

Draft Technical Support Document

Ohio Area Designations For the 2010 SO₂ Primary National Ambient Air Quality Standard

Summary

Pursuant to section 107(d) of the Clean Air Act, EPA must initially designate areas as either “unclassifiable”, “attainment”, or “nonattainment” for the 2010 one-hour sulfur dioxide (SO₂) primary national ambient air quality standard (NAAQS). The Clean Air Act defines a nonattainment area as one that does not meet the NAAQS or that contributes to a violation in a nearby area.

Ohio submitted designation recommendations on June 3, 2011, and submitted supplemental information and amended recommendations on June 29, 2011, April 12, 2012, and January 18, 2013. Table 1 below identifies the counties or portions of counties in Ohio that EPA intends to designate “nonattainment” based on monitored violations.

Table 1. Nonattainment Area Designations for Ohio

| Area | Ohio’s Recommendation of Areas/Counties | EPA’s Intended Designated Nonattainment Areas/Counties |
|---|---|--|
| Lake County, OH Lake County | Nonattainment | Nonattainment |
| Muskingum River, OH Morgan County (partial): Center Township | Nonattainment | Nonattainment |
| Washington County (partial): Waterford Township | Nonattainment | Nonattainment |
| Steubenville OH-WV* Jefferson County, OH (partial): Cross Creek, Steubenville, Warren, and Wells Townships | Nonattainment | Nonattainment |
| Brooke County, WV | Nonattainment** | Nonattainment |
| Wheeling WV-OH* Marshall County, WV | Nonattainment** | Nonattainment |
| Belmont County, OH (partial): Mead Township | Unclassifiable | Nonattainment |
| Campbell County KY-OH* Campbell County, KY (partial) Census tracts 533.01, 529, 531, 519.03, 519.01 | Unclassifiable** | Nonattainment |
| Clermont County, OH (partial): Pierce Township | Unclassifiable | Nonattainment |

* This is a multi-state nonattainment area. Additional information on boundary recommendations and analyses can be found in the draft technical support documents for West Virginia and Kentucky.

**Recommendation by West Virginia or Kentucky; Ohio made no recommendation outside Ohio.

Background

On June 3, 2010, EPA revised the primary SO₂ NAAQS (75 FR 35520, published on June 22, 2010). EPA revised the primary SO₂ standard by establishing a new one-hour standard at a level of 75 parts per billion (ppb) which is attained when the three-year average of the 99th percentile of one-hour daily maximum concentrations does not exceed 75 ppb. EPA has determined that this is the level necessary to provide protection of public health with an adequate margin of safety, especially for children, the elderly and those with asthma. These groups are particularly susceptible to the health effects associated with breathing SO₂. EPA is revoking the two prior primary standards of 140 ppb evaluated over 24 hours, and 30 ppb evaluated over an entire year because they will not add additional public health protection given a one-hour standard at 75 ppb. Accordingly, EPA is not designating areas in this process on the basis of either of these two primary standards. Similarly, the secondary standard for SO₂ has not been revised, so EPA is not designating areas in this process on the basis of the secondary standard.

EPA's SO₂ Designation Approach

Section 107(d) of the Clean Air Act requires that not later than one year after promulgation of a new or revised NAAQS, state Governors must submit their recommendations for designations and boundaries to EPA by June 2011. Section 107(d) also requires EPA to provide notification to states no less than 120-days prior to promulgating an initial area designation that is a modification of a state's recommendation. EPA was to promulgate initial area designations within two years of promulgation of the revised primary standard, although EPA has extended this deadline for one additional year due to having insufficient information to promulgate the designations. If a state did not submit designation recommendations, EPA will promulgate the designations that it deems appropriate. If a state or tribe disagrees with EPA's intended designations, they have an opportunity to demonstrate why any proposed modification is inappropriate.

Designations guidance was issued by EPA through a March 24, 2011, memorandum from Stephen D. Page, Director, U.S. EPA, Office of Air Quality Planning and Standards, to Air Division Directors, U.S. EPA Regions I-X. This memorandum identifies factors EPA intends to evaluate in determining boundaries for areas designated nonattainment. These five factors include: 1) air quality data; 2) emissions and emissions-related data (location of sources and potential contribution to ambient SO₂ concentrations); 3) meteorology (weather/transport patterns); 4) geography/topography (mountain ranges or other air basin boundaries); and 5) jurisdictional boundaries (e.g., counties, air districts, pre-existing nonattainment areas, reservations, metropolitan planning organization), among any other criteria deemed to be relevant to establishing appropriate area designations and boundaries for the one-hour SO₂ NAAQS.

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

In this technical support document (TSD), EPA discusses its review and technical analysis of the recommendations regarding areas with monitored violations submitted by Ohio for designations for the one-hour SO₂ standard and any modifications from these recommendations.

Definition of important terms used in this document:

1) **Designated nonattainment area** – an area which EPA has determined, based on a state recommendation and/or on the technical analysis included in this document, has violated the 2010 SO₂ NAAQS, based on the most recent three years of air quality monitoring data, or contributes to a violation in a nearby area.

2) **Recommended nonattainment area** – an area a state or tribe has recommended that EPA designate as nonattainment.

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

4) **2010 SO₂ NAAQS** – The NAAQS for SO₂ promulgated in 2010. This NAAQS is 75 ppb, based on the three year average of the 99th percentile of the annual distribution of daily maximum one-hour average concentrations. See 40 CFR Part 50.17.

5) **Design Value** - a statistic computed according to the data handling procedures of the NAAQS (in 40 CFR 50 Appendix T) that, by comparison to the level of the NAAQS, indicates whether the area is violating the NAAQS.

A. Technical analysis for Lake County, OH

Introduction

This technical analysis for the Lake County Area identifies the monitor that violated the 2010 SO₂ NAAQS, and evaluates nearby counties for contributions to SO₂ concentrations in the area. EPA has evaluated this county and nearby counties based on the evidence for the factors recommended in the March 24, 2011 EPA guidance. This county is listed above in Table 1.

Figure 1 shows the proposed nonattainment area and the monitor location.

