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September 19, 2024

Ms. Jeaneanne Gettle
Acting Regional Administrator
U.S. EPA, Region 4
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, Georgia 30303

RE: Submittal of the Proposed Kentucky State Implementation Plan (SIP) Revision, Clean Air Act (CAA) Section 110(a)(2)(D)(i)(I) Demonstration of the "Good Neighbor" Provision for the Primary 2010 Sulfur Dioxide (SO_2) National Ambient Air Quality Standard (NAAQS)

Dear Ms. Gettle:

On behalf of the Commonwealth of Kentucky, the Energy and Environment Cabinet (Cabinet) submits to the United States Environmental Protection Agency (EPA), the following proposed SIP revision for the CAA Section 110(a)(2)(D)(i)(I) demonstration of the "good neighbor" provision for the primary 2010 SO_2 NAAQS. The Cabinet's Division for Air Quality (Division) submitted the Section 110(a) Infrastructure SIP for both the 2010 nitrogen dioxide (NO_2) and 2010 SO_2 NAAQS on April 26, 2013. At the time of submission, the EPA did not treat section 110(a)(2)(D)(i)(I) of the CAA as a required part of the SIP submission; therefore, the Division did not address prongs 1 and 2 of CAA Section 110(a)(2)(D)(i)(I), referred to as the "good neighbor" provision.

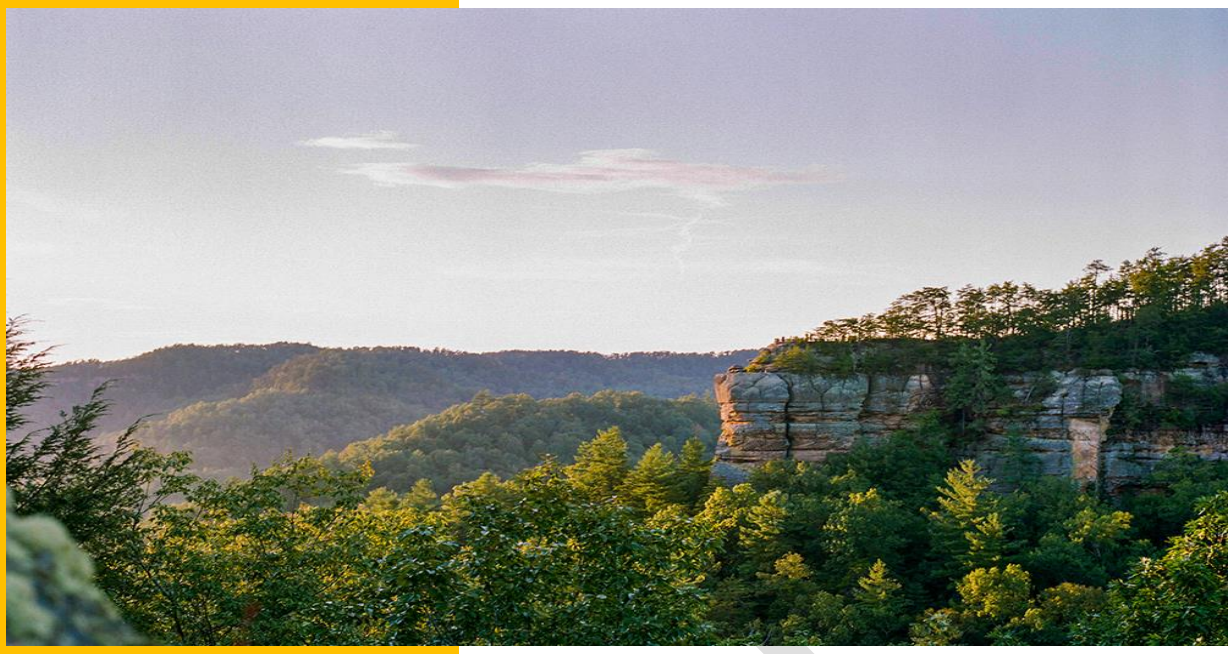
This proposed SIP revision is being submitted in response to the U.S. Supreme Court's April 29, 2014 ruling requiring states to fulfill the requirements of section 110(a)(2)(D)(I) of the CAA. The draft SIP revision proposes that Kentucky has satisfied all the requirements of section 110(a)(2)(D)(i)(I) of the CAA, for purposes of implementing the 2010 SO_2 NAAQS.

In accordance with 40 CFR 51.102, the proposed SIP revision will be available for public review and comment from September 19, 2024, until October 25, 2024. If you have any questions regarding this matter, please contact Ms. Cassandra Jobe, Environmental Control Manager, in the Program Planning and Administration Branch at (502) 782-6670, or cassandra.jobe@ky.gov.

Sincerely,

Michael Kennedy

Michael Kennedy, P.E.
Director



PROPOSED: Kentucky State Implementation Plan Revision

Clean Air Act Section 110(a)(2)(D)(i)(I) Demonstration of "Good Neighbor" Provision for the Primary 2010 Sulfur Dioxide National Ambient Air Quality Standard

Prepared for: U.S. Environmental Protection Agency

Prepared by: Kentucky Energy and Environment Cabinet, Division for Air Quality

September 2024, Pre-Hearing Review

TEAM KENTUCKY
ENERGY AND ENVIRONMENT CABINET

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[1] https://eec.ky.gov/Environmental-Protection/Air/Pages/Public-Notices.aspx

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Introduction

Background

Sulfur dioxide (SO_2) and other sulfur oxides (SO_x), caused by SO_2 emissions, contribute to the formation of regional haze and acid rain pollution. SO_x can react with other compounds in the atmosphere to form small particles. These small particles contribute to particulate matter (PM) pollution, which is known to adversely affect the lungs and, in sufficient quantity, contribute to health problems. When SO_2 oxidizes in the atmosphere, it forms sulfuric acid (H_2SO_4). When this reaction occurs under dry conditions, often combining with dust or smoke, it is known as "dry deposition." When this reaction occurs with water present in the atmosphere, it yields acid rain and is known as "wet deposition." Both dry and wet deposition are forms of pollution that have negative effects on human health, crop yields, and land and marine ecosystems.

Sections 110(a)(1) and (2) of the Clean Air Act (CAA) require that each state adopt new or revised National Ambient Air Quality Standards (NAAQS) into an infrastructure plan that implements, maintains, and enforces each standard. The U.S. Environmental Protection Agency (EPA) revised the SO_2 primary standard on August 23, 2010. The EPA's revision adopted a new 1-hour standard of 75 parts per billion (ppb), based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations.[2]

The Kentucky Energy and Environment Cabinet (Cabinet), Department for Environmental Protection, Division for Air Quality (Division) submitted the Section 110(a) Infrastructure State Implementation Plan (SIP) for the 2010 nitrogen dioxide (NO_2) and 2010 SO_2 NAAQS on April 26, 2013. At the time of submission, the EPA did not treat section 110(a)(2)(D)(i)(I) of the CAA as a required part of the SIP submission; therefore, the Division did not address prongs 1 and 2, referred to as the "good neighbor" provision.

On August 21, 2012, the U.S. Court of Appeals for the District of Columbia Circuit (U.S. Circuit Court) vacated the Cross-State Air Pollution Rule (CSAPR) and clarified that only the EPA can determine "significant contribution" and that "a SIP cannot be deemed to lack a required submission or be deemed deficient for failing to implement the good neighbor obligation until after the EPA has defined the state's good neighbor obligation."[3] The U.S. Circuit Court's ruling was reversed by the U.S. Supreme Court on April 29, 2014. The Supreme Court held that, (i) the plain text of the CAA allowed the states in the first instance to determine whether and to what extent their interstate emissions were unlawful and, where a state failed to do so, EPA could impose a Federal Implementation Plan (FIP), (ii) EPA's calculation of the states' interstate contributions to downwind nonattainment was a permissible construction of the CAA, and (iii) the CAA did not prohibit EPA from considering the cost of emission controls when determining the appropriate level of reductions.[4]

In response to the U.S. Supreme Court's ruling, and to fulfill the requirements of section 110(a)(2)(D)(I) of the CAA, the Division has assessed the most current regulations and programs, SO_2 monitoring data, and emissions data to determine if sources within Kentucky are

[2] 75 FR 35519
[3] EME Homer City Generation, LP v. EPA, No. 11-132 (2012)
[4] EPA v. EME Homer City Generation, LP, 134 S.Ct 1584, 1600-01 (2014)

significantly impacting downwind states. The Division is requesting EPA's approval of this SIP revision, demonstrating all the requirements of section 110(a)(2)(D)(i)(I) of the CAA have been met for the purpose of implementing the 2010 SO_2 NAAQS.

Good Neighbor Provision

CAA Section 110(a)(2)(D)(i)(I) specifically states that each implementation plan shall:

> (D) Contain adequate provisions—
>
> > (i) prohibiting, consistent with the provisions of this subchapter, any source or other type of emissions activity within the State from emitting any air pollutant in amounts which will—
> >
> > > (I) contribute significantly to nonattainment in, or interfere with maintenance by, any other State with respect to any such national primary or secondary ambient air quality standard

Section 110(a)(2)(D)(i)(I) of the CAA is divided into two prongs requiring each SIP to contain provisions that will prohibit any source or other type of emissions activity in the state from emitting excessive air pollutants. Contributing significantly to nonattainment of the NAAQS in any other state is referred to as "prong 1." Interfering with maintenance of the NAAQS in any other state is referred to as "prong 2." In order to have a fully approvable SIP, a demonstration must show that Kentucky's SO_2 emissions do not contribute to other states' nonattainment areas or interfere with other states' maintenance areas.

SO_2 Good Neighbor Provision Demonstration

Permanent and Enforceable Measures

Kentucky Administrative Regulations

Section 110(a)(2)(A) of the CAA requires SIPs to include enforceable emission limitations and other control measures, means, techniques, and schedules for compliance. Kentucky Revised Statute Chapter 224 Section 10-100 (KRS 224.10-100) provides the Cabinet the authority to administer all rules, regulations and orders promulgated under Chapter 224, and to provide for the prevention, abatement and control of all water, land, and air pollution.

The following Kentucky regulations mandate that facilities will comply with best practices in order to attain and maintain the NAAQS and not interfere with attainment or maintenance of the NAAQS in surrounding states:

- 401 KAR 50:015. *Documents incorporated by reference*. This administrative regulation provides for the incorporation by reference of documents referred to within these administrative regulations.
- 401 KAR 50:050. *Monitoring*. This administrative regulation establishes requirements for stack gas monitoring, ambient air monitoring, and recording and reporting requirements as related to monitoring data
- 401 KAR 50:055. *General compliance requirements*. This administrative regulation establishes requirements for compliance during shutdown and malfunctions; establishes requirements for demonstrating compliance with standards; establishes requirements for compliance when a source is relocated within the Commonwealth of Kentucky; and other general compliance requirements. The Division submitted a SIP revision to remove Section 1(1) and (4) from 401 KAR 50:055 in response to a SIP call in which EPA found these provisions of the regulation inadequate. The removal of Sections 1(1) and (4) of 401 KAR 50:055 were officially approved by EPA on August 11, 2022. This SIP revision approval from EPA became effective on September 12, 2022.
- 401 KAR 50:060. *Enforcement*. This administrative regulation provides for enforcement of the terms and conditions of permits and compliance schedules.
- 401 KAR 51:001. *Definitions for 401 KAR Chapter 51.* This administrative regulation defines the terms used in 401 KAR Chapter 51. The definitions contained in this administrative regulation are neither more stringent nor otherwise different from the corresponding federal definitions.
- 401 KAR 51:005. *Purpose and general provisions*. This administrative regulation establishes the general provisions as related to new sources with respect to the prevention of significant deterioration of air quality and construction of stationary sources impacting on nonattainment areas.
- 401 KAR 51:010. *Attainment status designations.* This administrative regulation designates the status of all areas of the Commonwealth of Kentucky with regard to attainment of the ambient air quality standards.
- 401 KAR 51:017. *Prevention of significant deterioration of air quality.* This administrative regulation applies to the construction of any new major stationary source or any project at an existing major stationary source in an area designated as attainment or unclassifiable.

