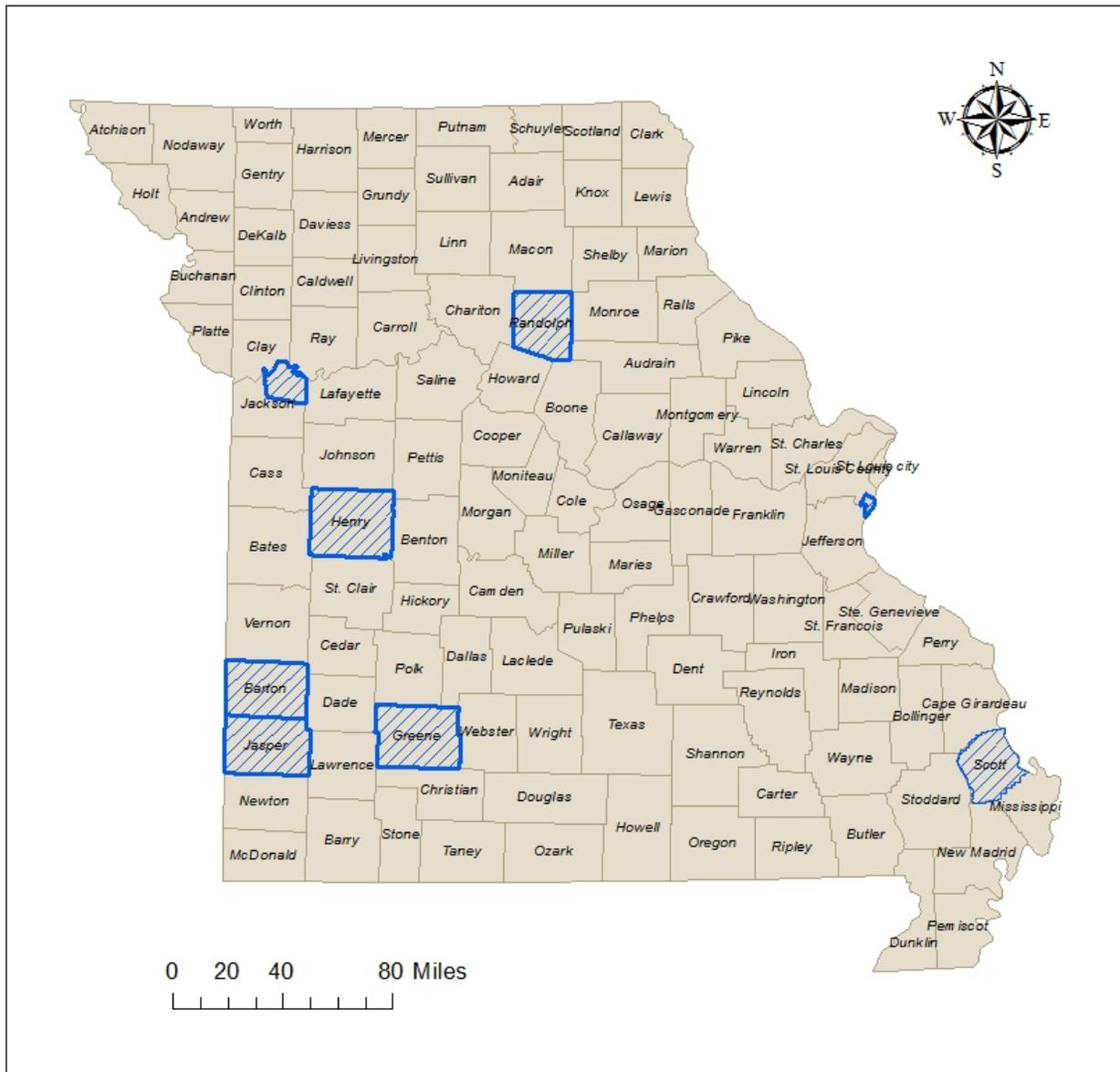
The air program is proposing to recommend attainment boundaries for each of the seven sources that chose modeling as their preferred method of characterization. The boundary for each area was selected following the five factor analysis outlined in EPA's boundary designations guidance. Each area's boundaries are based on air dispersion modeling using actual emissions data for these areas.

Table 1 summarizes the proposed area boundary and designation recommendations for the 1-hour SO<sub>2</sub> standard discussed in this document and appendices. The respective appendices discuss in more detail the data and analysis used to support the recommendations. The map in Figure 1 graphically depicts these proposed area boundaries.

