
Technical Support Document

WEST VIRGINIA
Area Designations For the
2010 SO_2 Primary National Ambient Air Quality Standard

Summary

Pursuant to section 107(d) of the Clean Air Act (CAA), EPA must designate areas as either "nonattainment," "attainment," or "unclassifiable" for the 2010 1-hour sulfur dioxide (SO_2) primary national ambient air quality standard (NAAQS). The CAA defines a nonattainment area as one that does not meet the NAAQS or that contributes to poor air quality in a nearby area that does not meet the NAAQS. Table 1 below identifies the counties or portions of counties in West Virginia that EPA is initially designating "nonattainment" based on monitored violations. EPA is not prepared to designate other areas in West Virginia, and will address them in a future final designations action.

West Virginia submitted designation recommendations on May 23, 2011 and submitted supplemental information on January 22, 2013. On February 6, 2013, EPA sent out a letter with intended initial designations for West Virginia. West Virginia responded in a letter dated April 5, 2013. In West Virginia's April 5, 2013 letter, they also indicated some areas in Ohio which they felt should be nonattainment. These are discussed later in this Technical Support Document (TSD). Information on the Ohio portions of the Steubenville OH-WV area is included in the TSD for Ohio.

Table 1. Nonattainment Area Designations for West Virginia

Area	West Virginia's Recommended Designation of Areas/Counties	EPA's Nonattainment Designations of Areas/Counties
Steubenville, OH-WV		
Brooke County, WV (partial) — Cross Creek Tax District	Nonattainment	Nonattainment
Jefferson County, OH (partial)—Cross Creek, Steubenville, Warren and Wells Townships	Nonattainment*	Nonattainment
Marshall, WV		
Marshall County, WV (partial)—Clay, Franklin and Washington Tax Districts	Nonattainment	Nonattainment

* Recommendations and technical analyses for and by Ohio can be found in Ohio's technical support document.

Background

On June 2, 2010, EPA revised the primary SO_2 NAAQS (75 FR 35520) by establishing a new 1-hour standard at a level of 75 parts per billion (ppb) which is met at an ambient air quality monitoring site when the 3-year average of the annual 99th percentile of the daily maximum 1-hour average concentrations does not exceed 75 ppb, as determined in accordance with Appendix T of 40 CFR part 50 40 CFR 50.17(a)-(b). EPA has determined that this is the level necessary to provide protection of public health with an adequate margin of safety, especially for children, the elderly and those with asthma. These groups are particularly susceptible to the health effects associated with breathing SO_2. The Agency is revoking the two prior primary standards of 140 ppb evaluated over 24-hours, and 30 ppb evaluated over an entire year because the standards will not add additional public health protection given a 1-hour standard at 75 ppb. Accordingly, EPA is not designating areas in this process on the basis of either of these two prior primary standards. Similarly, the secondary standard for SO_2 has not been revised, so EPA is not designating areas in this process on the basis of the secondary standard.

EPA's SO_2 Designation Approach

Section 107(d) of the CAA provides that no later than one year after promulgation of a new or revised NAAQS, state Governors must submit their recommendations for designations and boundaries to EPA. This deadline was in June 2011. Section 107(d) also requires EPA to provide a notification to states of no less than 120 days prior to promulgating an initial area designation that is a modification of a state's recommendation. EPA reviewed the State's recommendations and has notified the State through a letter signed by the Regional Administrator on February 6, 2013, of any intended modifications. While language in section 107 specifically addresses States, we intend to follow the same process for tribal governments, pursuant to section 301(d) of the CAA and the Tribal Authority Rule (40CFR Part 49). Therefore, we are designating areas of tribal government, in consultation with the tribal government, on the same schedule as State designations. West Virginia does not have any tribal governments affected by this designation. If a state or tribal government does not submit designation recommendations, EPA will promulgate the designations that it deems appropriate. If a State or tribal government disagrees with EPA's intended area designations, it has 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 5 factors include: 1) Air quality data; 2) Emissions and emissions-related data (location of sources and potential contribution to ambient SO_2 concentrations); 3) Meteorology (weather/transport patterns); 4) Geography/topography (mountain ranges or other air basin boundaries); and 5) Jurisdictional boundaries (e.g., counties, air districts, pre-existing nonattainment areas, reservations,

metropolitan planning organization), among any other information deemed relevant to establishing appropriate area designations and boundaries for the 1-hour SO_2 NAAQS.

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

In this technical support document (TSD), EPA discusses its review and technical analysis of the recommendations submitted by West Virginia regarding areas within West Virginia in response to EPA's proposed nonattainment area designations for West Virginia for the 1-hour SO_2 standard which were also made available for public comment (78 FR 11124) on February 15, 2013. The response to comment document also contains information related to West Virginia's response to EPA's proposed nonattainment designations. Information related to Ohio may be found in the Response to Comment document and also in the Ohio TSD.

Definitions of important terms used in this document:

1) **Designated "nonattainment" area –** an area which EPA has determined, based on a state recommendation and/or on the technical analysis included in this document, has violated the 2010 SO_2 NAAQS, based on 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 tribal government has recommended to EPA be designated as nonattainment.