- 401 KAR 51:052. *Review of new sources in or impacting upon nonattainment areas.* This administrative regulation establishes requirements for the construction or modification of stationary sources within, or impacting upon, areas where the national ambient air quality standards have not been attained.
- 401 KAR 51:260. *Cross-State Air Pollution Rule (CSAPR) SO_2 group 1 trading program*. This administrative regulation establishes the requirements for the control of sulfur dioxide (SO_2) emissions from large boilers and turbines used in power plants, pursuant to the CSAPR SO_2 group 1 trading program, 40 C.F.R. 97.601 through 97.635, Subpart CCCCC for sources located in the Commonwealth of Kentucky.
- 401 KAR 52:030. *Federally enforceable permits for non-major sources*. This administrative regulation establishes requirements for air contaminant sources located in Kentucky that accept emission limitations to avoid the New Source Review requirements under Title I of the CAA or the Operating Permit Program requirements under Title V of the CAA.
- 401 KAR 52:100. *Public, affected state, and US EPA review*. This administrative regulation establishes the procedures used by the Cabinet to provide for the review of federally enforceable permits by the public, affected states, and the U.S. EPA.
- 401 KAR 53:005. *General provisions*. This administrative regulation is to provide for the establishment of general provisions, definitions, and time schedules as they pertain to this chapter.
- 401 KAR 53:010. *Ambient air quality standards.* This administrative regulation establishes ambient air quality standards necessary for the protection of the public health, the general welfare, and the property and people in the Commonwealth of Kentucky.
- 401 KAR 59:001. *Definitions for 401 KAR Chapter 59*. This administrative regulation defines the terms used in 401 KAR Chapter 59.
- 401 KAR 59:005. *General provisions*. This administrative regulation is to provide for the establishment of monitoring requirements, performance testing requirements, and other general provisions as related to new sources.
- 401 KAR 59:105. *New process gas streams*. This administrative regulation provides for the control of emissions from new process gas streams.
- 401 KAR 61:001. *Definitions for 401 KAR Chapter 61*. This administrative regulation defines the terms used in 401 KAR Chapter 61.
- 401 KAR 61:005. *General provisions*. This administrative regulation provides for the establishment of monitoring requirements, performance testing requirements, and other general provisions as related to existing sources.
- 401 KAR 61:030. *Existing sulfuric acid plants*. This administrative regulation provides standards of performance for existing sulfuric acid plants.
- 401 KAR 61:035. *Existing process gas streams*. This administrative regulation provides for the control of emissions from existing process gas streams.
- 401 KAR 61:140. *Existing by-product coke manufacturing plants*. This administrative regulation provides for the control of emissions from existing by-product coke manufacturing plants.
- 401 KAR 61:145. *Existing petroleum refineries*. This administrative regulation provides for the control of emissions from existing petroleum refineries.
- 401 KAR 63:001. *Definitions for 401 KAR Chapter 63*. This administrative regulation defines the terms used in 401 KAR Chapter 63.

The following regulations are not approved into the Kentucky SIP; however, they are relevant permanent and enforceable measures pertaining to SO_2 emissions and are therefore included for reference:

- 401 KAR 52:020. *Title V permits*. This administrative regulation establishes requirements for air contaminant sources located in Kentucky that are required to obtain a Title V permit.
- 401 KAR 52:040. *State-origin permits*. This administrative regulation establishes requirements for minor sources whose permits are not required to be federally enforceable.
- 401 KAR 52:060 *Acid rain permits*. This administrative regulation incorporates by reference the federal acid rain provisions as codified in 40 CFR Parts 72 to 78.
- 401 KAR 52:070. *Registration of designated sources*. This administrative regulation establishes the procedure for the registration of designated air contaminant sources in Kentucky.
- 401 KAR 59:015. *New indirect heat exchangers.* This administrative regulation establishes requirements for the control of emissions from new indirect heat exchangers.
- 401 KAR 59:021. *New municipal solid waste incinerators*. This administrative regulation provides standards of performance for new municipal solid waste incinerators.
- 401 KAR 59:023. *New medical waste incinerators*. This administrative regulation provides standards of performance for new medical waste incinerators.
- 401 KAR 61:011. *Existing municipal solid waste incinerators*. This administrative regulation provides standards of performance for existing municipal solid waste incinerators.
- 401 KAR 61:013. *Existing medical waste incinerators*. This administrative regulation provides standards of performance for existing medical waste incinerators.
- 401 KAR 61:015. *Existing indirect heat exchangers*. This administrative regulation establishes requirements for the control of emissions from existing indirect heat exchangers.

Regional Haze

Sources that emit SO_2 contribute to regional haze, which is defined as visibility impairment caused by the emission of air pollutants from numerous sources located across a broad geographic area. On July 1, 1999, the EPA promulgated the Regional Haze Rule (RHR) to integrate provisions addressing regional haze impairment for 156 Federal Class I areas located throughout the United States. In response to the ruling, Kentucky developed the Kentucky Regional Haze SIP to address visibility impairment in its only Class I area, Mammoth Cave National Park (Mammoth Cave). This SIP prepared a long-term strategy and examined the possible application of Best Available Retrofit Technology (BART) in order to meet reasonable progress goals for Mammoth Cave.

Kentucky submitted the final Regional Haze SIP to EPA on June 25, 2008, as amended on May 28, 2010. However, EPA issued a limited approval/disapproval of this submittal on March 30,

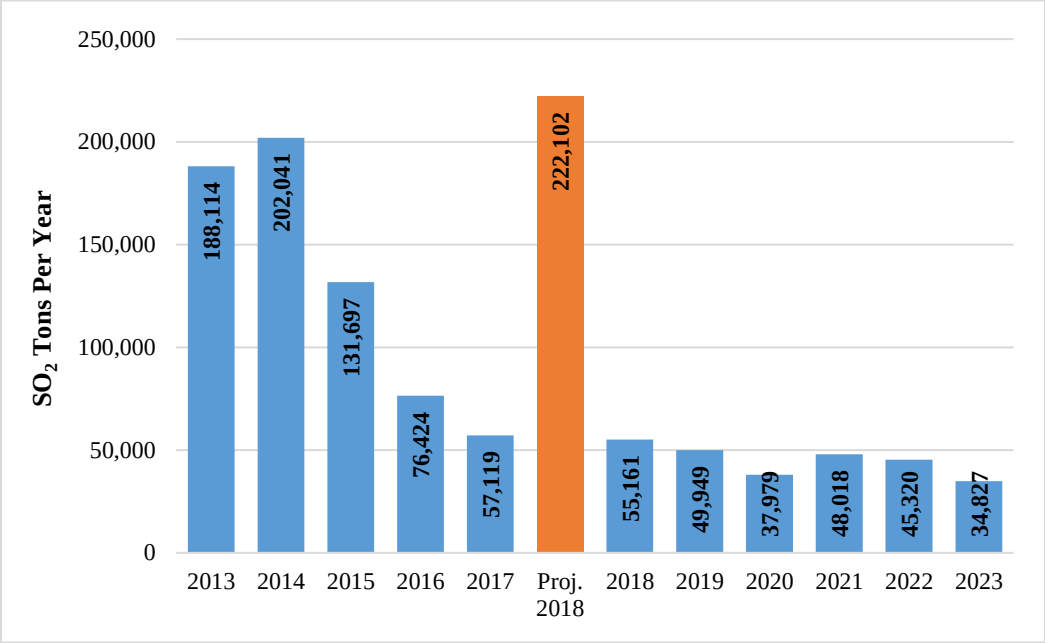
2012.[5] The Division submitted a letter detailing the reliance on CSAPR instead of the Clean Air Interstate Rule (CAIR). Following this submission, Kentucky's Regional Haze SIP was fully approved on April 8, 2019.[6] In accordance with the requirements of 40 CFR 51.308(d)(1), Kentucky's Regional Haze SIP established reasonable progress goals designed to reduce visibility impairing pollutants from sources impacting Mammoth Cave. Ammonium sulfate is the largest contributor to visibility impairment at Mammoth Cave. Kentucky determined that focusing on the reduction of SO_2 emissions from electric generating units (EGUs) and large industrial boilers would be the most effective means to reduce ammonium sulfate. Kentucky will continue to evaluate SO_2 emissions and other pollutants that contribute to regional haze at Class I areas.

Since the submittal of Kentucky's Regional Haze SIP in June 2008, which addressed the first implementation period for the RHR, many of the EGUs within Kentucky have installed controls, switched to natural gas, or shut down their facilities, which has led to a significant decrease in SO_2 emissions. The Visibility Improvement State and Tribal Association of the Southeast (VISTAS) projected SO_2 emissions from EGUs to be 222,102 tons per year (tpy) by the end of the first implementation period (2018). Figure 1 depicts that Kentucky's actual 2018 EGU SO_2 emissions (55,161 tpy), retrieved from EPA's Clean Air Markets Program Data (CAMPD), were significantly less than the 2018 projection.

On January 10, 2017, the EPA promulgated revisions to the RHR that apply for the second and subsequent implementation periods.[7] The 2017 rulemaking made several changes to the requirements for regional haze SIPs, notably that states' SIPs contain provisions for making reasonable progress towards the national visibility goal. Regional haze SIP revisions for the second implementation period were due July 31, 2021. On August 30th, 2022, EPA issued 15 states, including Kentucky, a finding of failure to submit complete regional haze SIPs that meet the requirements of the RHR and CAA sections 169A and 169B for the regional haze second planning period.[8] The public comment period for the Division's pre-hearing draft of the Regional Haze SIP for Kentucky's Class I area (Mammoth Cave National Park) for the Second Planning Period (2019-2028) was held from June 4, 2024 through July 11, 2024.

[5] 77 FR 19098
[6] 84 FR 13800
[7] 82 FR 3078
[8] 87 FR 52856

Figure 1 – Kentucky SO_2 EGU Actual Emissions



Data retrieved from EPA's Clean Air Markets Program Data (CAMPD) at https://campd.epa.gov.

CSAPR Implementation

Although the CSAPR was not developed to address downwind air quality issues specifically for the 2010 1-hour SO_2 NAAQS, SO_2 reductions have been realized as a result of participation in the Group I SO_2 trading programs for the 1997 and 2006 $PM_{2.5}$ NAAQS.

On July 5, 2018, 401 KAR 51:260. *Cross-State Air Pollution Rule (CSAPR) SO_2 group 1 trading program* became effective. The Division submitted 401 KAR 51:260, along with two other CSAPR trading program regulations, to EPA on September 14, 2018. The Division specifically requested EPA's approval of the three regulations into the Kentucky SIP. On February 10, 2020, EPA approved two of these state regulations, 401 KAR 51:240. *CSAPR NO_x annual trading program* and 401 KAR 51:260. *CSAPR SO_2 group 1 trading program.*[9] EPA will address 401 KAR 51:250. *CSAPR NO_x ozone season group 2 trading program* in a separate action.[10]

Additionally, on November 16, 2018, the Division submitted a final revision to EPA requesting the Kentucky Regional Haze SIP be revised to rely on CSAPR instead of CAIR to satisfy the BART requirements. The Division provided the Federal Land Managers (FLMs) and EPA with a pre-draft copy of the SIP revision on August 3, 2018, in accordance with 40 CFR 51.308(i)(2). Subsequently, a public hearing for this proposed SIP revision was conducted on October 4, 2018.

[9] 85 FR 7449

[10] On March 15, 2021, EPA published a CSAPR NO_x Ozone Season Group 3 rule. The Division will revise 401 KAR 51:250 at a future date.

EPA approved this submittal on April 8, 2019, allowing for a full approval of the Kentucky Regional Haze SIP.[11]

On April 30, 2021, EPA published the final rule for the Revised CSAPR Update to resolve the interstate transport obligations of 21 states under the good neighbor provision by establishing FIP requirements.[12] However, EPA is not currently implementing the Good Neighbor Plan "Group 3" ozone season NO_x control program for power plants in multiple states, including Kentucky, due to judicial orders partially staying its action.[13]

Federal Program

On April 30, 2020, the National Highway Traffic Safety Administration (NHTSA) and EPA promulgated as a joint action, the ''Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years (MYs) 2021–2026 Passenger Cars and Light Trucks."[14] The rule effectively addresses additional control measures to meet the requirements of section 110(a)(2)(D)(i)(I) for the 2010 SO_2 NAAQS. This rule also amended certain existing Corporate Average Fuel Economy (CAFE) and tailpipe carbon dioxide (CO_2) emissions standards and established new standards, covering MYs 2021 through 2026. NHTSA amended its MY 2021 CAFE standards because they are no longer maximum feasible standards. EPA amended its carbon dioxide emissions standards for MYs 2021 through 2025 since they are no longer appropriate and reasonable. EPA also established new standards for MY 2026.

Since being implemented in 2020, the CAFE and CO_2 emissions standards have and will continue to increase in stringency at 1.5% per year from MY 2020 levels over MYs 2021 – 2026. These standards apply to light-duty vehicles, of which NHTSA divides for purposes of regulation into passenger cars and light trucks, and EPA divides into passenger cars, light-duty trucks, and medium-duty passenger vehicles. These increasingly stringent standards will also result in year-over-year improvements in fuel efficiency for all vehicle types, resulting in energy conservation that helps address environmental concerns, including criteria pollutants such as SO_2.