**Table 1 – Missouri’s Proposed Boundary Recommendations for the 2010 1-hour SO<sub>2</sub> Standard: December 2017 Designations**

<b>Affected Source</b>	<b>Proposed Boundary</b>	<b>Proposed Area Designation Recommendation</b>
Ameren Missouri-Meramec Energy Center	Portion of St. Louis County	Attainment
Empire District Electric Co-Asbury Plant	Barton and Jasper Counties	Attainment
Kansas City Power And Light Co (KCP AND L)-Montrose Generating Station	Henry County	Attainment
KCP AND L - Greater Mo Operations-Sibley Generating Station	Portion of Jackson County	Attainment
Sikeston Power Station	Scott County	Attainment
City Utilities of Springfield - John Twitty Energy Center	Greene County	Attainment
Thomas Hill Energy Center Power Division-Thomas Hill	Randolph County	Attainment

# 2010 1-hour SO<sub>2</sub> NAAQS Proposed Area Boundary Recommendations



## Legend

-  Proposed Attainment Area Boundaries
-  County Boundaries



Division of Environmental Quality  
Air Pollution Control Program  
Prepared: August 17, 2016

**Figure 1 – 2010 1-hour SO<sub>2</sub> NAAQS Missouri’s Proposed Attainment Area Boundary Recommendations for December 2017 Round of Designations**

## BACKGROUND

On June 22, 2010, the EPA established a new 1-hour SO<sub>2</sub> primary National Ambient Air Quality Standard (NAAQS) of 75 parts per billion (ppb), based on the three-year average of the annual 99<sup>th</sup> percentile of 1-hour daily maximum concentrations (75 FR 35520; June 22, 2010). This new SO<sub>2</sub> standard replaces the previous 24-hour and annual primary SO<sub>2</sub> NAAQS promulgated in 1971 (36 FR 8187; April 30, 1971). Once EPA establishes or revises a NAAQS, the Clean Air Act requires EPA to designate areas as "attainment" (meeting), "nonattainment" (not meeting), or "unclassifiable" (insufficient data).

The EPA has chosen a different approach to determine attainment status for the 1-hour SO<sub>2</sub> NAAQS. Unlike other criteria pollutants, SO<sub>2</sub> is almost exclusively a point source-emitted pollutant. A monitoring network large enough to adequately cover all large sources would be prohibitively expensive and an affordable network would leave large gaps in coverage. Therefore, EPA has decided to use a hybrid monitoring-modeling approach for the implementation of the 1-hour SO<sub>2</sub> standard.

In the March 20, 2015 document, "Updated Guidance for Area Designations for the 2010 Primary Sulfur Dioxide National Ambient Air Quality Standard," EPA defines area designation categories for this standard as follows:

- **Nonattainment:** An area that the EPA has determined violates the 2010 SO<sub>2</sub> NAAQS, based on the most recent three years of ambient air quality monitoring data or an appropriate modeling analysis, or that EPA has determined contributes to a violation in a nearby area.
- **Attainment:** An area that the EPA has determined meets the 2010 SO<sub>2</sub> NAAQS and does not contribute to a violation of the NAAQS in a nearby area based on either: a) the most recent three years of ambient air quality monitoring data from a monitoring network in an area that is sufficient to be compared to the NAAQS per EPA interpretations in the Monitoring Technical Assistance Document (TAD), or b) an appropriate modeling analysis.
- **Unclassifiable:** An area where the EPA cannot determine based on available information whether the area is or is not meeting the 2010 SO<sub>2</sub> NAAQS and whether the area contributes to a violation in a nearby area.

EPA is promulgating designations under this standard for areas throughout the nation in multiple phases. In the initial round, EPA designated areas as nonattainment based on 2010-2012 monitoring data from existing monitors showing a violation of the NAAQS. In Missouri, EPA designated portions of Jackson and Jefferson Counties as nonattainment for the 2010 SO<sub>2</sub> primary NAAQS, effective October 4, 2013. The air program developed Nonattainment Area (NAA) State Implementation Plan (SIP) revisions for each of the nonattainment areas. The Jefferson County SIP was adopted by the Missouri Air Conservation Commission (MACC) on May 28, 2015 and submitted to EPA the next day. The Jackson County SIP was adopted by the MACC on August 3, 2015, and was submitted to EPA on October 9, 2015.

