State of Ohio 2010 Revised Sulfur Dioxide National Ambient Air Quality Standard

Recommended Area Designations

Round 3

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CHAPTER ONE:

General Discussion

The United States Environmental Protection Agency (U.S. EPA) promulgated the revised National Ambient Air Quality Standard (NAAQS) for sulfur dioxide (SO_2) on June 2, 2010. U.S. EPA replaced the 24-hour and annual standards with a new short-term 1-hour standard of 75 parts per billion (ppb). The new 1-hour SO_2 standard was published on June 22, 2010 (75 FR 35520) and became effective on August 23, 2010. The standard is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations.

On August 15, 2013, U.S. EPA published (78 FR 47191) the initial, first round, SO_2 nonattainment area designations for the 1-hour SO_2 standard across the country based upon areas with monitored violations (effective October 4, 2013). On March 2, 2015, the U.S. District Court for the Northern District of California accepted as an enforceable order an agreement between the U.S. EPA and Sierra Club and the Natural Resources Defense Council to resolve litigation concerning the deadline for completing designations. As explained in U.S. EPA's March 20, 2015 memorandum *Updated Guidance for Area Designations for the 2010 Primary Sulfur Dioxide National Ambient Air Quality Standard* (herein referred to as SO_2 Designation Guidance), the court's order directs U.S. EPA to complete the remaining designations in three steps: round two by July 2, 2016; round three by December 31, 2017 and round four by December 31, 2020.

As part of round two of designations, U.S. EPA identified areas with newly monitored violations of the standard, or areas that contain stationary sources that emitted more than 16,000 tons of SO_2 in 2012 or emitted more than 2,600 tons of SO_2 and had an emission rate of at least 0.45 lbs SO_2/MMBtu in 2012. The U.S. EPA identified two facilities in Ohio as meeting one or more of the emissions thresholds: the General James M. Gavin Plant and the W.H. Zimmer Generating Station. On July 12, 2016, U.S. EPA published (81 FR 45039) final second round designations for these source areas.

Round three and round four designations will be informed by U.S. EPA's August 21, 2015 *Data Requirements Rule for the 2010 1-hr Sulfur Dioxide (SO2) Primary National Ambient Air Quality Standard (NAAQS); Final Rule* (herein referred to as the Data Requirements Rule). The Data Requirements Rule requires characterization of sources with actual emissions greater than 2,000 tons per year (TPY) through modeling or monitoring. Round three designations will be informed based on these larger sources characterized by modeling and will also inform designations of areas that do not contain SO_2 sources that would require further characterization. Round four designations will be informed based on larger sources characterized by monitoring.

Pursuant to round three of designations and in accordance with the Data Requirements Rule, Ohio EPA is submitting designation recommendations for all areas of Ohio not

designated on August 15, 2013 or July 12, 2016, with the exception of the General James M. Gavin Plant area. This source area, which includes Kyger Creek Generating Station, was designated as unclassifiable under the round two designations. Ohio EPA intends to use monitoring to characterize this source area and will address a final designation recommendation under round four of designations.

Requirements

Pursuant to section 107(d) of the Clean Air Act (CAA), U.S. EPA must initially designate areas as either "unclassifiable", "attainment", or "nonattainment" for the 2010 1-hour SO_2 standard. Since the original 2011 state submittals of designation recommendations and pursuant to the March 2, 2015 court order, new information may be relevant for future designations. CAA Section 107(d) does not require states to submit updated recommendations. However, U.S. EPA will consider such information. For the round of designations to be completed by December 31, 2017, U.S. EPA requests that states submit updated recommendations and supporting information for consideration by January 13, 2017. If U.S. EPA intends to modify any state's designation recommendation, original or updated, the state will be notified no later than 120 days prior to promulgating the final designations. For the designations due to be promulgated on or before December 31, 2017, this notification will occur no later than September 1, 2017.

Section 107(d)(1) of the CAA defines an area as "nonattainment" if it is violating the NAAQS or if it is contributing to a violation in a nearby area. The first step in making designation decisions is to identify areas for which monitoring or appropriate modeling information indicate a violation of the NAAQS. U.S. EPA may designate an area as attainment if it is clear that that it meets the SO_2 NAAQS and does not contribute to a violation in a nearby area. Recent U.S. EPA actions for the second round of designations [81 FR 45039] indicates that U.S. EPA intends to designate areas as "unclassifiable", "unclassifiable/attainment", and "nonattainment". Based on this precedence, Ohio EPA is therefore making recommendations of "unclassifiable", "unclassifiable/attainment", and "nonattainment".

U.S. EPA's Data Requirements Rule, references the December 2013 *Draft SO_2 NAAQS Designations Modeling Technical Assistance Document* (herein referred to as SO_2 Modeling TAD). This document indicates that the purpose of the modeling is to assess actual, current air quality and that those recommendations could include modeling the source area as attaining the standard. Areas designated as "unclassifiable" or "unclassifiable/attainment" may be subject to additional and continued analysis to assess attainment over time.

Ohio EPA's Approach

This submittal is Ohio's recommendation for the round three designations. In accordance with the Data Requirements Rule and the SO_2 Designation Guidance, the starting point

for the area designations would be the county boundary around the SO_2 source(s) in question, unless additional information is provided to U.S. EPA demonstrating a different boundary is appropriate. U.S. EPA's SO_2 Designation Guidance states that U.S. EPA generally believes that in the absence of other relevant information, it is appropriate to use county boundaries to define nonattainment areas, but they recognize that the five-factor analysis and other information may support designating only a portion of a county as nonattainment. U.S. EPA states that modeling could be used to address several of these factors simultaneously. Ohio used the five-factor analysis approach, and for those areas identified by Ohio EPA as meeting the 2,000 TPY emissions criteria established in the Data Requirements Rule, refined dispersion modeling was used to support Ohio's recommended designations. While using this approach, the SO_2 Designation Guidance states this analysis should show that: 1) violations are not occurring in nearby portions that are excluded from the designation area; and 2) the excluded portions do not contain emission sources that contribute to the monitored or modeled violations, if observed.

The following summarizes the major factors included in Ohio's analysis for the purposes of round three designation recommendations. Specifically, Ohio has used the five factor analysis approach, including refined dispersion modeling where applicable, as recommended in the SO_2 Designation Guidance, to support the boundary recommendations. Ohio understands, based on the both the SO_2 Modeling TAD and the SO_2 Designation Guidance, that dispersion modeling accounts simultaneously for multiple elements of the five-factor analysis. As such, Ohio believes that the modeling analyses presented for those areas containing sources greater than 2,000 TPY carry significant weight in the designation of an area. Where appropriate, Ohio is providing additional supporting information with respect to the five-factor designation approach.

Because of the extensive time and resources necessitated to gather data and conduct the modeling and analyses for round three of designations, data from 2012-2014 was used as this was the most recent data available at the time. However, Ohio EPA has reviewed, and presented where necessary, 2015 data to ensure the results and recommended designations would not be impacted by more recent data. Where possible, and when necessary, more recent data was incorporated into Ohio's analysis. It should be noted that the Conesville Power Plant experienced lengthy outages in 2012. As a consequence, Ohio EPA requested and obtained 2013-2015 emissions data for the modeling analysis in this source area.

Factor 1: Dispersion Modeling and Air Quality Data

Ohio conducted refined dispersion modeling analyses following the guidance issued by U.S. EPA in the SO_2 Modeling TAD, the SO_2 Designation Guidance, and the Data Requirements Rule. The modeling analyses were based on 3-years of actual emissions from those sources greater than 2,000 TPY and representative meteorological data from

the same period. Ohio also examined air quality monitoring data for relevant monitors to inform designation recommendations.

Factor 2: Emissions Data

Emissions of SO_2 were determined from Ohio EPA's Fee Emission Reports (FERs) which are the basis for Ohio's National Emissions Inventory (NEI) submittals. Tables identified in analyses of emissions show stationary sources with reported SO_2 emissions in tons per year (TPY) at the facility level within each county relevant to the area being examined. U.S. EPA's SO_2 Modeling TAD suggests sources greater than the thresholds established under the Data Requirements Rule located within 50 kilometers of any facility 2,000 TPY or greater should be considered in the analysis of emissions data. Ohio EPA's initial analyses and prior modeling experience with the 1-hour SO_2 standard indicate facilities beyond approximately 10 to 25 kilometers are highly unlikely to cause a concentration gradient beyond what is accounted for via conservative and representative backgrounds.

Further, U.S. EPA Region 5 indicated to the Region 5 states that sources permanently retired prior to the promulgation of a designation for a particular area do not need to be modeled (Appendix A). This is consistent with the language of the Data Requirements Rule. Therefore, Ohio will consider the reduction in SO_2 emissions due to permanent retirements as part of its recommended designation, if applicable. In counties with total SO_2 emissions less than 2,000 TPY, Ohio is, with few exceptions, recommending an unclassifiable/attainment designation based on emissions alone (without an extensive five factor analysis).

Factor 3: Meteorology

The meteorology review of the five-factor analysis looks at wind data gathered at stations in and near Ohio by the National Weather Service (NWS). Information presented under this factor is indicative of annual average winds. These data may also suggest that emissions originating from some directions may be more prone to contribute than emissions in other directions.

Ohio is located in what is meteorologically termed the Mid-Latitudes. For pollutant dispersion, the most important meteorological parameter is wind speed and wind direction. In this region, surface weather systems predominantly travel from west too east, guided by either the sub-tropical or polar jet streams. The resulting surface transport winds associated with these systems will generally have a western component with additional southern components in the summer and northern components in the winter, although, on any given day, winds can blow from any direction. Discussions regarding this factor will show representative wind roses for the source area and SO_2 sources surrounding a source or county.

There are two major geographic feature affecting winds in portions of Ohio. The first is Lake Erie, which influences local winds and introduces localized diurnal and seasonal variation in wind directions and speeds. For counties and sources close to the shoreline of Lake Erie, careful consideration of representative meteorological sites was necessary. The second major geographic feature affecting winds in portions of Ohio is the hilly terrain associated with the Ohio River valley. Areas near to the Ohio River Valley typically have significant forested areas which modify the surface roughness lengths and can impact wind speed and wind direction. As with areas located near to Lake Erie, careful consideration of representative meteorological data was required.

For areas where sources were explicitly modeled, a significant portion of the influence of terrain and land use on local meteorology is accounted for in the model itself. The AERSURFACE preprocessor component of the AERMOD model accounts for land use and its impact on surface roughness lengths, albedo, and Bowen ratio. Ohio EPA determined monthly surface characteristics informed by 30-year precipitation norms collected at representative meteorological stations for all areas where refined dispersion modeling was conducted for the purposes of designation recommendations. The meteorological inputs to AERMOD itself were taken from measurements at this airport.

Factor 4: Topography and Land Use/Land Cover

The topography and land use/land cover analysis looks at physical features and land use or land cover that might have an effect on the airshed and, therefore, the distribution of pollutants over an area. The geographical and topographical features for the majority of the State of Ohio are not likely to limit or impact the transport of SO_2 in a significant manner. As such, Ohio does not consider topography and land use to be a significant factor for theses analyses, beyond what is analyzed directly via the refined dispersion modeling analysis conducted for specific source areas.

Factor 5: Jurisdictional Boundaries

The analysis of jurisdictional boundaries looks at the planning and organizational structure of an area to determine if the implementation of controls in a potential nonattainment area can be carried out in a cohesive manner. Core Based Statistical Areas (CBSAs), comprised of Metropolitan Statistical Areas (MSAs) and Combined Statistical Areas (CSAs), boundaries were considered for these recommendations.

CHAPTER TWO: Analyses and Recommended Designations

Ohio is recommending round three designations in this document for all areas of the state that were not previously designated on August 15, 2013 or July 12, 2016, or will not be characterized under round four designations.

All counties or partial counties marked with an asterisks in Table 2, below, are analyzed and included in the discussion (see the section entitled "Source Areas Necessitating Refined Dispersion Analysis") for areas containing one or more sources greater than 2,000 TPY and therefore necessitating refined dispersion modeling and a more extensive five-factor analysis to inform designations. All modeling was conducted following Ohio's Data Requirements Rule Modeling Protocol, submitted to U.S. EPA on July 1, 2016 and included as Appendix B of this submittal. These sources, as identified in Ohio's July 1, 2016 letter[1] to U.S. EPA, include:

- Miami Fort Station Dynegy, Facility ID 1431350093, Hamilton County
- Bay Shore First Energy and BP Husky Refining LLC, Facility IDs 0448020006 and 0448020007, Lucas County
- Conesville AEP, Facility ID 0616000000, Coshocton County
- W.H. Sammis First Energy, Facility ID 0641160017, Jefferson County
- J.M. Stuart DP&L and Killen DP&L, Facility IDs 0701000007 and 0701000060, Adams County
- Carmeuse Lime Inc. Maple Grove, Facility ID 0374000010, Seneca County

The Data Requirements Rule provides additional compliance pathways in lieu of air quality characterization via modeling or monitoring. First, accepting federally enforceable emission limits which would restrict facility-wide SO_2 emissions to less than 2,000 TPY or indicating that the facility has permanently shut down. Second, permitting authorities have the option of submitting dispersion modeling demonstrating that new, federally enforceable emission limits of SO_2 provide for attainment of the standard at all receptors in the modeling domain.

Several facilities accepted restrictions such that SO_2 emissions will be sufficiently below 2,000 TPY and further characterization of ambient air quality was unnecessary. The Data Requirements Rule requires facilities electing this option must have federally enforceable emissions limitations in place and effective by January 13, 2017. Ohio EPA is issuing federally enforceable permit-to-install permits for each facility in this category, requiring compliance by January 13, 2017. These facilities and the relevant federally enforceable emission limits are detailed in the applicable county discussion below (see the section entitled "Recommended Designations: Counties not Necessitating Modeling,

[1] http://epa.ohio.gov/Portals/27/sip/so2/Signed_DRR_Sources_Letter.pdf

Monitoring or not Previously Designated" and "Source Areas Necessitating Refined Dispersion Analysis").

- The Medical Center Company, Facility ID 1318003059, Cuyahoga County
- The City of Orrville, Department of Public Utilities, Facility ID 0285010188, Wayne County
- The Morton Salt, Inc., Facility ID 0285020059, Wayne County
- The P.H. Glatfelter Chillicothe, Facility ID 0671010028, Ross County

One facility greater than 2,000 TPY, the Avon Lake Power Plant in Lorain County (Facility ID 0247030013), accepted federally enforceable limits on both coal fired boilers that provide for modeled attainment. The Data Requirements Rule requires facilities electing this option must have federally enforceable emissions limitations in place and effective by January 13, 2017. Ohio EPA issued a federally enforceable permit-to-install for Avon Lake Power Plant, requiring compliance by January 13, 2017. This facility is discussed in more detail below (see the section entitled "Recommended Designations: Counties or Source Areas with Sources Accepting Limits that Provide for Modeled Attainment").

For the remaining counties, Ohio EPA analyzed air quality data, emissions and other factors for the purposes of designation recommendations (see the section entitled "Recommended Designations: Counties not Necessitating Modeling, Monitoring or not Previously Designated").

Statewide Air Quality Data

Complete quality-assured ambient air quality monitoring data for 2012 through 2015, with 3-year design values for 2012-2014 and 2013-2015, demonstrate that the air quality has met the 1-hour SO_2 standard in all counties with monitors except Lake and Morgan Counties (Table 1). Lake County and a portion of Morgan County (Center Township) are included in the State of Ohio Nonattainment Area State Implementation Plan and Demonstration off Attainment for 1-hour SO2 Nonattainment Areas[2] and were a part of the round one nonattainment designations. The location of the SO_2 monitors are shown in Figure 1 (Table 1 can be used to correlate the location of each monitor on the map in the figure).