Lake County, OH

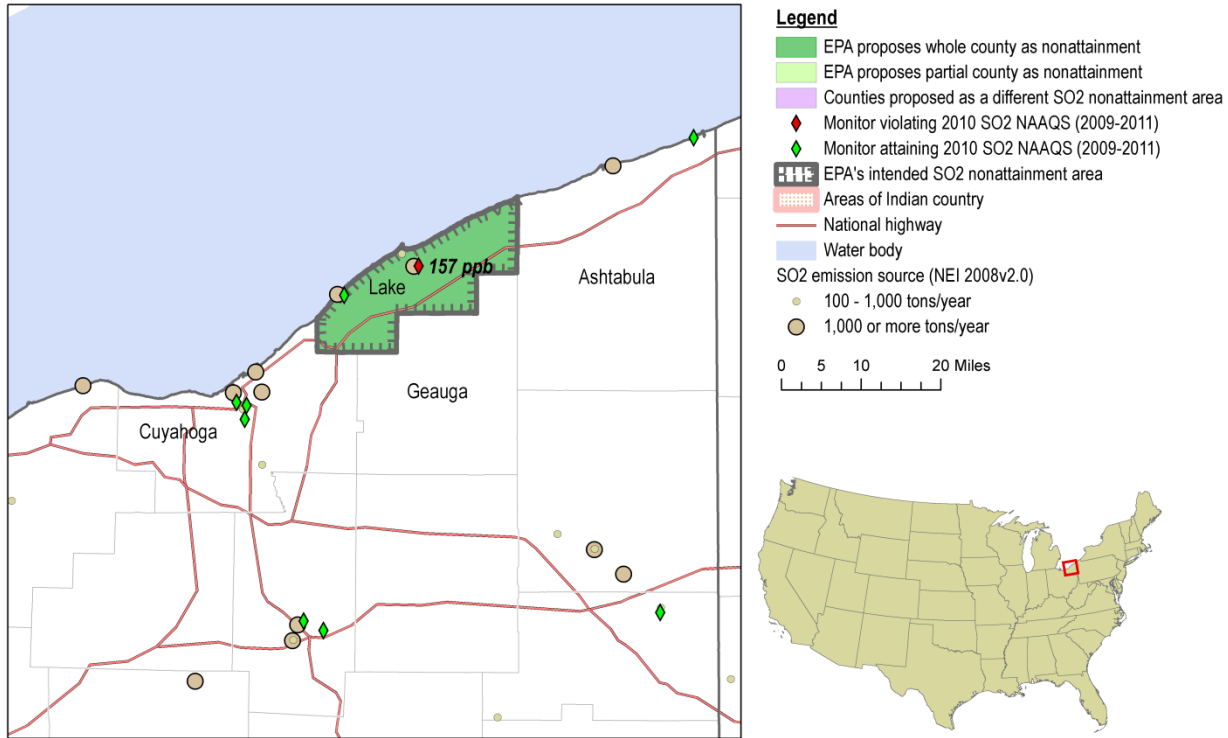


Figure 1. Map of Lake County, OH Nonattainment Area.

Ohio recommended that Lake County be designated as nonattainment for the 2010 SO₂ NAAQS based on monitored air quality data from 2008-2010. EPA intends to designate Lake County, Ohio as nonattainment for the 2010 SO₂ NAAQS, based upon currently available information, including the monitored design value for 2009-2011.

Detailed Assessment

Air Quality Data

This factor considers the SO₂ air quality monitoring data, including the design values (in ppb) calculated for all air quality monitors in Lake County and the surrounding area based on data for the 2009-2011 period. The 2010 SO₂ NAAQS design value for Lake County is shown in Table 2.

Table 2. Air Quality Data for Lake County Nonattainment Designations

| County | State Recommended Nonattainment? | Monitor Air Quality System ID | Monitor Location | SO ₂ Design Value, 2009 - 2011 (ppb) |
|-------------|----------------------------------|-------------------------------|--------------------|---|
| Cuyahoga | No | 39-035-0038 | Cleveland | 71 |
| | No | 39-035-0045 | Cleveland | 42 |
| | No | 39-035-0060 | Cleveland | 73* |
| | No | 39-035-0065 | Newburgh Hts | 38 |
| Lake | Yes | 39-085-0003 | Eastlake | 33 |
| | Yes | 39-085-0007 | Painesville | 157 |
| Ashtabula | No | 39-007-0001 | Conneaut | 24 |

Monitor in Bold has the highest 2009-2011 design value in the area.

*Data for 2009 is incomplete.

Lake County shows a violation of the 2010 SO₂ NAAQS at one of its monitors. Therefore, some area in Lake County and possibly additional areas in surrounding counties must be designated nonattainment. The absence of a violating monitor alone is not a sufficient reason to eliminate nearby counties as candidates for nonattainment status.

Emissions and Emissions-Related Data

Evidence of SO₂ emissions in the vicinity of a violating monitor is an important factor for determining whether a nearby area is contributing to a monitored violation. For this factor, EPA considered county emissions data for SO₂ and data for sources within 50 kilometers of violating monitors. Ohio provided this data in its June 3, 2011 submittal. Ohio's emissions data came from facility reports to the state, which were the basis for Ohio's submittal to the 2008 National Emissions Inventory (NEI). EPA relied primarily on this data for its analysis of Ohio's SO₂ designation recommendations.

Table 3 shows the annual emissions of SO₂ (given in tons per year) for violating and potentially contributing counties in and around Lake County, and sources emitting (or anticipated to contribute) greater than 100 tons per year of SO₂ according to the 2008 NEI. Lake County is shown in **bold**. Most of the facilities in Ashtabula and Cuyahoga Counties are over 40 kilometers from the Lake County monitors. Given their moderate level of SO₂ emissions and their distance from the Lake County monitor, these sources are not judged to be nearby sources contributing to the violation in Lake County.

Table 3. SO₂ Emissions for the Lake County Area

| County | Facility Located in State Recommended Nonattainment Area? | Facility Name | Facility Location/ Distance from violating monitor (km) | Facility Total SO ₂ Emissions (tons per year) |
|-----------|---|--|---|--|
| Lake | Yes | Eastlake Power Plant | Willoughby/17 | 50521.0 |
| | Yes | Painesville Municipal Electric Plant | Painesville/1 | 7212.0 |
| | Yes | Carmeuse Lime – Grand River Operations | Grand River/4 | 910.0 |
| | Yes | Lubrizol Corporation | Painesville/3 | 23.0 |
| | Yes | Lubrizol Corporation – Wickliffe Facility | Wickliffe/23 | 6.7 |
| Cuyahoga | No | Lake Shore Power Plant | Cleveland/39 | 4582.0 |
| | No | The Medical Center Company | Cleveland/41 | 2203.0 |
| | No | Cleveland Thermal LLC | Cleveland/45 | 1332.0 |
| | No | ArcelorMittal Cleveland, Inc. | Cleveland/46 | 718.0 |
| | No | Charter Steel – Cleveland, Inc. | Cleveland/47 | 61.0 |
| Ashtabula | No | FirstEnergy Ashtabula Plant | Ashtabula/44 | 3850.0 |
| | No | Millennium Organic Chemicals, Inc. Plant 2 | Ashtabula/44 | 20.0 |
| | No | Millennium Organic Chemicals, Inc. Plant 1 | Ashtabula/45 | 6.4 |
| | No | USA Waste Geneva Landfill | Geneva/28 | 2.9 |

Emission Controls

The emissions data used by EPA in this technical analysis and provided in Table 3 represent emissions levels taking into account any control strategies implemented on stationary sources up to and including 2008. EPA has not received any additional information on emissions reductions resulting from controls put into place after 2008.

Meteorology (weather/transport patterns)

While meteorological records for Cleveland indicate that winds blow predominantly from the southwest, the winds in this area can come from any direction. Near Lake Erie, a diurnal lake/land breeze pattern may occur. Therefore, sources in all directions can have some potential contribution. This factor did not play a significant role in determining the nonattainment boundary.

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

Lake County is adjacent to Lake Erie. The area can experience lake and land breezes, but the geographical and topographical features of the area are not considered to significantly limit air pollution transport. Therefore, this factor did not play a significant role in determining the nonattainment boundary.

Jurisdictional Boundaries

There are no current SO₂ nonattainment areas in Lake County and the surrounding region. The recommended nonattainment area for the 2010 SO₂ NAAQS is Lake County. The SO₂ sources which are believed to be the main contributors to the monitored violations are located within this county. The SO₂ ambient air quality monitors are also located within Lake County. EPA finds the county boundaries to be a suitably clear basis for defining nonattainment area boundaries.

Other Relevant Information

EPA did not receive additional information relevant to establishing a nonattainment area boundary for this area.

Conclusion

After considering the factors described above, EPA intends to find that it is appropriate to designate Lake County as a nonattainment area for the 2010 SO₂ NAAQS. The air quality monitors in Lake County show violations of the 2010 SO₂ NAAQS. Lake County facilities emit over 58,000 tons per year of SO₂ (based on 2008 data). The large facilities in the neighboring counties are 40 kilometers or more from the violating Lake County monitor, and are not judged to contribute significantly to the monitored violation. EPA believes that Lake County encompasses the appropriate initial nonattainment area based on the monitored violation of the 2010 SO₂ NAAQS.