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

4) **2010 SO_2 NAAQS –** 75 ppb, national ambient air quality standard for SO_2 promulgated in 2010. Based on the 3-year average of the 99th percentile of the annual distribution of daily maximum 1-hour average concentrations

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

Nonattainment Designations

Introduction

In West Virginia's designation recommendation letter to EPA, dated May 23, 2011, Randy Huffman, Secretary of the West Virginia Department of Environmental Protection (WVDEP),

recommended that Brooke, Hancock, Marshall, Monongalia, and Wood Counties be designated as nonattainment for the 2010 SO_2 NAAQS based on monitored air quality data from 2008-2010. On January 22, 2013, West Virginia submitted a revised recommendation letter to EPA indicating that subsequent air monitoring data (2010-2012) suggests that the air quality has significantly improved in three of those counties: monitors in Hancock, Monongalia, and Wood are no longer showing violations of the 2010 1-hour SO_2 standard. EPA took this information into consideration when it responded to West Virginia's original nonattainment recommendations. On April 5, 2013, West Virginia submitted a response to EPA's 120-day letter and recommended that a portion of Brooke County (Cross Creek Tax District) as well as a portion of Marshall County (Clay, Franklin and Washington Tax Districts) be designated as nonattainment. West Virginia also recommended that a portion of Belmont County, Ohio (Mead Township) as well as a portion of Monroe County, Ohio (Ohio Township) be designated as nonattainment.

Based on EPA's technical analysis, EPA is initially designating two areas as nonattainment (Table 1) based on monitored violations of the NAAQS. The Steubenville, OH-WV Nonattainment Area consists of a portion of Brooke County, WV (Cross Creek Tax District) and a portion of Jefferson County, OH (Cross Creek, Steubenville, Warren and Wells Townships). The Marshall Nonattainment Area consists of a portion of Marshall County, WV (Washington, Franklin and Clay Tax Districts). The TSD for Ohio and Response to Comment document contain a detailed discussion about the Ohio portion of the Steubenville, OH-WV Nonattainment Area as well as information regarding the status of Mead Township in Belmont County Ohio and Ohio Township in Monroe County Ohio.

The 5 factors were used to analyze the nonattainment areas for 1-hour SO_2 designations:

1. Air quality data. This factor considers the SO_2 air quality monitoring data from EPA's Air Trends website (see http://www.epa.gov/airtrends/values.html), primarily including the design values (in ppb) calculated for each monitor in the area for the 2009-2011 three-year period. Additional information on monitored values for 2010-2012 provided by West Virginia was also considered. A monitor's design value indicates whether that monitor violates a specified air quality standard. The 2010 SO_2 NAAQS is met at a monitoring site when the identified design value is valid and less than or equal to 75 ppb as described in Appendix T of 40 CFR part 50. An ambient air monitor, whose valid design value exceeds 75 ppb, as described in Appendix T of 40 CFR part 50, is deemed a violating monitor. A design value is only valid if minimum data completeness criteria are met. An SO_2 design value that meets the NAAQS is generally considered valid if it encompasses 3 years of complete data. A year is complete when all 4 quarters are complete. A quarter is complete when 75% of the days are complete. A day is complete when it has 75% of its hours. Data substitution tests are described in Appendix T of 40 CFR part 50. Areas where monitoring data indicate a violation of the 1-hour, 75 ppb primary SO_2 standard are being designated as nonattainment.

2. Emissions and emissions-related data (location of sources and potential contribution to ambient SO_2 concentrations). EPA reviewed data for the point source and non point source categories from version 3 of the 2008 National Emissions Inventory (NEI) which is the most current version of the national inventory now available (see

http://www.epa.gov/ttn/chief/net/2008inventory.html), as well as emissions information West Virginia provided. Generally, the point source inventory represents the bulk of the SO_2 emissions in EPA Region III.

3. Meteorology (weather/transport patterns). EPA evaluated meteorological data to help determine how weather conditions, including wind speed and direction, affect the plume of sources contributing to ambient SO_2 concentrations. The National Weather Service maintains surface and upper air monitoring sites across the United States. Automated Surface Observing System (ASOS) (http://www.weather.gov/asos) sites collect hourly averaged wind measurements including wind direction and wind speed. Upper air measurements (rawinsonde) are collected at a limited number of sites where vertical wind profiles are taken using weather balloons. Measurements taken at ASOS and rawinsonde sites are often used in dispersion modeling analyses using EPA's AERMOD modeling system.

   One-minute meteorological wind fields for an area's nearby airport(s) were downloaded and run through AERMOD's preprocessor AERMINUTE to produce hourly averaged wind fields. This data was then run through Lakes Environmental's WRPLOT software to produce wind roses for the airports, showing prevailing wind patterns in the area.

4. Geography/topography (mountain ranges or other air basin boundaries). EPA examined the physical features of the land that might affect the distribution of SO_2 over an area. Mountains or other physical features may affect the distribution of emissions, and may help define boundaries. Maps depicting elevations and point sources were constructed and evaluated to determine the effects of the topography on point source emissions.

5. Jurisdictional boundaries As discussed in the West Virginia TSD that was included in the docket as part of EPA's proposal for nonattainment areas (78 FR 11124) on February 15, 2013, EPA reviewed several possible boundaries but used county boundaries for the proposed West Virginia portions of proposed nonattainment areas. In response to EPA's proposal, West Virginia recommended that the boundaries for West Virginia portions of nonattainment areas be based on partial counties and that boundaries could be determined based on the 2013 version of the tax district boundaries within its counties.

The five factor descriptions above are a combination of descriptions from the March 24, 2011 memo and other relevant information pertaining to this TSD.