			Year				3-Year Average	
County	**Site**	**MapID**	**2012**	**2013**	**2014**	**2015**	**2012 to 2014**	**2013 to 2015**
Adams	39-001-0001	25	29.0	24.0	24.0	12.0	26	20
Allen	39-003-0009	20	12.0	7.0	13.0	10.0	11	10
Ashtabula	39-007-1001	18	53.0	29.0	17.0	37.0	33	28
Belmont	39-013-0006	21				14.0		14

[2] http://epa.ohio.gov/portals/27/SIP/SO2/2010SO2_AttainDemo_Revised_Final.pdf

County	Site	MapID	Year				3-Year Average	
			2012	2013	2014	2015	2012 to 2014	2013 to 2015
Belmont	39-013-3002	21	44.0	33.0	33.0	46.0	37	37
Butler	39-017-0019	9	62.0	26.0	27.0	44.0	38	32
Butler	39-017-0020	10	56.0	47.0	30.0	29.0	44	35
Butler	39-017-0021	11		25.0	32.0	31.0	29	29
Clark	39-023-0003	7	18.0	17.0	19.0	13.0	18	16
Columbiana	39-029-0019	19		28.0	23.0	15.0	26	22
Columbiana	39-029-0022	19	22.0	24.0			23	24
Cuyahoga	39-035-0038	3	83.0	63.0	65.0	59.0	70	62
Cuyahoga	39-035-0045	4	88.0	18.0	17.0	32.0	41	22
Cuyahoga	39-035-0060	5	80.0	66.0	53.0	63.0	66	61
Cuyahoga	39-035-0065	6	104.0	30.0	80.0	55.0	71	55
Franklin	39-049-0034	17		13.0	17.0	6.0	15	12
Hamilton	39-061-0010	12	63.0	68.0	71.0	54.0	67	64
Hamilton	39-061-0040	13	98.3	56.9	67.2	36.1	74	53
Jefferson	39-081-0017	22	92.0	37.0	30.0	29.0	53	32
Jefferson	39-081-0018	31	37.0	52.0	38.0	50.0	42	47
Jefferson	39-081-0020	32	28.0	33.0	24.0	23.0	28	27
Lake	39-085-0003	14	38.0	32.0	33.0	36.0	34	34
Lake	39-085-0007	15	163.0	119.0	72.0	89.0	118	93
Lawrence	39-087-0012	26	13.0	22.0	17.0	16.0	17	18
Lucas	39-095-0008	28		29.0	17.0	22.0	23	23
Mahoning	39-099-0013	16	43.0	27.0	44.0	32.0	38	34
Meigs	39-105-0003	23	26.0	33.0	32.0	47.0	30	37
Morgan	39-115-0004	24	142.0	124.0	148.0	91.0	138	121
Preble	39-135-1001	8	25.8	15.5	25.6	25.2	22	22
Scioto	39-145-0013	27	10.0	10.0	8.0	15.0	9	11
Scioto	39-145-0020	29	22.9	14.3	44.9	19.7	27	26
Scioto	39-145-0022	30	16.9	11.2	28.5	17.4	19	19
Summit	39-153-0017	1	22.0	23.0	21.0	14.0	22	19
Summit	39-153-0022	2	47.0	59.0	43.0	25.0	50	42
Tuscarawas	39-157-0006	34	45.0				45	

Monitor exceeds standard of 75 ppb

Table 1: Annual 99th percentile of 1-Hour Daily Maximum SO_2 Concentrations (ppb)

Figure 1: Location of SO_2 Monitors

Statewide Emissions Data and Summary of Recommended Designations

Emissions of SO_2 for 2014 and 2015 were determined from Ohio EPA's FERs which are the basis for Ohio's NEI submittals. Tables identified in this analysis show stationary sources with reported SO_2 emissions in tons per year (TPY) of 1 TPY or greater at the facility level.

County	2014	2015	Comments	Ohio EPA Recommended Designation or Current Status
Adams*	23,866.60	14,732.27	See Recommended Source Area Designation for Dayton Power & Light Stuart and Killen; one monitor attaining	Recommend Unclassifiable/Attainment
Allen	241.52	304.92	Not significant (< 2,000 TPY); one monitor attaining	Recommend Unclassifiable/Attainment
Ashland	2.06	1.07	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Ashtabula	3,598.63	2,818.98	See discussion below; one monitor attaining	Recommend Unclassifiable/Attainment
Athens	526.51	444.94	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Auglaize	6.25	6.11	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Belmont*	< 1	4.70	Not significant (< 2,000 TPY); two monitors attaining; Also see Recommended Source Area Designation for First Energy W.H. Sammis Power Plant	Recommend Unclassifiable/Attainment
Brown*	10.23	10.56	Not significant (< 2,000 TPY); Also See Recommended Source Area Designation for Dayton Power & Light Stuart and Killen	Recommend Unclassifiable/Attainment
Butler	2,998.74	2,833.42	See discussion below; three monitors attaining	Recommend Unclassifiable/Attainment
Carroll*	3.39	4.08	Not significant (< 2,000 TPY); Also see Recommended Source Area Designation for First Energy W.H. Sammis Power Plant	Recommend Unclassifiable/Attainment
Champaign	< 1	< 1	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Clark	< 1	< 1	Not significant (< 2,000 TPY); one monitor attaining	Recommend Unclassifiable/Attainment
Clermont (Pierce Township)	32,603.00	< 1	See Redesignation Request and Maintenance Plan for the Ohio Portion of the Campbell-Clermont Counties, KY-OH 1-hr SO_2 Nonattainment Area[3]	Designated Nonattainment Round 1

[3] http://epa.ohio.gov/Portals/27/sip/so2/Final%20Redesignation%20Request%20August2015.pdf

County	2014	2015	Comments	Ohio EPA Recommended Designation or Current Status
Clermont (remainder of county)	13,498.10	13,498.10	See Recommended Source Area Designation for W. H. Zimmer Generating Station[4]	Designated Unclassifiable/Attainment Round 2
Clinton	< 1	< 1	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Columbiana*	3.27	4.73	Not significant (< 2,000 TPY); two monitors attaining; Also see Recommended Source Area Designation for First Energy W.H. Sammis Power Plant	Recommend Unclassifiable/Attainment
Coshocton*	7,396.19	5,023.70	See Recommended Source Area Designation for American Electric Power Conesville Power Plant	Recommend Unclassifiable/Attainment
Crawford*	7.01	13.57	Not significant (< 2,000 TPY); Also see Recommended Source Area Designation for Carmeuse Lime Maple Grove Operations	Recommend Unclassifiable/Attainment
Cuyahoga	5,792.26	4,766.52	See discussion below; four monitors attaining	Recommend Unclassifiable/Attainment
Darke	12.06	12.00	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Defiance	28.20	29.03	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Erie*	44.12	109.94	Not significant (< 2,000 TPY); Also see Recommended Source Area Designation for Carmeuse Lime Maple Grove Operations	Recommend Unclassifiable/Attainment
Fairfield	90.24	7.81	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Fayette	6.00	5.92	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Franklin	128.69	131.43	Not significant (< 2,000 TPY); one monitor attaining	Recommend Unclassifiable/Attainment
Fulton*	310.69	255.20	Not significant (< 2,000 TPY); Also See Recommended Source Area Designation for Bay Shore Power Plant	Recommend Unclassifiable/Attainment

[4] http://epa.ohio.gov/portals/27/SIP/SO2/Zimmer_Desig.pdf

County	2014	2015	Comments	Ohio EPA Recommended Designation or Current Status
Gallia	50,620.80	31,320.80	See Recommended Source Area Designation for General James M. Gavin and Kyger Creek Station Power Plants[5]	Designated Unclassifiable Round 2 Will be monitored and designated under Round 4
Geauga	7.64	9.40	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Greene	870.96	509.37	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Guernsey*	632.01	845.70	Not significant (< 2,000 TPY); Also see Recommended Source Area Designation for American Electric Power Conesville Power Plant	Recommend Unclassifiable/Attainment
Hamilton*	30,425.44	15,923.32	See Recommended Source Area Designation for Dynegy Miami Fort Station; two monitors attaining	Recommend Unclassifiable/Attainment
Hancock*	2.85	4.79	Not significant (< 2,000 TPY); Also see Recommended Source Area Designation for Carmeuse Lime Maple Grove Operations	Recommend Unclassifiable/Attainment
Hardin	< 1	< 1	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Harrison*	20.83	29.56	Not significant (< 2,000 TPY); Also see Recommended Source Area Designation for First Energy W.H. Sammis Power Plant	Recommend Unclassifiable/Attainment
Henry*	< 1	< 1	Not significant (< 2,000 TPY); Also See Recommended Source Area Designation for Bay Shore Power Plant	Recommend Unclassifiable/Attainment
Highland*	< 1	1.32	Not significant (< 2,000 TPY); Also See Recommended Source Area Designation for Dayton Power & Light Stuart and Killen	Recommend Unclassifiable/Attainment

[5] http://epa.ohio.gov/portals/27/SIP/SO2/GavinKyg_Desig_Draft.pdf

County	2014	2015	Comments	Ohio EPA Recommended Designation or Current Status
Hocking	7.37	7.22	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Holmes*	4.84	4.59	Not significant (< 2,000 TPY); Also see Recommended Source Area Designation for American Electric Power Conesville Power Plant	Recommend Unclassifiable/Attainment
Huron*	< 1	< 1	Not significant (< 2,000 TPY); Also see Recommended Source Area Designation for Carmeuse Lime Maple Grove Operations	Recommend Unclassifiable/Attainment
Jackson	2.46	3.88	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Jefferson* (Brush Creek, Island Creek, Knox, Mount Pleasant, Ross, Salem, Saline, Smithfield, Springfield, and Wayne Townships)	10,468.67	7,727.26	See Recommended Source Area Designation for First Energy W.H. Sammis Power Plant	Recommend Unclassifiable/Attainment
Jefferson (Cross Creek, Warren, and Wells Townships and Steubenville)	10,660.70	9,555.86	See State of Ohio Nonattainment Area State Implementation Plan and Demonstration of Attainment for 1-hr SO_2 Nonattainment Areas[6]; three monitors attaining	Designated Nonattainment Round 1
Knox*	6.37	6.58	Not significant (< 2,000 TPY); Also see Recommended Source Area Designation for American Electric Power Conesville Power Plant	Recommend Unclassifiable/Attainment
Lake	23,099.72	11,378.66	See State of Ohio Nonattainment Area State Implementation Plan and Demonstration off Attainment for 1-hr SO_2 Nonattainment	Designated Nonattainment Round 1

[6] http://epa.ohio.gov/portals/27/SIP/SO2/2010SO2_AttainDemo_Revised_Final.pdf

County	2014	2015	Comments	Ohio EPA Recommended Designation or Current Status
			Areas[7]; one monitor attaining; one monitor not attaining	
Lawrence	24.08	25.66	Not significant (< 2,000 TPY); one monitor attaining	Recommend Unclassifiable/Attainment
Licking*	241.60	51.81	Not significant (< 2,000 TPY); Also see Recommended Source Area Designation for American Electric Power Conesville Power Plant	Recommend Unclassifiable/Attainment
Logan	18.27	17.80	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Lorain	35,288.23	49,894.26	See Recommended Source Area Designation for Lorain County	Recommend Unclassifiable/Attainment
Lucas*	4,093.52	4,162.51	See Recommended Source Area Designation for Bay Shore Power Plant; one monitor attaining	Recommend Unclassifiable/Attainment
Madison	< 1	< 1	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Mahoning	1,307.52	871.19	Not significant (< 2,000 TPY); one monitor attaining	Recommend Unclassifiable/Attainment
Marion	111.46	108.14	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Medina	56.33	91.34	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Meigs (Bedford, Columbia, Rutland, Salem, Salisbury and Scipio Townships)	< 1	< 1	Not significant (< 2,000 TPY); one monitor attaining; Also see Recommended Source Area Designation for General James M. Gavin and Kyger Creek Station Power Plants[8]	Designated Unclassifiable Round 2 Will be monitored and designated under Round 4
Meigs (remainder of county)	< 1	< 1	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Mercer	1.26	1.94	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment

[7] http://epa.ohio.gov/portals/27/SIP/SO2/2010SO2_AttainDemo_Revised_Final.pdf
[8] http://epa.ohio.gov/portals/27/SIP/SO2/GavinKyg_Desig_Draft.pdf

County	2014	2015	Comments	Ohio EPA Recommended Designation or Current Status
Miami	10.68	15.21	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Monroe	< 1	< 1	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Montgomery	875.25	670.93	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Morgan (Center Township)[9]	< 1	< 1	Not significant (< 2,000 TPY); one monitor not attaining; Also see State of Ohio Nonattainment Area State Implementation Plan and Demonstration off Attainment for 1-hr SO_2 Nonattainment Areas[10]	Designated Nonattainment Round 1
Morgan (remainder of county)	< 1	< 1	Not significant (< 2,000 TPY);	Recommend Unclassifiable/Attainment
Morrow	3.54	< 1	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Muskingum*	187.98	181.66	Not significant (< 2,000 TPY); Also see Recommended Source Area Designation for American Electric Power Conesville Power Plant	Recommend Unclassifiable/Attainment
Noble	< 1	< 1	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Ottawa*	827.55	762.63	Not significant (< 2,000 TPY); Also see Recommended Source Area Designation for Carmeuse Lime Maple Grove Operations	Recommend Unclassifiable/Attainment
Paulding	860.12	959.16	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Perry	4.38	6.36	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Pickaway	< 1	< 1	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment

[9] Also see Washington (Waterford Township). Muskingum River Power Plant, now permanently shutdown, resided partly between Center Township and Waterford Township although all emissions were reported as if the source was solely in Waterford Township.

[10] http://epa.ohio.gov/portals/27/SIP/SO2/2010SO2_AttainDemo_Revised_Final.pdf

County	2014	2015	Comments	Ohio EPA Recommended Designation or Current Status
Pike*	< 1	< 1	Not significant (< 2,000 TPY); Also See Recommended Source Area Designation for Dayton Power & Light Stuart and Killen	Recommend Unclassifiable/Attainment
Portage	19.52	17.47	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Preble	< 1	1.61	Not significant (< 2,000 TPY); one monitor attaining	Recommend Unclassifiable/Attainment
Putnam	2.77	2.61	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Richland	89.36	92.86	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Ross	18,446.04	14,982.21	See discussion below	Recommend Unclassifiable/Attainment
Sandusky*	1,891.56	1,439.99	Not significant (< 2,000 TPY); Also see Recommended Source Area Designation for Carmeuse Lime Maple Grove Operations	Recommend Unclassifiable/Attainment
Scioto*	1,937.37	1,459.37	Not significant (< 2,000 TPY); three monitors attaining; Also See Recommended Source Area Designation for Dayton Power & Light Stuart and Killen	Recommend Unclassifiable/Attainment
Seneca*	4,764.88	4,471.70	See Recommended Source Area Designation for Carmeuse Lime Maple Grove Operations	Recommend Unclassifiable/Attainment
Shelby	310.94	197.09	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Stark	460.66	607.22	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Summit	3,745.75	309.51	See discussion below; two monitors attaining	Recommend Unclassifiable/Attainment
Trumbull	696.07	506.77	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Tuscarawas*	2,273.42	2,243.86	See Recommended Source Area Designation for American Electric Power Conesville Power Plant; one monitor attaining	Recommend Unclassifiable/Attainment

County	2014	2015	Comments	Ohio EPA Recommended Designation or Current Status
Union	< 1	< 1	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Van Wert	1,181.51	777.11	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Vinton	< 1	< 1	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Warren	11.83	28.98	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Washington (Waterford Township)	50,869.86	16,701.16	See State of Ohio Nonattainment Area State Implementation Plan and Demonstration off Attainment for 1-hr SO_2 Nonattainment Areas[11]	Designated Nonattainment Round 1
Washington (remainder of county	4,274.48	2,845.72	See discussion below	Recommend Unclassifiable/Attainment
Wayne	17,795.76	14,077.83	See discussion below	Recommend Unclassifiable/Attainment
Williams	< 1	2.80	Not significant (< 2,000 TPY)	Recommend Unclassifiable/Attainment
Wood*	418.11	389.67	Not significant (< 2,000 TPY); Also see Recommended Source Area Designation for Carmeuse Lime Maple Grove Operations	Recommend Unclassifiable/Attainment
Wyandot*	3.33	3.13	Not significant (< 2,000 TPY); Also see Recommended Source Area Designation for Carmeuse Lime Maple Grove Operations	Recommend Unclassifiable/Attainment

Table 2: County Totals of SO_2 Point Source Emissions 1 TPY or Greater and Ohio's Recommended Designations

This inventory review includes facility permanent shut downs and conversions to natural gas. When an owner or operator notifies[12] Ohio EPA of a permanent shut down, the facility cannot resume operations without being considered a new facility and being subject to the new source review (NSR) requirements. Ohio Administrative Code (OAC)

[11] http://epa.ohio.gov/portals/27/SIP/SO2/2010SO2_AttainDemo_Revised_Final.pdf

[12] Notification may occur by official letter or electronically through the STARS2/Air Services tracking system.

Chapter 3745-31[13] contains Ohio's Permits-to-Install New Sources and Permit-to-Install and Operate Program rules. OAC rule 3745-31-02 prevents installation or modification, and subsequent operation of new sources without properly obtaining appropriate permits. A new source is defined in OAC rule 3745-31 as any air contaminant source for which an owner or operator undertakes a continuing program of installation or modification, wherein a modification is defined as any physical change in, or change in the method of operation of any air contaminant source that results in an increase in the allowable emissions. In addition, it has been Ohio's longstanding policy and memorialized under OAC Chapter 3745-31 that for any emission unit that is permanently shut down (physically removed from service or altered in such a way that it can no longer operate without a subsequent "modification" or installation), authorization to operate the affected emissions unit shall cease upon the date certified by the authorized official that the emissions unit was permanently shut down. No emission unit certified by the authorized official as being permanently shut down may resume operation without first applying for and obtaining a permit pursuant to OAC Chapter 3745-31. Thus, the cessation of emissions from shut down facilities or units is permanent and enforceable.

Ohio EPA is not considering emissions in currently designated nonattainment areas as part of these recommendations, as those emissions along with any other sources within a 50-kilometer radius of the characterized sources were already addressed under previous recommended source area designations or Ohio's attainment demonstration of attainment for those areas.

Recommended Designations: Counties not Necessitating Modeling, Monitoring or not Previously Designated

As shown in Table 2 above, all counties except those discussed in more detail below or in previous designations do not have significant SO_2 emissions (2,000 TPY or more) based on 2014 or 2015 data. Ohio EPA recommends a designation of unclassifiable/attainment for all of these counties based on insignificant emissions alone.