B. Technical Analysis for the Muskingum River, OH Area

Introduction

This technical analysis for the Muskingum River Area identifies the monitor that violates the 2010 SO₂ NAAQS, and evaluates nearby counties for contributions to SO₂ concentrations in the area. EPA has evaluated this county and nearby counties based on the evidence for the factors recommended in the March 24, 2011 EPA guidance.

Figure 2 shows a map of the proposed nonattainment area including the monitor location.

Muskingum River, OH

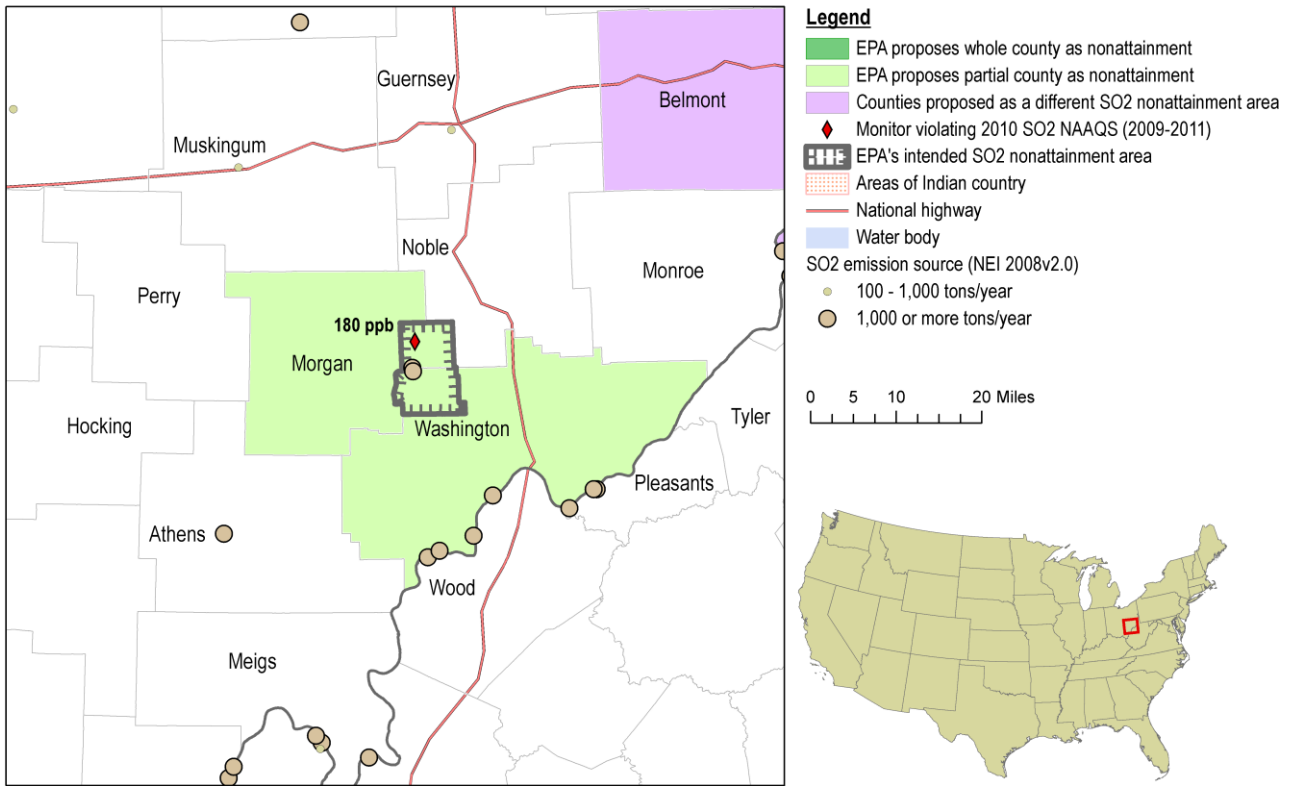


Figure 2. Map of Muskingum River, OH Nonattainment Area.

Ohio recommended that Center Township in Morgan County and Waterford Township in Washington County be designated as nonattainment for the 2010 SO₂ NAAQS. For clarity, EPA will refer to this nonattainment area as the Muskingum River Area, since the primary source in the area is American Electric Power's Muskingum River Power Plant. EPA intends to designate Center Township in Morgan County and Waterford Township in Washington County in Ohio as the Muskingum River nonattainment area, based upon currently available information. These partial counties are listed above in Table 1.

Detailed Assessment

Air Quality Data

This factor considers SO₂ air quality monitoring data and the design value (in ppb) calculated for the air quality monitor in Morgan County for 2009-2011. The 2010 SO₂ NAAQS design value for Morgan County is shown in Table 4.

Table 4. Air Quality Data for the Muskingum River Area

| County | State Recommended Nonattainment? | Monitor Air Quality System ID | Monitor Location | SO ₂ Design Value, 2009 - 2011 (ppb) |
|--------|----------------------------------|-------------------------------|------------------|---|
| Morgan | Yes | 39-115-0004 | Hackney, OH | 180 |

Morgan County shows a monitored violation of the 2010 SO₂ NAAQS. Therefore, some area in this county and possibly additional areas in surrounding counties must be designated nonattainment. The absence of a violating monitor alone is not a sufficient reason to eliminate nearby counties as candidates for nonattainment status.

Emissions and Emissions-Related Data

Evidence of SO₂ emissions in the vicinity of a violating monitor is an important factor for determining whether a nearby area is contributing to a monitored violation. For this factor, EPA considered county emissions data for SO₂ and data for sources within 50 kilometers of violating monitors. Ohio provided this data in its June 3, 2011 submittal. Ohio’s emissions data came from facility reports to the state, which were the basis for Ohio’s submittal to the 2008 NEI. EPA relied primarily on this data for its analysis of Ohio’s SO₂ designation recommendations.

Table 5 shows the annual emissions of SO₂ (given in tons per year) for potentially contributing counties in and around the Muskingum River Area and sources emitting (or anticipated to contribute) greater than 100 tons per year of SO₂ according to the 2008 NEI. There are no significant sources of SO₂ within Morgan County, except that a portion of the Muskingum River power plant, which is generally inventoried as part of Washington County, is physically located in Morgan County. Ohio considered all SO₂ sources within 50 kilometers of the violating monitor. Listed below are the sources which are considered most likely to impact the Morgan County SO₂ monitor. They are all located within 5 to 12 kilometers of the monitor. There are two additional sources over 100 tons per year in Washington County, but they are 37 kilometers from the Morgan County monitor and, at less than 3000 tons per year each, are not judged to be nearby sources contributing to the monitored violation in Morgan County. There are two sources which emit over 100 tons per year in two other neighboring counties, but they are over 40 kilometers from the Morgan County monitor. Given their distance, and the fact that they each emit less than 500 tons per year, they are not judged to be nearby sources contributing to the violation in Morgan County. Therefore, EPA agrees that the nonattainment boundaries proposed by Ohio for the Muskingum River Area encompass all the sources which are judged to contribute significantly to the monitored violation in this area.

Table 5. SO₂ Emissions for the Muskingum River Area

| County | Facility Located in State Recommended Nonattainment Area? | Facility Name | Facility Location/ Distance from monitor | Facility total SO ₂ Emissions (tons per year) |
|------------|---|---------------------------------------|--|--|
| Washington | Yes | Muskingum River Power Plant | Waterford/5 | 133,338.0 |
| | Yes | Globe Metallurgical | Waterford/5 | 1190.6 |
| | Yes | Washington Energy Facility | Beverly/6 | 0.81 |
| | Yes | AEP/Columbus Southern Waterford Plant | Waterford/12 | 0.66 |

Emission Controls

The emissions data used by EPA in this technical analysis and provided in Table 5 represent emissions levels taking into account any control strategies implemented on stationary sources in the area up to and including 2008. EPA has not received any additional information on emissions reductions resulting from controls put into place after 2008.