Subsequent rounds of designations are prescribed by a consent decree between EPA, the Sierra Club, and the Natural Resource Defense Council which was signed and entered by the court on

March 2, 2015. The decree specifies a schedule for the EPA to complete SO<sub>2</sub> designations for the rest of the country in three additional rounds:

- Second round by July 2, 2016;
- Third round by December 31, 2017; and
- Final round by December 31, 2020.

To meet the first deadline, on June 30, 2016, EPA designated areas that contained either a newly violating monitor or a stationary source that according to the EPA's Air Markets Database:

- Emitted 16,000 tons of SO<sub>2</sub> in 2012; or
- Emitted 2,600 tons of SO<sub>2</sub> and had an average emission rate of at least 0.45 lbs. SO<sub>2</sub>/MMBtu in 2012.

EPA designated the following areas of Missouri: portions of Jackson, St. Charles, and Franklin Counties as unclassifiable and Scott County as unclassifiable/attainment. [81 FR 45039]

The last two deadlines for EPA to complete remaining designations are December 31, 2017, and December 31, 2020. The designations completed by these later deadlines are to be made pursuant to the EPA's Data Requirements Rule (DRR) for the 1-hour SO<sub>2</sub> NAAQS. The final DRR was published in the Federal Register (FR) on August 21, 2015 [80 FR 51052]. The DRR establishes a timetable and other requirements for the characterization of current air quality around large sources of SO<sub>2</sub> emissions.

As stated in §51.1202, sources that emitted more than 2,000 tons of SO<sub>2</sub> in the most recent, quality assured emission year [2014], excluding sources in previously designated nonattainment areas, must be evaluated under the DRR. The DRR details two characterization options available to sources: modeling or monitoring. Alternatively, a source may elect to adopt federally enforceable emissions limitations to less than 2,000 tons per year to forego characterization under the DRR.

In January 2016, the air program submitted a list of sources affected by the DRR around which to characterize air quality to fulfill the requirement outlined in §51.1203(a). The sources being evaluated under the DRR are listed in Table 2 and displayed graphically in Figure 2. The air program used the most recent, certified emissions year to compare to the threshold established in the DRR. At the time of developing the list for submission to EPA in January 2016, the latest certified emissions year was 2014. In June 2016, the air program submitted a document detailing the method with which each of the affected sources' air quality is to be characterized. The air program concurrently submitted a modeling protocol for characterization of air quality under the federal DRR. The air program also made the annual ambient monitoring network plan available for public inspection in May 2016. These three items together fulfill the requirement outlined in §51.1203(b).

In February and August 2016, EPA released technical assistance documents (TADs) for each avenue of characterization, monitoring and modeling, respectively. The purpose of the TADs is to aid in the technical aspects of using these methods for designation purposes. The air program relied on the TADs while developing the air quality evaluations and subsequent area recommendations presented here.

Table 2 lists the sources affected by the DRR and their chosen method of characterization as was submitted to EPA in June 2016. The sources are sorted by their 2014 actual emissions. There are 16 total sources in Missouri affected by the DRR. Four sources have elected to install new ambient air quality monitors to characterize their air quality impact. Seven areas have elected to characterize their air quality impact through air dispersion modeling using their recent actual emissions. The modeling of actual conditions acts as a surrogate for monitoring. The remaining five sources have elected to adopt federally enforceable emission limitations to forego characterization under the DRR.