Among those counties not being discussed under recommended source area designations based upon modeling in this document or Ohio's previously submitted demonstrations/recommendations, the following counties identified above have reported actual total SO_2 emissions 2,000 TPY or greater for 2014 or 2015 (the threshold established under the Data Requirements Rule): Ashtabula, Butler, Cuyahoga, Ross, Summit, Washington and Wayne. These counties are discussed in more detail below, including a review of facility-level inventory of stationary sources with reported SO_2 emissions of 1 TPY or greater, to justify Ohio's recommended designation.

If, after accounting for facility shut downs and conversions to natural gas, the county emissions total is less than 2,000 TPY, Ohio EPA recommends the county be designated

[13] http://epa.ohio.gov/dapc/regs/3745_31.aspx

as unclassifiable/attainment. If, after accounting for facility shut downs and conversions to natural gas, the county emissions total remains 2,000 TPY or greater, Ohio EPA conducted a cluster analysis to identify any clusters of sources totaling 2,000 TPY or greater within a 5-kilometer radius. Five kilometers was selected based on Ohio EPA's experience and similar analysis performed by U.S. EPA. If no clusters are identified that would likely cause a violation of the standard, Ohio EPA recommends the county be designated as unclassifiable/attainment. Ohio EPA also reviewed stationary sources in Ohio to identify any clusters that may occur across bordering counties within Ohio or neighboring states that total 2,000 TPY or greater within a 5-kilometer radius. This analysis is located in the section below titled "Additional cluster analysis between counties".

Ashtabula County

Table 3 shows stationary sources with reported actual SO_2 emissions of 1 TPY or greater at the facility level in Ashtabula County. Only FirstEnergy Generation Corp., Ashtabula Plant, which permanently shut down December 17, 2015 (Appendix C), exceeded the Data Requirements Rule threshold of 2,000 TPY. All remaining sources have actual SO_2 emissions well below the 2,000 TPY significance level. Accounting for the shutdown of the Ashtabula Plant, the total sources in the County are less than 2,000 TPY, combined. In addition, Ashtabula County has a monitor attaining the standard (see Table 1). Ohio EPA recommends Ashtabula County be designated unclassifiable/attainment.

Facility	**2014**	**2015**
Cristal USA Inc., Ashtabula Complex Plant 1 (0204010200)	10.21	10.24
Cristal USA Inc., Ashtabula Complex Plant 2 (0204010193)	25.47	29.49
FirstEnergy Generation Corp., Ashtabula Plant (0204010000) – shut down 12/17/15	*3,560.61*	*2,777.01*
USA Waste Geneva Landfill, Inc. (0204030303)	2.34	2.24
County Total	**3,598.63**	**2,818.98**
County Total excluding FirstEnergy Generation Corp., Ashtabula Plant	**38.02**	**41.97**

Table 3: Ashtabula County Facility SO_2 Point Source Emissions (TPY)

Butler County

Table 4 shows stationary sources with reported actual SO_2 emissions of 1 TPY or greater at the facility level in Butler County. No facilities exceeded the Data Requirements Rule threshold of 2,000 TPY. Figure 1 identifies the location of these sources. There are no clusters of stationary source totaling 2,000 TPY or more within a 5 kilometer radius in Butler County. AK Steel and SunCoke Energy Middletown Operations are within 5 kilometers but total less than 2,000 TPY. Wausau Paper Towel & Tissue and MillerCoors

LLC are both outside of the 5-kilometer radius of AK Steel and Suncoke Energy. MB Manufacturing Corporation and Mt. Pleasant Asphalt Company Inc. are also within 5 kilometers but total emissions are significantly below 2,000 TPY. In addition, all three monitors located in Butler County (see Table 1) are attaining the standard. As shown in the inset in Figure 2 below, all three of these monitors are located in close proximity to the two highest emitters in the county, AK Steel and SunCoke Energy. Ohio EPA recommends Butler County be designated unclassifiable/attainment.

Facility	**2014**	**2015**
AK Steel Corporation (1409010006)	990.39	964.95
MB MANUFACTURING CORPORATION (1409030403)	1.24	1.17
Miami University (1409090081)	271.15	148.13
MillerCoors LLC (1409000353)	334.00	276.07
Mt Pleasant Asphalt Company Inc. (1409030042)	1.75	1.66
SunCoke Energy Middletown Operations (1409011031)	792.20	894.44
Wausau Paper Towel & Tissue, LLC (1409010043)	608.01	547.00
County Total	**2,998.74**	**2,833.42**

Table 4: Butler County Facility SO_2 Point Source Emissions (TPY)

Figure 2: Butler County Facility SO_2 Point Sources (1 TPY or greater)

Cuyahoga County

Table 5 shows stationary sources with reported actual SO_2 emissions of 1 TPY or greater at the facility level in Cuyahoga County. Only The Medical Center Company exceeded the Data Requirements Rule threshold of 2,000 TPY and was identified in Ohio's July 1, 2016 letter. The Medical Center is converting to natural gas by January 13, 2017, shuttering its two coal-fired boilers (B003 and B004) and replacing them with a natural gas boiler (B023) with a federally-enforceable SO_2 limit of 1.18 TPY. Ohio EPA has issued a federally enforceable permit containing the limitation (Appendix D).

All remaining sources do not have actual SO_2 emissions greater than 2,000 TPY; however, the county total for remaining sources combined is greater than 2,000 TPY. Cleveland Thermal LLC is retiring all coal-fired and oil-fired boilers by January 31, 2017, except two oil-fired boilers which will be retained for auxiliary use (Appendix E). Cleveland Electric Illuminating Co., Lake Shore Plant permanently shut down December 17, 2015

(Appendix F). Accounting for the shutdown of the Lake Shore Plant and conversions of the Medical Center and Cleveland Thermal, the total for sources in the County will be less than 2,000 TPY. In addition, all four monitors located in Cuyahoga County are attaining the standard (see Table 1). Ohio EPA recommends Cuyahoga County be designated unclassifiable/attainment.

Facility	**2014**	**2015**
ALLIED CORPORATION PLANT #71 (0664980014)	7.68	< 1
ALLIED CORPORATION PLANT 76 (0664005005)	1.92	< 1
ArcelorMittal Cleveland LLC (1318001613)	980.81	942.75
Charter Steel - Cleveland Inc (1318171623)	84.24	80.24
Cleveland Electric Illuminating Co., Lake Shore Plant (1318000245) – shut down 12/17/2015	*665.30*	< 1
Cleveland Thermal LLC (1318000246) – retiring most coal-fired and oil-fired boilers by January 31, 2017; retaining two auxiliary boilers with 2014 emissions of 5.46 tons and 2015 emissions of 10.39 tons	*1,062.92*	*820.64*
Cuyahoga Regional Sanitary Landfill (1318247813)	2.14	1.75
DiGeronimo Aggregates LLC (1318270383)	513.96	520.02
ELCO CORP. (1318000152)	39.76	32.26
Independence Recycling, Inc. (1318958479)	1.11	< 1
Kokosing Materials Inc Plant 519 (0142000095)	8.01	22.20
Kokosing Materials, Inc. -- Plant 522 (1318008747)	6.17	9.45
Southerly Wastewater Treatment Center (1318172479)	13.75	14.94
The Lincoln Electric Company (1318202137)	1.11	< 1
The Medical Center Company (1318003059) – converting to natural gas by January 13, 2017; natural gas boilers potential emissions are 1.18 TPY and emissions of smaller sources at the facility total 0.13 tons in each 2014 and 2015	*2,403.38*	*2,322.27*
County Total	**5,792.26**	**4,766.52**
County Total excluding Cleveland Electric Illuminating Co., Lake Shore Plant, Cleveland Thermal LLC *(excluded emissions from retired/retiring boilers; retained emissions from conversion to auxiliary boilers)* and The Medical Center Company *(retained conversion to natural gas potential emissions and remaining actual emissions for unaffected units)*	**1,667.43**	**1,635.31**

Table 5: Cuyahoga County Facility SO_2 Point Source Emissions (TPY)

Ross County

Table 6 shows stationary sources with reported actual SO_2 emissions of 1 TPY or greater at the facility level in Ross County. Only P. H. Glatfelter Company - Chillicothe Facility, which is converting its two coal-fired boilers to natural gas (Appendix H), exceeded the Data Requirements Rule threshold of 2,000 TPY and was identified in Ohio's July 1, 2016 letter. On December 29, 2016, Ohio EPA issued a federally enforceable permit (Permit

No. P0118906) with emissions limitations for the entire facility of 1,800 TPY effective beginning January 13, 2017 (Appendix H). All remaining sources have SO_2 emissions well below the 2,000 TPY significance level and combined with P.H. Glatfelter's potential emissions, are all well below 2,000 TPY in total. Ohio EPA recommends Ross County be designated unclassifiable/attainment.

Facility	**2014**	**2015**
Chillicothe VAMC (0671015004)	< 1	1.55
P. H. Glatfelter Company - Chillicothe Facility (0671010028) – converting both coal-fired boilers B002 (No. 7) and B003 (No. 8) to natural gas by January 13, 2017 (B002 and B003 emissions totaled 18,197.5 tons in 2014 and 14,759.86 tons in 2015); facility-wide potential emissions following the conversion will be 1,800 TPY	*18,444.40*	*14,978.40*
SHELLY MATERIALS PLANT 15 (0664000040)	1.64	2.26
County Total	**18,446.04**	**14,982.21**
County Total excluding P. H. Glatfelter Company - Chillicothe Facility *(excluded all emissions except 1,800 TPY)*	**1,801.64**	**1,803.81**

Table 6: Ross County Facility SO_2 Point Source Emissions (TPY)

Summit County

Table 7 shows stationary sources with reported actual SO_2 emissions of 1 TPY or greater at the facility level in Summit County. No facilities exceeded the Data Requirements Rule threshold of 2,000 TPY. Cargill, Incorporated - Salt Division shut down coal-fired boilers B001, B002, B003 and B004 in Ohio's STARS2/Air Services tracking system effective November 21, 2014, and shut down gas-fired boiler B006 on November 23, 2014 (Appendix I). City of Akron Steam Generating shut down its coal-fired boiler B001 on April 22, 2015 (Appendix J). Accounting for the shutdown of coal-fired boilers at Cargill, Incorporated - Salt Division and City of Akron Steam Generating, the total sources in the County are well below 2,000 TPY. In addition, both monitors located in Summit County are attaining the standard (see Table 1). Ohio EPA recommends Summit County be designated unclassifiable/attainment.

Facility	**2014**	**2015**
Allied Plant 79 (formerly Shelly Materials Plant 91) (0664980011)	2.09	2.63
Cargill, Incorporated - Salt Division (Akron, OH) (1677010027) – shut down coal-fired boilers (B001, B002, B003 and B004) on 11/21/14 and gas-fired boiler (B006) on 11/23/14; remaining SO_2 emissions for other sources totaled 0.04 tons in 2014 and 0.26 tons in 2015	*1,439.09*	*< 1*
City of Akron Steam Generating (1677010757) – shut down coal-fired boiler (B001) 04/22/15; remaining SO_2 emissions for other sources totaled 0.19 tons in 2014 and 0.24 tons in 2015	*1,683.27*	*304.06*
Emerald Performance Materials, LLC (1677010029) *– facility has a new gas-fired boiler (B014) and did not operate their coal-fired boiler (B008) in 2015;*	621.30	< 1

however, as B008 is not permanently shut down in Ohio's STARS2/Air Services tracking system, these emissions are retained in the total below		
KENMORE ASPHALT PRODUCTS, INC. (1677011122)	< 1	2.82
County Total	**3,745.75**	**309.51**
County Total excluding Cargill, Incorporated - Salt Division and City of Akron Steam Generating *(excluded emissions from shutdown boilers only)*	**623.62**	**5.95**

Table 7: Summit County Facility SO_2 Point Source Emissions (TPY)

Washington County – Portion of county not included in Muskingum River, OH Nonattainment Area (Round One)

Table 8 shows stationary sources with reported actual SO_2 emissions of 1 TPY or greater at the facility level in Washington County, except those included in the Muskingum River, OH nonattainment area (i.e. Waterford Township in Washington County). As discussed in the Statewide Emissions Data Section of this submittal, Ohio EPA is not considering emissions in the nonattainment area as part of this analysis, as those emissions were already addressed in the State of Ohio Nonattainment Area State Implementation Plan and Demonstration off Attainment for 1-hr SO2 Nonattainment Areas[14].

No facilities exceeded the Data Requirements Rule threshold of 2,000 TPY. Kraton Polymers U.S. LLC shut down all coal-fired boilers on August 31, 2015 (Appendix K). All remaining sources do not have SO_2 emissions greater than 2,000 TPY. Accounting for the shutdown of coal-fired boilers B005 and B007 at Kraton Polymers, the total sources in the portion of Washington County that does not include the Muskingum River, OH nonattainment area are less than 2,000 TPY. Ohio EPA recommends the portion of Washington County which does not include Muskingum River, OH nonattainment area be designated unclassifiable/attainment.

Although one monitor in the Muskingum River, OH nonattainment area (Morgan County) is above the 1-hour SO_2 standard based on the 3-year design values (see Table 1), ambient monitoring data levels have declined dramatically since May 14, 2015 when Muskingum River Power Plant permanently ceased operations. Since that time the hourly SO_2 readings have averaged <1 ppb with a highest reading of 18 ppb being recorded.

Facilities	**2014**	**2015**
DTE Marietta (0684015015)	< 1	1.04
Eramet Marietta, inc. (0684020006)	5.35	4.59
Kraton Polymers U.S. LLC (0684010011) – shut down coal-fired boilers B005 and B007 on 8/31/15; remaining SO_2 emissions for other sources totaled 0.31 tons in 2014 and 0.67 tons in 2015	*2,708.83*	*1,390.67*
Orion Engineered Carbons LLC (0684010049)	1,557.02	1,446.31

[14] http://epa.ohio.gov/portals/27/SIP/SO2/2010SO2_AttainDemo_Revised_Final.pdf

Solvay Specialty Polymers USA, L.L.C. (0684020008)	3.28	3.11
County Total (portion which does not include Muskingum River, OH nonattainment area)	**4,274.48**	**2,845.72**
County Total (portion which does not include Muskingum River, OH nonattainment area) excluding Kraton Polymers U.S. LLC *(excluded emissions from shutdown boilers only)*	**1,565.96**	**1,455.72**

Table 8: Washington County Facility SO_2 Point Source Emissions (TPY) – portion which does not include Muskingum River, OH nonattainment area

Wayne County

Table 9 shows stationary sources with reported actual SO_2 emissions of 1 TPY or greater at the facility level in Wayne County. Only Department of Public Utilities, City of Orrville, and Morton Salt, Inc. exceeded the Data Requirements Rule threshold of 2,000 TPY and were identified in Ohio's July 1, 2016 letter. Department of Public Utilities, City of Orrville, accepted a facility-wide federally enforceable restriction of 1,475 TPY. Ohio EPA finalized these restrictions into a federally enforceable permit on December 20, 2016 (Permit No. P0120280), that will require compliance by January 13, 2017 (Appendix L). Morton Salt, Inc. is converting to natural gas by January 13, 2017, shuttering its two coal-fired boilers (B002 and B003) and replacing them with two new natural gas boilers (B005 and B006) with a federally-enforceable SO_2 limit of 0.76 TPY combined. Ohio EPA has issued a federally enforceable permit containing the limitation (Appendix M). Accounting for the restriction at City of Orrville and the conversion to natural gas at Morton Salt, the total sources in the county will be less than 2,000 TPY. Ohio EPA recommends Wayne County be designated unclassifiable/attainment.

Facility	**2014**	**2015**
CEDAR LANE FARMS CORPORATION (0285030221)	12.82	12.82
D & R Supply, Inc. (0285000099)	< 1	1.19
Department of Public Utilities, City of Orrville, Ohio (0285010188) – accepted restricted limit of 1,475 TPY by January 13, 2017	*12,453.90*	*9,425.89*
KOKOSING MATERIALS INC PLANT NO 517 (0285030277)	< 1	1.04
Morton Salt, Inc. (0285020059) – converting to natural gas by January 15, 2017; natural gas boilers potential emissions are 0.76 TPY and remaining SO_2 emissions for other sources totaled 0.04 tons in 2014 and 0.06 tons in 2015	*5,329.04*	*4,636.89*
County Total	**17,795.76**	**14,077.83**
County Total excluding Morton Salt *(retained conversion to natural gas potential emissions and remaining actual emissions for unaffected units)*, and Department of Public Utilities, City of Orrville, Ohio *(excluded all emissions except 1,475 TPY)*	**1,488.62**	**1,490.87**

Table 9: Wayne County Facility SO_2 Point Source Emissions (TPY)

Additional cluster analysis between counties

Ohio EPA also reviewed stationary sources in Ohio, along with neighboring counties sharing a border, to identify any additional clusters of sources totaling 2,000 TPY or greater within a 5-kilometer radius which were not captured by the already designated nonattainment areas or the county-wide analyses above (e.g., clusters that may occur across bordering counties within Ohio or neighboring states). Emissions for counties outside Ohio were derived from the 2011 NEI[15].