Meteorology (weather/transport patterns)

Winds in this general area tend to blow most often from the southwest, but can come from any direction. Therefore, sources in all directions can have some potential contribution. This factor did not play a significant role in determining the nonattainment boundary.

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

The Muskingum River recommended nonattainment area does not have any geographical or topographical barriers significantly limiting air pollution transport. Therefore, this factor did not play a significant role in determining the nonattainment boundary.

Jurisdictional Boundaries

There are no current SO₂ nonattainment areas in Morgan and Washington Counties. The recommended Muskingum River nonattainment area for the 2010 SO₂ NAAQS consists of the two adjacent townships in Morgan and Washington Counties which are believed to enclose all SO₂ sources contributing to the monitored violations. The SO₂ ambient air quality monitor is also located within this area. Townships in Ohio have well established boundaries and EPA finds that they are suitable for defining Ohio's nonattainment areas.

Other Relevant Information

EPA did not receive additional information relevant to establishing a nonattainment area boundary for this area.

Conclusion

After considering the factors described above, EPA intends to find that it is appropriate to designate the portions of Morgan and Washington Counties listed in Table 1 as the Muskingum River, OH nonattainment area for the 2010 SO₂ NAAQS. EPA believes that the boundaries described herein encompass the appropriate nonattainment area for the 2010 SO₂ NAAQS.

Interstate Areas

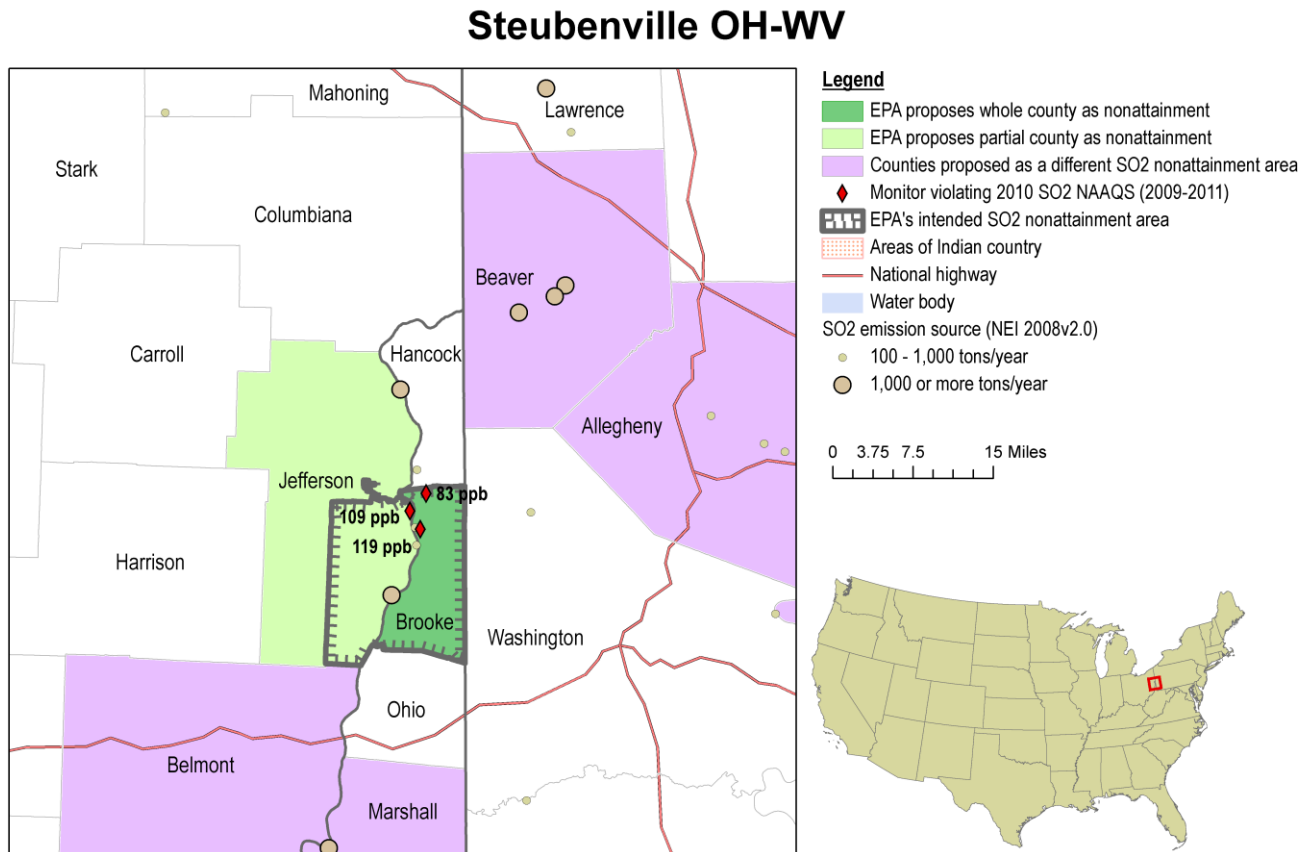
The next three technical analyses discuss a set of nonattainment designations that cross state boundaries. The Steubenville OH-WV Interstate Area, the Wheeling WV-OH Interstate Area, and the Campbell County KY-OH Interstate Area are all adjacent to the Ohio River, which forms the boundary between Ohio and West Virginia, and between Ohio and Kentucky. The location of the main SO₂ sources and the monitors are such that Ohio, West Virginia, and Kentucky sources can be culpable to air quality impacts on the opposite side of the Ohio River. Therefore, these nonattainment areas should be treated as interstate areas.¹ Ohio did not specifically address interstate issues when addressing these areas in its June 3, 2011 submittal. This TSD focuses on the Ohio portion of these interstate nonattainment areas.

C. Technical Analysis for the Steubenville OH-WV Interstate Area

Introduction

This technical analysis for the Ohio portion of the Steubenville OH-WV Interstate Area identifies the monitors that violate the 2010 SO₂ NAAQS and evaluates nearby counties for contributions to SO₂ concentrations in the area. EPA has evaluated this county and nearby counties based on the evidence for the factors recommended in the March 24, 2011 EPA guidance.

Figure 3 shows a map of the proposed nonattainment area and the monitor location.



¹ More detailed information regarding the portions of the nonattainment areas within West Virginia and Kentucky are provided in technical support documents for these states.

Figure 3. Map of the Steubenville OH-WV Interstate Nonattainment Area

Ohio has recommended that four townships in Jefferson County, near the city of Steubenville, Ohio, be designated as nonattainment for the 2010 SO₂ NAAQS. West Virginia recommended that Brooke County, West Virginia, also be designated nonattainment. Brooke County is located across the Ohio River from Steubenville. The full analysis for the West Virginia portion of this area can be found in the TSD for West Virginia. EPA believes that these areas should be combined to form the Steubenville OH-WV Interstate Area. Based on EPA's technical analysis described below, EPA is intending to designate Cross Creek, Steubenville, Warren, and Wells Townships in Jefferson County as nonattainment for the 2010 SO₂ NAAQS, in conjunction with Brooke County in West Virginia.

Detailed Assessment

Air Quality Data

This factor considers SO₂ air quality monitoring data for the monitors in Jefferson and Brooke Counties. The SO₂ NAAQS design values for these counties are shown in Table 6.