SO_2 Monitoring Data

SO_2 is primarily formed through the burning of fossil fuels by power plants, particularly coal-fired EGUs and industrial facilities.[15] The 2010 revised 1-hour SO_2 NAAQS is intended to reduce the exposure to high, short-term concentrations of SO_2. The short-term form of this standard suggests that a violation of the standard would be associated with local conditions near the source of emissions rather than long-range transport of SO_2 emissions.[16] Similarly, the ambient concentration of SO_2 from a single source tends to correlate with the emissions from

[11] 84 FR 13800
[12] 86 FR 23054
[13] 88 FR 67102
[14] 85 FR 24174
[15] EPA. (2015). Integrated Science Assessment for Sulfur Oxides-Health Criteria, External Review Draft.
[16] EPA. (2016). Office of Air and Radiation, Office of Air Quality Planning and Standards, Air Quality Assessment Division, SO_2 NAAQS Designations Modeling Technical Assistance Document, Draft. https://www.epa.gov/sites/default/files/2016-06/documents/so2modelingtad.pdf

that source.[17] Data collected on SO_2 concentrations from the State and Local Air Monitoring Stations (SLAMS) and National Air Monitoring Stations (NAMS) have shown that the decline in SO_2 emissions from EGUs have significantly improved air quality.[18] Due to the short-distance dispersion of SO_2, EPA recommends states use 50 kilometers (km) as a reasonable transport distance threshold to evaluate emission source impacts into neighboring states and to assess air quality monitors within 50 km of the State's border.[19]

As shown in Table 1, the majority of SO_2 point source emissions in Kentucky originate from fuel combustion of EGUs. In 2020, SO_2 emissions from point sources in Kentucky comprised approximately 96 percent of the total SO_2 emissions in the state, with 78 percent of the state's total SO_2 emissions coming from fuel combustion point sources. Emissions from the nonpoint source categories are more dispersed throughout the state; therefore, these categories are less likely to cause high ambient concentrations when compared to a point source on a ton-for-ton basis. The Division finds it appropriate to focus the analysis of SO_2 emissions on Kentucky's larger point sources (i.e., emitting over 100 tpy of SO_2), including fuel combustion point sources, which are located within 50 km of another state's border.

Table 1 – Summary of 2020 NEI SO_2 Data for Kentucky by Source Type

Source Type	SO_2 Emissions (tpy)	Percent of Total SO_2 Emissions
Fuel Combustion: EGUs (All Fuel Types)	38,105	76
Fuel Combustion: Industrial Boilers/Internal Combustion Engines (All Fuel Types)	560	1
Fuel Combustion: Commercial/Institutional (All Fuel Types)	307	1
Fuel Combustion: Residential (All Fuel Types)	235	0
Industrial Processes (All Categories)	9,180	18
Mobile Sources (All Categories)	367	1
Fires (All Types)	876	2
Waste Disposal	386	1
Solvent Processes	84	0
Miscellaneous (Non-Industrial)	2	0
SO_2 Emissions Total	**50,102**	**100**

Data obtained from EPA's Emissions Inventory System (EIS) Gateway for 2020 National Emissions Inventory (NEI) (https://www.epa.gov/air-emissions-inventories/emissions-inventory-system-eis-gateway)

[17] Commission on Natural Resources, National Academy of Sciences, National Academy of Engineering, National Research Council. (1975). Air Quality and Stationary Source Emission Control.
[18] EPA. (2008). Integrated Science Assessment for Sulfur Oxides – Health Criteria.
[19] 84 FR 16801

2010 1-Hour SO_2 Designations

On August 5, 2013, EPA published the initial SO_2 nonattainment area designations for the 1-hour SO_2 standard across the country, which became effective October 4, 2013.[20] Due to violating monitors, portions of Campbell and Jefferson counties in Kentucky were designated as nonattainment for the 2010 SO_2 NAAQS. The violating Northern Kentucky University (NKU) monitor (21-037-3002), located in Campbell County, had a design value of 89 ppb for the years 2009 through 2011. The violating design value for the Watson Lane monitor (21-111-0051), located in Jefferson County, was 112 ppb for the years 2009 through 2011.

Campbell County

The Campbell County-NKU monitor (21-037-3002) attained the 2010 1-hour SO_2 standard in 2014 with a 2012-2014 design value of 72 ppb. Since that time, data values have significantly decreased and the Campbell County-NKU monitor has continued to attain the SO_2 standard. This decline in SO_2 emissions is in part due to the decommissioning of the Duke Energy, Walter C. Beckjord Station (Beckjord). On October 14, 2014, Beckjord provided notification to Ohio EPA that all six coal-fired emissions units had been permanently shut down and removed from service. The Beckjord facility was located by the Ohio River in New Richmond, Ohio (Clermont County). An in-depth analysis on the closure of the Beckjord facility and the effects on monitor data is discussed further in the Section 110(a)(2)(D)(i)(I) Demonstration.

Ohio EPA submitted a maintenance plan to EPA on August 11, 2015, for the Campbell-Clermont KY-OH SO_2 nonattainment area. On November 21, 2016, EPA redesignated the Ohio portion of the Campbell-Clermont, KY-OH area from nonattainment to attainment.[21] This redesignation resulted from the demonstrated closure of the most culpable source (Beckjord) as well as various additional analyses showing that no other sources in or near the area were causing or contributing to violations in the area.

Subsequently, the Division submitted a SIP revision to EPA on February 22, 2016, requesting EPA's redesignation of the Kentucky portion of the Campbell-Clermont, KY-OH area to attainment. On March 10, 2017, EPA redesignated the Kentucky portion of the Campbell-Clermont, KY-OH area to attainment in a final rule approving the Division's redesignation request.[22]

The area's SO_2 emissions are significantly lower than they were when it was first designated as nonattainment. The monitoring data seen in Table 2 is reflective of the significant improvement in SO_2 emissions. There are currently no SO_2 emissions sources on the Kentucky side of the maintenance area that would cause violations of the NAAQS across the Ohio border.

[20] 78 FR 47191
[21] 81 FR 83158
[22] 82 FR 13227

Table 2 – Campbell County SO_2 Design Values (ppb)

	2017-2019	2018-2020	2019-2021	2020-2022	2021-2023
3-Year Design Value	11	9	9	10	8

Data obtained from AMP480 report located in Appendix A

Jefferson County

The Mill Creek Generating Station (Mill Creek) installed controls in 2015, which have resulted in a drastic reduction in SO_2 emissions at the facility. Consequently, since the implementation of these control measures, the violating Jefferson County Watson Lane monitor (21-111-0051) has yielded seven consecutive years of clean data as of 2023. On behalf of the Louisville Metro Air Pollution Control District (District), the Division submitted an attainment plan to EPA on June 23, 2017, providing information on the progress made to bring the area back into attainment. In a final rule published on June 28, 2019, EPA approved this SIP revision.[23] Additionally, since being redesignated to attainment in 2019, Jefferson County has continued to yield clean data and achieve increasing lower design values. As shown in Table 3, the Louisville area is currently maintaining design values well below the SO_2 NAAQS. Thus, it is unlikely that any violations of the SO_2 NAAQS are occurring in Indiana that can be attributed to air quality in Louisville.

Table 3 – Jefferson County SO_2 Design Values (ppb)

	2017-2019	2018-2020	2019-2021	2020-2022	2021-2023
3-Year Design Value	15	15	14	13	12

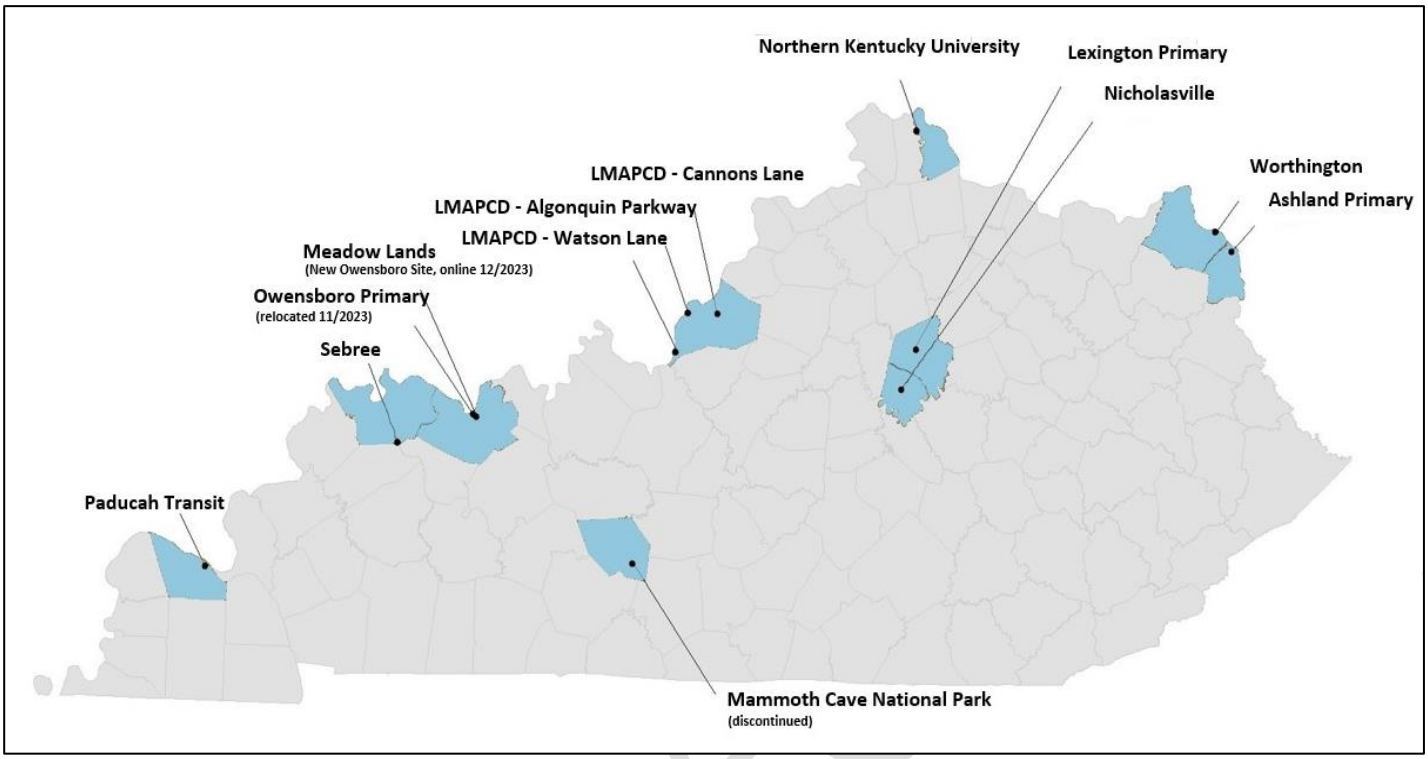
Data obtained from AMP480 report located in Appendix A, monitor 21-111-0051

Statewide Monitoring

Figure 2 shows there are currently 11 active SO_2 monitors throughout the Commonwealth. The Division operates eight of the monitors and the District operates three. The SO_2 portion of the monitor at Mammoth Cave National Park ceased operations on August 1, 2023. The Owensboro Primary monitor was shut down on August 7, 2023, and relocated to the Meadow Lands site in November of 2023; this site went online in December of 2023.

[23] 84 FR 30920

Figure 2: SO_2 Monitors in Kentucky

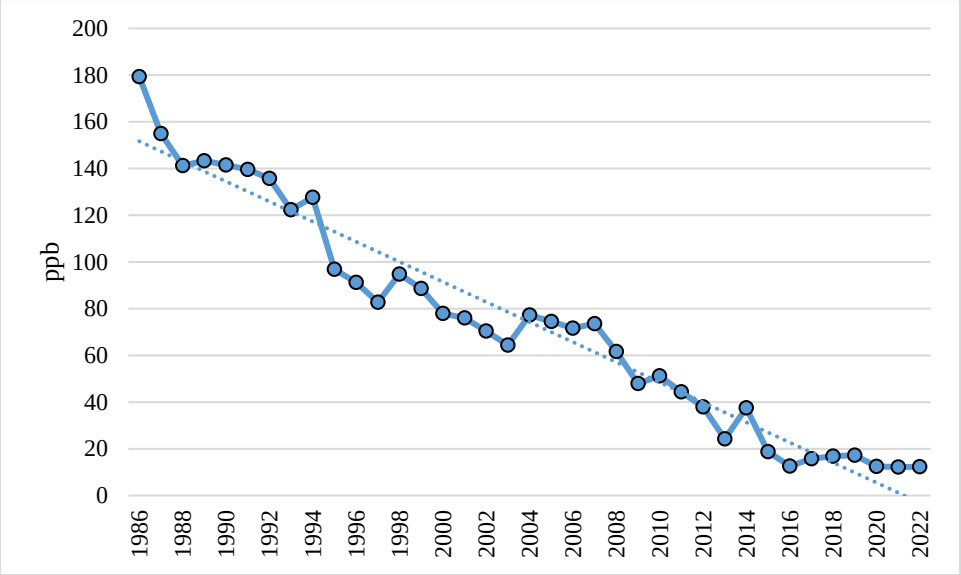


Data retrieved from 2023 Kentucky Annual Air Monitoring Network Plan (https://eec.ky.gov/Environmental-Protection/Air/Division%20Reports/2023%20Kentucky%20Annual%20Ambient%20Air%20Monitoring%20Network%20Plan.pdf)

Statewide SO_2 levels have significantly declined over the past thirty-six years, as shown in Figure 3.[24] Control strategies implemented by the Division and the District have led to continual reductions in SO_2 emissions and the overall improvement of air quality in Kentucky.