Ohio EPA only identified one additional cluster of sources totaling 2,000 TPY or greater within a 5-kilometer radius: Graymont Dolime (OH) Inc. (0362000079) in Ottawa County and Martin Marietta Magnesia Specialties Inc. (0372000127) in Sandusky County. As noted in Ohio EPA's January 15, 2016[16] and July 1, 2016[17] letters to U.S. EPA, Ohio EPA committed to analyzing these two sources and working with U.S. EPA in determining the suitability of subjecting these sources to the Data Requirements Rule. Ohio EPA has completed a modeling analysis and determined the combined emissions from this pair of sources would not cause a violation of the standard and therefore does not warrant subjecting them to requirements of the Data Requirements Rule. This analysis was shared with U.S. EPA Region 5 on August 12, 2016. In addition, Ottawa and Sandusky Counties each have less than 2,000 TPY of emissions individually, as demonstrated in Table 2 above. Ohio EPA recommends both Ottawa and Sandusky Counties be designated as unclassifiable/attainment.

Recommended Designations: Counties or Source Areas with Sources Accepting Limits that Provide for Modeled Attainment

Lorain County

Table 10 shows stationary sources with reported actual SO_2 emissions of 1 TPY or greater at the facility level in Lorain County. Only Avon Lake Power Plant exceeded the Data Requirements Rule threshold of 2,000 TPY and was identified in Ohio's July 1, 2016 letter. Avon Lake Power Plant has accepted operating restrictions and modeling was conducted, using Good Engineering Practice (GEP) stack heights and three years of meteorological data, to develop federally enforceable limitations that will not result in a modeled exceedance of the 1-hour SO_2 standard (Appendix G).

This analysis included a background concentration inclusive of emissions from the sources in Table 10 below, among other sources impacting the area modeled. Due to the low level of emissions of these sources and the distance (see Figure 3) from Avon Lake Power Plant, Ohio EPA determined it was not necessary to include them explicitly

[15] https://www.epa.gov/air-emissions-inventories/2011-national-emissions-inventory-nei-data
[16] http://epa.ohio.gov/portals/27/SIP/SO2/ListApplicableSources_2010_1-hr_signed.pdf
[17] http://epa.ohio.gov/Portals/27/sip/so2/Signed_DRR_Sources_Letter.pdf

in the modeling. As can be seen from Figure 3-3 of Appendix G, the modeled domain extended beyond the borders of Lorain County and the modeled emissions rates demonstrate compliance with the 1-hour SO_2 standard. Therefore, the modeling supports a designation of unclassifiable/attainment for all of Lorain County.

Ohio EPA issued a federally enforceable permit to Avon Lake on November 23, 2016 (Permit No. P0121748) with emissions limitations effective beginning January 13, 2017 that will not result in a modeled exceedance of the 1-hour SO_2 standard (Appendix G). In addition to the modeling supporting a designation of unclassifiable/attainment, as noted above, the remaining sources in Lorain County have actual emissions well below the 2,000 TPY significance level, combined. Furthermore, Oberlin College shut down coal fired boilers on April 22, 2014 (B001 and B002 permanently shut down in Ohio's STARS2/Air Services tracking system).

There are no clusters of stationary source totaling 2,000 TPY or more within a 5-kilometer radius in Lorain County (Figure 3). Kokosing Materials, Inc. Plant 503 and Republic Steel are within 5 kilometers but total less than 2,000 TPY. Likewise, Oberlin College, Lorain County Facilities and Lorain County LFG Power Station are within 5 kilometers but total less than 2,000 TPY. Ohio EPA recommends Lorain County be designated unclassifiable/attainment.

Facility	**2014**	**2015**
Avon Lake Power Plant (0247030013) – accepted operating restrictions	34,935.20	49,844.50
Green Circle Growers (0247101010)	5.00	4.85
KOKOSING MATERIALS, INC. - Plant 503 (0247120476)	1.14	2.79
Kokosing Materials, Inc. (0247000554)	< 1	1.71
Lorain County Facilities (0247000760)	3.01	2.76
Lorain County LFG Power Station (0247100968)	14.30	13.34
OBERLIN COLLEGE (0247100408) – shut down coal fired boilers 4/22/14	230.47	< 1
Republic Steel, f/k/a Republic Engineered Products, Inc (0247080229)	23.18	15.49
Ross Incineration Services, Inc. (0247050278)	3.02	3.22
West Lorain Plant (0247080487)	72.90	5.60
County Total	**35,288.23**	**49,894.26**

Table 10: Lorain County Facility SO_2 Point Source Emissions (TPY)

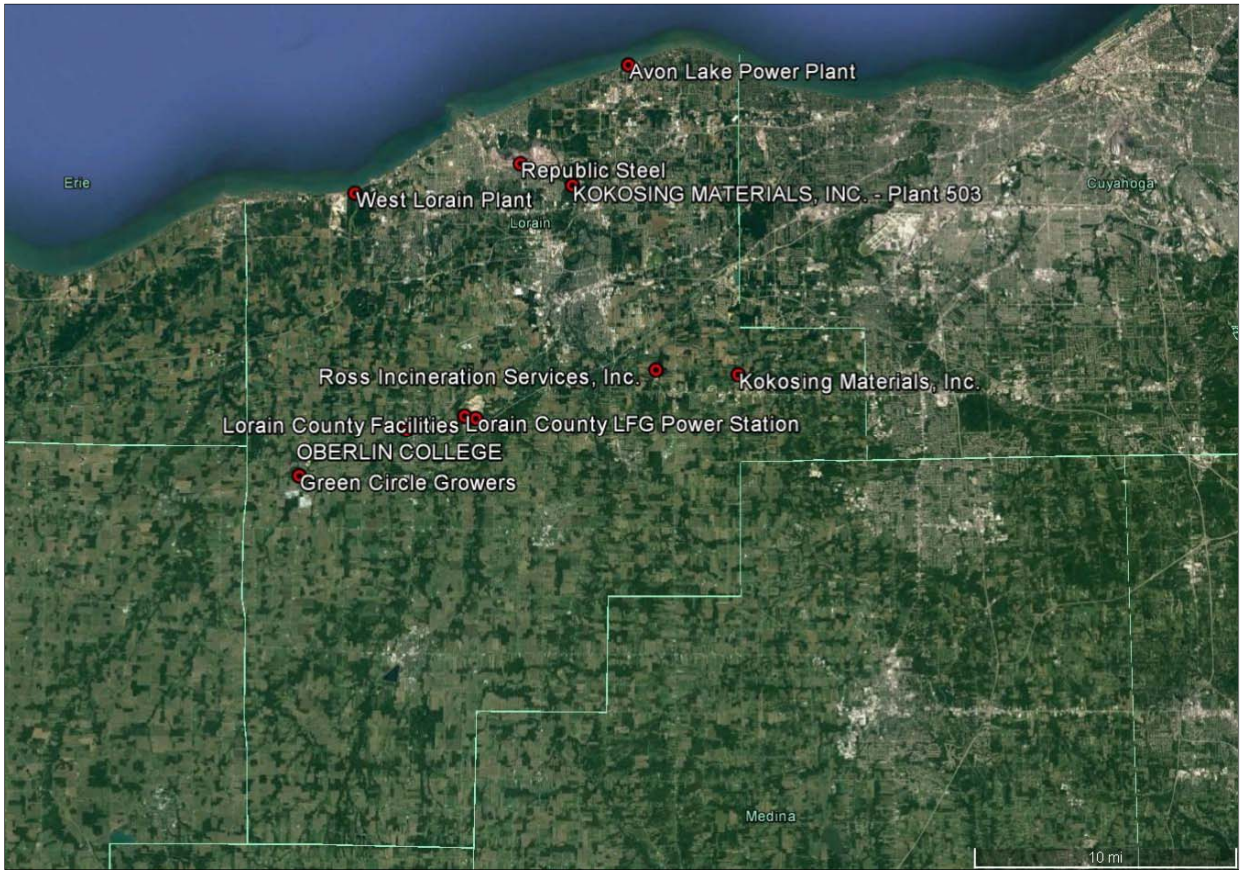


Figure 3: Lorain County Facility SO2 Point Sources (1 TPY or greater)

Recommended Designations: Source Areas Necessitating Refined Dispersion Analysis

First Energy W.H. Sammis

Discussion and Recommended Designations

The W.H. Sammis facility is located in Jefferson County. Emissions sources from Belmont, Carroll, Columbiana and Harrison County were considered in the dispersion modeling analysis conducted for W.H. Sammis. In addition, portions of some of these counties were included in the modeling domain. Therefore, this section of analysis will address Ohio's recommended designation for all of these counties, or portions thereof.

As detailed under Factor 1, Ohio EPA modeled actual SO_2 emissions from the W.H. Sammis facility, years 2012-2014. No exceedances of the standard were modeled, inclusive of a conservative background concentration. Ohio EPA also conducted an extensive analysis of SO_2 emissions and meteorology in this portion of Jefferson County,

as well as the counties surrounding it, to inform the recommended designations. Absent emissions from the W.H. Sammis facility, emissions in this portion of Jefferson County are well below the 2,000 TPY significance threshold.

The predominant factor relevant to Ohio's recommended designations for Belmont, Carroll, Columbiana, and Harrison Counties was Factor 2, emissions data. Combined, SO2 emissions in these counties were well below the 2,000 TPY significance threshold. The other factors did not refute the recommended designations of each of these counties.

In addition to the five factors, it is worth noting that Belmont County contains two ambient air monitors attaining the standard (see Table 1 and Figure 1).

Based on the five factor analysis below, Ohio is recommending the portion of Jefferson County not previously designated as nonattainment in round two of designations, containing Brush Creek, Island Creek, Knox, Mount Pleasant, Ross, Salem, Saline, Smithfield, Springfield, and Wayne Townships be designated as unclassifiable/attainment. Further, Ohio EPA is recommending the entirety of Belmont, Carroll, Columbiana, and Harrison Counties, which border Jefferson County, be designated unclassifiable/attainment. Ohio EPA is recommending these counties, and remaining undesignated townships within Jefferson County, be individually designated as unclassifiable/attainment at each distinct county level (or partial for Jefferson County). Counties and Townships in Ohio have well-established boundaries and jurisdictions.

Factor 1: Dispersion Modeling and Air Quality Data

Ohio EPA modeled actual emissions from the W.H. Sammis facility for years 2012-2014, inclusive of background, as described in detail in Appendix N of this submittal. Derivation of the background for all sources explicitly modeled for the purposes of recommended designations are presented in Appendix O of this submittal. Ohio EPA reviewed SO_2 emissions sources within 50 kilometers of W.H. Sammis and determined the only source necessitating inclusion in the modeling analysis was the W.H. Sammis facility and the remaining sources are represented via the background concentrations. For this analysis, the maximum modeled 3-year design value, years 2012-2014, was 84.50621 $\mu g/m^3$ including background. Note that Ohio ensured that the maximum combined impacts were captured by the finest receptor grid included in the modeling domain, as described in Appendix N of this submittal. An area meets the standard of 75 ppb if a concentration of 196.2 $\mu g/m^3$ or lower is modeled, inclusive of background. Thus, no exceedance of the standard was modeled. The results of this analysis are shown in Figure 4. Note that for clarity, only design values of 80 $\mu g/m^3$ or greater, inclusive of background, are displayed.

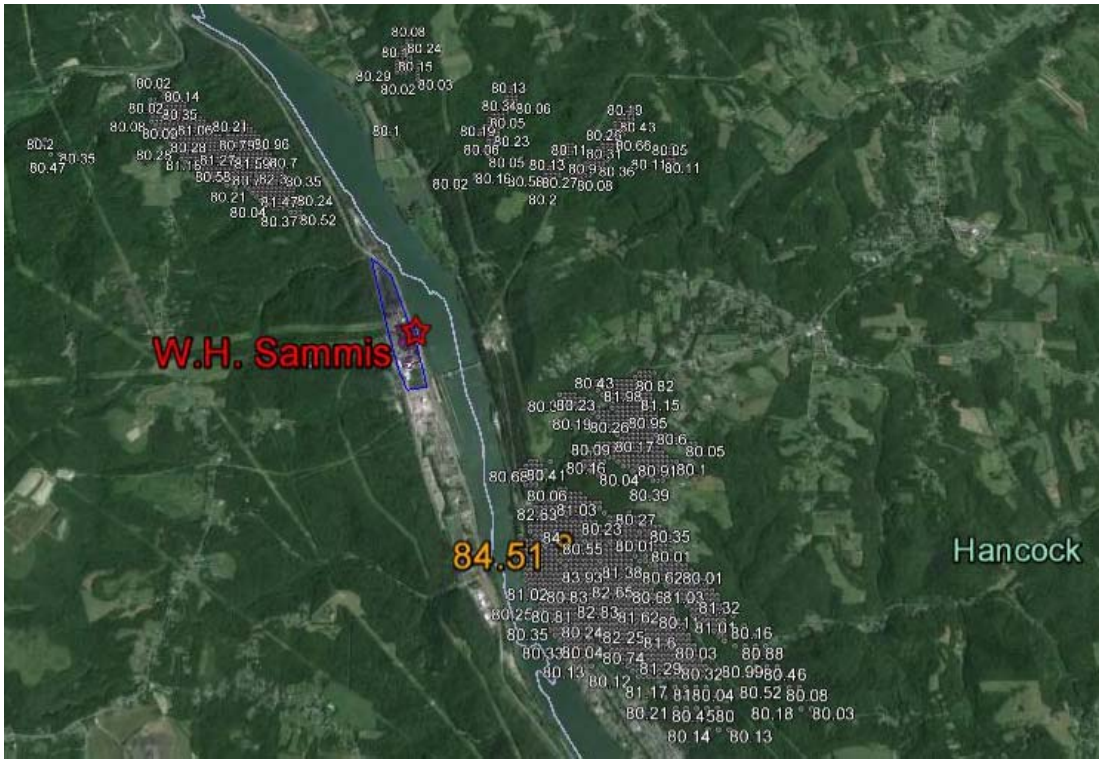


Figure 4: Maximum SO_2 impacts, First Energy W.H. Sammis facility, 2012-2014. Concentrations are shown in μg/m³ including background.

The maximum modeled 3-year design value concentration, 84.50621 μg/m³, or 32.3 ppb including background, was modeled approximately 2.6 kilometers to the southeast of the W.H. Sammis egress point, the singular source modeled in this analysis. Modeled 3-year design values greater than or equal to 80 μg/m³ did not extend beyond 5 to 6 kilometers from the modeled source. Beyond this distance, modeled concentrations are highly uniform, as they are dominated by the peak hourly background concentration of 25 ppb (65.4 μg/m³) rather than emissions from the W.H. Sammis facility.

Ohio EPA does not believe it is necessary to model 2013-2015 emissions, as opposed to the 2012-2014 modeling analysis presented here. In 2012, the W.H. Sammis facility had 3,949 tons of SO_2 emissions and 2015 emissions of 7,674 tons. Despite this increase, 2015 emissions are less than those of 2013 and 2014, which had emissions of 8,495 and 10,263 tons, respectively. The 4th highest maximum daily values modeled for years 2012, 2013, and 2014 were 80.03 μg/m³, 86.75 μg/m³, and 102.76 μg/m³, respectively. Thus, even if 2015 emissions resulted in a modeled 4th highest maximum daily value equivalent to that obtain for 2014, the 3-year design value would remain well below the standard.

In addition, the Data Requirements Rule provides general guidelines on when it may be necessary to conduct additional modeling based upon more recent actual emissions. Specific criteria were not promulgated as U.S. EPA felt it was best judged on a case-by-case basis. The general guideline for modeling results within 90% or more of the standard

was for re-modeling if there is any emission increase. The general guideline for modeling results between 50% and less than 90% of the standard was for re-modeling if there is a 15% or more increase in emissions. For any sources that modeled below 50% of the standard, a State could request U.S. EPA terminate the requirement to consider re-modeling in the future. Based upon the Data Requirements Rule, Ohio EPA believes additional modeling is not necessary and also requests W.H. Sammis be removed from the ongoing data requirements in accordance with 40 CFR 51.1205(b)(2).

Factor 2: Emissions

As part of the modeling analysis of the W.H. Sammis facility, Ohio EPA examined emissions within 50 kilometers of the facility. It was determined additional sources did not necessitate modeling but were represented by the background concentrations (Appendix N). The entirety of the domain modeled demonstrated attainment.

As part of this Factor 2 analysis, Ohio EPA is analyzing SO_2 emissions from the partial Jefferson County area and those Ohio counties surrounding the portion of Jefferson County for which Ohio EPA is recommending a designation of unclassifiable/attainment, absent those emissions from the W.H. Sammis facility explicitly modeled. Portions of the surrounding Ohio counties were also part of the modeled domain. These counties include Harrison, Carroll, Columbiana, and Belmont. The surrounding region is primarily un-industrialized outside of the Ohio River valley. Table 11 shows total emissions from stationary sources with reported actual SO_2 emissions of 1 TPY or greater at the county level. Combined, these counties are all well below the 2,000 TPY significance threshold.