Table 6. Air Quality Data for the Steubenville OH-WV Interstate Area

| County | State Recommended Nonattainment? | Monitor Air Quality System ID | Monitor Location | SO ₂ Design Value, 2009 – 2011 (ppb) |
|---------------|----------------------------------|-------------------------------|---------------------------|---|
| Jefferson, OH | Yes | 39-081-0017 | Steubenville, OH | 109 |
| Brooke, WV | Yes | 54-009-0005 | Mahan Lane (Follansbee) | 119 |
| Brooke, WV | Yes | 54-009-0007 | McKims | 83 |
| Brooke, WV | Yes | 54-009-0011 | Marland Heights (Weirton) | 174 |

Jefferson County shows a monitored violation of the 2010 SO₂ NAAQS. Therefore, some area in this county must be designated nonattainment. The absence of a violating monitor alone is not a sufficient reason to eliminate nearby counties as candidates for nonattainment status. Additional monitors in Brooke County, West Virginia, are also showing violations of the 2010 SO₂ NAAQS, as discussed in the West Virginia TSD. Based on evidence that violations are occurring in Jefferson County, Ohio, and Brooke County, West Virginia, EPA intends to designate a nonattainment area that includes the sources in the area that contribute to these violations.

Emissions and Emissions-Related Data

Evidence of SO₂ emissions in the vicinity of a violating monitor is an important factor for determining whether a nearby area is contributing to a monitored violation. For this factor, EPA considered county emissions data for SO₂ and data for sources within 50 kilometers of violating monitors. Ohio provided this data with respect to Ohio sources in its June 3, 2011 submittal. Ohio's emissions data came from facility reports to the state, which were the basis for Ohio's submittal to the 2008 NEI. EPA relied primarily on these data and corresponding West Virginia data for its analysis of Ohio's SO₂ designation recommendations.

Table 7 shows the emissions of SO₂ in Ohio which may contribute to violations in and around the Steubenville OH-WV Interstate Area. The county shown in **bold** contains the Ohio portion of the Steubenville OH-WV Interstate Area nonattainment area for the 2010 SO₂ NAAQS.

Table 7. Ohio SO₂ Emissions for the Steubenville OH-WV Interstate Area

| County | Facility Located in State Recommended Nonattainment Area? | Facility Name | Facility Location/ Distance from Monitor (km) | Total SO ₂ Emissions (tons per year) |
|------------|---|--|---|---|
| Jefferson | No | FirstEnergy W.H. Sammis Power Plant | Stratton, OH/18 | 102,197.0* |
| | Yes | American Electric Power/Buckeye Power Cardinal Power Plant | Brilliant, OH/13 | 33,317.0 |
| | Yes | Severstal Wheeling, Inc | Steubenville/ Mingo Junction, OH/5 | 700.0 |
| | Yes | Severstal Wheeling, Inc | Yorkville, OH/15 | 0.24 |
| | Yes | Mingo Junction Energy Center | Mingo Junction, OH/5 | 82.0 |
| | No | Titanium Metals Corp. | Toronto, OH/9 | 0.20 |
| Columbiana | No | Heritage – WTI, Inc | East Liverpool, OH/30 | 3.60 |
| Belmont | No | Severstal Wheeling, Inc. | Martins Ferry, OH/28 | 0.06 |
| Carroll | No | Summitville Tiles, Inc. | Minerva, OH/33 | 7.0 |

* The W.H. Sammis plant has recently reduced its emissions as part of a consent decree. Data shown above is from the 2008 NEL.

Parts of four counties lie within 50 kilometers of the Jefferson County monitor. Columbiana County has one SO₂ source, emitting 3.6 tons per year. The source is located 30 kilometers from the violating monitor in Jefferson County, and is not considered to contribute to the Jefferson County monitor. The SO₂ sources in Carroll County and Belmont County within 50 kilometers are also very low in SO₂ emissions, less than 10 tons per year, and are located at a similar distance. EPA agrees with Ohio that these sources do not merit inclusion in the Steubenville OH-WV Interstate Area. Most of the significant sources within Jefferson County are located in the townships that Ohio recommended be designated nonattainment. The exception is the FirstEnergy's W.H. Sammis power plant, which is located 18 kilometers north of the Jefferson County monitor and a similar distance from the violating monitors in Brooke County. The W.H. Sammis power plant significantly reduced its emissions after installing pollution controls in 2010. The Columbiana County SO₂ monitor in East Liverpool, about 14 kilometers north of the power plant, has measured a noticeable drop in SO₂ concentrations since 2010. Its SO₂ design value (three year average of 99th percentile concentrations) was 117 ppb for 2007-2009, when the 2007 99th percentile value was 128 ppb. For 2008-2010, the design value had fallen to 90 ppb, with a 99th percentile value of 47 in 2010. For 2009-2011, the design value was 62 ppb, with a 99th percentile value of 27 ppb in 2011. The W.H. Sammis power plant is not judged to be a nearby source contributing to the violations at the Jefferson County monitor or the Brooke County monitors and therefore does not merit inclusion in the Steubenville OH-WV Interstate Area.

Emission Controls

The emissions data used by EPA in this technical analysis and provided in Table 7 represent emissions levels taking into account any control strategies implemented on stationary sources in the area up to and including 2008. Ohio did not submit any additional information on actual emissions reductions resulting from controls put into place after 2008, but the Clean Air Markets Division database suggests

that the W.H. Sammis Power Plant has reduced its emissions significantly. For example, in 2011, the company reported emissions from Sammis of 4,202 tons.

Meteorology (weather/transport patterns)

For this area, winds can be from any direction. Therefore, sources in all directions can have some potential contribution. This factor did not play a significant role in determining the nonattainment boundary.

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

The recommended nonattainment portion of Jefferson County lies along the Ohio River, in the foothills of the Appalachians. While the river valley can experience nighttime inversions and air flow into and out of the valley, the geographical and topographical features of the area are not considered to significantly limit air pollution transport. Therefore, this factor did not play a significant role in determining the nonattainment boundary.

Jurisdictional Boundaries

There are no current SO₂ nonattainment areas in Jefferson County. The recommended nonattainment area for the 2010 SO₂ NAAQS for the Ohio portion of the Steubenville area consists of the four townships along the Ohio River in Jefferson County which are believed to enclose all SO₂ sources contributing to the monitored violations. The SO₂ ambient air quality monitors within Ohio are also located within this area. Townships in Ohio have well established boundaries and EPA finds that they are a suitable administrative basis for defining Ohio's nonattainment areas.

Other Relevant Information

EPA did not receive additional information relevant to establishing a nonattainment area boundary for this area.

Conclusion

After considering the factors described above, EPA intends to find that it is appropriate to designate Cross Creek, Steubenville, Warren, and Wells Townships in Jefferson County as the Ohio portion of the Steubenville OH-WV Interstate SO₂ nonattainment area. EPA intends to combine this Ohio portion with Brooke County in West Virginia to form a single bi-state nonattainment area. EPA believes that the boundaries described herein encompass the entire area that does not meet or that contributes to ambient air quality that does not meet the 2010 SO₂ NAAQS.

D. Technical Analysis for the Wheeling WV-OH Interstate Area

This technical analysis for Belmont County identifies the monitor that violated the 2010 SO₂ NAAQS and evaluates nearby counties for contributions to SO₂ concentrations in the area. EPA has evaluated this county and nearby counties based on the evidence for the factors recommended in the March 24, 2011 EPA guidance.

Figure 5 shows a map of the proposed nonattainment area and the monitor location.