[24] Kentucky Division for Air Quality FY2023 Annual Report, https://eec.ky.gov/Environmental-Protection/Air/Division%20Reports/DAQ%202023%20Annual%20Report.pdf

Figure 3 – Statewide 99th Percentile Averages for Sulfur Dioxide



Data retrieved from KY Division for Air Quality FY2023 Annual Report[25]

As shown in Table 4, all of the SO_2 monitors located in Kentucky, with the exception of the Sebree SO_2 Data Requirements Rule (DRR) monitor (Sebree) (21-101-1011) in Henderson County, are attaining the 2010 1-hour SO_2 NAAQS. The Sebree monitor was established on January 1, 2017, to characterize the air quality around the three sources in the immediate area as mandated by the SO_2 DRR. On April 30, 2021, EPA formally designated partial areas of Henderson and Webster counties as nonattainment based on data from the Sebree monitor showing violations of the 2010 1-hour SO_2 NAAQS.[26]

The Division is preparing three separate SIP revisions to address the nonattainment planning requirements for the nonattainment area. These SIP revisions will address three separate requirements of the CAA:

1) nonattainment new source review (NNSR) requirements (172(c)(5));
2) an accurate base year emissions inventory of current emissions for all sources of SO_2 within the nonattainment area (172(c)(3)); and
3) an attainment demonstration that includes a modeling analysis showing that the enforceable emissions limitations and other control measures taken by the Division will provide for expeditious attainment of the NAAQS for SO_2 (172(c)).

[25] *ibid*, pg. 12
[26] 86 FR 16055

The NNSR SIP revision was submitted to EPA on January 26, 2024, and the base year emissions inventory SIP revision was submitted to EPA on February 15, 2024. The Division is currently drafting the attainment demonstration SIP revision.

Despite the current nonattainment status of the area, the Division maintains the position that adjacent states are not significantly impacted. As shown in Table 5, the Century Aluminum – Sebree facility is 49 km from the Illinois border and 19 km from the Indiana border. Currently, neither Illinois nor Indiana has an area classified as nonattainment for the 2010 SO_2 standard.

Table 4 – Monitored SO_2 Ambient Air Quality Data
Kentucky and Surrounding States (ppb)

Monitor ID	County	99th Percentile SO_2 1-hour Concentration				Design Values		Within 50 km of KY Border?
		2020	2021	2022	2023	2020 - 2022	2021 - 2023	
Kentucky								
21-019-0017	Boyd	5.0	5.0	5.5	5.4*	5	5	**Yes (2.5 km)**
21-037-3002	Campbell	10.0	9.0	9.9	4.8*	10	8	**Yes (5.44 km)**
21-059-0005	Daviess	12.0	7.0	8.4	5.3*	9	7*	**Yes (1.40 km)**
21-061-0501	Edmonson	2.2	2.7	1.9	1.7*	2	2*	**No**
21-067-0012	Fayette	3.0	5.4	2.8	2.4*	4	4	**No**
21-089-0007	Greenup	6.0	8.0	6.6	6.2*	7	7	**Yes (1.12 km)**
21-101-1011	Henderson	73.0	68.0	72.6	94.3*	71	78	**Yes (21.73 km)**
21-111-0051	Jefferson	14.6	12.7	11.8	12.6*	13	12	**Yes (1.66 km)**
21-111-0067	Jefferson	9.1	9.1	8.0	7.6*	9	8	**Yes (7.68 km)**
21-111-1041	Jefferson	5.1	4.3	4.2	6.0*	5	5*	**Yes (1.39 km)**
21-113-0001	Jessamine	3.0	3.3	5.4	7.4*	4	5	**No**
21-145-1024	McCracken	7.0	12.0	10.6	-	10	-	**Yes (2.29 km)**
21-145-1027	McCracken	-	-	-	9.5*	-	10*	**Yes (2.03 km)**
Illinois								
17-133-9001	Monroe	10.0*	14.0*	20.0*	6*	15	13	**No**
17-031-0076	Cook	14.4	9.7	10.5*	10.6*	12	10	**No**
17-117-0002	Macoupin	2.9	3.4	4.2	3.1*	4	4	**No**
17-031-1601	Cook	4.8	6.9	7.1	6.5*	6	7	**No**
17-019-1001	Champaign	2.6	3.2	4.5	3.2*	3	4	**No**
17-163-0010	St. Clair	8.3	12.4	13.8	11.2*	12	12	**No**
17-115-0317	Macon	38.5	51.8	44.5	66.1*	45	54	**No**
17-099-0007	LaSalle	7.6	5.3	4.5	15.6*	6	8	**No**
17-179-0004	Tazewell	14.3	12.2	11.0	4.6*	13	9	**No**
17-185-0001	Wabash	48.9	21.0	24.9	10.2*	32	19	**Yes (49.46 km)**
17-115-0217	Macon	38.8	42.6	55.4	50.3*	46	49	**No**

17-119-3007	Madison	7.2	12.0	9.1	13.9*	9	12	**No**
17-115-0117	Macon	16.3*	-	-	-	-	-	**No**
17-031-4201	Cook	6.1*	5.7	3.6	6.4*	5	5	**No**
17-115-0013	Macon	21.6	16.6	18.2	19.0*	19	18	**No**
Indiana								
18-089-0034	Lake	22.7	18.5	10.0	19.3*	17	16	**No**
18-089-2008	Lake	25.0	19.3	13.7	21.2*	19	18	**No**
18-097-0057	Marion	6.1	7.6*	6.6	-	7	-	**No**
18-027-0002	Daviess	11.0	8.7*	-	-	-	-	**No**
18-127-0011	Porter	39.0*	-	-	-	-	-	**No**
18-127-0028	Porter	80.5	72.5	44.9	79.4*	66	66	**No**
18-043-1004	Floyd	4.5	3.8	6.5	-	5	-	**Yes (3.03 km)**
18-043-0008	Floyd	-	-	-	4.6*	-	5*	
18-051-0002	Gibson	59.3	37.2	33.8	21.9*	43	31	**Yes (48.28 km)**
18-089-0022	Lake	31.5	32.2	20.4	23.5*	28	25	**No**
18-167-0018	Vigo	3.7	3.6	3.2	3.6*	4	3	**No**
18-097-0078	Marion	3.7	2.8	2.7	2.6*	3	3	**No**
18-163-0021	Vanderburgh	6.8	8.8	10.0	6.7*	9	9	**Yes (4.31 km)**
18-173-0011	Warrick	-	21.3	22.7	19.6*	22*	21	**Yes (5.21)**
Missouri								
29-183-9004	St. Charles	28.0	23.0	37.0	38.0	29	33	**No**
29-095-0034	Jackson	7.1	4.6	7.3	5.5	6	6	**No**
29-510-0085	St. Louis	7.9	13.3	11.4	14.2	11	13	**No**
29-099-0027	Jefferson	17.1	12.8	15.1	7.2	15	12	**No**
29-099-9007	Jefferson	19.0	24.0	31.0	6.0	25	20	**No**
29-099-9009	Jefferson	22.0	21.0	16.0	9.0	20	15	**No**
29-137-0001	Monroe	4.8	4.4	4.7	3.8	5	4	**No**
29-143-9001	New Madrid	366.9	405.2	479.0	472.8	417	452	**Yes (0.65 km)**
29-143-9002	New Madrid	285.3	284.9	303.7	283.2	291	291	**Yes (0.95 km)**
29-143-9003	New Madrid	69.4	87.9	128.4	127.7	95	115	**Yes (1.69 km)**
29-183-9002	St. Charles	31.0	17.0	39.0	33.0	29	30	**No**
29-071-9001	Franklin	29.0	34.0	38.0	38.0	34	37	**No**
29-071-9002	Franklin	34.0	26.0	44.0	26.0	35	32	**No**
29-093-0034	Iron	47.1	41.9	41.8	67.2	44	50	**No**
29-093-9009	Iron	44.5	42.7*	38.8	45.2*	42	42	**No**
29-093-9010	Iron	35.2	42.3	61.3	37.1	46	47	**No**
29-093-9011	Iron	48.1	37.2*	38.8	41.0	41	39	**No**
29-189-0016	St. Louis	11.7	18.6	22.6	14.9*	18	19	**No**
Ohio								
39-153-0025	Summit	4.0**	3.0	-	-	-	-	**No**
39-095-0008	Lucas	10.0*	14.0*	17.0	15.0*	14*	15*	**No**
39-099-0013	Mahoning	6.0	6.0*	-	-	-	-	**No**

39-115-0004	Morgan	13.0	18*	13.0	24.0*	15	18	**No**
39-135-1001	Preble	6.5	7.0	6.5	4.6*	7	6	**No**
39-145-0020	Scioto	13.0*	15.0*	21.0*	12.0*	16	16	**Yes (2.57 km)**
39-145-0022	Scioto	7.0*	9.0*	17.0*	11.0*	11	12	**Yes (0.44 km)**
39-153-0017	Summit	4.0	5.0	6.0	8.0*	5	6	**No**
39-061-0010	Hamilton	28.0	28.0	24.0	13.0*	27	22	**Yes (8.58 km)**
39-061-0040	Hamilton	12.7	16.3	13.4	6.6*	14	12	**Yes (2.32 km)**
39-081-0017	Jefferson	22.0	94.0	36.0	22.0*	51	51	**No**
39-081-0018	Jefferson	2.0*	-	-	-	-	-	**No**
39-081-0020	Jefferson	12.0*	-	-	-	-	-	**No**
39-085-0003	Lake	5.0*	6.0	-	-	-	-	**No**
39-085-0007	Lake	80.0*	9.0	4.0	3.0*	31	5	**No**
39-087-0012	Lawrence	3.0*	3.0	4.0	2.0*	3	3	**Yes (0.57 km)**
39-029-0019	Columbiana	3.0	4.0	-	-	-	-	**No**
39-035-0038	Cuyahoga	17.0	39.0	28.0	27.0*	28	31	**No**
39-035-0045	Cuyahoga	11.0*	4.0	-		-	-	**No**
39-035-0060	Cuyahoga	19.2	19.0	12.8	19.2*	17	17	**No**
39-035-0065	Cuyahoga	13.0	11.0	13.0	8.0*	12	11	**No**
39-049-0034	Franklin	3.0*	2.0*	3.0	4.0*	3	3	**No**
39-053-0004	Gallia	57.0	57.0	30.0	47.0	48	45	**No**
39-053-0005	Gallia	58.0	52.0	40.0	52.0*	50	48	**No**
39-053-0006	Gallia	52.0	39.0	32.0	52.0*	41	41	**No**
39-001-0001	Adams	5.0*	-	-	-	-	-	**Yes (10.21 km)**
39-003-0009	Allen	3.0	3.0	4.0	3.0*	3	3	**No**
39-007-1001	Ashtabula	5.0*	8.0	-	-	-	-	**No**
39-013-0006	Belmont	1.0	3.0	4.0	5.0*	3	4	**No**
39-017-0019	Butler	35.0*	13.0	18.0	14.0*	22	15	**Yes (40.0 km)**
39-017-0020	Butler	41.0	22.0	13.0*	21.0*	25	19	**Yes (39.35 km)**
39-017-0021	Butler	32.0	17.0	13.0	20.0*	21	17	**Yes (38.58 km)**
39-023-0003	Clark	5.0*	-	-	-	-	-	**No**
39-099-0015	Mahoning	-	6.0*	6.0	10.0*	6*	7*	**No**
39-059-0003	Guernsey	35.2*	35.2	33.1	49.2*	35*	39	**No**
39-167-0011	Morgan	-	17.0*	24.0	26.0*	21*	22*	**No**
39-063-0005	Hancock	15.0*	21.0	13.0	18.0*	16*	17	**No**
39-059-0004	Guernsey	3.9*	23.5	19.2	37.0*	16*	27	**No**
Tennessee								
47-163-6003	Sullivan	73.0	84.0	55.0	61.0*	71	67	**No**
47-157-0075	Shelby	1.9	2.4	2.5	1.6*	2	2	**No**
47-163-6002	Sullivan	27.0	24.0	29.0	28.0*	27	27	**No**
47-009-0101	Blount	0.8	1.4	1.0*	1.4*	1*	1*	**No**
47-163-6004	Sullivan	46.0	61.0	45.0	51.0*	51	52	**No**
47-163-6001	Sullivan	45.0	42.0	36.0	37.0*	41	38	**No**

47-037-0040	Davidson	2.0	4.0	3.0	6.0*	3	4	**No**
Virginia								
51-580-0008	Covington	62.9*	-	-	-	-	-	**No**
51-650-0008	Hampton	3.7*	3.1	3.1	2.9*	3	3	**No**
51-710-0024	Norfolk	1.7*	1.9	2.4	3.3*	2	3	**No**
51-023-0004	Botetourt	46.5*	-	-	-	-	-	**No**
51-165-0003	Rockingham	2.0*	1.8	1.7	1.8*	2	2	**No**
51-059-0030	Fairfax	2.4*	2.7	2.5	1.5*	3	2	**No**
51-071-0007	Giles	143.9*	98.7	61.5	39.1	101	66	**No**
51-087-0014	Henrico	2.2*	1.5	2.8	1.5*	2	2	**No**
51-161-1004	Roanoke	3.3*	3.4	2.9*	3.3*	3*	3*	**No**
51-036-0002	Charles City	2.6*	2.7	3.9	2.8*	3	3	**No**
West Virginia								
54-061-0003	Monongalia	10.0	10.0	11.0*	10.0*	10	10	**No**
51-107-1002	Wood	19.0	16.0	19.0*	28.0*	18	21	**No**
51-029-0009	Hancock	21.0	24.0	15.0*	16.0*	20	18	**No**
54-029-0015	Hancock	10.0	12.0	17.0*	10.0*	13	13*	**No**
54-039-0020	Kanawha	4.4	5.5	4.7*	5.0*	5	5	**No**
54-051-1002	Marshall	9.0	10.0	8.0*	7.0*	9	8	**No**
54-029-0007	Hancock	20.0	23.0	15.0*	21.0*	19	20*	**No**
54-057-8883	Mineral	2.3*	-	-	-	-	-	**No**
54-009-0005	Brooke	38.0	41.0	30.0*	23.0*	36	31	**No**
54-009-0007	Brooke	41.0	52.0	21.0*	22.0*	38	32	**No**
54-009-0011	Brooke	39.0	61.0	24.0*	31.0*	41	39	**No**
54-009-6000	Brooke	18.0	-	-	-	-	-	**No**
54-053-0001	Mason	55.0	43.0	32.0	36.0*	43	37	**No**

Data retrieved from EPA Design Value Report (AMP480), located in Appendix A
*Indicates either a failure to meet completeness criteria, the lack of quality assurance by EPA, and/or data has not been certified. See Appendix A for additional details about each monitor.