County	2014	Modeled	2014 Absent Modeled	2015	Modeled	2015 Absent Modeled
Partial Jefferson[18]	10,468.67	10,262.70	205.97	7,727.26	7,674.20	53.06
Harrison	20.83	0	20.83	29.56	0	29.56
Carroll	3.39	0	3.39	4.08	0	4.08
Columbiana	3.27	0	3.27	4.73	0	4.73
Belmont	<1	0	<1	4.70	0	4.70

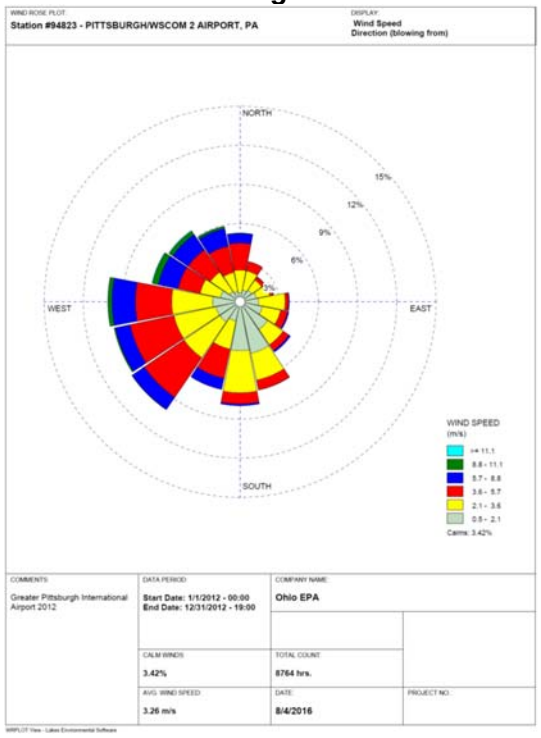
Table 11: County Totals of SO_2 Point Source Emissions 1 TPY or Greater in Jefferson, Harrison, Carroll, Columbiana, and Belmont Counties.

[18] Emissions from sources within the Steubenville, OH-WV nonattainment area are not included in these totals as those emissions were analyzed under a separate action.

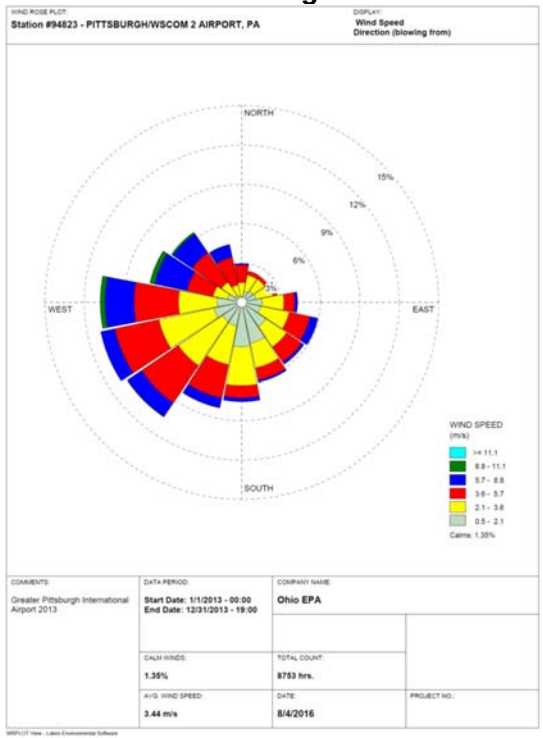
Factor 3: Meteorology

Please refer to the Factor 3 general discussion at the beginning of this document for general meteorological information applicable to the W.H. Sammis facility and the surrounding area. Per relevant U.S. EPA guidance, dispersion modeling accounts for the majority of topographical and land use features that influence the meteorology of the analysis area. Of particular importance in Ohio's designation recommendation for this area are the annual trends and distribution of wind directions in this area, which are best represented by data from the National Weather Service station located at the Greater Pittsburgh International Airport. Wind roses from this station, years 2012-2014, are shown in Figure 5, below.

2012 Pittsburgh Met Data



2013 Pittsburgh Met Data



2014 Pittsburgh Met Data

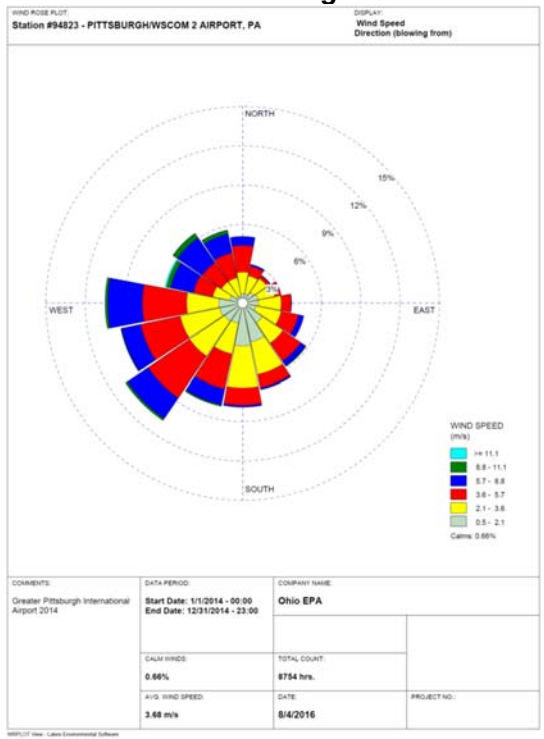


Figure 5: Jefferson County wind roses, 2012-2014.

The predominant wind directions were used, in part, to inform which facilities within 50 kilometers may potentially impact ambient SO_2 concentrations in the W.H. Sammis source area not accounted for by background and therefore necessitate inclusion in the dispersion modeling analysis. This is discussed in more detail in Appendix N.

Factor 4: Topography and Land Use/Land Cover

Please refer to the general discussion of Factor 4 at the beginning of this document. Ohio, consistent with U.S. EPA guidance, understands that the topography and land use characteristics influencing meteorology and the dispersion of SO_2 emissions from the W.H. Sammis facility is adequately accounted for via the dispersion modeling analysis. Although Ohio EPA did not explicitly conduct a land use analysis for this source area, a cursory examination of the included map (see Figure 4) indicate that the source is clearly located in a primarily rural location, and thus rural dispersion coefficients were used in the AERMOD modeling analysis.

Factor 5: Jurisdictional Boundaries

The Pittsburgh-New Castle – Weirton, PA-WV-OH Combined Statistical Area (CSA) encompass 12 counties in Western Pennsylvania, the Northern Panhandle of West Virginia, and Jefferson County in Ohio. A subsection of this large CSA, the Weirton-Steubenville Metropolitan Statistical Area (MSA), is comprised of Jefferson County, Ohio, as well as Brooke and Hancock Counties in West Virginia. These Statistical Areas represent the majority of sources included in this analysis.

Belmont County is part of the Wheeling Metropolitan Statistical Area. Carroll County is included in the Canton–Massillon Metropolitan Statistical Area along with Stark County. Columbiana County is part of the Youngstown–Warren, OH-PA Combined Statistical Area. Harrison County is not included in any larger Statistical Area.

The Ohio EPA Central Office and the Ohio EPA Southeast District Office are responsible for air quality planning within all areas of Jefferson, Belmont, and Harrison Counties. Ohio EPA Central Office and Ohio EPA Northeast District Office are responsible for air quality planning within all areas of Carroll and Columbiana Counties. Currently, Belmont, Carroll, and Columbiana Counties are not nonattainment for the 2010 1-hour SO_2 standard. The southern portion of Jefferson County, consisting of Cross Creek, Steubenville, Warren, and Wells Townships, as well as Steubenville City, is currently designated nonattainment of the 1-hour SO_2 standard as part of the Steubenville OH-WV Nonattainment Area. This nonattainment area was addressed in a separate attainment demonstration action, submitted to U.S. EPA on April 3, 2015.

Carmeuse Lime Maple Grove

Discussion and Recommended Designations

The Carmeuse Lime Maple Grove facility is located in Seneca County. Emissions sources from Hancock, Ottawa, Sandusky, Wood, Wyandot, Crawford, Huron, and Erie County were considered in the dispersion modeling analysis conducted for Carmeuse Lime Maple Grove. In addition, portions of some of these counties were included in the modeling domain. Therefore, this section of analysis will address Ohio's recommended designation for all of these counties.

As detailed under Factor 1, Ohio EPA modeled actual SO_2 emissions from the Carmeuse Lime Maple Grove facility, years 2012-2014. No exceedances of the standard were modeled, inclusive of a conservative background concentration developed through screen modeling. Ohio EPA also conducted an extensive analysis of SO_2 emissions and meteorology in Seneca County, as well as the counties surrounding it, to inform the recommended designations. Absent emissions from the Carmeuse Lime Maple Grove facility, emissions in Seneca County are well below the 2,000 TPY significance threshold.

The predominant factor relevant to Ohio's recommended designations for Hancock, Ottawa, Sandusky, Wood, Wyandot, Crawford, Huron, and Erie Counties was Factor 2, emissions data. SO_2 emissions in these counties were well below the 2,000 TPY significance threshold. The other factors did not refute the recommended designations of each of these counties.

Based on the five factor analysis presented below, Ohio is recommending Seneca County be designated as unclassifiable/attainment. Further, Ohio EPA is recommending Hancock, Ottawa, Sandusky, Wood, Wyandot, Crawford, Huron, and Erie Counties be designated unclassifiable/attainment. Counties in Ohio have well-established boundaries and jurisdictions.

Factor 1: Dispersion Modeling and Air Quality Data

Ohio EPA modeled actual emissions from the Carmeuse Lime Maple Grove facility for years 2012-2014, inclusive of background. The full details of the modeling analysis are presented in detail Appendix P of this submittal. Derivation of the background for all sources explicitly modeled for the purposes of recommended designations are presented in Appendix O of this submittal. Ohio EPA reviewed SO_2 emissions sources within 50 kilometers of Carmeuse Lime and determined the only source necessitating inclusion in the modeling analysis was the Carmeuse Lime facility and the remaining sources are represented via the background concentrations. For this analysis, the maximum modeled 3-year design value, years 2012-2014, was 146.01914 $\mu g/m^3$ including background. Note that Ohio ensured that the maximum combined impacts were captured by the finest

receptor grid included in the modeling domain, as described in Appendix P of this submittal. An area meets the standard of 75 ppb if a concentration of 196.2 μg/m^3 or lower is modeled, inclusive of background. Thus, no exceedance of the standard was modeled. The results of this analysis are shown in Figure 6. Note that for clarity, only design values of 125 μg/m^3 or greater, inclusive of background, are displayed.

Figure 6: Maximum SO_2 impacts, Carmeuse Lime Maple Grove facility, 2012-2014. Concentrations are shown in μg/m^3 including background.

The maximum modeled 3-year design value concentration, 146.01914 μg/m^3, or 55.8 ppb including background, was modeled approximately 360 meters to the east of the Carmeuse Lime fenceline, approximately 850 meters from the Carmeuse Lime egress point, the singular source modeled in this analysis. Modeled 3-year design values greater than or equal to 125 μg/m^3 did not extend beyond 1.3 kilometers from the modeled source.

Ohio EPA does not believe it is necessary to model actual emissions for years 2013-2015 due to decreasing emissions from the Carmeuse Lime Maple Grove facility. SO_2 emissions from the facility decreased from 4,903 tons in 2012 to 4,117 tons in 2015, an approximately 16% reduction. This decrease would likely provide a lesser 3-year modeled

design value concentration than that modeled using 2012-2014 emissions data, resulting again in no exceedance of the standard being modeled.

Factor 2: Emissions

As part of the modeling analysis of Carmeuse Lime, Ohio EPA examined emissions within 50 kilometers of the facility. It was determined additional sources did not necessitate modeling but were represented by the background concentrations (Appendix P). The entirety of the domain modeled demonstrated attainment.

As part of this Factor 2 analysis, Ohio EPA is analyzing SO_2 emissions from Seneca County and those Ohio counties surrounding Seneca County for which Ohio EPA is recommending a designation of unclassifiable/attainment, absent those emissions from the Carmeuse Lime facility explicitly modeled. Portions of the surrounding Ohio counties were also part of the modeled domain. These counties include: Hancock, Ottawa, Sandusky, Wood, Wyandot, Crawford, Huron, and Erie. The surrounding region are primarily un-industrialized, agricultural counties. Table 12 shows actual county-wide SO_2 emissions from facilities with 1 TPY or greater. These county totals are all below the 2,000 TPY significance threshold. The largest of these sources is Martin Marietta in Sandusky County which was discussed in the "Additional Cluster Analysis Between Counties" section of this analysis above. Figure 7 shows the location of the most significant of these sources.

County	2014	Modeled	2014 Absent Modeled	2015	Modeled	2015 Absent Modeled
Seneca	4,764.88	4,438.00	326.88	4,471.70	4,117.00	354.70
Hancock	2.85	0	2.85	4.79	0	4.79
Ottawa	827.55	0	827.55	762.63	0	762.63
Sandusky	1,891.56	0	1,891.56	1,439.99	0	1,439.99
Wood	418.11	0	418.11	389.67	0	389.67
Wyandot	3.33	0	3.33	3.13	0	3.13
Crawford	7.01	0	7.01	13.57	0	13.57
Huron	<1	0	<1	<1	0	<1
Erie	44.12	0	44.12	109.94	0	109.94

Table 12: County Totals of SO_2 Point Source Emissions 1 TPY or Greater in Seneca, Hancock, Ottawa, Sandusky, Wood, Wyandot, Crawford, Huron and Erie Counties.

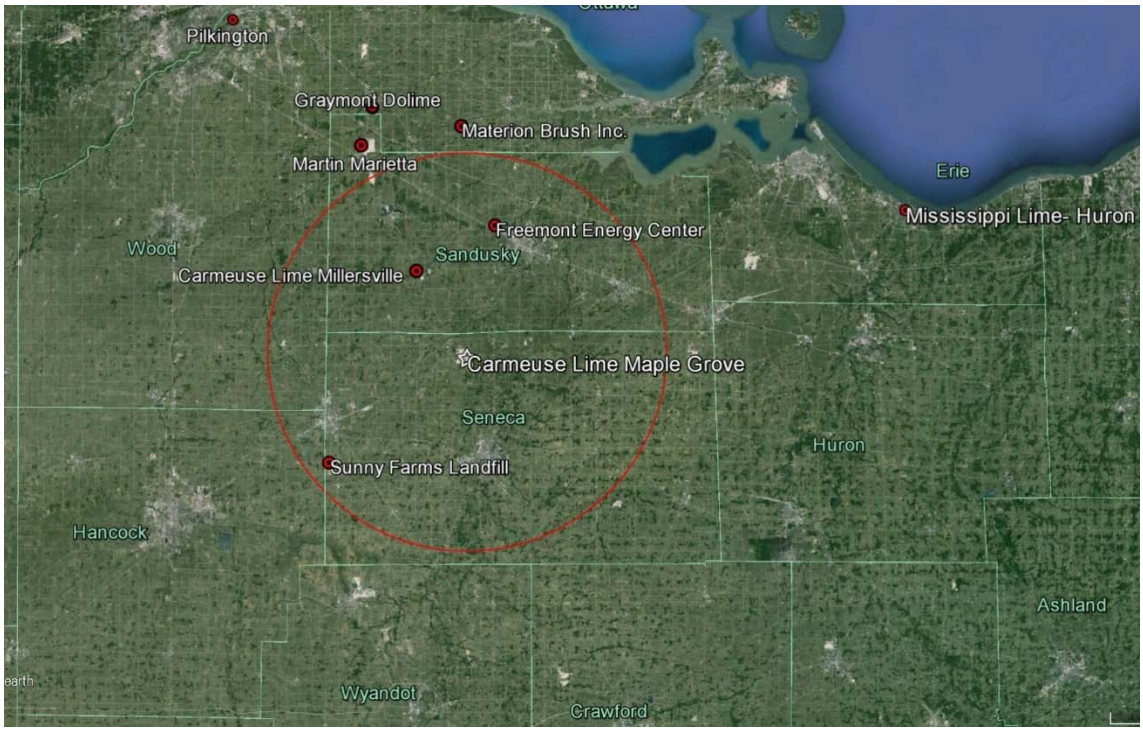
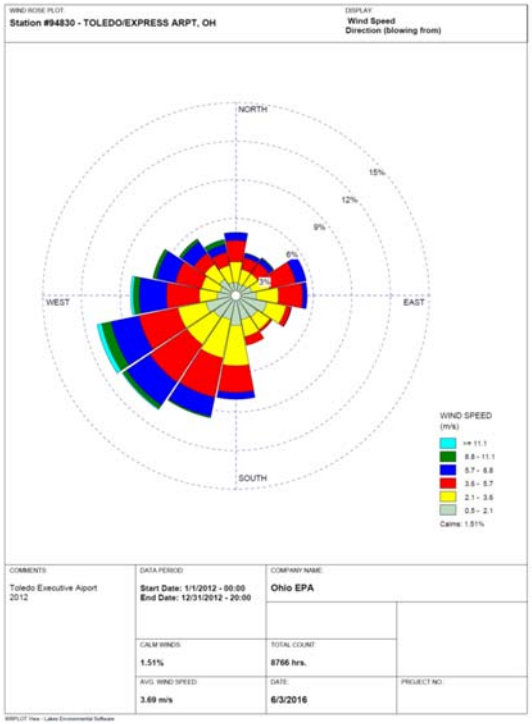


Figure 7: SO2 sources: Seneca County and Carmeuse Lime Maple Grove facility.