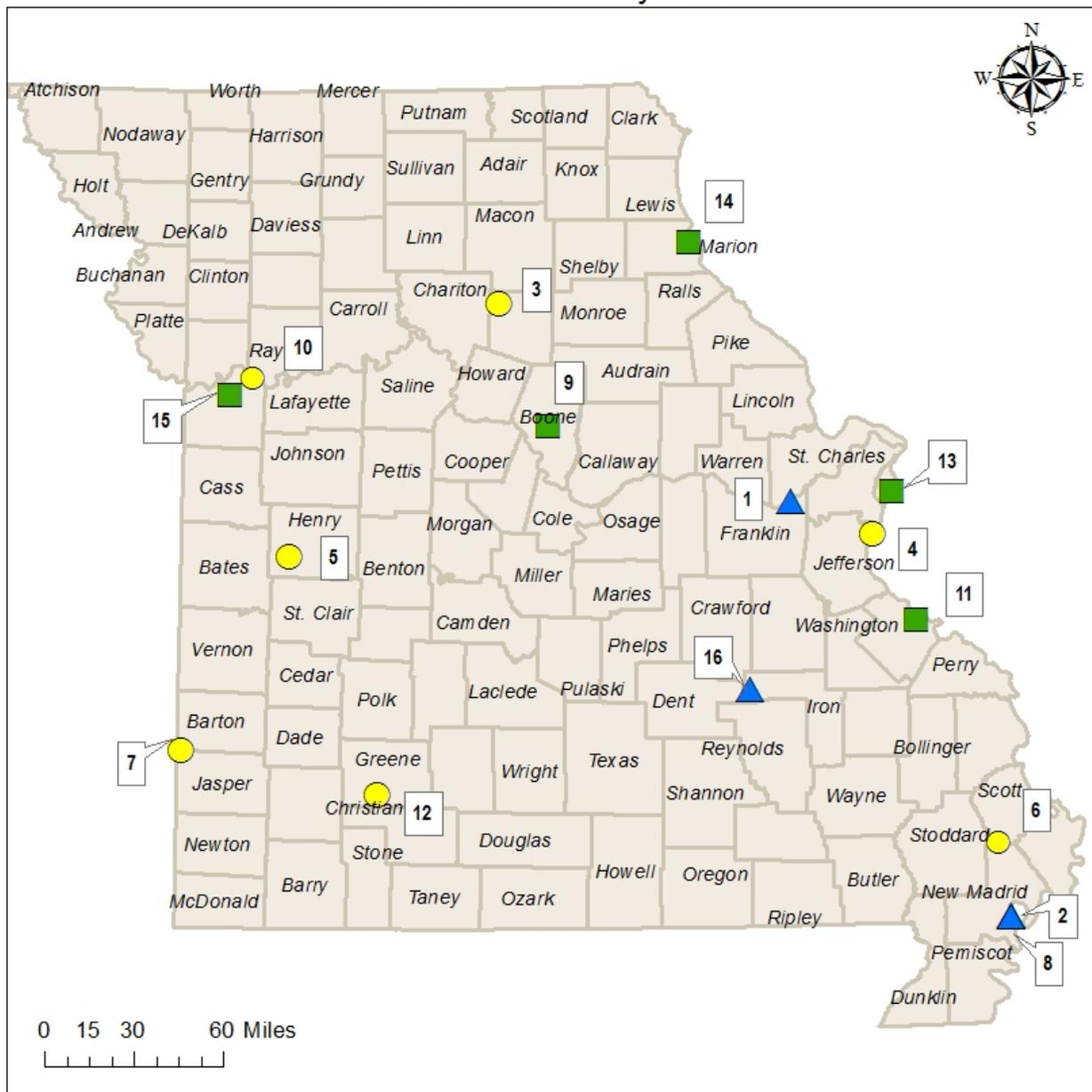
This document provides proposed area boundary recommendations that address the seven areas containing sources that elected to characterize their air quality through air dispersion modeling. The seven sources addressed in this proposed recommendation are denoted by the shaded rows in Table 2.

**Table 2 – Sources Affected by EPA’s SO<sub>2</sub> Data Requirements Rule**

Map ID	FID	Plant Name	Method of Air Quality Characterization		Federally enforceable requirement to limit SO <sub>2</sub> emissions to under 2,000 tpy	Description
			Monitoring	Modeling		
1	071-0003	AMEREN MISSOURI-LABADIE ENERGY CENTER	X			
2	143-0004	NEW MADRID POWER PLANT-MARSTON	X			
3	175-0001	THOMAS HILL ENERGY CENTER POWER DIVISION-THOMAS HILL		X		
4	189-0010	AMEREN MISSOURI-MERAMEC ENERGY CENTER		X		
5	083-0001	KANSAS CITY POWER AND LIGHT CO (KCP AND L)-MONTROSE GENERATING STATION		X		
6	201-0017	SIKESTON POWER STATION		X		
7	097-0001	EMPIRE DISTRICT ELECTRIC CO-ASBURY PLANT		X		
8	143-0008	NORANDA ALUMINUM INC-NEW MADRID	X			
9	019-0004	UNIVERSITY OF MISSOURI (MU)- COLUMBIA POWER PLANT			X	Facility-wide limit enforceable through permit
10	095-0031	KCP AND L - GREATER MO OPERATIONS-SIBLEY GENERATING STATION		X		
11	186-0001	MISSISSIPPI LIME COMPANY-STE. GENEVIEVE			X	Facility-wide limit enforceable through permit
12	077-0039	CITY UTILITIES OF SPRINGFIELD -JOHN TWITTY ENERGY CENTER		X		