Data Requirements Rule

The Data Requirements Rule (DRR) for the 1-hour SO_2 NAAQS, promulgated by EPA on August 21, 2015,[27] requires air agencies to submit a list to EPA of point sources that emit 2,000 tpy or more of SO_2 emissions and provide data to characterize current air quality in these areas.[28] The deadline for this submittal to EPA was July 1, 2016. This list excludes sources that are in areas designated as nonattainment before January 2016.[29] Air agencies had the choice of either 1) characterizing peak 1-hour SO_2 concentrations through ambient air quality monitoring, 2)

[27] 80 FR 51052
[28] As required by 40 CFR 51.1203 (80 FR 51087)
[29] 80 FR 51053

characterizing peak 1-hour SO_2 concentrations through air quality modeling techniques or 3) providing federally- enforceable emission limitations.

The Division submitted a letter to EPA on January 7, 2016, identifying 15 sources located in Kentucky that emitted more than 2,000 tpy of SO_2 in 2014. On March 22, 2016, EPA sent a response letter requesting that the Division include the Cane Run facility (AFS# 21-111-00126) in the list of sources subject to the DRR. The Division provided EPA with the requested information in a letter dated June 20, 2016 (located in Appendix B).

On January 6, 2017, the Division submitted the *Data Requirements Rule Submittal for the 2010 1-Hour Sulfur Dioxide (SO_2) Primary National Ambient Air Quality Standard* to EPA.[30] Sixteen Kentucky sources were analyzed to determine if they were subject to the DRR. The modeling protocol and analysis method was chosen to characterize nine of the sources. Peak hourly concentrations were modeled and evaluated, showing that concentrations of SO_2 were less than the 2010 SO_2 NAAQS at every facility. The Division utilized receptor grids in locations that would be considered ambient air relative to each modeled facility, including into adjacent states; the Division chose to include these receptors to provide for a cautious study of SO_2 impacts in the area of analysis.[31]

Three facilities chose to establish a monitor to collect emissions data over three years, which would be used during the fourth and final round of designations. One facility, EKPC – John Sherman Cooper Power Station, revised their permit to accept a federally-enforceable source-wide emissions limitation to less than 2,000 tpy. Three sources permanently shut down their coal-fired units, which greatly reduced their potential-to-emit (PTE) and demonstrated these areas to be in attainment. Of these three sources, one source, KU – Green River Station, permanently closed its facility. Table 5 shows that all but one of the DRR sources in Kentucky are under 50 km from the Kentucky border. The facilities are grouped based upon how they were characterized in the Division's DRR submittal.

Table 5 – Kentucky DRR SO_2 Sources and Distance from the Kentucky Border

AQS #	Facility	Kilometers from Nearby State	
Monitored Sources			
21-101-00029	Century Aluminum – Sebree	Indiana: 19	Illinois: 49
21-233-00052	Big Rivers – Sebree Green	Indiana: 22	
21-233-00001	Big Rivers – Sebree Reid	Indiana: 22	

[30]Data Requirements Rule Submittal for the 2010 1-Hour Sulfur Dioxide (SO_2) Primary National Ambient Air Quality Standard, https://eec.ky.gov/Environmental-Protection/Air/Documents/2010 SO2 Data Requirement Rule with Sec. Ltr.pdf

[31] Technical Support Document: Chapter 15 Proposed Round 3 Area Designations for the 2010 1-Hour SO_2 Primary National Ambient Air Quality Standard for Kentucky, https://www.epa.gov/sites/default/files/2017-12/documents/15-ky-so2-rd3-final.pdf

Modeled Sources			
21-015-00029	Duke Energy – East Bend Station	Ohio: 25	Indiana: 0.92
21-041-00010	KU – Ghent	Indiana: 0.52	
21-059-00027	OMU – Elmer Smith	Indiana: 1.17	
21-091-00004	Century Aluminum – Hawesville	Indiana: 1.21	
21-177-00006	TVA – Paradise	Indiana: 58.7	
21-145-00006	TVA – Shawnee	Illinois: 1.63	Missouri: 35
21-161-00009	EKPC – HL Spurlock	Ohio: 0.87	
21-223-00002	LG&E – Trimble	Indiana: 1.07	
21-183-00069	Big Rivers – D.B. Wilson	Indiana: 36	
Federally Enforceable Requirements			
21-199-00005	EKPC – John Sherman Cooper Power Station	Tennessee: 44.27	
Sources with Permanently Shut Down Coal-Fired Units			
21-111-00126	LG&E – Cane Run	Indiana: 1.11	
21-127-00003	KY Power CO – Big Sandy Plant	Ohio: 26.38	West Virginia: 0.14
Closed Facilities			
21-177-00001	KU – Green River Station	Indiana: 46.56	

Two sources in Table 5 (above), D.B. Wilson Station – Big Rivers Electric Corporation (Wilson) and John Sherman Cooper Power Station – East Kentucky Power Cooperative (Cooper), are located in areas in Kentucky that were designated unclassifiable by EPA in Round 2 of the SO_2 DRR designations.

Table 6 demonstrates that SO_2 emissions from Cooper have decreased significantly from 2010 through 2022 and SO_2 emissions from Wilson have decreased moderately over the 12-year period.

Table 6 – SO_2 Emissions Trends for Cooper and Wilson, 2010-2022 (tpy)

Facility	Unit	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Cooper	**1**	4,287	2,812	2,319	825	171	27	43	21	14	43	2
Cooper	**2**	3,141	1,792	2,005	979	149	83	105	60	33	121	153
Wilson	**W1**	7,387	7,607	6,901	7,800	6,934	5,815	5,082	5,217	4,481	7,157	6,404

Data retrieved from Kentucky Emissions Inventory System (KyEIS)

Wilson, located in Ohio County, has a dry bottom, wall-fired boiler that is equipped with an electrostatic precipitator (ESP), wet flue gas desulfurization (WFGD), and selective catalytic reduction (SCR) as SO_2 controls in Unit W1. During Round 2 designations of the DRR in 2015, the Division provided modeling that was conducted for Wilson and nearby background sources. The modeling demonstration showed compliance with the SO_2 standard; Wilson was conservatively modeled at 17,130 tpy, which is significantly higher than the 2022 emissions of 6,404 tpy. The Round 2 modeling report can be found in Appendix C.

The facility replaced the prior WFGD system with an advanced WFGD control device in November of 2022 to further reduce emissions (Appendix C). The implementation of more stringent control measures has increased the SO_2 emissions removal efficiency to 97% for the facility.[32] Following the installation of the device, the maximum controlled emissions for the facility are 3,732 tpy, nearly half of recent years' emissions. For the second implementation period for the Kentucky Regional Haze SIP submittal, the Division requested that Wilson conduct a four-factor analysis to assess potential emissions controls. However, because Wilson installed the advanced WFGD device that will result in significant reductions in SO_2 emissions, it was determined that Wilson is effectively controlled and thus not required to perform a four-factor analyses.

Cooper is a coal-fired electric generating station located in Pulaski County. The station is comprised of two coal-fired generating units, Units 1 and 2, which have both added dry lime flue gas desulfurization (FGD) scrubbers as control devices to mitigate their SO_2 emissions. Unit 2 began operating its dry lime FGD on May 29, 2012, and Unit 1 began operating its dry lime FGD on November 24, 2015. Table shows a rapid decline in SO_2 emissions for both units following the implementation of their respective control measure upgrades. In 2012, emissions from Unit 2 decreased by about two-thirds when compared to the previous year and in the same timespan Unit 1 nearly cut its emissions in half. After Unit 1 began operating its dry lime FGD in 2015, its subsequent annual emissions significantly decreased in comparison to its 2014 emissions. Overall, the emissions totals in 2022 show a remarkable reduction in SO_2 emissions in comparison to 2010. In addition, Cooper is 44.27 km from the Kentucky-Tennessee border and annual emissions for Units 1 and 2 combined have been under 200 tpy since 2017, decreasing the relative impact of the facility's emissions on interstate transport of SO_2.

Pursuant to 40 CFR 51.1205(b), the Division is required to submit an ongoing DRR report of the identified sources to EPA by July 1st of every year. The report provides the annual emissions for each source along with an assessment if there is an increase in emissions, a recommendation if additional modeling is needed, and whether a source is no longer deemed to be subject to the DRR requirements based on a modeling demonstration. The Division's most recent submittal was approved in a letter from EPA on December 21, 2023.[33]

DRR Round 3 - Unclassifiable Area in Virginia

During Round 3 of DRR Designations, the EPA determined Buchanan County, Virginia to be unclassifiable for the 2010 1-hour SO_2 standard. The primary source of SO_2 emissions in

[32] Renewal Permit V-21-018 issued on 11/21/2021
[33] Kentucky Sulfur Dioxide Ongoing Data Requirements Rule 2023 Annual Report for Modeled Sources, https://eec.ky.gov/Environmental-Protection/Air/Documents/Final 2023 Annual SO2 DRR Report.pdf

Buchanan County is from Jewell Coke Company LLP.[34] The facility is approximately 21 km from the Kentucky border. The nearest Kentucky DRR sources of SO_2 are over 100 km away, double the EPA's recommended analysis radius of 50 km. Given Kentucky's sizable distance from the facility's location, the Division has determined further analysis is not needed.

Sources with Permanently Shut Down Units

In response to the DRR, two sources within Kentucky, LG&E Cane Run and KY Power Big Sandy, chose to permanently shut down units to reduce emissions of SO_2. In 2015, both facilities converted from coal to natural gas-fired plants. Following the natural gas conversion, the emissions are well within the 2,000 tpy limit established by the DRR for further characterization, as seen in Table 7. Given the significant decrease in emissions and lack of nonattainment areas in nearby states, the Division maintains both facilities are not significantly contributing to maintenance of the NAAQS in nearby states.

During initial designations, Owensboro Municipal Unit – Elmer Smith (OMU) modeled for attainment for the 2010 SO_2 standard. On June 9, 2020, the Division performed a Full Compliance Evaluation and noted that the facility was offline and had ceased production (see Appendix B). On August 12, 2020, the Division received a letter from OMU requesting a recension of the Title V permit due to the closure and decommissioning of the power plant.

Table 7 – SO_2 Emissions Trends for LG&E Cane Run and Big Sandy, 2012-2022 (tpy)

Facility	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
LG&E Cane Run	6,127	6,268	8,762	1,812	10	7	10	11	9	10	9
KY Power Big Sandy	19,699	18,733	32,834	21,852	138	15	17	27	23	15	14
OMU – Elmer Smith	4,958	8,064	5,741	3,902	2,449	1,853	2,088	1,977	587	0	0

Data retrieved from CAMPD (https://campd.epa.gov/)

Kentucky Non-DRR Sources

Kentucky has multiple sources not subject to the DRR that are within 50 km of its border and emit greater than 100 tpy of SO_2. These sources were analyzed to determine if they contribute to neighboring states' nonattainment of, or interfere with the maintenance of, the SO_2 NAAQS. Table 8 shows that none of these Kentucky sources are within the 50 km threshold from a neighboring state's violating monitor.