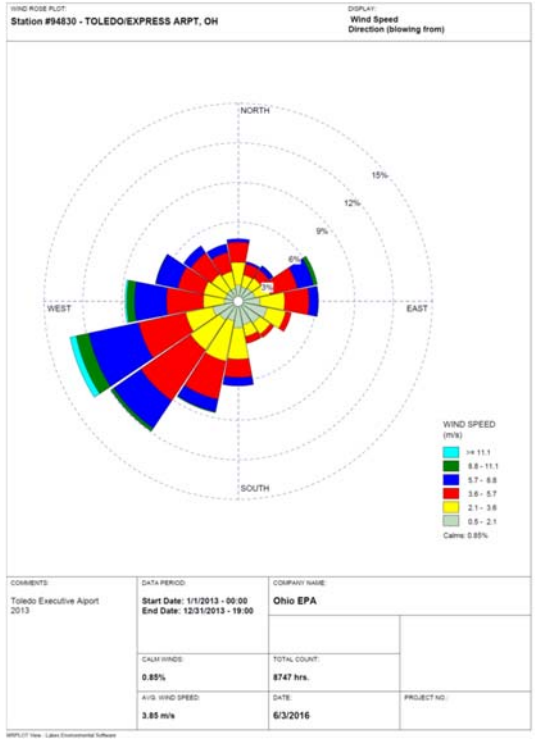
Factor 3: Meteorology

Please refer to the Factor 3 general discussion at the beginning of this document for general meteorological information applicable to the Carmeuse Lime Maple Grove facility and the surrounding area. Per relevant U.S. EPA guidance, dispersion modeling accounts for the majority of topographical and land use features that influence the meteorology of the analysis area. Of particular importance in Ohio's designation recommendation for this area are the annual trends and distribution of wind directions in this area, which are best represented by data from the National Weather Service station located at the Toledo Express Airport in Lucas County, Ohio. Wind roses from this station, years 2012 to 2014, are shown in Figure 8, below.

2012 Toledo Met Data



2013 Toledo Met Data



2014 Toledo Met Data

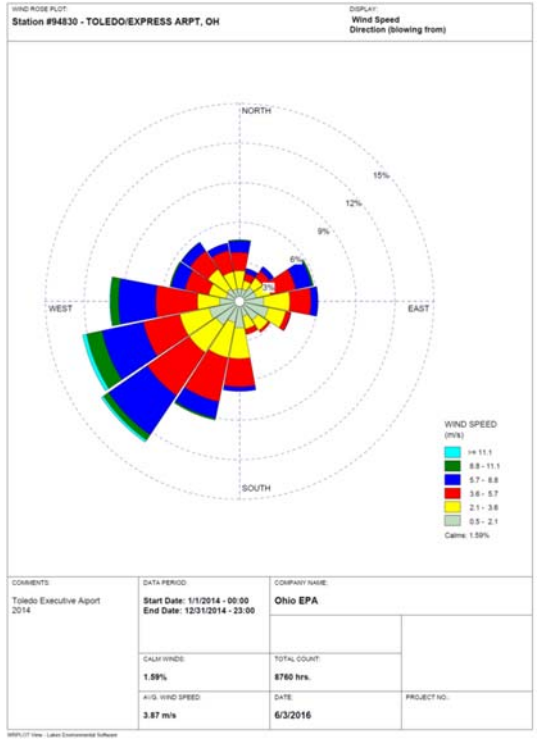


Figure 8: Toledo wind roses, 2012-2014.

The predominant wind directions were used, in part, to inform which facilities within 50 kilometers may potentially impact ambient SO_2 concentrations in the Carmeuse Lime source area not accounted for by background and therefore necessitate inclusion in the dispersion modeling analysis. This is discussed in more detail in Appendix P.

Factor 4: Topography and Land Use/Land Cover

Please refer to the general discussion of Factor 4 at the beginning of this document. Ohio, consistent with U.S. EPA guidance, understands that the topography and land use characteristics influencing meteorology and the dispersion of SO_2 emissions from the Carmeuse Lime Maple Grove facility is adequately accounted for via the dispersion modeling analysis. Although Ohio EPA did not explicitly conduct a land use analysis for this source area, a cursory examination of the included map (Figure 7) of the source area indicate that the source is clearly located in a rural location, and thus rural dispersion coefficients were used in the AERMOD modeling analysis. Agriculture accounts for approximately 80% of land use in Seneca County and the surrounding source area.

Factor 5: Jurisdictional Boundaries

The Findlay-Tiffin, Ohio Combined Statistical Area includes Seneca and Hancock Counties. Crawford County is included in the Mansfield-Ashland-Bucyrus Combined Statistical Area, and Wyandot County (population ~22,000) is not a part of any combined statistical area. Ottawa and Wood Counties are a part of the Toledo-Fremont, OH Combined Statistical Area. Huron and Erie Counties are part of the Cleveland-Akron-Canton, OH Combined Statistical Area. Sandusky County is encompassed entirely by the Fremont, OH Micropolitan Statistical Area, but is not part of any larger combined statistical area. The Ohio EPA Central Office and the Ohio EPA Northwest District Office are responsible for air quality planning within all areas of Hancock, Ottawa, Sandusky, Seneca, Wood, Wyandot, Crawford, Huron, and Erie Counties. All nine of these Ohio Counties are not currently nonattainment for the 2010 1-hour SO_2 standard.

American Electric Power Conesville Power Plant

Discussion and Recommended Designations

The Conesville facility is located in Coshocton County. Emissions sources from Guernsey, Holmes, Knox, Licking, Muskingum and Tuscarawas County were considered in the dispersion modeling analysis conducted for the Conesville facility. In addition, portions of these counties were included in the modeling domain. Therefore, this section of the analysis will address Ohio's recommended designation for all of the counties.

As detailed under Factor 1, Ohio EPA modeled actual SO_2 emissions from the Conesville facility, years 2013-2015. As noted above, 2013-2015 emissions data were used, as the facility experienced a lengthy outage period in 2012 and therefore Ohio EPA did not believe emissions from 2012 were adequately representative of the normal operation of the facility. No exceedances of the standard were modeled, inclusive of a conservative background concentration. Ohio EPA also conducted an extensive analysis of SO_2 emissions and meteorology in Coshocton County, as well as the counties surrounding it, to inform the recommended designations. Absent emissions from the Conesville facility, emissions in Coshocton County are well below the 2,000 TPY significance threshold.

The predominant factor relevant to Ohio's recommended designations for Guernsey, Holmes, Knox, Licking, Muskingum and Tuscarawas Counties was Factor 2, emissions data. Except for Tuscarawas County, SO_2 emissions in these counties were well below the 2,000 TPY significance threshold. Emissions with Tuscarawas County were 2,273.42 TPY and predominantly comprised of emissions from Dover Municipal and Belden Brick (1,362 tons and 902 tons of SO_2 emissions, respectively, in 2014). These sources are well over 5 kilometers from each other and a significant distance from the Conesville facility. The other factors did not refute the recommended designations of each of these counties.

Based on the five factor analysis below, Ohio is recommending that the entirety of Coshocton County be designated as unclassifiable/attainment. Furthermore, Ohio EPA is recommending the counties of Guernsey, Holmes, Knox, Licking, Muskingum and Tuscarawas be designated as unclassifiable/attainment. Ohio EPA is recommending these counties be individually designated as unclassifiable/attainment at each distinct county level. Counties in Ohio have well-established boundaries and jurisdictions.

Factor 1: Dispersion Modeling and Air Quality Data

Ohio EPA modeled actual emissions from the Conesville facility for years 2013-2015, inclusive of background, as described in detail in Appendix Q. For this analysis, the maximum modeled 3-year design value, years 2013-2015, was 72.62956 $\mu g/m^3$ including background. Derivation of the background concentration applied to this source are is described in Appendix O of this submittal. Ohio EPA reviewed SO_2 emissions sources within 50 kilometers of the Conesville facility and determined the only source necessitating inclusion in the modeling analysis was the Conesville facility and the remaining sources are represented via the background concentrations. Note that Ohio ensured that the maximum combined impacts were captured by the finest receptor grid included in the modeling domain, as described in Appendix Q of this submittal. An area meets the standard of 75 ppb if a concentration of 196.2 $\mu g/m^3$ or lower is modeled, inclusive of background. Thus, no exceedance of the standard was modeled. The results

of this analysis are shown in Figure 9. Note that for clarity, only design values of 70 μg/m^3 or greater, inclusive of background, are displayed.

The Data Requirements Rule provides for any sources that modeled below 50% of the standard, a State could request U.S. EPA terminate the requirement to consider re-modeling in the future. Based upon the Data Requirements Rule, Ohio EPA believes additional modeling will not be necessary and requests the Conesville facility be removed from the ongoing data requirements in accordance with 40 CFR 51.1205(b)(2).

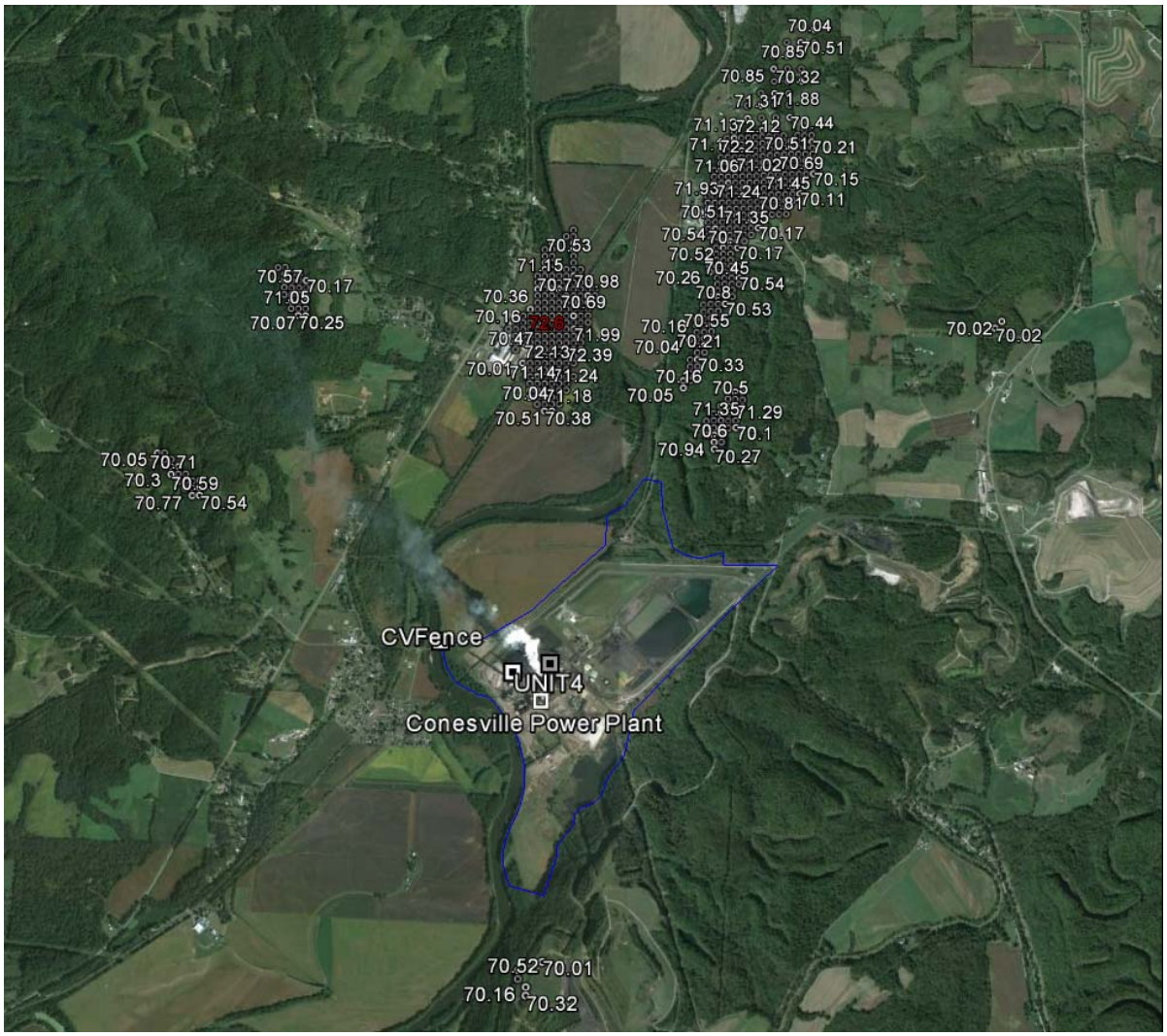


Figure 9: Maximum SO_2 impacts, American Electric Power Conesville facility, 2013-2015. Concentrations are shown in μg/m^3 including background.

The maximum modeled 3-year design value concentration, 72.62956 $\mu g/m^3$, or 27.8 ppb including background, was modeled approximately 2.5 kilometers to the north of the Conesville egress points. Modeled 3-year design values greater than or equal to 70 $\mu g/m^3$ did not extend beyond 5 to 6 kilometers from the modeled source. Beyond this distance, modeled concentrations drop to highly uniform values, as they are dominated by the by the flat background concentration of 8 ppb (20.9 $\mu g/m^3$) rather than emissions from the Conesville facility.

Factor 2: Emissions

As part of the modeling analysis of the Conesville facility, Ohio EPA examined emissions within 50 kilometers of the facility. It was determined additional sources did not necessitate modeling but were represented by the background concentrations (Appendix Q). The entirety of the domain demonstrated attainment.

As part of this Factor 2 analysis, Ohio EPA is analyzing SO_2 emissions from Coshocton County and those counties surrounding Coshocton County, for which Ohio EPA is recommending a designation of unclassifiable/attainment, absent those emissions from the Conesville facility that were explicitly modeled. Portions of the surrounding counties were also a part of the modeled domain. These counties include Guernsey, Holmes, Knox, Licking, Muskingum and Tuscarawas. The surrounding region is primarily un-industrialized. Table 13 shows county-wide emissions for all facilities with emissions greater than or equal to 1 TPY. With the exception of Tuscarawas County, these counties are all well below the 2,000 TPY significance threshold.

County	2014	Modeled	2014 Absent Modeled	2015	Modeled	2015 Absent Modeled
Coshocton	7,396.19	7,370.11	26.08	5,023.70	4,998.29	25.41
Guernsey	632.01	0	632.01	845.7	0	845.7
Holmes	4.84	0	4.84	4.59	0	4.59
Knox	6.37	0	6.37	6.58	0	6.58
Licking	241.60	0	241.60	51.81	0	51.81
Muskingum	187.98	0	187.98	181.66	0	181.66
Tuscarawas	2,273.42	0	2,273.42	2,243.86	0	2,243.86

Table 13: County Totals of SO_2 Point Source Emissions 1 TPY or Greater in Coshocton, Guernsey, Holmes, Knox, Licking, Muskingum and Tuscarawas Counties.

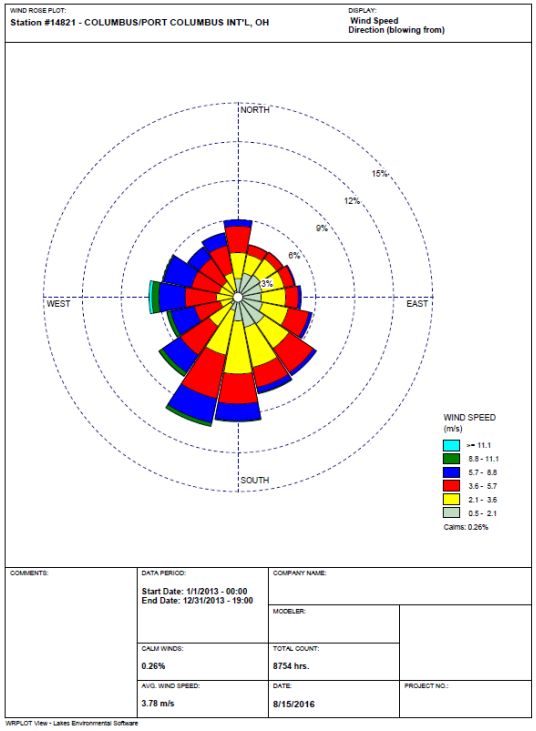
The most significant sources in Tuscarawas County are the Dover Municipal Light Plant and The Belden Brick Company, located 51 and 41 kilometers, respectively, to the North/Northeast of Conesville. Dover Municipal and Belden Brick had 1,362 tons and 902

tons of SO_2 emissions, respectively, in 2014. As described in Appendix Q, modeled impacts from Conesville were highest within 3 kilometers of the facility and gradually drop to near-background concentrations beyond that. Therefore, based on these emissions levels and distances, it is unlikely these two facilities impact Conesville and they are accounted for in the background concentrations. These two facilities are over 14 kilometers from each other. Because of the distance between them (greater than 5 kilometers), it is unlikely their combined impacts would lead to an exceedance of the standard.

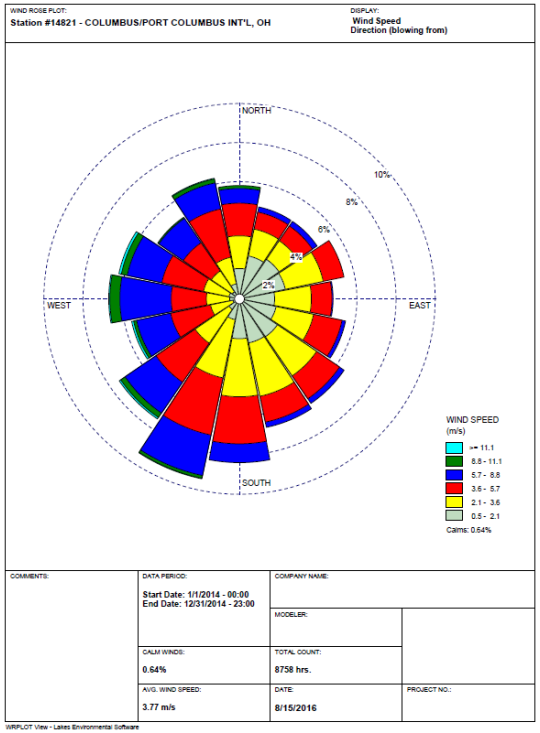
Factor 3: Meteorology

Please refer to the Factor 3 general discussion at the beginning of this document for general meteorological information applicable to the Conesville facility and the surrounding area. Per relevant U.S. EPA guidance, dispersion modeling accounts for the majority of topographical and land use features that influence the meteorology of this analysis area. Of particular importance in Ohio's designation recommendation for this area are the annual trends and distribution of wind directions in this area, which are best represented by data from the National Weather Service station located at the John Glenn Columbus International Airport. Wind roses from this station, years 2013-2015, are shown in Figure 10, below.