13	510-0003	ANHEUSER-BUSCH INC-ST. LOUIS			X	Facility-wide limit enforceable through permit
14	127-0001	BASF CORPORATION- HANNIBAL PLANT			X	Reduction of potential to emit through equipment shutdown or fuel switch. Post-2016 PTE less than 2,000 tons per year.
15	095-0050	INDEPENDENCE POWER AND LIGHT-BLUE VALLEY STATION			X	Reduction of potential to emit through equipment shutdown or fuel switch. Post-2016 PTE less than 2,000 tons per year.
16	093-0009	DOE RUN –BUICK RESOURCE RECYCLING FACILITY	X			

## 2010 1-hour SO<sub>2</sub> Standard: Round 3 and 4 Sources affected by DRR



### Legend

- Modeled Sources
- ▲ Monitoring Sources
- Limited Sources



**Figure 2 – Sources Affected by EPA’s SO<sub>2</sub> Data Requirements Rule**

## **AREAS TO BE DESIGNATED BY DECEMBER 31, 2020**

### **Sources Installing New Monitors**

Sources that have elected to install new ambient air monitors to characterize their air quality will not be designated in this round of designations. Designations for areas with new monitors will be based on monitoring data collected from 2017-2019. EPA is required by court order to finalize designations for these areas and all remaining undesignated areas no later than December 31, 2020. Specific information regarding the monitoring site locations can be found in the latest annual monitoring network plan available on the air program's webpage. As seen in Table 2, there are four sources that will be characterizing their air quality impact through the installation of new ambient air quality monitors: Ameren Labadie, Noranda Aluminum, AECI New Madrid, and Doe Run Buick.

Ameren Labadie began collecting monitoring data surrounding their facility in April 2015. Labadie sited two monitors surrounding their facility to quantify their air quality impact. Data collected thus far has not exceeded the standard. The two existing monitor site locations were chosen based on dispersion modeling and follow minimum monitor siting criteria. The air program is working with EPA and Ameren to ensure the monitoring network appropriately characterizes the area's air quality.

Noranda Aluminum has elected to install three monitors surrounding their facility to quantify their air quality impact. Noranda shares a property boundary with the AECI New Madrid power plant, and both are affected by the DRR. Per 51.1203(b), for any area with multiple applicable sources, the air agency (or air agencies if a multi-state area) shall use the same technique (monitoring, modeling, or emissions limitation) for all applicable sources in the area. Therefore the air program combined the evaluation of these sources and relied on a single characterization method to evaluate the combined area containing both sources due to their close proximity. Based on these evaluations, Noranda's emissions have a greater influence on the location of the area of maximum concentration than the impacts from AECI's emissions. As such, monitor site locations were chosen based on dispersion modeling with a focus on Noranda's areas of maximum concentration. All monitors follow minimum monitor siting criteria. Should Noranda not install the monitors by January 1, 2017, the area including both Noranda and AECI New Madrid will be evaluated through air dispersion modeling and will be designated by EPA in December 2017 per the final 2015 federal consent decree.

Doe Run Buick has elected to site three monitors surrounding their facility to quantify their air quality impact. Monitor site locations were chosen based on dispersion modeling and follow minimum monitor siting criteria.

### **Sources taking a 2,000 ton per year limit**

Sources that have elected to limit their emissions to less than 2,000 tons of SO<sub>2</sub> per year will not be designated in this round of designations. EPA has indicated that taking a satisfactory limit removes the source from undergoing the DRR's required technical evaluation at this time. These areas will be designated along with all remaining undesignated areas in December 2020. These sources are listed below along with a brief description of the limit's enforceable mechanism.

The University of Missouri Power Plant and Anheuser Busch have elected to take a facility-wide 2,000 ton per 12 month rolling average SO<sub>2</sub> limit in a construction permit. These permits will be available on the air program's issued permit webpage.

Mississippi Lime Company has elected to take a facility-wide 2,000 ton per 12 month rolling average SO<sub>2</sub> limit in their Title V operating permit. See Permit #OP2013-035A (Amendment Project #2016-03-080) for specific limit related language. This permit is available on the air program's issued permit webpage.