[34] Technical Support Document: Chapter 41 Final Round 3 Area Designations for the 2010 1-Hour SO_2 Primary National Ambient Air Quality Standard for the Commonwealth of Virginia, https://www.epa.gov/sites/default/files/2017-12/documents/41-va-so2-rd3-final.pdf

Table 8 – Kentucky Non-DRR SO_2 Sources within 50 km of the Kentucky Border

Kentucky Source	2021 Annual SO_2 Emissions (tons)	Approximate Distance to Kentucky Border (km)	Closest Neighboring State	Near a violating monitor in neighboring state?
Brown-Forman Distillery Co., Early Times	0.34*	5	Indiana	No
CC Metals and Alloys LLC	512.05	10	Illinois	No
Calgon Carbon Corporation	78.20	<1	West Virginia/Ohio	No
Carmeuse Lime Inc.	1,071.59	<1	Ohio	No
Carmeuse Lime & Stone Inc.	0	<1	Ohio	No
Cincinnati/ Northern Kentucky Airport	49.38*	5	Ohio	No
Jim Beam Brands Co. - Boston Nelson Co	199.17	32	Indiana	No
Jim Beam Brands Co. - Clermont Plant	0.03	26	Indiana	No
Arcosa LW KY LLC (was Kentucky Solite Corp.)	720.99	18	Indiana	No
Kosmos Cement Company LLC (was CEMEX – Louisville Cement Plant)	270.13*	1	Indiana	No
Louisville Muhammad Ali Intl Airport	82.62*	9	Indiana	No
Louisville Medical Center Steam & Chilled Water Plant	281.41*	2	Indiana	No
Marathon Petroleum Co LLC – Cattlesburg Refining	120.07*	<1	West Virginia	No
Owensboro Grain Co.	0.34*	1	Indiana	No
DRR source within 50 km of the Kentucky border that took federally enforceable limits to exempt out of DRR requirements				
Kentucky Power Company – Big Sandy Plant	14.64	<1	West Virginia	No

Data retrieved from KyEIS
*Data retrieved from EPA's EIS Gateway

Violating SO_2 Design Values in Surrounding States

The Division evaluated the air monitoring data and EPA's Technical Support Documents (TSDs) for each of the seven states surrounding Kentucky, which are Illinois, Indiana, Missouri, Ohio, Tennessee, Virginia, and West Virginia. Ambient air monitors in these states were assessed to determine if Kentucky SO_2 emissions are potentially contributing to interstate transport air quality issues. Appendix A contains 2013-2023 monitoring data for Kentucky and surrounding states.

There are three SO_2 monitors in Missouri's air monitoring network that are within 50 km of the Kentucky border. All three of these monitors, located in New Madrid County, are currently above the 75 ppb 2010 1-hour SO_2 standard. Table 9 shows their 2021-2023 design values and distance to the Kentucky border. Effective April 30, 2021, EPA designated New Madrid County, which includes the aforementioned Missouri monitors, as nonattainment for the 2010 1-hour SO_2 standard.[35]

Table 9 – Distances from Kentucky Border to Surrounding States Violating DRR Monitors

State	Site ID	Monitor Location	Distance from KY Border (km)	2021 – 2023 Design Values (ppb)
MO	29-143-9001	AECI Water Tower	0.71	452
MO	29-143-9002	East Graveyard	0.96	291
MO	29-143-9003	M7M Site #3 West Entrance	2.80	115

Data retrieved from EPA Design Value Report (AMP480), located in Appendix A

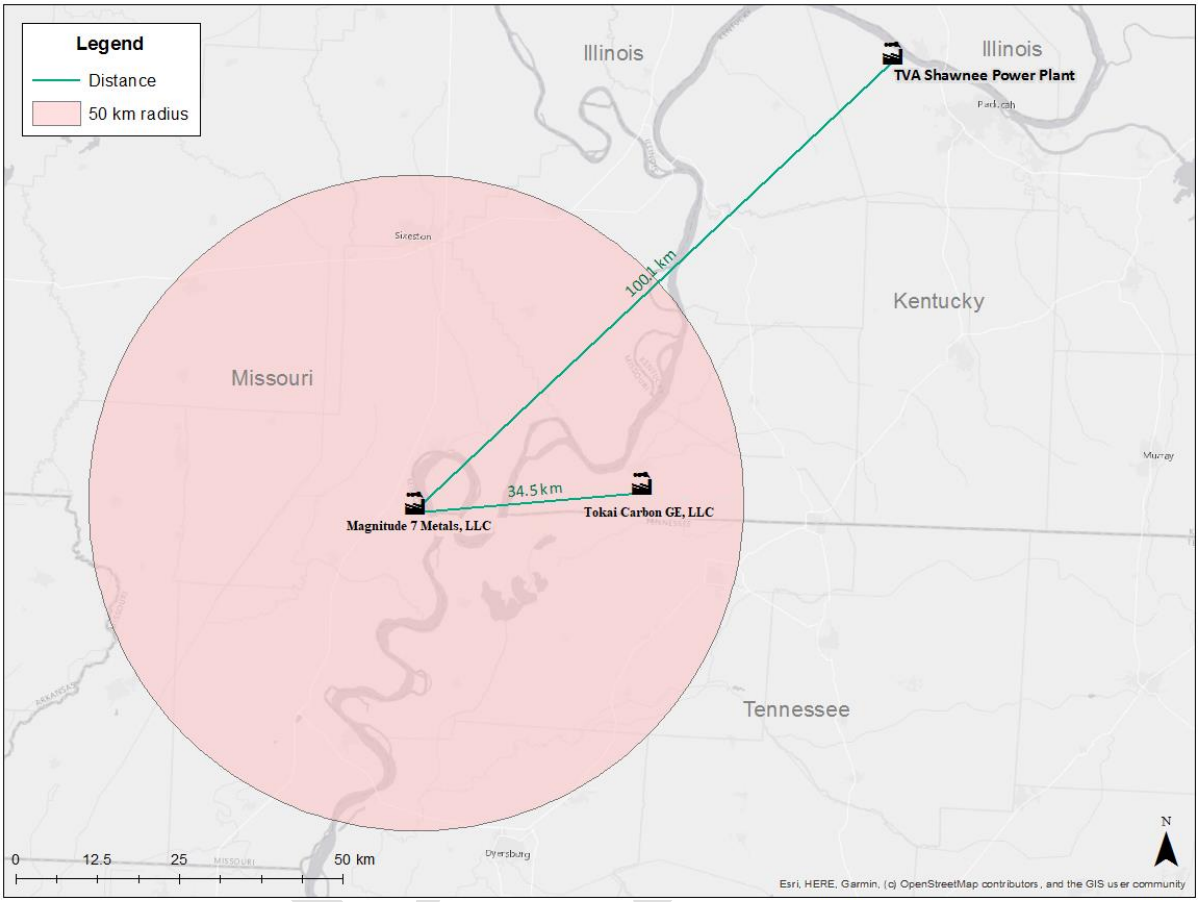
The three Missouri monitors are located around Magnitude 7 Metals, LLC, an aluminum smelter facility located in Marston, MO.[36] The facility is approximately 1 km from the Kentucky border and about 2.3 km from the Tennessee border. Figure 4 depicts the placement of the three monitors around the facility. It should be noted that on January 24, 2024, Magnitude 7 Metals announced the curtailment of the facility's smelter, ceasing its operations; it is currently unknown if the facility will reopen.[37]

[35] 86 FR 16055
[36] Missouri Department of Natural Resources Air Pollution Control Program 2020 Monitoring Network Plan, September 25, 2020.
[37] Sustainable Aluminum Network, Statement on the Curtailment of the Magnitude 7 Metals Aluminum Smelter, https://www.sustainablealuminumnetwork.org/reports-news-and-insights/statement-on-closure-of-magnitude-7-metals

Figure 4 – Missouri Monitors Around Magnitude 7 Metals, LLC

The only Kentucky source that emits more than 100 tpy of SO_2 in the vicinity of the violating Missouri monitors is the Tennessee Valley Authority Shawnee Fossil Plant (TVA Shawnee). TVA Shawnee is a coal-fired power plant located in McCracken County, Kentucky. The facility is located 100 km to the northeast of the three Missouri monitors. As seen in Figure 5, TVA Shawnee is well outside the 50 km travel range typical for SO_2 emissions to be deemed significant when assessing impacts on air quality from point sources. However, due to the large volume of emissions from TVA Shawnee, additional information is provided here. During the Round 3 designations for the DRR, air modeling was performed for the facility and indicated that TVA Shawnee was in attainment for the NAAQS. At the time of modeling, the SO_2 emissions were double the current value. In addition, evidence has shown a decreasing concentration gradient as SO_2 travels away from a source. The modeling demonstration and concentration gradient data can be found in Appendix D.

Figure 5 – Distance of Kentucky Sources from Missouri Monitors



The closest Kentucky source to the Missouri monitors (approximately 33 km) is Tokai Carbon GE LLC (Tokai), formerly known as SGL Carbon LLC, which is located in Fulton County, Kentucky. Tokai manufactures graphite electrodes for the U.S. steel industry. Tokai is located northeast of Magnitude 7 Metals and the violating Missouri monitors. Recent data has shown that Tokai has consistently emitted less than 100 tpy of SO_2. In 2022, the facility emitted 31.71 tons of SO_2.[38] Given that Tokai's emissions are well under the 100 tpy threshold, it is unlikely that its SO_2 emissions could interact with SO_2 emissions from neighboring states' sources in such a way as to contribute significantly to nonattainment in Missouri.

Non-violating Monitors in Neighboring States

Using certified monitoring data from EPA's Air Quality System (AQS), found in Appendix A, design values for the 2010 1-hour SO_2 NAAQS were analyzed for states adjacent to Kentucky. There is one AQS monitor in Illinois, three AQS monitors in Indiana, and eight AQS monitors in Ohio that are located within 50 km of Kentucky. As shown in Table 10, design values for non-

[38] Data retrieved from KyEIS.

violating monitoring sites within 50 km of Kentucky's border have remained well below the 2010 1-hour SO_2 NAAQS since 2015. Additionally, Table 10 demonstrates how the design values at these monitors generally trended downward from 2017 through 2022, except for the Yankee and Made monitors in Ohio. However, both Ohio monitors are still consistently attaining the 2010 1-hour SO_2 NAAQS. Overall, these trends show that Kentucky will not significantly contribute to nonattainment of the 2010 1-hour SO_2 NAAQS in another state.

Table 10 – Non-violating Monitors within 50 km of the Kentucky Border in Adjacent States

State	Site ID	Site Name	2018 - 2020 Design Value (ppb)	2019 - 2021 Design Value (ppb)	2020- 2022 Design Value (ppb)	2021- 2023 Design Value (ppb)	Approximate Distance from KY Border (km)
IL	17-185-0001	PSI/Duke Energy-Gibson Network/Mt. Carmel	39	33	32	19	49
IN	18-051-0002	PSI/Duke Energy-Gibson Network/Mt. Carmel	50	46	43	31	48
IN	18-163-0021	Evansville- Buena Vista	9	8	9	9	5
IN	18-173-0011	Dayville	-	21*	22*	21	6
IN	18-043-1004	New Albany- Green Valley Elem. Sch.	6	4	5	-	4
IN	18-043-0008	New Albany – 4H Road	-	-	-	5*	4
OH	39-145-0020	Back Road	22	20	16	16	3
OH	39-145-0022	Gallia Pike South	16	9	11	12	<1
OH	39-061-0010	Colerain	26	27	27	22	9
OH	39-061-0040	Taft NCore	12	14	14	12	3
OH	39-087-0012	ODOT Ironton	6	3	3	3	<1
OH	39-017-0019	Amanda Elem	28	25	22	15	40
OH	39-017-0020	Yankee	65	66	25	19	40
OH	39-017-0021	Made	30*	31	21	17	39

Data retrieved from EPA Design Value Report (AMP480), located in Appendix A. Virginia, West Virginia, and Tennessee are omitted from this table because no monitors in these states are located within 50 km of Kentucky. Missouri monitors within 50 km of Kentucky are detailed in Table 9.
*Indicates an invalid design value

Round 4 2010 1-hour SO_2 Designations

Some states and facilities chose to establish monitors to characterize air quality around stationary sources that emitted either (a) more than 16,000 tons of SO_2, or (b) more than 2,600 tons of SO_2 and had an average emission rate of at least 0.45 lbs SO_2/MMBtu for the DRR (third round). For EPA to meet the fourth-round designation deadline, states began operating the new monitors on January 1, 2017. Final designations were based on the 99th percentile of 1-hour daily maximum concentrations averaged over 3 years (2017-2019), and states were required to certify 2019 monitoring data by May 1, 2020.