2013 Coshocton Met Data



2014 Coshocton Met Data



2015 Coshocton Met Data

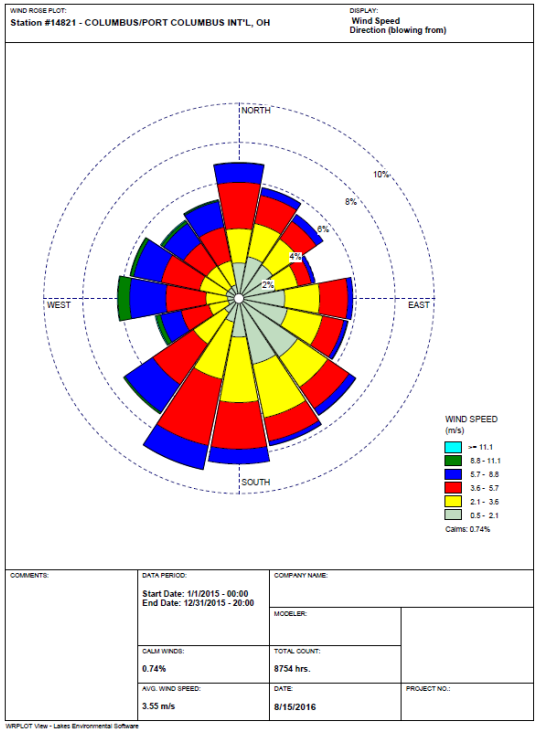


Figure 10: Coshocton County wind roses, 2013-2015.

The predominant wind directions were used, in part, to inform which facilities within 50 kilometers may potentially impact ambient SO_2 concentrations in the Conesville source area not accounted for by background and therefore necessitate inclusion in the dispersion modeling analysis. This is discussed in more detail in Appendix Q.

Factor 4: Topography and Land Use/Land Cover

Please refer to the general discussion of Factor 4 at the beginning of this document. Ohio, consistent with U.S. EPA guidance, understands that the topography and land use characteristics influencing meteorology and the dispersion of SO_2 emissions from the Conesville facility is adequately accounted for via the dispersion modeling analysis. Although Ohio EPA did not explicitly conduct a land use analysis for this source area, a cursory examination of the included map (Figure 9) of the source area indicate that the source is clearly located in a primarily rural location, and thus rural dispersion coefficients were used in the AERMOD modeling analysis.

Factor 5: Jurisdictional Boundaries

Coshocton County, Ohio is not included in any larger Statistical Area. In addition to Coshocton County, Ohio is including in its recommended designation the following Ohio Counties based on the lack of significant sources of SO_2: Guernsey, Holmes, Knox, Licking, Muskingum and Tuscarawas. Guernsey, Licking, Knox and Muskingum Counties are part of the Columbus-Marion-Chillicothe, OH Combined Statistical Area (CSA), and Licking is part of the Columbus, OH Metropolitan Statistical Area (MSA). Tuscarawas County is part of the Cleveland-Akron-Canton, OH CSA. Holmes County is not included in any larger Statistical Area.

The Ohio EPA Central Office and the Ohio EPA Southeast District Office are responsible for air quality planning within all areas of Coshocton, Muskingum, Guernsey and Tuscarawas Counties. The Ohio EPA Central Office and the Ohio EPA Central District Office are responsible for air quality planning within all areas of Knox and Licking Counties. The Ohio EPA Central Office and the Ohio EPA Northeast District Office are responsible for air quality planning within all areas of Holmes County. Currently, all of these Counties are not nonattainment for the 2010 1-hour SO_2 standard.

Miami Fort Station

Discussion and Recommended Designations

The Miami Fort Station facility is located in Hamilton County. Emissions sources within 50 kilometers of the facility were considered in the dispersion modeling analysis conducted for Miami Fort Station and portions of neighboring counties were included in

the modeling domain. However, Hamilton County is bordered by areas that have been designated under round one and round two designations. Therefore, this section of analysis will only address Ohio's recommended designation for Hamilton County.

As detailed under Factor 1, Ohio EPA modeled actual SO_2 emissions from the Miami Fort Station facility, years 2012-2014. No exceedances of the standard were modeled, inclusive of a conservative background concentration. Ohio EPA also conducted an extensive analysis of SO_2 emissions and meteorology in Hamilton County to inform the recommended designation. Absent emissions from the Miami Fort Station facility and taking into consideration the conversion to natural gas of the DTE St. Bernard facility (Appendix R), emissions in Hamilton County are well below the 2,000 TPY significance threshold.

In addition to the five factors, it is worth noting that Hamilton County contains two ambient air monitors attaining the standard (see Table 1 and Figure 1).

Based on the five factor analysis below, Ohio is recommending Hamilton County be designated as unclassifiable/attainment.

Factor 1: Dispersion Modeling and Air Quality Data

Ohio EPA modeled actual emissions from the Miami Fort Station facility for years 2012-2014, inclusive of background. The full details of the modeling analysis are presented in detail in Appendix S of this submittal. Derivation of the background for all sources explicitly modeled for the purposes of recommended designations are presented in Appendix O of this submittal. Ohio EPA reviewed SO_2 emissions sources within 50 kilometers of the Miami Fort Station facility and determined the only source necessitating inclusion in the modeling analysis was the Miami Fort Station facility, and the remaining sources are represented via the background concentrations. For this analysis, the maximum modeled 3-year design value, years 2012-2014, was 159.08418 $\mu g/m^3$, or 60.8 ppb, including background. Note that Ohio ensured that the maximum impacts were captured by the finest receptor grid included in the modeling domain, as described in Appendix R of this submittal. Additionally, Ohio EPA did not model emissions from Miami Fort Station Unit 6, which ceased operations on June 1, 2015. An area meets the standard of 75 ppb if a concentration of 196.2 $\mu g/m^3$ or lower is modeled, inclusive of background. Thus, no exceedance of the standard was modeled. The results of this analysis are shown in Figure 11. Note that for clarity, only design values of 145 $\mu g/m^3$ or greater, inclusive of background, are displayed.

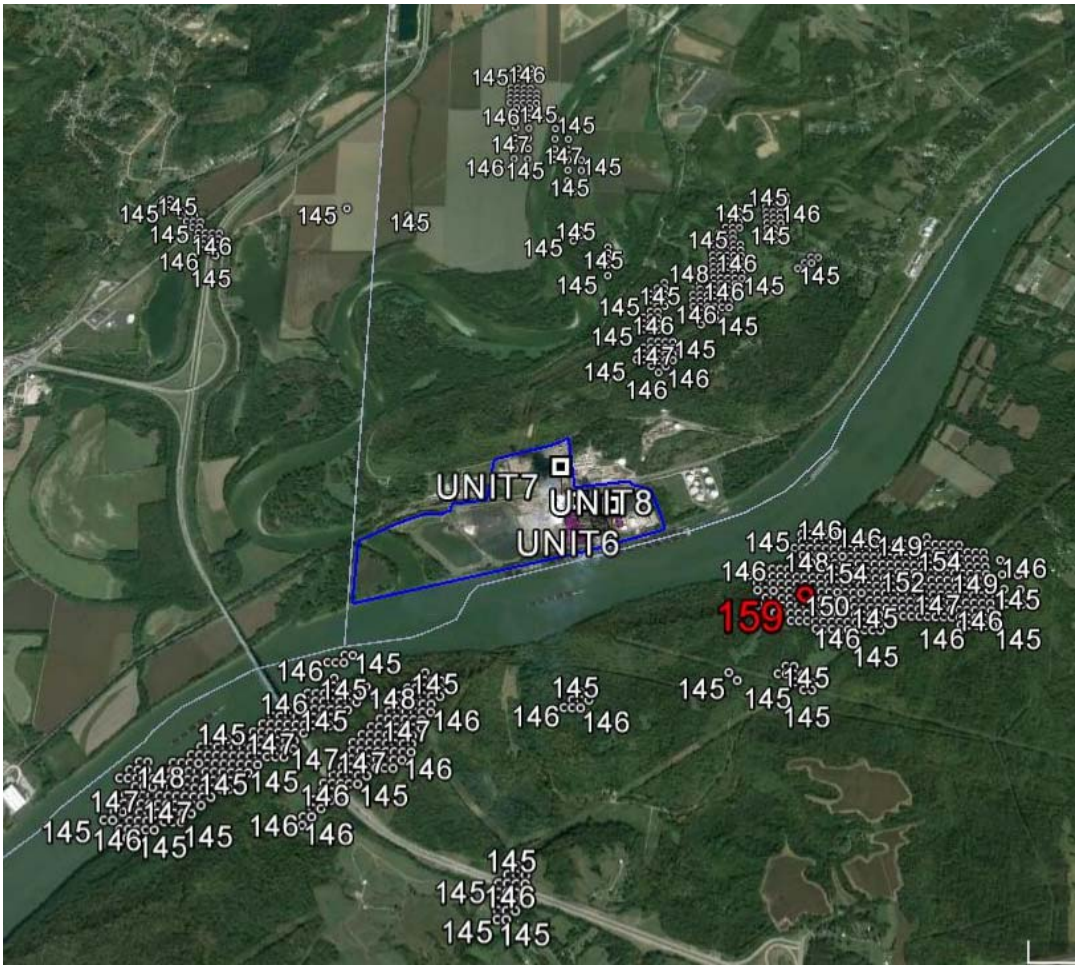


Figure 11: Maximum SO_2 impacts, Miami Fort Station, 2012-2014. Concentrations are shown in μg/m³ including background.

The maximum modeled 3-year design value concentration, 159.08418 μg/m³, or 60.8 ppb including background, was modeled approximately 1.4 kilometers to the east-southeast of the Miami Fort fenceline. Modeled 3-year design values greater than or equal to 145 μg/m³ did not extend beyond 4 kilometers from the modeled sources. Beyond approximately 10 kilometers, concentrations become relatively uniform, as the design values are dominated by the peak hourly background (31.57 ppb) rather than the impact of emissions from the Miami Fort Station facility.

Ohio EPA does not find it necessary to model actual emissions for years 2013-2015, due to decreasing emissions from the Miami Fort Station facility. SO_2 emissions from the facility decreased from 26,407 tons in 2012 to 14,327 tons in 2015. The approximately 45 percent decrease in emissions would likely lead to a smaller 3-year modeled design value

using 2013-2015 emissions, resulting in no exceedance of the standard again being modeled.

In addition to the dispersion modeling analysis of the Miami Fort Station, there are two ambient SO_2 monitoring sites in Hamilton County, as noted above. The location and monitoring data are presented in Figure 1 and Table 1, respectively.

For clarity, the locations of Hamilton County monitors 39-061-0010 and 39-061-0040 are shown in Figure 12.

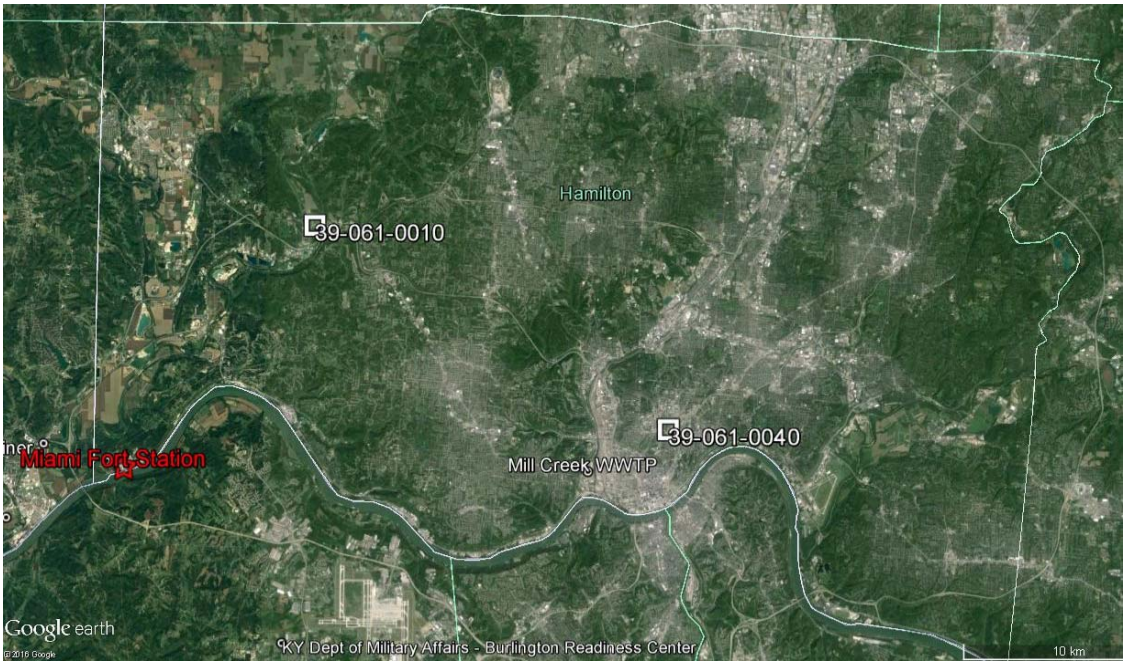


Figure 12: Hamilton County SO_2 monitoring locations.

These monitors provide strong evidence that portions of Hamilton County beyond what is immediately impacted by the Miami Fort Station facility are attaining the standard.

Factor 2: Emissions

As part of the modeling analysis of the Miami Fort Station facility, Ohio EPA examined emissions within 50 kilometers of the facility. It was determined additional sources did not necessitate modeling but were represented by the background concentrations (Appendix S). The entirety of the domain modeled demonstrated attainment.

As a part of this Factor 2 analysis, Ohio EPA is analyzing SO_2 emissions of 1 TPY or greater at the facility level in Hamilton County (Table 14). Emissions are under the 2,000 TPY significance threshold.

County	2014	Modeled	2014 Absent Modeled	2015	Modeled	2015 Absent Modeled
Hamilton	30,425.44	28,479.00	1,946.44	15,923.32	14,327.00	1,596.32

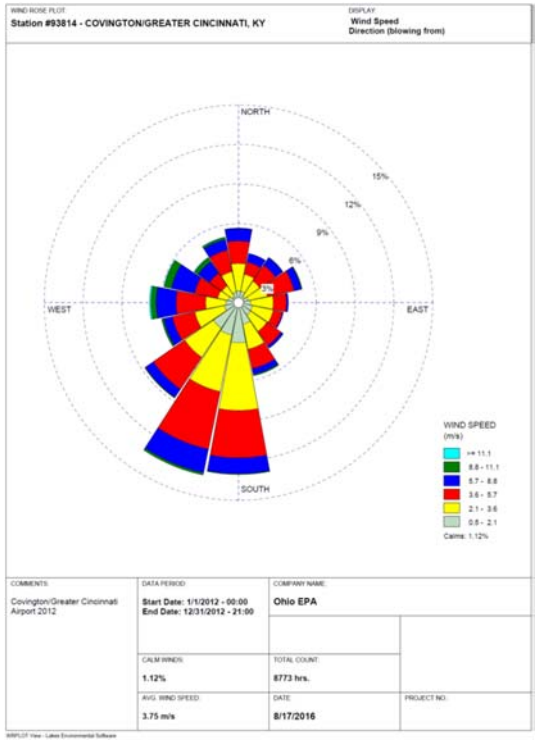
Table 14: County Totals of SO_2 Point Source Emissions 1 TPY or Greater in Hamilton County.

The largest remaining source in Hamilton County is the DTE St. Bernard facility, which accounted for 1,666 TPY and 1,450 TPY of the remaining 1,946 TPY and 1,596 TPY, in 2014 and 2015, respectively. DTE St. Bernard converted all coal-fired boilers to natural gas in November of 2015, and now has a facility-wide SO_2 potential to emit of 55.6 TPY (see Appendix R).