Technical Analysis for the Steubenville, OH-WV Nonattainment Area

In EPA's 120-day letter, EPA proposed that the Steubenville, OH-WV Nonattainment Area include Brooke County, WV in its entirety and a portion of Jefferson County, OH. In response to EPA's 120-day letter West Virginia recommended that only a portion of Brooke County (Cross Creek Tax District) be included in the nonattainment area. In West Virginia's response to

the 120-day letter, West Virginia included an analysis supporting its recommendation of a portion of Brooke County to be included in the Steubenville, OH-WV Nonattainment Area.

Based on EPA's technical analysis described below, EPA intends to initially designate, based on the violating monitors in Brooke County in West Virginia, a portion of Brooke County (Cross Creek Tax District) and a portion of Jefferson County, Ohio (Cross Creek, Steubenville, Warren and Wells Townships) as nonattainment for the 2010 1-hour SO_2 NAAQS as part of the Steubenville, OH-WV Nonattainment Area. The analysis in this TSD is primarily for the West Virginia portion of the nonattainment area. The analysis for the Ohio portion (Jefferson County) can be found in the TSD for Ohio.

Air Quality Data

This factor considers the SO_2 design values (in ppb) for air quality monitors in Brooke County based on certified data for the 2009-2011 period. The 2010 1-hour SO_2 design values for all the monitors located in Brooke County are shown in Table 2. In West Virginia's response to EPA's 120-day letter, EPA was informed that all the monitors are located in the Cross Creek Tax District of Brooke County

Table 2. Brooke County Monitor Trends: 1-Hour SO_2 99th % and Design Values in ppb

Monitor	ID	99th %					Design Value	Design Value
		2007	2008	2009	2010	2011	2008-10	2009-11
Mahan Lane	54-009-0005	131	168	82	131	143	127	119
McKims	54-009-0007	168	137	81	92	75	103	83
Marland Heights	54-009-0011	169	159	143	143	219**	148	174**

** Incomplete 2nd and 3rd quarters of 2011 data do not meet requirements in Appendix T of 40 CFR Part 50

All monitors with complete data in Brooke County showed violations using both 2008-10 and 2009-11 data. West Virginia provided data for 2010-2012 which still showed violations in Brooke County. An additional monitor in Jefferson County, Ohio is also showing a monitored violation of the 2010 1-hour SO_2 NAAQS, as discussed in the TSD for Ohio. Based on evidence that violations are occurring in Brooke County, West Virginia and Jefferson County, Ohio, EPA is initially designating a nonattainment area that includes the sources in the area that we are currently prepared to conclude contribute to these monitored violations. Information related to the monitoring locations which were provided by West Virginia in its response to EPA's 120-day letter shows that the area of concern with respect to the monitoring data is limited to the Cross Creek Tax District of Brooke County.

Emissions and Emissions-Related Data

Evidence of SO_2 emissions sources in the vicinity of a violating monitor is an important factor for determining whether a nearby area is contributing to a monitored violation. For this factor,

EPA evaluated county-level emissions data for SO_2 and any change in SO_2 emitting activities since the date represented by those emissions data. Areas and sources that we are not yet prepared to conclude are contributing to the monitored violation are not included in this initial nonattainment area. These areas and sources will be addressed in a future final designations action.

Emissions

In its response to EPA's 120-day letter, West Virginia provided updated emissions information from their draft 2011 NEI. EPA also reviewed v3 of the 2008 NEI as well as the draft 2011 NEI data provided by West Virginia.

Table 3 shows total emissions of SO_2 in tons per year (tpy) for sources emitting greater than 100 tpy of SO_2 according to the 2008 NEI in Brooke County in WV. The Ohio TSD provides a discussion of those sources in the Ohio portion of the nonattainment area.

Table 3. SO_2 Emissions in Steubenville, OH-WV Nonattainment Area

County	Facility Located in State Recommended Nonattainment Area?	Facility Name	Total Facility SO_2 Emissions from 2008 NEI (tpy)	Draft 2011 NEI SO_2 Emissions (tpy)
Brooke, WV	Yes	Mountain State Carbon, LLC	731	697‡

‡ Draft 2011 NEI provided by WV DEP

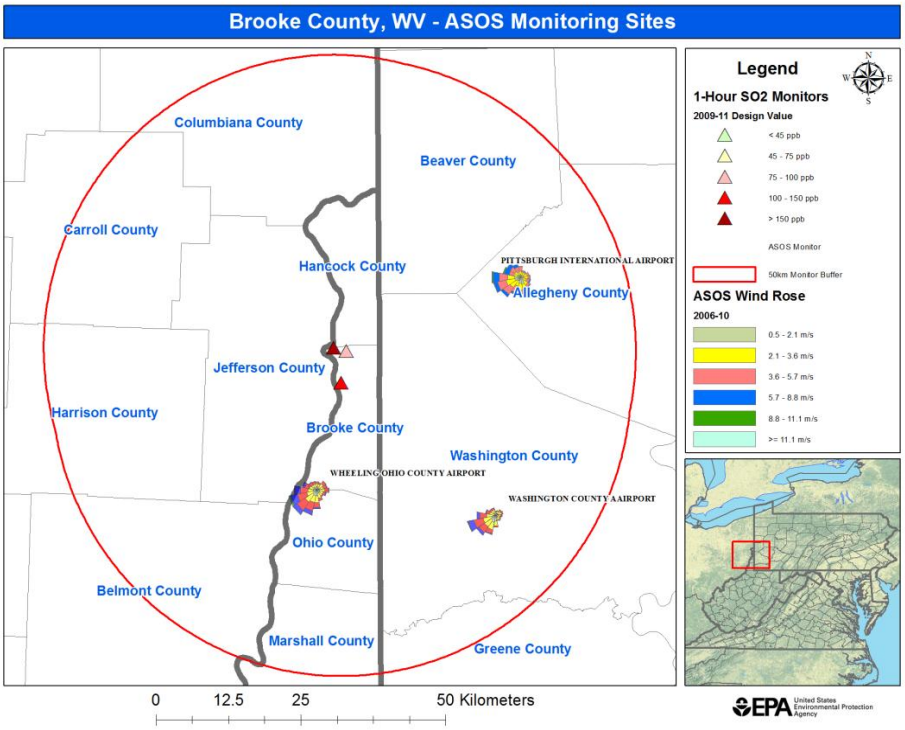
Currently, all sources of SO_2 in Brooke County are located in the Cross Creek Tax District. In terms of emissions, the Cross Creek Tax District is the only area of concern for Brooke County.