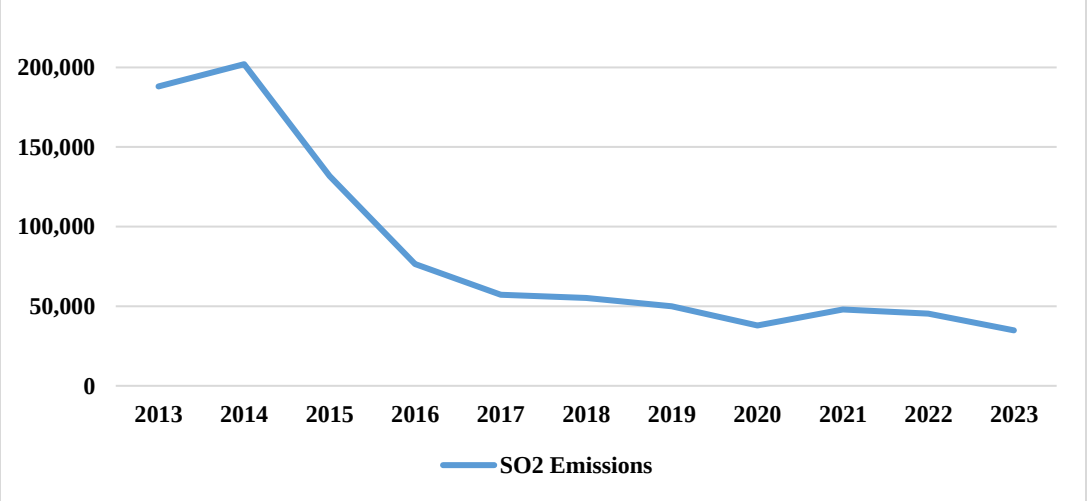
The EPA was required to designate all remaining areas (areas not designated during the first three rounds) by a court-ordered deadline of December 31, 2020. On December 21, 2020, the EPA Administrator signed the Round 4 2010 SO_2 NAAQS designations action. A final rule was promulgated on March 26, 2021, in which a portion of Henderson and Webster counties in

Kentucky were designated as nonattainment, with the remaining areas of each county designated as attainment/unclassifiable. The effective date of the designation was April 30, 2021. [39] As previously stated in the Statewide Monitoring section, the Division is currently preparing the final portion of the Henderson-Webster SIP submittal, an attainment demonstration that includes a modeling analysis showing that the enforceable emissions limitations and other control measures taken by the Division will provide for expeditious attainment of the 2010 SO_2 NAAQS by the April 30, 2026 attainment deadline.

Section 110(a)(2)(D)(i)(I) Demonstration

As shown in Figure 6, Kentucky's statewide annual SO_2 emissions have significantly declined since 2012 due to state and federal programs. Furthermore, Figure 7 displays Kentucky SO_2 emissions by source sector with emissions data from the 2020 NEI. The majority of SO_2 emissions in Kentucky come from point sources.

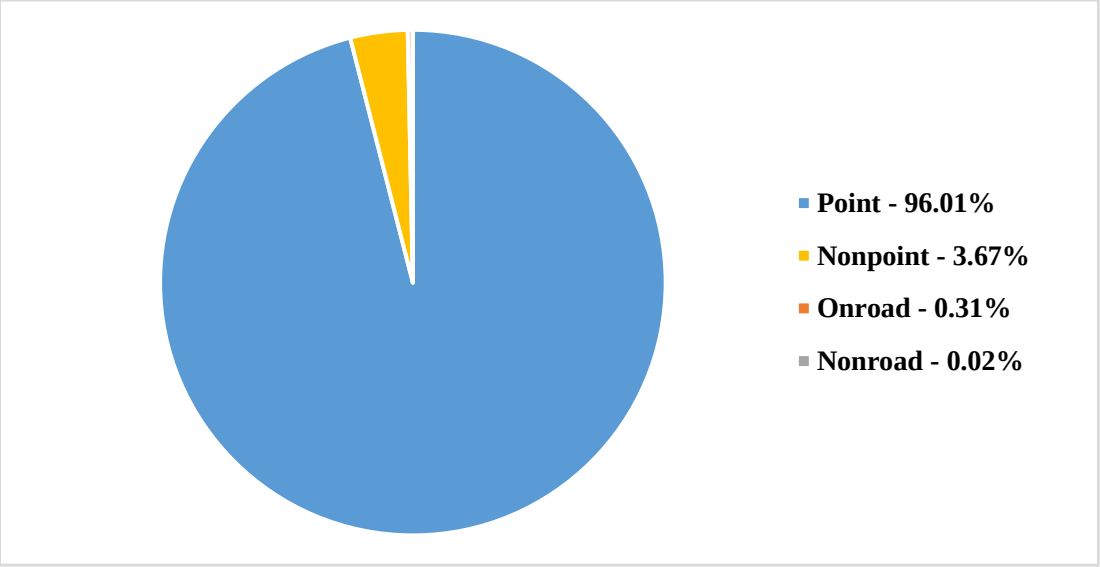
Figure 6 – Trends in Annual EGU SO_2 Emissions 2013-2023 (tpy)



Data retrieved from CAMPD (https://campd.epa.gov/)

[39] 86 FR 16055

Figure 7 – Kentucky SO_2 Emissions by Sector in 2020



Data retrieved from EPA's 2020 NEI (https://www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei)

As mentioned previously in the SO_2 Monitoring Data section, portions of Campbell and Jefferson counties were designated as nonattainment on August 5, 2013, due to monitoring data showing a violation of the 2010 1-hour SO_2 NAAQS. The violating monitor located in Campbell County, NKU (21-037-3002), had a design value of 89 ppb for 2009 through 2011. The design value for the Watson Lane monitor (21-111-0051), located in Jefferson County, was 112 ppb for 2009 through 2011.

Since the nonattainment designations in 2013, facilities impacting the two monitors have either closed or installed controls. As detailed below, these changes have resulted in significant drops in the design values for each monitor. In 2023, the NKU monitor (21-037-3002) had a design value of 8 ppb and the Watson Lane monitor (21-111-0051) had a design value of 12 ppb.

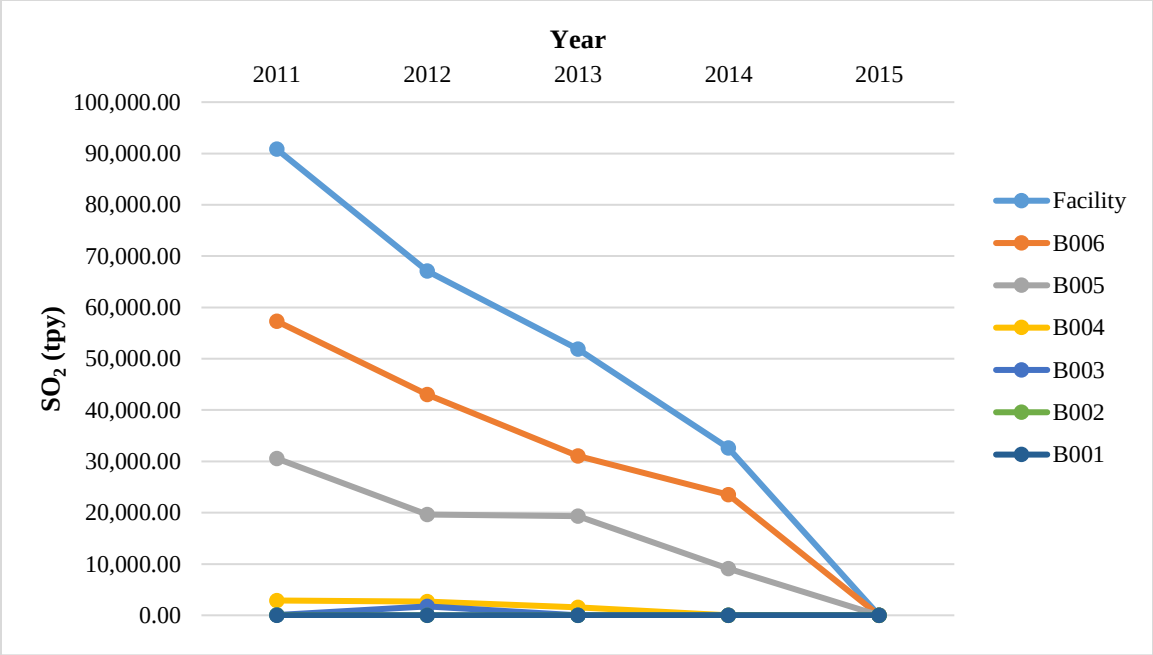
Duke Energy, Walter C. Beckjord Station

The TSD for Kentucky, provided by EPA, identified the Beckjord Generating Station as the major source of SO_2 emissions within the Campbell-Clermont, KY-OH nonattainment area.[40] Beckjord, located in Clermont County Ohio, is approximately 16.1 km from the Campbell County-NKU Monitoring Station. Beckjord shut down all operations in 2014, which consequently caused a drastic decrease in the design value at the NKU monitor (21-037-3002).[41]

[40] EPA Technical Support Document (TSD) Kentucky Area Designations for the 2010 SO_2 Primary National Ambient Air Quality Standard, https://www.epa.gov/sites/production/files/2016-03/documents/ky-tsd.pdf
[41] Please see Appendix A regarding monitoring data and design values for this monitor.

The Beckjord facility was sixty years old with no SO_2 controls at the time of its closure. The facility was comprised of six EGUs: B001 and B002 were 94 megawatts (MW) each; B003 was 128 MW; B004 was 150 MW, B005 was 238 MW; and B006 was 414 MW. Emissions of SO_2 by unit and for the entire facility from 2011 through 2015 are shown in Figure 8.

Figure 8 – Walter C. Beckjord SO_2 Emissions by Unit and Entire Facility



Data retrieved from Appendix G: Beckjord SO_2 Emissions from Ohio EPA's Clermont County 2010 1-hr SO_2 Redesignation (https://epa.ohio.gov/divisions-and-offices/air-pollution-control/state-implementation-plans/so2-clermont-county-redesignation)

B001 last operated in 2009, B002 in 2011, B003 in 2012, B004 in 2013, and both B005 and B006 ceased operation on September 1, 2014. A permit is required through Ohio EPA for the facility to restart and would be subject to major source regulatory programs that are efficient at controlling emissions released.

Table 11 was included in a SIP revision, submitted February 22, 2016, requesting that the Kentucky portion of the Campbell-Clermont, KY-OH nonattainment area be redesignated to attainment for the 2010 1-hour SO_2 NAAQS. The majority of SO_2 emissions in the Ohio portion of the nonattainment area are predominantly from the Beckjord facility. The table shows projections out to 2027 for maintenance purposes. Between 2011 and 2017, there was a substantial drop in SO_2 emissions due to the shutdown of several units and the eventual closure of the facility. Subsequently, the design values between 2013 and 2023 declined from 24 ppb to 12 ppb, respectively.[42] The reduced emissions in the Ohio portion of the Campbell-Clermont, KY-OH nonattainment area demonstrate that local facility emissions and monitoring data are

[42] Please see Appendix A regarding monitoring data and design values for this monitor (39-145-0022).

directly linked. Effective March 10, 2017, EPA redesignated the Kentucky portion of the Campbell-Clermont, KY-OH Area to attainment for the 2010 1-hour SO_2 NAAQS.[43]

Table 11 – Combined Campbell-Clermont, KY-OH Area SO_2 Emission Inventory Totals for Base Year 2011, Attainment 2014, Projected 2017 and 2022, Interim 2020 and 2027 Maintenance (tpy)

SO_2	2011 Base	2014 Attainment	2017 Projected	2020 Interim	2022 Projected	2027 Maintenance
Ohio Portion	90,842.52	32,610.58	8.25	8.37	8.34	8.47
Kentucky Portion	8.56	8.53	8.49	8.47	8.38	8.26
COMBINED SO_2 TOTAL	**90,851.08**	**32,619.11**	**16.74**	**16.84**	**16.72**	**16.73**

Louisville Gas & Electric, Mill Creek Generating Station

Mill Creek is located approximately 1.6 km from the Watson Lane Monitoring Station (21-111-0051). According to EPA's TSD, "Mill Creek Station facility is likely the major contributor to the violating monitor's design value." This is based upon a wind rose showing that for the majority of exceeding hours, there are winds blowing at moderate and high speeds from the southwest. [44] Table 12 demonstrates that Mill Creek is a major contributor of SO_2 emissions within Jefferson County. Various permit limitations have been implemented at Mill Creek in recent years. When the partial Jefferson County nonattainment area was first designated in 2013, Mill Creek was operating four coal-fired boiler units with three stacks. Over the years, Mill Creek has installed control technology that has decreased SO_2 emissions significantly. Subsequently, annual 99th percentile values between 2013 and 2023 declined from 93.1 ppb to 12.6 ppb, respectively.[45]

Table 12 – Comparison between Jefferson County SO_2 Point Source Emissions and Mill Creek Generating Station Annual Totals (tpy)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Jefferson County Point Source Totals*	37,688	36,662	37,938	16,900	5,385	3,998	4752	3,511	3,484	3,859	3,755
LG&E Mill Creek Generating Station**	30,499	29,447	28,149	14,082	4,335	3,040	3,752	2,923	2,889	3,210	3,169

*Jefferson County Point Source data includes Mill Creek emissions – data from the District
**Data from CAMPD (https://campd.epa.gov/)

[43] 82 FR 13227
[44] EPA Technical Support Document (TSD) Kentucky Area Designations for the 2010 SO_2 Primary National Ambient Air Quality Standard, https://www.epa.gov/sites/production/files/2016-03/documents/ky-tsd.pdf
[45] Please see Appendix A regarding monitoring data and annual 99th percentile values for this monitor. Completeness criteria for monitor 21-111-0051 was not met for the 2013 data year.