**Sources no longer subject to the DRR**

The BASF-Hannibal plant has removed their coal burning/handling capabilities to comply with other federal regulations. Their potential emissions are now below 2,000 tons of SO<sub>2</sub> per year. This is enforceable through construction permit #072013-001. Specifically, BASF dismantled two coal burning boilers in 2015 to comply with the federal Major Source Boiler MACT (Maximum Achievable Control Technology) regulation. Since the coal boilers were removed, there are four incinerators at BASF that account for the majority of their current potential SO<sub>2</sub> emissions. Their current facility-wide calculated potential emissions sum to 1,963.3 tons of SO<sub>2</sub> per year. BASF's reported actual emissions from 2015, excluding the two coal boilers that have since been removed, do not exceed 200 tons. BASF is therefore no longer subject to the DRR. Further source discussion and potential emission calculations are included in Appendix I for reference.

As of January 2016, Blue Valley has switched to burning exclusively natural gas to comply with other federal regulations. Their potential emissions are now below 2,000 tons of SO<sub>2</sub> per year. This is enforceable through 10 CSR 10-6.261. The compliance date for this rule is January 1, 2017. Blue Valley is therefore no longer subject to the DRR. Specifically, Blue Valley discontinued burning coal and switched to exclusively burn natural gas in all of its three boilers to comply with the Major Source Boiler MACT and the MATS (Mercury Air Toxics Standard). Boilers 1 and 2 are subject to the Boiler MACT and boiler 3 is subject to the MATS. The compliance dates were April 16, 2015, for the MATS and January 31, 2016, for the Boiler MACT.

**Table 3 – Summary of Sources Electing DRR Compliance Methods other than Monitoring or Modeling**

Source Name	Compliance Method	Enforceable Mechanism
Anheuser Busch	Facility-wide 2,000 tpy limit	Pending Construction Permit
BASF-Hannibal	PTE less than 2,000 tpy	Construction Permit #072013-001
Blue Valley	PTE less than 2,000 tpy	10 CSR 10-6.261
Mississippi Lime Company	Facility-wide 2,000 tpy limit	Title V Permit #OP2013-035A
University of Missouri Power Plant	Facility-wide 2,000 tpy limit	Pending Construction Permit

## RECOMMENDATION FOR 1-HOUR SO<sub>2</sub>: ATTAINMENT

The proposed area boundaries and designation recommendations presented in this document were developed in accordance with EPA’s March 20, 2015, document titled, “Updated Guidance for Area Designations for the 2010 Primary Sulfur Dioxide National Ambient Air Quality Standard.” This guidance provides information on the recommended process for designating areas under the 2010 revised 1-hour SO<sub>2</sub> NAAQS. In this document, EPA lists five factors to be considered when developing boundary designation recommendations:

- Monitoring/Modeling data
- Emissions information, including growth, controls, and regional emission reductions
- Meteorology
- Topography
- Jurisdictional boundaries

The air program developed the proposed 1-hour SO<sub>2</sub> boundary recommendations based on these five factors. Appendices A.1 through G.1 detail the technical analysis performed for each of the seven modeled areas. Table 4 lists the respective appendix for each source. Each area analysis evaluates the five factors as they apply to the individual area and details the rationale for the proposed recommendation. The modeling protocol details the general modeling conditions and procedures utilized in these technical evaluations. The protocol is included in Appendix H.

The supporting modeling files for each area are included for reference in the second subpart (A.2, B.2, etc.) of each sources’ appendices. Certain lengthy modeling files are excerpted, but the complete set of all modeling files used for these analyses are available upon request in digital format from the air program. As established in EPA’s modeling TAD, modeling for designation purposes should be done using actual emissions to act as a surrogate for monitoring data. Hourly emissions, recorded by Continuous Emissions Monitoring Systems (CEMS), are the best option for source characterization. Additional justification is given for sources without hourly recorded emissions. Moreover, EPA has indicated that hourly variable stack release parameters should be used in modeling for designation purposes when available.

**Table 4 – Source Appendices**

Affected Source	Appendix
Ameren Missouri-Meramec Energy Center	A
Empire District Electric Co-Asbury Plant	B
Kansas City Power And Light Co (KCP AND L)-Montrose Generating Station	C
KCP AND L - Greater Mo Operations-Sibley Generating Station	D
Sikeston Power Station	E
City Utilities of Springfield - John Twitty Energy Center	F
Thomas Hill Energy Center Power Division-Thomas Hill	G