Meteorology (weather/transport patterns)

Evidence of source-receptor relationships between specific emissions sources and high SO_2 values at violating monitors is another important factor in determining the appropriate contributing areas and the appropriate extent of the nonattainment area boundary. For this factor, EPA considered data from sites that collected hourly averaged wind measurements including wind direction and speed for 5 years. The two closest meteorological monitoring sites currently operating near the violating monitors in Brooke County are at the Wheeling/Ohio County Airport and the Pittsburgh International Airport. An ASOS and rawinsonde site is located at the Pittsburgh International Airport. The Washington County Airport in Pennsylvania was also included. However, the data recovery at this site was not as complete as at the Pittsburgh and Wheeling sites. One-minute meteorological wind fields for the Pittsburgh and Wheeling ASOS

sites were downloaded and run through AERMOD's preprocessor AERMINUTE to produce hourly averaged wind fields. These data along with the Washington County data recovered from the Pennsylvania State Climatologists Office were then run through Lakes Environmental's WRPLOT software to produce wind roses for the surface sites nearest the Brooke County monitors. Figure 1 depicts the ASOS wind roses for the ASOS sites closest to the Brooke County monitors.

Figure 1. ASOS Monitoring Sites



Wind rose plots for Pittsburgh International, Wheeling/Ohio County and Washington County airports show there are slightly different wind distribution patterns. At Pittsburgh International airport, the prevailing surface winds are predominantly out of the west with secondary peaks out of the southwest and northwest, whereas the winds at the Wheeling, Ohio County airport are predominantly out of the southwest. These slightly different wind patterns between the sites are probably due to differences in local topography.

Given this information, with a dominant southwest wind at the Wheeling, Ohio County airport, EPA is not prepared to conclude that smaller sources in Hancock County and the large sources located northeast of the violating monitors, are likely to be contributing to the violating Brooke County monitors. (These sources and areas will be addressed in a future final designations action.) These prevailing wind patterns, however, show that the emissions from large sources in Jefferson County are likely impacting the violating monitors in Brooke County. In West Virginia's response to EPA's 120-day letter, it was recommended that the Buffalo Tax district in West Virginia be removed from the nonattainment area because there are no sources in that tax

district, therefore no transport of emissions originating from that area can occur. In terms of transport, the Cross Creek Tax District is therefore Brooke County's most likely area of concern.

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

Brooke County lies on the eastern side of the Ohio River. The County's elevated terrain contrasts with the lower elevations of the Ohio River and its tributaries that pass through the counties. This creates sharp contrasts in elevation with the Ohio River sitting around 200 meters above mean sea level and the adjacent mountains exceeding 350 meters.

Most of the large (>100 tpy) point sources in this region reside within the Ohio River Valley. It should be noted that the three surface meteorological sites reviewed in the previous section are located at higher elevations than most of the point sources, and therefore sources may be subject to different wind patterns, which could influence local dispersion patterns. It is unlikely, however that this would impact the transport of pollutants from large sources west of the violating monitors given that the emissions from those sources are significant. In response to EPA's 120-day letter, West Virginia concurred with EPA's characterization that geography/topography are not significant in determining the nonattainment boundary.

Jurisdictional boundaries

EPA provided information about all boundaries considered prior to proposing nonattainment areas and this information can be found in the West Virginia TSD as part of the docket on proposed designations (78 FR 11124) and is not restated here. EPA originally proposed including all of Brooke County in the nonattainment area. However, additional information provided by West Virginia in response to EPA's proposal demonstrates that the monitors and sources of concern in this area of West Virginia are all located in the Cross Creek Tax District within Brooke County. Therefore, EPA is including only the Cross Creek Tax District within Brooke County, WV in the initial nonattainment area.

Conclusion for the Steubenville, OH-WV Nonattainment Area

After considering the factors described above, EPA finds that the boundary for the portion of Brooke County, WV with violating monitors is a multi-state nonattainment area consisting of the Cross Creek Tax District of Brooke County and a portion of Jefferson County in Ohio (Cross Creek, Steubenville, Warren and Wells Townships) as identified in Table 1 with the area name Steubenville, OH-WV Nonattainment Area for the 2010 SO_2 NAAQS. Refer to Figure 2 for a depiction of the nonattainment area.