On June 15, 2012, the District issued a construction permit that authorized the following control equipment at Mill Creek: one new combined FGD for Unit 1 (U1) and Unit 2 (U2); one new FGD for Unit 3 (U3); and one new FGD for Unit 4 (U4). The new FGDs for U1 and U2 went into service on May 27, 2015; the new FGD for U3 went into service on June 8, 2016; and the new FGD for U4 went into service on December 9, 2014. The same construction permit from 2012 also included a 0.20 lb/MMBtu limit on SO_2 as a surrogate for the hydrochloric acid gas requirements in the MATS (Mercury Air Toxics Standards) rule.

On October 20, 2016, Mill Creek made a request that SO_2 emission limits for emission units U1, U2, U3 and U4 be based on a 30-day rolling average to demonstrate attainment of the 1-hour SO_2 NAAQS.[46] The Title V Operating Permit for Mill Creek was revised on June 1, 2017, and shows the source is operating in compliance.

The Division conducted modeling using the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) for the Jefferson County nonattainment area, which demonstrated that ambient concentrations of SO_2 were projected to be and have remained well below the NAAQS due to more stringent permit limitations. The Division submitted an attainment plan to EPA on June 23, 2017, which provided EPA with information on what progress has been made to bring the area back into attainment. The Jefferson County monitors have yielded clean monitoring data since 2015. The Division submitted an SO_2 redesignation request on behalf of Jefferson County on December 9, 2019. On August 6, 2020, EPA published a final rule approving Kentucky's request to redesignate the portion of Jefferson County from nonattainment to attainment.[47]

Weight of Evidence Analysis

The Division conducted a weight of evidence analysis to examine whether SO_2 emissions from Kentucky adversely affect attainment or maintenance of the 2010 1-hour SO_2 NAAQS in downwind states.

The Division reviewed the following information to support its conclusion that Kentucky sources do not significantly contribute to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS in downwind states:

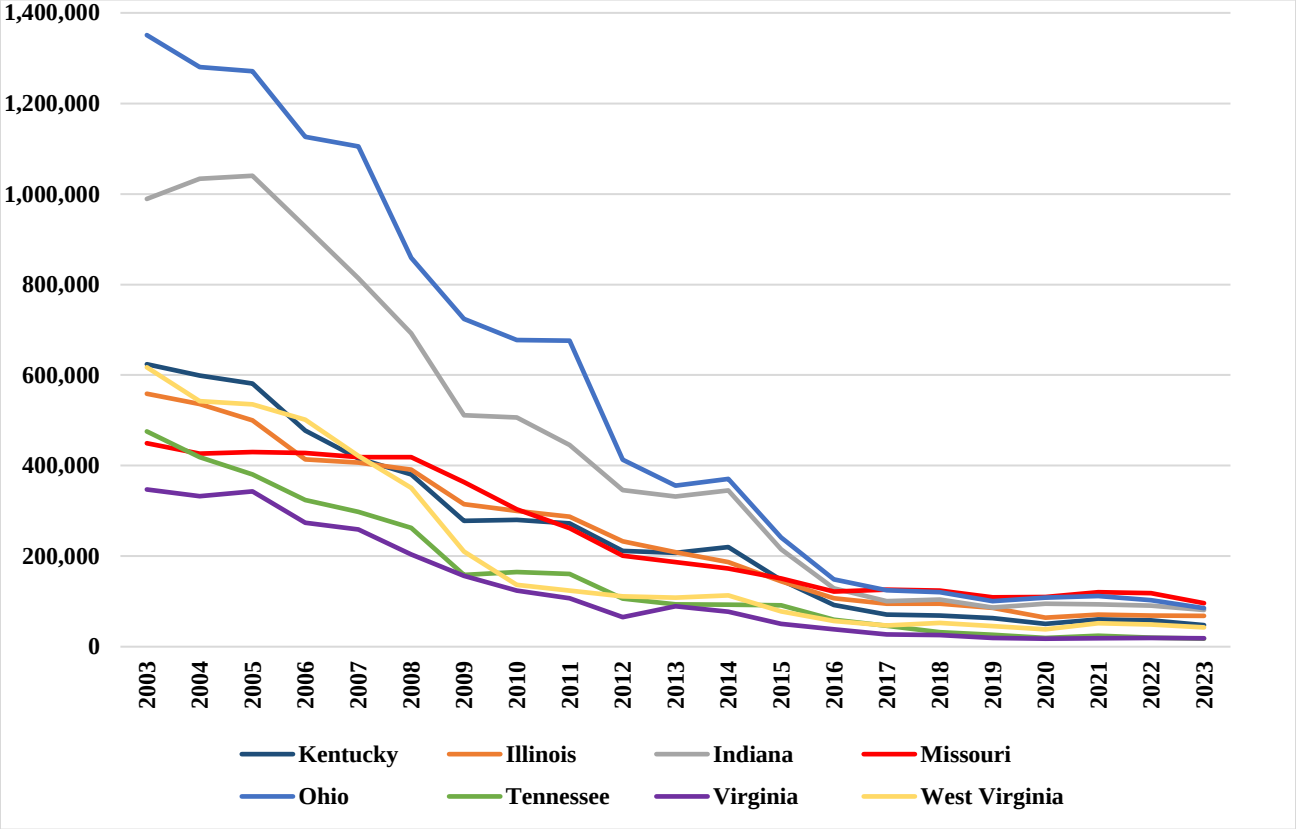
- Annual SO_2 99th percentile values (2019-2022) and three-year design values (2020-2022; 2021-2023) at monitors in Kentucky and adjacent states within 50 km of Kentucky's border (see Figure 3 and Table 4);
- SO_2 emissions trends in Kentucky and adjacent states from 2013 to 2023 (see Figures 1 and 6);

[46] Louisville Metro Air Pollution Control District; Title V Statement of Basis, June 1, 2017, https://louisvilleky.gov/sites/default/files/air_pollution_control_district/documents/permits/titlev/20170601-sob-145-97-tv-r4-0127.pdf

[47] 85 FR 47670

- The fact that EPA designated all counties within 50 km of Kentucky's border as attainment/unclassifiable, other than New Madrid County, MO (see Table 4, 8, 9, and 10);
- Clusters of sources within 50 km of one another emitting over 2,000 tpy of SO_2 (see Table 13); and
- Established federal control measures which reduce SO_2 emissions in the present and future (see Page 8).

Figure 9 – SO_2 Emissions Trends in Kentucky and Adjacent States from 2003-2023



Data retrieved from EPA's Air Pollutant Emissions Trends Data – State Tier 1 CAPS Trends

Several Kentucky facilities are located within 50 km of the border but have emitted less than one ton per year of SO_2 since 2019. These facilities include the Cincinnati/Northern Kentucky Airport, Brown-Forman Distillery Co., Early Times, Jim Beam Brands Co. – Clermont Plant, and the Owensboro Grain Company. Given the small amount of SO_2 generated by these facilities, the Division has concluded they do not significantly contribute to nonattainment or interfere with maintenance in downwind states.

Analysis of Point Source Clusters

In addition to the weight of evidence approach, certain facilities need additional justification due to their proximity to the Kentucky border and/or current emission levels. The 2015 DRR

required states to provide additional information for stationary sources emitting over 2,000 tons of SO_2 per year. Following this protocol, the Division has mapped sources in Kentucky and surrounding states to identify clusters of sources within 50 km of one another. As demonstrated in Table 13, only one cluster of sources exceeded the 2,000 tpy threshold in 2021. Within this cluster, the majority of emissions come from LG&E Trimble County.

Table 13 – 2021 SO_2 Emissions (tpy) of Sources in Kentucky and Neighboring States within 50 km Clusters

Cluster	State	EIS ID	Facilities	SO_2 Emissions	Total SO_2 Emissions
1	KY	7351111	Calgon Carbon	78.2	211.91
	KY	7331911	Marathon Petroleum*	120.07	
	KY	6019011	Kentucky Power-Big Sandy*	14.74	
2	KY	7351711	Carmuese Lime Inc.	1,071.59	1,071.74
	KY	9618811	Cincinnati/NKY Airport*	49.38	
3	KY	5892411	Owensboro Grain Company*	0.34	1,519.46
	IN	8183011	Sigeco-Culley*	1,519.12	
4	KY	96133611	Louisville Medical Center Water Plant*	281.41	1,554.66
	KY	9612011	Brown Forman-Early Times*	0.34	
	KY	9622011	Louisville Airport*	82.62	
	KY	5868711	Arcosa	720.99	
	KY	7353311	Kosmos Cement*	270.13	
	KY	5178511	Jim Beam-Nelson County	199.17	
5	KY	96133611	Louisville Medical Center Water Plant*	281.41	1,701.19
	KY	9612011	Brown Forman-Early Times*	0.34	
	KY	9622011	Louisville Airport*	82.62	
	KY	5868711	Arcosa	720.99	
	KY	7353311	Kosmos Cement*	270.13	
	IN	84198511	Lehigh Cement Company*	345.70	
6	KY	7351111	Calgon Carbon	78.2	1,702.36
	KY	7331911	Marathon Petroleum*	120.07	
	OH	9236811	Haverhill Coke Company*	1,504.09	
7	OH	8394011	Veolia North American*	122.51	1,918.58
	IN	4747911	Anchor Glass*	40.24	
	KY	6040811	Duke Energy-East Bend*	1,755.68	
	KY	9618811	Cincinnati/NKY Airport*	49.38	
8	KY	5742811	LG&E Trimble County*	2,900.80	3,246.49
	IN	84198511	Lehigh Cement Company*	345.70	

*Denotes data retrieved from EIS Gateway using 2021NEI_FinalV2, all other data was obtained from KYEIS

Following DRR Requirements, the Division submitted the 2023 Annual Report for Modeled Sources on December 15, 2023, and examined the emissions from both facilities, as seen in Table 14; it was determined that no further modeling was needed.[48] Taking into consideration the decrease in overall emissions from 2019, EPA's December 21, 2023 approval of the Division's 2023 Annual Report for Modeled Sources, and the lack of any violating monitors in nearby states, the Division has concluded that neither facility is contributing significantly to the attainment status of any nearby states.

Table 14 – Duke Energy-East Bend and LG&E Trimble County SO_2 Emissions (tpy) from 2019-2022

Facility	2019	2020	2021	2022
Duke Energy-East Bend	2,408.09	1,932.15	1,755.68	1,823.71
LG&E Trimble County	3,945.08	3,747.99	2,900.79	3,511.55

Data retrieved from CAMPD (https://campd.epa.gov/)

Based on this weight of evidence analysis, the Division has concluded that emissions from Kentucky point sources will not contribute significantly to nonattainment or interfere with maintenance of the 2010 1-hour SO_2 NAAQS in any other state.

[48] Kentucky's Sulfur Dioxide Ongoing Data Requirements Rule 2023 Annual Report for Modeled Sources. https://eec.ky.gov/Environmental-Protection/Air/Documents/Final%202023%20Annual%20SO2%20DRR%20Report.pdf

Public Hearing

In accordance with 40 CFR 51.102, the SIP revision was available for public review and comment from X through X.

The SIP revision package was made available on the Division's website during the 37-day comment period from XX until XX. The Division received written comments from X during the public comment period and no other comment were received. The Division's response to those comments is provided in Appendix E along with a copy of the public hearing notice.

Conclusion

This submittal demonstrates that Kentucky SO_2 emissions do not impact surrounding states' air quality. The aforementioned permanent and enforceable measures are in place to provide for the prevention, abatement and control of SO_2 emissions, as well as ensure that these emissions will not significantly contribute to nonattainment or interfere with maintenance of the SO_2 NAAQS within Kentucky and surrounding states. Based on Kentucky's monitoring data (2012-2022) located in Appendix A, all Kentucky monitors, except for the SO_2 DRR Sebree monitor, are well below the 75 ppb 2010 1-hour SO_2 NAAQS. Near statewide compliance with the standard reflects decreasing trends in SO_2 emissions in Kentucky over recent years; the Division expects further SO_2 emissions reductions to continue into the future.

Although there are three violating monitors located in Missouri, they are clearly violating due to the nearby aluminum smelter facility's emissions. There are no Kentucky sources emitting 100 tpy or more of SO_2 located within the 50 km threshold from these monitors.

The information included in this supplement to the infrastructure SIP submitted April 26, 2013, for the 2010 1-hour SO_2 NAAQS, demonstrates that the Kentucky SIP contains adequate provisions to prevent sources and other types of emissions activities within the state from contributing significantly to nonattainment in any other state with respect to the 2010 1-hour SO_2 NAAQS (prong 1). Further, this submittal demonstrates that the Kentucky SIP contains adequate provisions to prevent sources and other types of emissions activities within the state from interfering with maintenance in any other state with respect to the 2010 1-hour SO_2 NAAQS (prong 2). Therefore, the Division requests EPA's approval that the demonstration satisfies all of the requirements of CAA 110(a)(2)(D)(i)(I), allowing Kentucky to fully implement the 2010 SO_2 NAAQS.