Wheeling, WV-OH

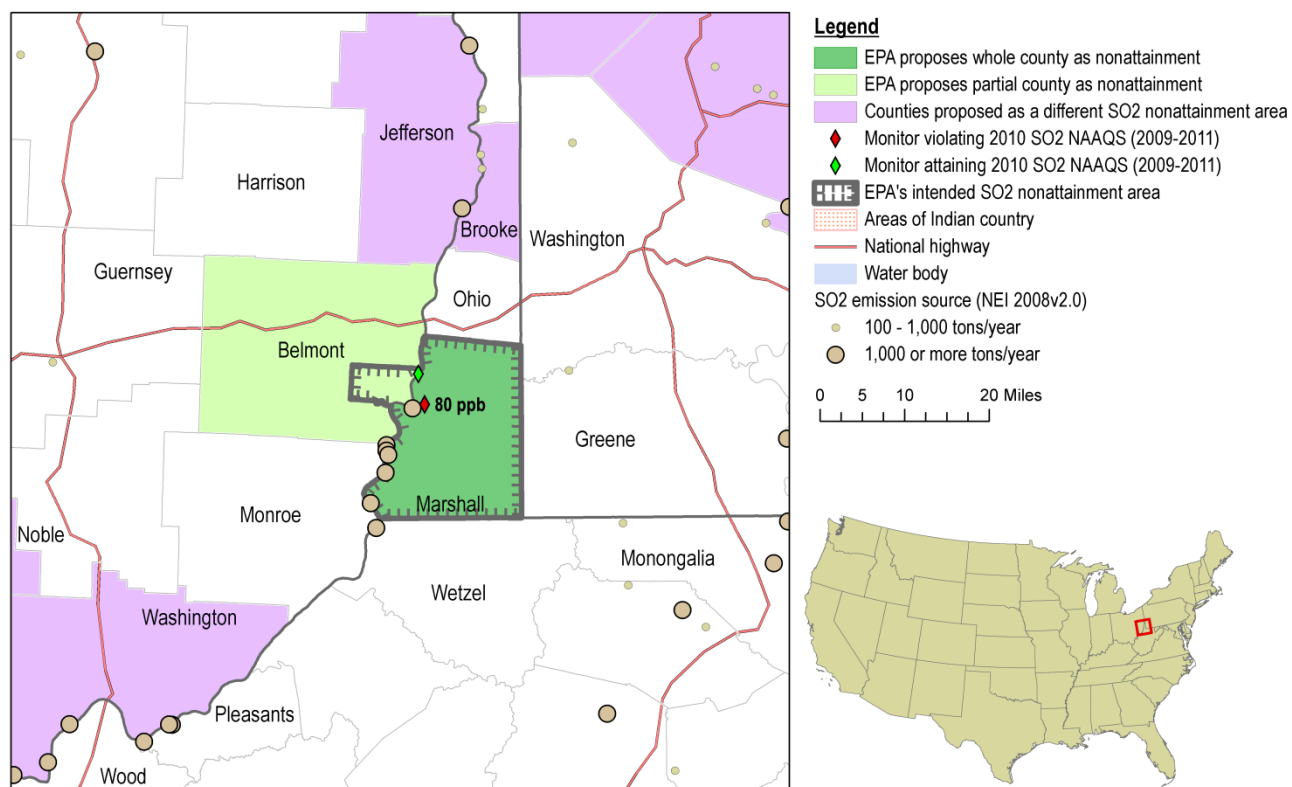


Figure 5. Map of the Wheeling WV-OH Interstate Nonattainment Area.

On June 3, 2011, Ohio recommended that Mead, Pease, Pultney, and York Townships in Belmont County be designated as nonattainment for the 2010 SO₂ NAAQS. This recommendation was based on a monitored violation in Belmont County for the period 2008-2010. However, for the period 2009-2011, the design value of the Belmont County SO₂ monitor was below the 2010 SO₂ NAAQS. Ohio amended its designation recommendation for Belmont County to unclassifiable in a letter dated April 12, 2012. EPA reviewed the SO₂ sources and monitor locations in Marshall and Belmont Counties, and concluded that Mead Township in Belmont County should remain in the Wheeling WV-OH Interstate Area, because it contains a large SO₂ source which may contribute to violations at the Marshall County SO₂ monitor. In June 2011, West Virginia recommended that Marshall County, West Virginia, be designated nonattainment. Marshall County is across the Ohio River from Belmont County. EPA believes that these areas should be combined to form the Wheeling WV-OH Interstate Area. The full analysis for the West Virginia portion of this area can be found in the TSD for West Virginia.

Detailed Assessment

Air Quality Data

This factor considers SO₂ air quality monitoring data and the 2009-2011 design value (in ppb) calculated for the air quality monitor in Belmont County. The design values for Belmont and Marshall Counties are shown in Table 8.

Table 8. Air Quality Data for Belmont County

| County | State Recommended Nonattainment? | Monitor Air Quality System ID | Monitor Location | SO ₂ Design Value, 2009-2011 (ppb) |
|--------------|----------------------------------|-------------------------------|------------------|---|
| Belmont, OH | Yes | 39-013-3002 | Shadyside, OH | 61 |
| Marshall, WV | Yes | 54-051-1002 | Moundsville, WV | 80 |

Marshall County shows a monitored violation of the 2010 SO₂ NAAQS for 2009-2011. Monitoring data Belmont County does not show a violation of the 2010 SO₂ NAAQS for 2009-2011. However, the absence of a violating monitor alone may not be a sufficient reason to eliminate a county as a candidate for nonattainment status.

Emissions and Emissions-Related Data

Evidence of SO₂ emissions in the vicinity of a violating monitor is an important factor for determining whether a nearby area is contributing to a monitored violation. For this factor, EPA considered county emissions data for SO₂ and data for sources within 50 kilometers of violating monitors. Ohio provided this data in its June 3, 2011 submittal. Ohio's emissions data came from facility reports to the state, which were the basis for Ohio's submittal to the 2008 NEI. EPA relied primarily on this data for its analysis of Ohio's SO₂ designation recommendations.

Table 9 shows the emissions of SO₂ in Ohio and West Virginia which may contribute to a monitored violation in Marshall County. Listed below for Belmont County are the sources within 20 kilometers of the Marshall County monitor. The other sources in Belmont County emit less than one ton per year of SO₂ and are located over 30 kilometers from the Marshall County monitor. These sources are not judged to be nearby sources contributing to the monitored violation in Marshall County. There is a large source in Jefferson County, the Cardinal Power Plant, which is about 40 kilometers from the Marshall County monitor. It is already included in the Steubenville OH-WV Interstate Area. The Belmont County sources in Table 9 are located along the Ohio River near Shadyside and Martins Ferry, Ohio. The R.E. Burger power plant is two kilometers from the Marshall County monitor in Moundsville, West Virginia, and about seven kilometers from the Belmont County monitor, and is located in the town of Shadyside, Ohio. It is the closest large source to either monitor, and therefore it is considered likely to be an important potential contributor to the monitored SO₂ concentrations. The two facilities in Martins Ferry, Ohio, are about 15 kilometers from the Marshall County monitor and emit much less than one ton per year of SO₂. These two facilities do not warrant being judged to be nearby sources contributing to the monitored violation in Marshall County, West Virginia. There is one source in Monroe County, Ohio, which emits about 2400 tons per year and is located over 30 kilometers from the Marshall County monitor. It is also judged not to be a nearby source contributing to the monitored violation. Table 9 includes sources in Marshall County, West Virginia, which are included in the West Virginia portion of the Wheeling WV-OH Interstate Area.