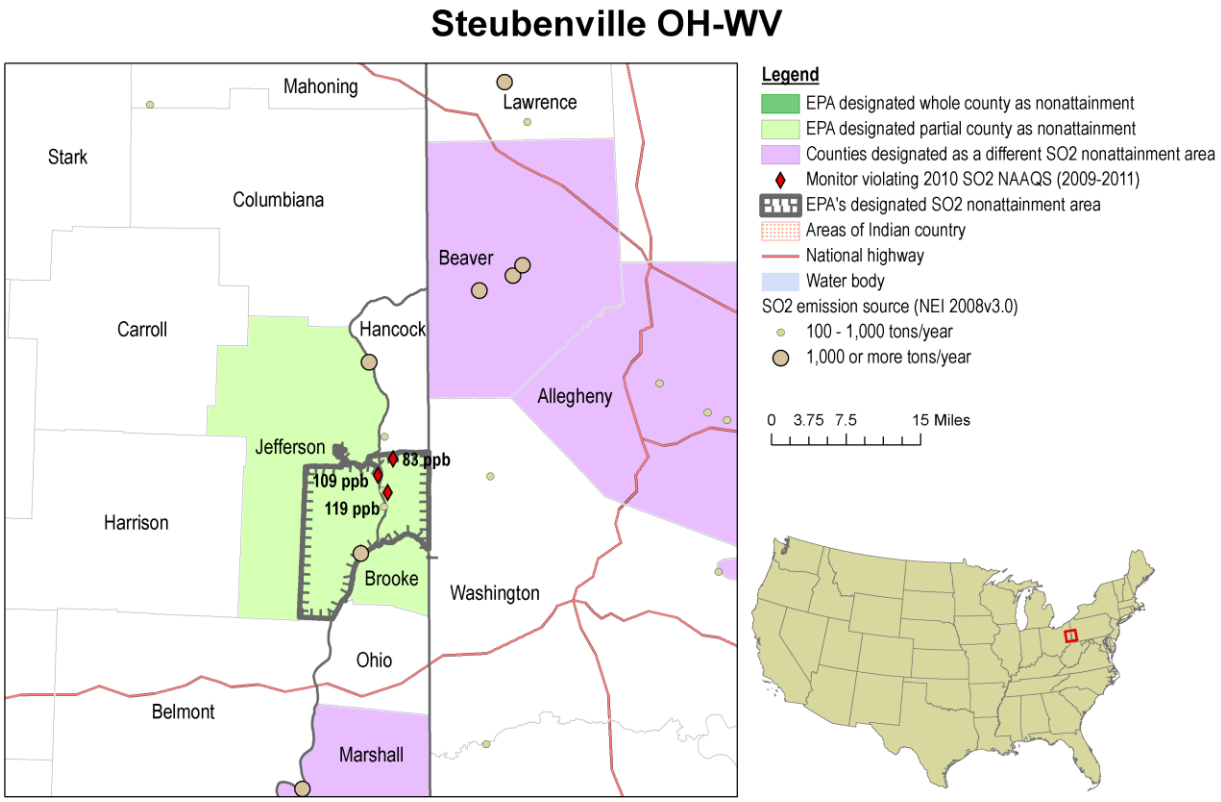
The air quality monitors in the Cross Creek Tax District of Brooke County show violations of the 2010 SO_2 NAAQS, based on certified 2009-2011 air quality data. Jefferson County, Ohio is a nearby area with sources that EPA finds contribute to the SO_2 concentrations in Brooke County. Available emissions, meteorological data, and geographical data suggest that large emissions sources west and southwest of the monitors likely impact the monitors and contribute to SO_2

NAAQS violations in Brooke County. Since there are no sources located in the Buffalo Tax District (the only other tax district in Brooke County), which is located south of the violating monitors, this tax district was not included in the Steubenville, OH-WV Nonattainment Area.

Additionally, in response to EPA's 120-day letter, West Virginia provided supporting information as referenced in the five factor analysis that assisted EPA in concluding that only a portion of Brooke County be included in the initial Steubenville, OH-WV Nonattainment Area.

Based on the consideration of all the relevant and available information, as described above, EPA believes that the boundaries described herein encompass the appropriate initial nonattainment area based on violating monitors in Brooke County in West Virginia. In a subsequent round of designations we will make final designation decisions for areas that are not currently included in the nonattainment area designations addressed in this TSD.

Figure 2. Steubenville, OH-WV Nonattainment Area



Technical Analysis for the Marshall, WV Nonattainment Area (Previously proposed as the Wheeling, WV-OH Nonattainment Area)

In EPA's 120-day letter, EPA originally proposed that an area called the Wheeling, WV-OH Nonattainment Area include Marshall County, WV in its entirety and a portion of Belmont County, OH. In response to EPA's 120-day letter West Virginia recommended that a portion of Marshall County, WV (Washington, Clay, and Franklin Tax Districts), a portion of Belmont County, OH (Mead Township), as well as a portion of Monroe County, OH (Ohio Township) be included in the Wheeling, WV-OH Nonattainment Area. In West Virginia's response to the 120-day letter, West Virginia included an analysis supporting its boundary recommendations for the Wheeling, WV-OH Nonattainment Area. While EPA agrees with some of West Virginia's recommendations, EPA does not agree with all of them.

EPA's technical analysis for this Area, now known as the Marshall, WV Nonattainment Area, identifies a portion of the County with a monitor that violates the 2010 SO_2 NAAQS, and evaluates nearby counties for contributions to SO_2 concentrations in the Area. For this area, a portion of Marshall County, WV has a violating monitor. EPA has evaluated this County and nearby counties based on the weight of evidence of the factors recommended in the March 24, 2011 guidance issued by EPA.

Based on the technical analysis described below, EPA is initially designating a portion of Marshall County (Washington, Clay and Franklin Tax Districts) in West Virginia as nonattainment for the 2010 SO_2 NAAQS as part of the Marshall, WV Nonattainment Area. The analysis in this TSD is primarily for the West Virginia portion of the nonattainment area. Detailed information explaining why Mead Township in Belmont County in Ohio was removed from the proposed area along with additional information about Monroe County is included in the Response To Comments and the TSD for Ohio. Areas and sources that we are not yet prepared to conclude are contributing to the monitored violation are not included in this initial nonattainment area, and will be addressed in a future final designations action.

Air Quality Data

This factor considers the SO_2 air quality monitoring data, including design values (in ppb) calculated for all air quality monitors in Marshall County, WV and primarily based on certified 2009-2011 data. West Virginia provided monitoring data for 2010-2012 which was also considered and indicates that the monitor in this county is not yet attaining the SO_2 NAAQS. The 2010 1-hour SO_2 design value for the monitor located in Marshall County is shown in Table 4.

Table 4. Marshall County Monitor Trend: 1-Hour SO_2 99th % and Design Value in Parts per Billion (ppb)

Monitor Name	Monitor Air Quality System ID	99th %					Design Value	Design Value
		2007	2008	2009	2010	2011	2008-10	2009-11
Moundsville	54-051-1002	161	113	61	101	79	92	80

One-hour SO_2 design values appear to be generally falling over the last four years though there is insufficient data to clearly establish a definitive trend. The Marshall County monitor's 99th % concentration for 2009 is significantly lower than its other values. The severe recession during 2009 or decreases in local source emissions in the vicinity of the monitor could have contributed to the monitor's lower concentrations in that year. In response to EPA's 120-day letter, West Virginia informed EPA that the violating monitor is located in the Washington Tax District. This information provided by West Virginia shows that the area of concern with respect to the monitoring data is limited to the Washington Tax District of Marshall County.

Emissions and Emissions-Related Data

Evidence of SO_2 emissions sources in the vicinity of a violating monitor is an important factor for determining whether a nearby area is contributing to a monitored violation. For this factor, EPA evaluated county-level emissions data for SO_2 and any change in SO_2 emitting activities since the date represented by those emissions data.

Emissions

In its response to EPA's 120-day letter, West Virginia provided updated emissions information from their draft 2011 NEI. EPA reviewed v3 of the 2008 NEI as well as the draft 2011 NEI data and some CAMD data provided by West Virginia.

Table 5 shows total emissions of SO_2 in tons per year (tpy) for violating and potentially contributing counties in and around the Marshall, WV Nonattainment Area and sources emitting greater than 100 tpy of SO_2 according to the 2008 NEI. EPA notes that the only significant changes in emissions from the previous TSD provided in the docket for proposed designations for the sources within Marshall County were at the Kammer Plant. However, this source is still emitting significant emissions and contributing to nonattainment. Also, any significant changes in Ohio were generally emission decreases. The Ohio TSD provides a discussion of those sources in the Ohio portion of the nonattainment area.

Table 5. SO_2 Emissions in the Vicinity of the Marshall, WV Nonattainment Area

County	Facility Located in State Recommended Nonattainment Area?	Facility Name	Total Facility SO_2 Emissions 2008 NEI version 3 or CAMD2011(tpy) WV's draft data	CAMD 2012 SO_2 Emissions (tpy)
Marshall, WV	Yes	Ohio Power – Kammer Plant	32,050	19,717
Marshall, WV	Yes	PPG Industries, Inc.	7,693	
Marshall,	Yes	Rain CII	7,630	

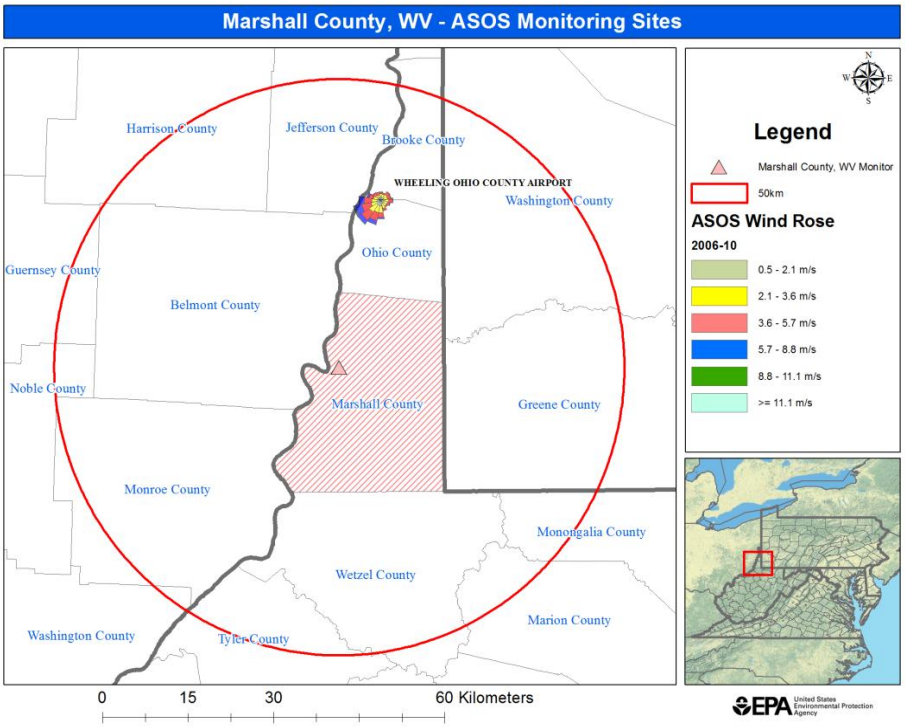
WV		Carbon Moundesville Calcining		
Marshall, WV	Yes	Ohio Power - Mitchell Plant	3,024	3,455
Marshall, WV	Yes	Columbian Chemicals Company	1,180	
Belmont, OH	No	R.E. Burger Plant	15,126	
Monroe, OH	No	Ormet Primary Aluminum	2,442	