Table 9. SO₂ Emissions in the Wheeling WV-OH Interstate Area

| County | Facility Located in State Recommended Nonattainment Area? | Facility Name | Facility Location/ Distance from Violating Monitor (km) | Facility SO ₂ Air Emissions (tons per year) |
|----------|---|---|---|--|
| Belmont | No* | FirstEnergy R. E. Burger Power Plant | Shadyside, OH/2 | 15,126.0 |
| | No | Severstal Wheeling, Inc., Martins Ferry | Martins Ferry, OH/15 | 0.06 |
| | No | Nickles Bakery | Martins Ferry, OH/15 | 0.01 |
| Marshall | Yes | Ohio Power (AEP) Kammer Plant | Moundsville, WV | 32050.0 |
| | Yes | PPG Industries | New Martinsville, WV | 7693.0 |
| | Yes | Rain CII Carbon Moundsville Calcining | Moundsville, WV | 7630.0 |
| | Yes | Ohio Power (AEP) Mitchell Plant | Moundsville, WV | 3024.0 |
| | Yes | Columbian Chemicals Company | Moundsville, WV | 1180.0 |

*Facility is located in EPA-recommended nonattainment area.

Emission Controls

The emissions data used by EPA in this technical analysis and provided in Table 9 represent emissions levels taking into account any control strategies implemented on stationary sources in the area up to and including 2008. EPA has not received any additional information on emissions reductions resulting from controls put into place after 2008.

Meteorology (weather/transport patterns)

For this area, winds can be from any direction. Therefore, sources in all directions can have some potential contribution. This factor did not play a significant role in determining the nonattainment boundary.

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

The recommended nonattainment portion of Belmont County is on the Ohio River, in the foothills of the Appalachians. While the river valley can experience nighttime inversions and air flow into and out of the valley, the geographical and topographical features of the area are not considered to significantly limit air pollution transport. Therefore, this factor did not play a significant role in determining the nonattainment boundary.

Jurisdictional Boundaries

Ohio does not have any current SO₂ nonattainment areas. For Belmont County, the intended nonattainment area consists of one township along the Ohio River which encloses both the Belmont County SO₂ ambient air quality monitor and an Ohio SO₂ source which is believed to contribute to the monitored violations in Marshall County, West Virginia. Townships in Ohio have well established

boundaries and EPA finds that they are a suitable administrative basis for defining Ohio's nonattainment areas.

Other Relevant Information

EPA did not receive additional information relevant to establishing a nonattainment area boundary for this area.

Conclusion

After considering the factors described above, EPA intends to find that it is appropriate to designate Mead Township in Belmont County as nonattainment for the 2010 SO₂ NAAQS, as part of the Wheeling WV-OH Interstate nonattainment area. EPA believes that this partial-county area, in conjunction with Marshall County, West Virginia, encompasses the appropriate nonattainment area for the 2010 SO₂ NAAQS.

E. Technical Analysis for the Campbell County KY-OH Interstate Area

Introduction

This technical analysis for the Ohio portion of the Campbell County KY-OH Interstate area identifies the monitor that violates the 2010 SO₂ NAAQS and evaluates the adjacent Ohio counties for contributions to SO₂ concentrations in the area. EPA has evaluated this county and nearby counties based on the evidence for the factors recommended in the March 24, 2011 EPA guidance.

Figure 7 is a map of the proposed Campbell County KY-OH Interstate Area, showing the location of the air quality monitor.

Campbell County, KY-OH

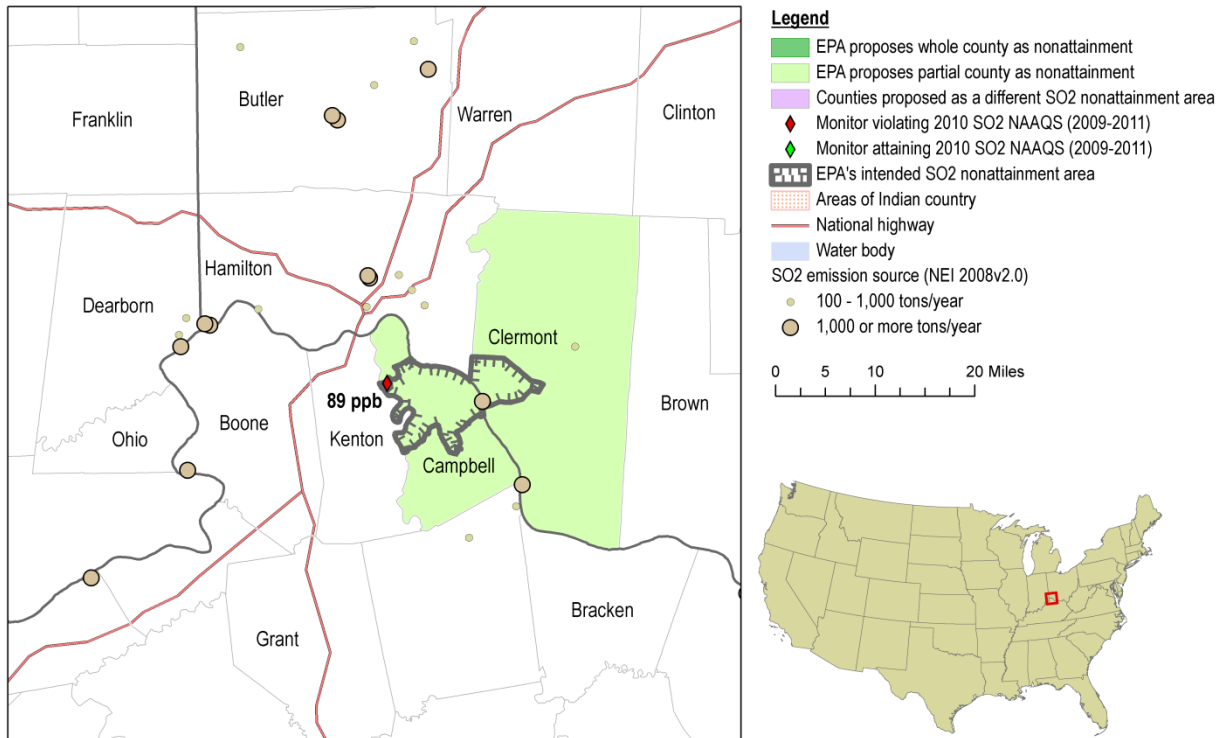


Figure 7. Map of Campbell County KY-OH Interstate Nonattainment Area.

Campbell County, Kentucky, is adjacent to and across the Ohio River from Hamilton and Clermont Counties, Ohio. The Campbell County monitor is located in Highland Heights, Kentucky, about 11 kilometers south of Cincinnati, Ohio. The Campbell County monitor is violating the 2010 SO₂ NAAQS for the 2009-2011 period. Because the Campbell County SO₂ monitor was not violating the 2010 SO₂ NAAQS for 2008-2010, Kentucky did not include it in its June 2, 2011 SO₂ designation recommendations. See EPA's TSD for Kentucky. Ohio did not include a discussion of the Cincinnati area in its June 3, 2011 letter, since the SO₂ monitors in that part of Ohio did not indicate that a nonattainment designation recommendation was necessary. However, after reviewing emissions and meteorological data for the region surrounding the Campbell County monitor, EPA believes that one township in Clermont County, Ohio, and five census tracts within Campbell County, Kentucky, should be designated as nonattainment for the 2010 SO₂ NAAQS, to form the Campbell County KY-OH Interstate Area.

Detailed Assessment

Air Quality Data

This factor considers SO₂ air quality monitoring data and the 2009-2011 design value (in ppb) calculated for the air quality monitor in Campbell County. The 2010 SO₂ NAAQS design value for Campbell County is shown in Table 10. The nearest Ohio SO₂ monitor is located in Hamilton County near Cleves, about 30 kilometers northwest of the Campbell County monitor.