However, in response to EPA's 120-day letter, West Virginia recommended including the Ohio Township of Monroe County, Ohio which is where Ormet Primary Aluminum is located. EPA's response to comment document contains additional information as well as the Ohio TSD to address this comment.

Meteorology (weather/transport patterns)

Evidence of source-receptor relationships between specific emissions sources and high SO_2 values at violating monitors is another important factor in determining the appropriate contributing areas and the appropriate extent of the nonattainment area boundary. For this factor, EPA considered data from sites that collected hourly averaged wind measurements including wind direction and speed for 5 years. There appears to only be one ASOS and one rawinsonde site located near the violating monitor in Marshall County (Figure 3). The closest surface site is the Wheeling/Ohio County Airport approximately 30 kilometers north of the Marshall County monitor. A rawinsonde site is located at the Pittsburgh International Airport located approximately 77 kilometers to the northeast. One-minute meteorological wind fields for the Wheeling/Ohio County Airport site were downloaded and run through AERMOD's preprocessor AERMINUTE to produce hourly averaged wind fields. This data was then run through Lakes Environmental's WRPLOT software to produce wind roses for the Wheeling/Ohio County Airport, the surface site nearest the Marshall County monitor.

Figure 3. Marshall County, WV- ASOS Monitoring Sites



The wind rose indicates that at the Wheeling/Ohio County Airport, the prevailing surface winds are predominantly out of the southwest and west. Given this information, the sources west and southwest of the violating monitor, particularly those within close proximity of the violating monitor, are likely to have the greatest impact on the violating monitor in Marshall County. EPA is not prepared to conclude that sources north and east are likely to contribute to the violating monitor in Marshall County. (These sources will be addressed in a future final designations action.) Since the meteorology indicates transport of SO_2 coming from the south and west, West Virginia recommended that the Franklin Tax District be included in the Wheeling, WV-OH Nonattainment Area since this tax district is located south of the monitor and contains several sources of SO_2. Additionally, West Virginia's analysis of wind direction has led them to conclude that R.E. Burger and Ormet Aluminum affect the violating monitor because these sources are located south and west of the monitor and the prevailing winds are out of the south and west. However, additional emission reductions have occurred at the Burger facility following a federally enforceable Consent Decree which makes it unlikely to contribute to continuing nonattainment at the Marshall County monitor. The Ormet facility is about 25 km away from the monitor and there is impeding terrain between Ormet and the monitor location. Please see the Response to Comment document and the Ohio TSD for additional information. Therefore, EPA is not prepared to conclude that the Ormet facility is contributing to the monitored violation. We will make final designation decisions for areas outside Marshall County, WV in a subsequent round of designations.

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

Marshall County lies on the eastern side of the Ohio River. The county's elevated terrain contrasts with the lower elevations of the Ohio River and its tributaries that pass through the

county. This creates sharp differences in elevation with the Ohio River sitting just under 200 meters above mean sea level and the adjacent mountains often exceeding 350 meters. Nearly all of the point sources within 50 kilometers of the Marshall County monitor lie along the Ohio River. Although the surface meteorological site reviewed in the previous section may be located at a somewhat higher elevation than most of the point sources, the difference in elevation is not significant enough where it is likely that there would be substantial differences in wind patterns between the two locations. Therefore, local dispersion patterns are likely predominantly from the southwest/west as well and sources located southwest and west of the monitor are likely to contribute to nonattainment in Marshall County. In response to EPA's 120-day letter, West Virginia recommended that the tax districts to the east of the monitor and sources not be designated nonattainment because the local dispersion patterns are predominantly from the southwest/west. West Virginia also recommended that a portion of Belmont County and a portion of Monroe County (Ohio Township) be included in the Wheeling, WV-OH nonattainment area because they are located along the river valley channel and are in the path of channel flow that moves from south to north. Although EPA does not disagree that sources in Belmont County and Monroe County are generally located in pathways that approach the monitor location, other information such as emissions and source distance from the monitor do not provide sufficient information to conclude that sources in these areas in Ohio should be considered nearby contributors to the Marshall County monitor. Additional information about these sources can be found in the Response to Comment document and in the Ohio TSD.

Jurisdictional boundaries

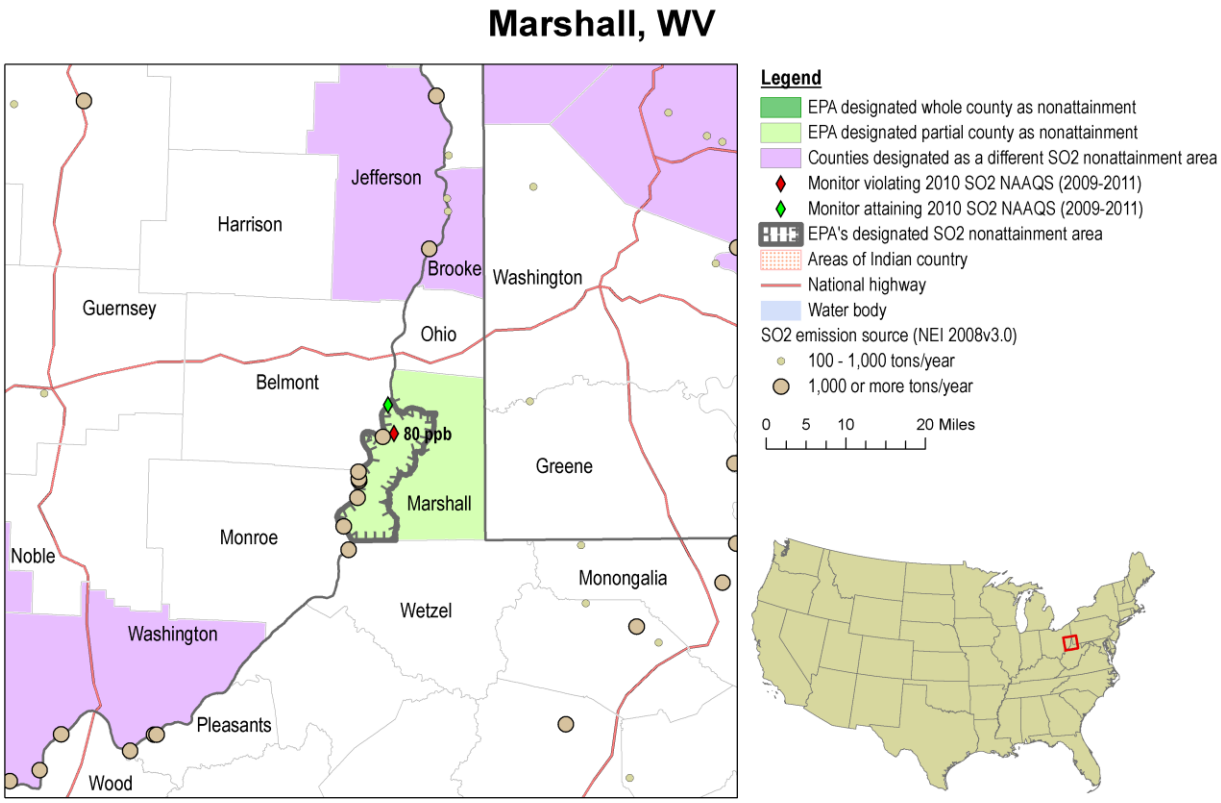
EPA provided information about all boundaries considered prior to proposing nonattainment areas and this information can be found in the West Virginia TSD as part of the docket on proposed designations (78 FR 11124) and is not restated here. EPA originally proposed including all of Marshall County in the nonattainment area. However, additional information provided by West Virginia in response to EPA's proposal demonstrates that the monitor and sources of concern in this area of West Virginia are all located in three Tax Districts within Marshall County: Washington, Franklin and Clay Tax Districts. Therefore, EPA is including only these three tax districts within Marshall County in the initial nonattainment area and EPA is not including any areas in Ohio.

Conclusion for the Marshall, WV Nonattainment Area

The air quality monitor in Marshall County, WV shows a violation of the 2010 SO_2 NAAQS, based on certified 2009-2011 air quality data and data provided by West Virginia for 2010-2012. Information provided by West Virginia indicates that only a portion of Marshall County contains sources likely to be contributing to the monitored violation in this area. In addition, due to recent emission reductions at the R. E. Burger facility in Belmont County, OH following a federally enforceable Consent Decree and a lack of sufficient information to show that the Ormet facility is contributing to the monitored violation as described in the factors above, no areas in Ohio are included in this initial nonattainment area.

After considering the factors described above, EPA finds that the boundary for the initial Marshall, WV Nonattainment Area should consist of the portions of Marshall County that encompass the Clay, Franklin and Washington Tax Districts. In a subsequent round of designations we will make final designations decisions for areas that are not currently included in the nonattainment area designation addressed in this TSD. A map of the area is provided in Figure 4.

Figure 4: Marshall WV Nonattainment Area



EPA's Area Designations Conclusion for West Virginia

EPA has reviewed the information above and finds that it is appropriate to designate based on violating monitors the portions of counties listed in Table 1 as nonattainment for the 2010 SO_2 NAAQS. EPA intends to designate portions of Brooke and Marshall Counties as nonattainment after considering the factors and information described in this technical support document. The nonattainment area boundaries that EPA describes above are based on the five factors which include: air quality data, emissions-related data, meteorology, geography/topography, and jurisdictional boundaries. Based on the consideration of all the relevant and available information, as described above, EPA believes that the boundaries described herein encompass

sufficient initial areas that do not meet (or that contribute to ambient air quality in a nearby area that does not meet) the 2010 SO_2 NAAQS based on the monitored violations.