Table 10. Air Quality Data for Campbell County

| County | State Recommended Nonattainment? | Monitor Air Quality System ID | Monitor Location | SO ₂ Design Value, 2009 - 2011 (ppb) |
|-----------------|----------------------------------|-------------------------------|----------------------|---|
| Campbell Co, KY | No* | 21-037-3002 | Highland Heights, KY | 89 |
| Hamilton Co, OH | No | 39-061-0010 | Cleves, OH | 69** |

*EPA intends to designate as part of the nonattainment area.

**The 2010 data were incomplete at this monitor.

Campbell County shows a monitored violation of the 2010 SO₂ NAAQS. Therefore, some area in this county and possibly additional areas in surrounding counties must be designated nonattainment. The absence of a violating monitor alone is not a sufficient reason to eliminate nearby counties as candidates for nonattainment status.

Emissions and Emissions-Related Data

Evidence of SO₂ emissions in the vicinity of a violating monitor is an important factor for determining whether a nearby area is contributing to a monitored violation. For this factor, EPA considered county emissions data for SO₂ and data for sources within 50 kilometers of violating monitors. Duke Energy's W. C. Beckjord Station, a coal-fired power plant, is believed to be the main Ohio source contributing to the violation at the Campbell County monitor. It is located 16 kilometers east of the monitor. The W.C. Beckjord Station emitted over 26,000 tons of SO₂ in 2008 (NEI08v2), and more recent data from EPA's Clean Air Markets Division suggests that its SO₂ emissions have increased significantly in more recent years. The W. C. Beckjord Station is located on the Ohio River in Pierce Township, near the town of New Richmond, Clermont County, Ohio. Duke Energy also operates the W. H. Zimmer Generating Station in Clermont County. This power plant emitted 16,000 tons of SO₂ in 2008. The Zimmer Generating Station is located 27 kilometers from the Campbell County monitor. At this distance, with emissions much lower than from the W.C. Beckjord Station, EPA believes that Zimmer Generating Station does not warrant being judged to be a nearby source contributing to the violation at the Campbell County monitor. There are eight facilities in southern Hamilton County which are located to the north or northwest of the Campbell County monitor, at distances of 13 kilometers or more. Of the sources closest to the monitor, only two emit more than 1,000 tons of SO₂; the others emit 100-600 tons of SO₂. These facilities are not judged to be nearby sources contributing to the violation in Campbell County. The largest facility in Hamilton County, Duke Energy's Miami Fort Station, emits about 25,000 tons of SO₂, but is located 30 kilometers from the violating monitor. Given that distance, EPA does not believe that the Miami Fort Station is contributing significantly to violations at the Campbell County monitor. Therefore, EPA believes that Pierce Township in Clermont County, in which Duke Energy's W. C. Beckjord Station is located, should be designated nonattainment and combined with portions of the neighboring Campbell County, Kentucky, to form the Campbell County KY-OH Interstate Area.

Table 11 shows the total emissions of SO₂ for potentially contributing sources emitting (or anticipated to contribute) more than 100 tons per year of SO₂ according to the 2008 NEI, in Hamilton and Clermont Counties, Ohio.

Table 11. Ohio SO₂ Emissions for the Campbell County (KY) Area

| County | Facility Located in State Recommended | Facility Name | Facility Location/ Distance from | Total SO ₂ Emissions (tons per |
|--------|---------------------------------------|---------------|----------------------------------|---|
|--------|---------------------------------------|---------------|----------------------------------|---|

| | Nonattainment Area? | | monitor (km) | year) |
|----------|---------------------|--|-----------------|------------|
| Hamilton | No | Duke Energy Miami Fort Station | North Bend/30 | 24,691.0 |
| | No | DEGS of St. Bernard, LLC | St. Bernard/17 | 2,005.0 |
| | No | E.I. DuPont Fort Hill Plant | North Bend/31 | 1,143.0 |
| | No | University of Cincinnati | Cincinnati/13 | 616.0 |
| | No | INEOS ABS (USA) Corporation | Addyston/24 | 472.0 |
| | No | Emerald Performance Materials, LLC | Cincinnati/27 | 306.0 |
| | No | Rock-Tenn Converting Company | Cincinnati/16 | 257.0 |
| | No | Caraustar Mill Group, Inc | Cincinnati/13 | 118.0 |
| Clermont | No* | Duke Energy W.C. Beckjord Station | New Richmond/16 | 26,404.0** |
| | No | Duke Energy W.H. Zimmer Generating Station | Moscow/27 | 16,513.0 |
| | No | ZF Batavia LLC (Ford)*** | Batavia | 118.0 |

*Facility is located in EPA-recommended nonattainment area.

** EPA Clean Air Markets Division information for 2010-2011 indicates that the W.C. Beckjord Station has increased its SO₂ emissions to over 70,000 tons per year in recent years.

***ZF Batavia (Ford) closed in late 2008.

Emission Controls

The emissions data used by EPA in this technical analysis and provided in Table 11 represent emissions levels taking into account any control strategies implemented on stationary sources in the area up to and including 2008. EPA has not received any additional information on emissions reductions resulting from controls put into place after 2008. EPA believes that at least one SO₂ source in Clermont County has been closed since 2008, and at least one Clermont County source may have significantly increased its emissions.

Meteorology (weather/transport patterns)

EPA analyzed the wind data in the vicinity of the Campbell County monitor in an effort to determine which areas outside Campbell County should be included in the designated nonattainment area. Wind data were considered from several meteorological measurement sites, including an air quality monitoring site in Cincinnati, Ohio and two airports in the Cincinnati area. The data suggested that Clermont County SO₂ sources, such as the W.C. Beckjord Station power plant, could contribute to the SO₂ NAAQS violation at the Campbell County monitor. Data from Cincinnati/Northern Kentucky International Airport indicated that during the hours when the monitor showed exceedances of the 2010 SO₂ NAAQS, the wind was blowing from the east and east-southeast. This meteorological data is expected to be generally representative of Campbell County. EPA also used the HYSPLIT Trajectory Model to create wind trajectories showing the path that winds may have followed over several hours. This model uses a forecast meteorological dataset instead of surface wind observations. The trajectories indicated that airflow tended to come from the east during the hours with monitored SO₂ NAAQS exceedances, which also supported the inclusion of a portion of Campbell County in the nonattainment area. Full details of this meteorological analysis can be found in the TSD for Kentucky.

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

Clermont County borders the Ohio River. While the river valley can experience nighttime inversions and air flow into and out of the valley, the geographical and topographical features of the area are not

considered to significantly limit air pollution transport. Therefore, this factor did not play a significant role in determining the nonattainment boundary.

Jurisdictional Boundaries

Clermont County is not currently nonattainment for SO₂. EPA is recommending designating Pierce Township in Clermont County, because it contains a large SO₂ source which is believed to contribute to high concentrations at the Campbell County, Kentucky, ambient air quality monitor. Townships in Ohio have well established boundaries and EPA finds that they are a suitable administrative basis for defining Ohio's nonattainment areas.

Other Relevant Information

EPA did not receive additional information relevant to establishing a nonattainment area boundary for this area.

Conclusion

After considering the factors described above, based on a monitored violation, EPA intends to designate Pierce Township in Clermont County in Ohio as nonattainment for the 2010 SO₂ NAAQS, as part of the Campbell County KY-OH Interstate Area. EPA believes that this partial-county area, in conjunction with portions of Campbell County, Kentucky, encompasses the appropriate nonattainment area for the 2010 SO₂ NAAQS.