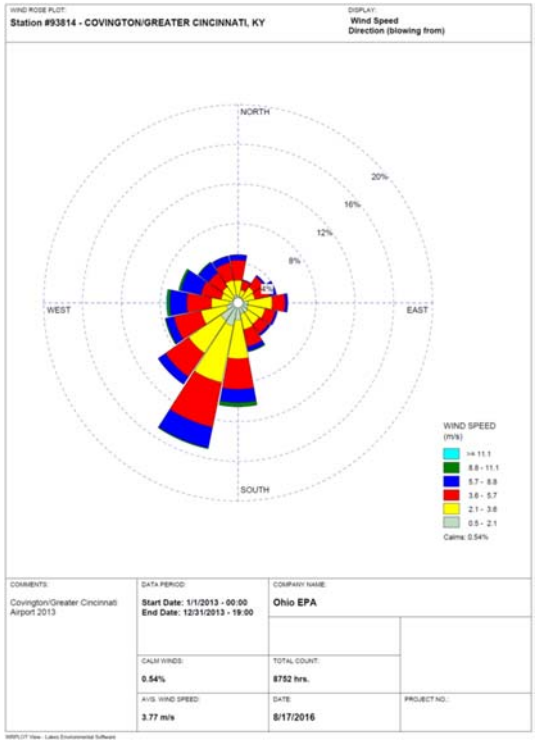
Factor 3: Meteorology

Please refer to the Factor 3 general discussion at the beginning of this document for general meteorological information applicable to Hamilton County and the area surrounding the Miami Fort Station facility. Per relevant U.S. EPA guidance, dispersion modeling accounts for the majority of topographical and land use features that influence the meteorology of the analysis area. Of particular importance in Ohio's designation recommendation for this area are the annual trends and distribution of wind directions in this area, which are best represented by data from the National Weather Service station located at the Cincinnati Northern Kentucky Airport (KCVG). Wind roses from this station, years 2012 to 2014, are shown in Figure 13, below.

2012 Cincinnati Met Data



2013 Cincinnati Met Data



2014 Cincinnati Met Data

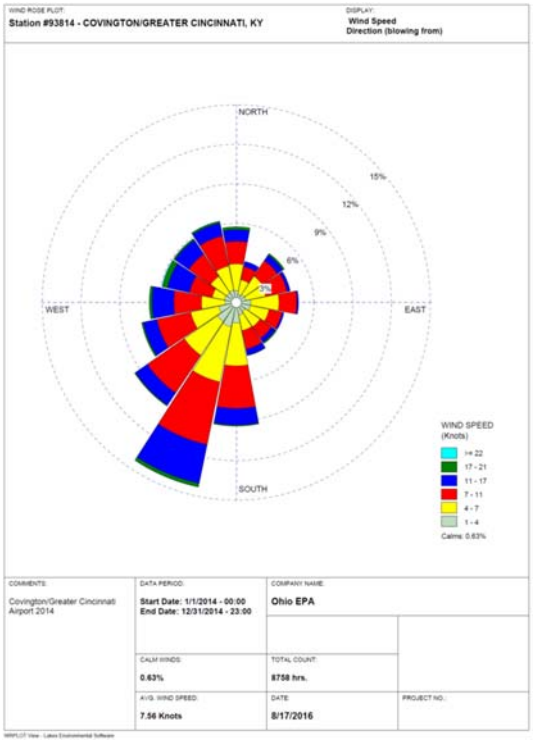


Figure 13: Cincinnati wind roses, 2012-2014.

The predominant wind directions were used, in part, to inform which facilities within 50 kilometers may potentially impact ambient SO_2 concentrations in the Miami Fort Station source area not accounted for by background and therefore necessitate inclusion in the dispersion modeling analysis. This is discussed in more detail in Appendix S.

Factor 4: Topography and Land Use/Land Cover

Please refer to the general discussion of Factor 4 at the beginning of this document. Ohio, consistent with U.S. EPA guidance, understands that the topography and land use characteristics influencing meteorology and the dispersion of SO_2 emissions from the Miami Fort Station facility is adequately accounted for via the dispersion modeling analysis. Although Ohio EPA did not explicitly conduct a land use analysis for this source area, a cursory examination of the included map (see Figure 11) indicate that the source is clearly located in a rural location, and thus rural dispersion coefficients were used in the AERMOD modeling analysis.

Factor 5: Jurisdictional Boundaries

The Cincinnati-Middletown, OH-KY-IN Metropolitan Statistical Area contains Hamilton County. The Ohio EPA Central Office and the Southwest Ohio Air Quality Agency are responsible for air quality planning within all areas of Hamilton County. Hamilton County is not currently nonattainment for the 2010 1-hour SO_2 standard.

Bay Shore Power Plant

Discussion and Recommended Designation

The Bay Shore Power Plant is located in Lucas County. Lucas County is bordered by two counties (Ottawa and Wood) that were already analyzed with the Carmeuse Lime Maple Grove facility five factor analysis above and will not be addressed here again. Lucas County is also bordered by Henry and Fulton County. Therefore, this section of analysis will address Ohio's recommended designations for Lucas, Henry and Fulton Counties. However, emissions sources within 50 kilometers of the facility were considered in the dispersion modeling analysis conducted for Bay Shore Power Plant and portions of neighboring counties were included in the modeling domain.

As detailed under Factor 1, Ohio EPA modeled actual SO_2 emissions, years 2012-2014, from the Bay Shore Power Plant and an additional facility in Lucas County, BP Husky Refinery/Chemtrade Refinery Solutions[19], that was determined to warrant inclusion based

[19] BP Husky Refinery and Chemtrade Refinery Solutions are considered two distinct facilities and report emissions as such. Emissions from Chemtrade Refinery Solutions are significantly lower than BP Husky Refinery. These

upon proximity and emissions. No exceedances of the standard were modeled, inclusive of a conservative background concentration.

Ohio EPA also conducted an extensive analysis of SO_2 emissions and meteorology in Lucas County to inform the recommended designation. Absent emissions from the Bay Shore Power Plant and BP Husky Refinery, emissions in Lucas County are well below the 2,000 TPY significance threshold.

The predominant factor relevant to Ohio's recommended designations for Henry and Fulton Counties was Factor 2, emissions data. SO_2 emissions in these counties were well below the 2,000 TPY significance threshold, combined. The other factors did not refute the recommended designations of each of these counties.

In addition to the five factors, it is worth noting the Lucas County contains an ambient air monitor attaining the standard (see Table 1 and Figure 1).

Based on the five factor analysis presented below, Ohio is recommending Lucas County be designated as unclassifiable/attainment. Further, Ohio EPA is recommending Henry and Fulton Counties be designated unclassifiable/attainment. Ohio EPA is recommending these counties be individually designated as unclassifiable/attainment at each distinct county level. Counties in Ohio have well-established boundaries and jurisdictions.

Factor 1: Dispersion Modeling and Air Quality Data

Ohio EPA modeled actual emissions from the Bay Shore Power Plant and the BP Husky Refinery for years 2012-2014, inclusive of a seasonally variable background. The full details of the modeling analysis are presented in Appendix W of this submittal. Derivation of the background for all sources explicitly modeled for the purposes of recommended designations are presented in Appendix O of this submittal. Ohio EPA reviewed SO_2 emissions sources within 50 kilometers of Bay Shore Power Plant and determined BP Husky Refinery warranted inclusion in the modeling analysis and the remaining sources are represented via the background concentrations. It should be noted that the coal-fired boilers at the Bay Shore Power Plant permanently shut down on December 17, 2015, and therefore emissions from these sources were not considered in the modeling analysis (Appendix X). For this analysis, the maximum modeled 3-year design value, years 2012-2014, was 175.29812 $\mu g/m^3$ including background. Note that Ohio ensured that the maximum combined impacts were captured by the finest receptor grid included in the modeling domain, as described in Appendix W of this submittal. An area meets the standard of 75 ppb if a concentration of 196.2 $\mu g/m^3$ or lower is modeled, inclusive of

facilities are co-located facilities and hereafter when referring to BP Husky Refinery, Ohio EPA is also referring to Chemtrade Refinery Solutions, unless specifically noted otherwise.

background. Thus, no exceedance of the standard was modeled. The results of this analysis are shown in Figure 14. Note that for clarity, only design values of 150 μg/m^3 or greater, inclusive of background, are displayed.

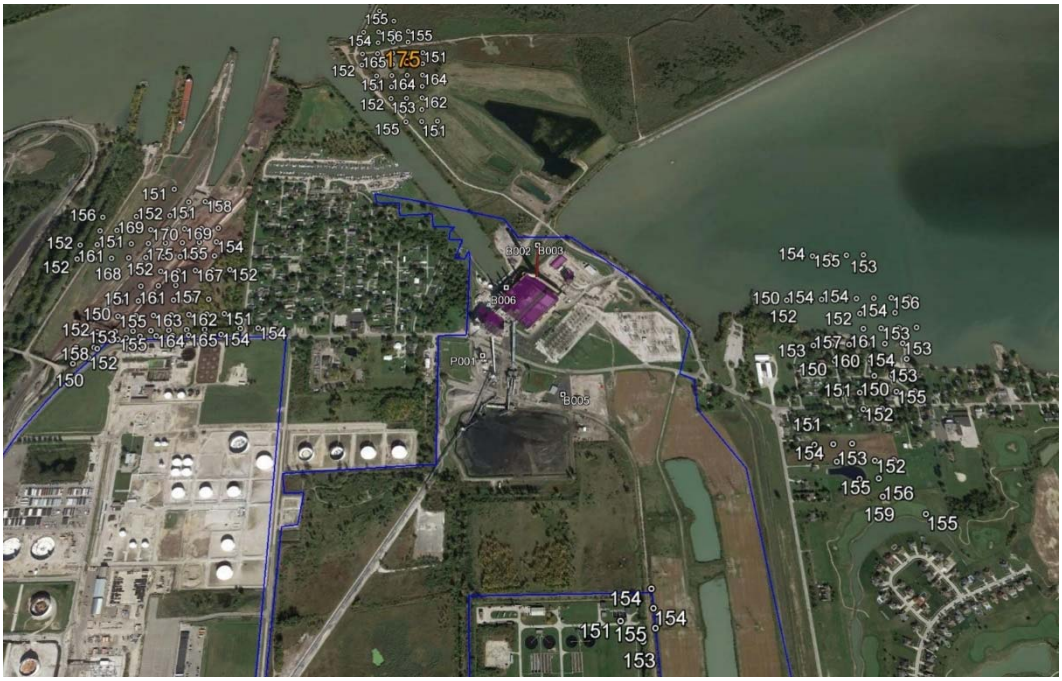


Figure 14: Maximum SO_2 impacts, Bay Shore and BP Husky facilities, 2012-2014. Concentrations are shown in μg/m^3 including background.

The maximum 3-year design value was modeled on the northern portion of the BP Husky fenceline, approximately 940 meters from the Bay Shore egress point, the primary contributor to the maximum modeled design values.

Ohio EPA does not believe it is necessary to model actual emissions for years 2013-2015 at the Bay Shore Power Plant and the BP Husky Refinery. Total emissions in 2012 were 3,577 and 3,773 tons in 2015, or a 5.5% total increase in emissions. This slight increase is unlikely to model a 3-year design value above the standard. The Data Requirements Rule provides general guidelines on when it may be necessary to conduct additional modeling based upon more recent actual emissions. Specific criteria were not promulgated as U.S. EPA felt it was best judged on a case-by-case basis. The general guideline for modeling results within 90% or more of the standard was for re-modeling if there is any emission increase. The general guideline for modeling results between 50% and less than 90% of the standard was for re-modeling if there is a 15% or more increase

in emissions. The modeling results, 175.29812 μg/m^3, were 89% of the standard. Therefore, it is Ohio EPA's judgement that this emission increase, 5.5%, does not necessitate further modeling.

In addition to the modeling analysis, Ohio examined monitor data from SO_2 monitor 39-095-0008, located in Lucas County approximately 4.5 kilometers to the southwest of the Bay Shore Plant, and approximately 2.7 kilometers to the southwest of the BP Husky facility. This monitor began operation on January 1, 2013, but experienced several extended outage periods in each year, 2013 to 2015. As such, a complete 3-year monitored design value is unavailable. However, the monitoring data available provides strong supporting evidence that the area surrounding the Bay Shore Power Plant is in attainment of the 2010 1-hour SO_2 standard. A summary of relevant statistics for this monitor are given in Table 15. Note that the mean, median, and mode were calculated for only those days when the maximum daily value was non-zero.

	Valid Days	99th Percentile (ppb)	Mean (ppb)	Median (ppb)	Mode (ppb)	MAX (ppb)
2013	342	30	6	3	1	36
2014	248	17	4	3	2	26
2015	289	19	4	3	2	30

Table 15: Monitor 39-095-0008 Summary Statistics, 2013-2015

The data in Table 15 indicates that the greatest concentration recorded at the monitoring location, years 2012-2015 is 36 ppb, less than half of the 1-hour SO_2 standard. This monitor is well-sited to reflect ambient air quality impacts of those sources not included in the modeling domain, and is likely impacted by emissions from the Bay Shore and BP Husky facilities, considering the meteorology of the area (Factor 3). The location of relevant SO_2 sources, as well as monitor 39-095-0008 are shown in Figure 15, below.

Figure 15: SO_2 monitor near the Bay Shore source area.

As shown in Figure 15, the monitor is well-sited to account for impacts from those sources not explicitly modeled given the prevailing winds of the source area, as described in Factor 3 of this analysis. Ohio believes that, in addition to the modeling results, concentrations recorded at this monitoring site provide strong evidence that the 75 ppb standard is attained in Lucas County.

Factor 2: Emissions

As part of the modeling analysis of the Bay Shore Power Plant, Ohio EPA examined emissions within 50 kilometers of the facility. It was determined BP Husky Refinery warranted inclusion in the modeling. BP Husky Refinery's emissions were 1,618.25 tons in 2014 and they are within 2.5 kilometers of Bay Shore Power Plant. The remaining sources within 50 kilometers did not warrant inclusions and were represented by the background concentrations (Appendix W).

As part of the Factor 2 analysis, Ohio EPA is analyzing SO_2 emissions from Lucas County, absent those emissions from Bay Shore Power Plant and BP Husky Refinery explicitly modeled, and Ohio counties surrounding Lucas County that were not analyzed elsewhere in this submittal. These include Fulton and Henry Counties. Portions of the surrounding

Ohio counties were also a part of the modeled domain. Table 16 shows emission totals from stationary sources with reported actual SO_2 emissions of 1 TPY or greater for each county in the analysis area. Combined, these counties are well below the 2,000 TPY significance threshold.

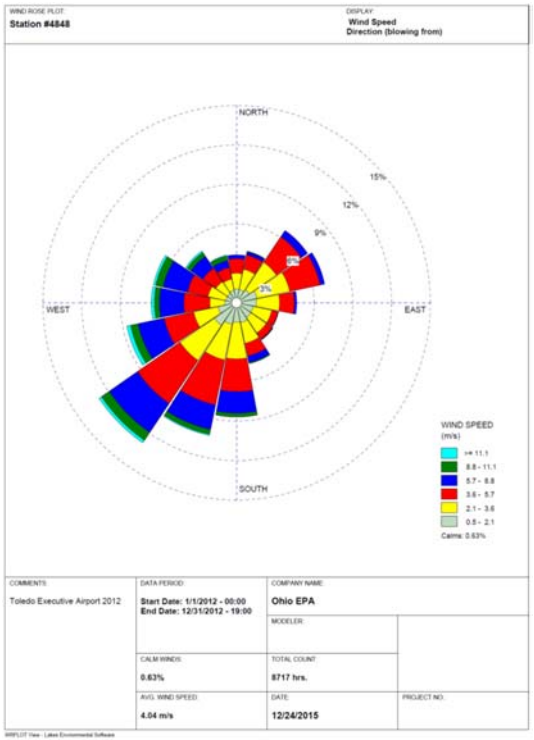
County	2014	Modeled	2014 Absent Modeled	2015	Modeled	2015 Absent Modeled
Lucas	4,039.52	3,620.67	384.28	4,162.51	3,772.38	355.56
Fulton	310.69	0	310.69	255.20	0	255.20
Henry	<1	0	<1	<1	0	<1

Table 16: County Totals of SO_2 Point Source Emissions 1 TPY or Greater in Lucas, Fulton and Henry Counties.

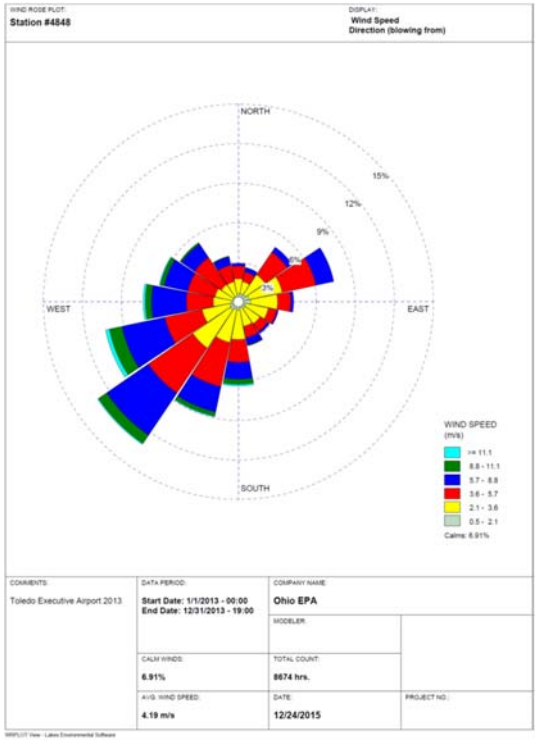
Factor 3: Meteorology

Please refer to the Factor 3 general discussion at the beginning of this document for general meteorological information applicable to Lucas County and the Bay Shore facility. Per relevant U.S. EPA guidance, dispersion modeling accounts for the majority of topographical and land use features that influence the meteorology of the analysis area. Of particular importance in Ohio's designation recommendation for this area are the annual trends and distribution of wind directions in this area, which are best represented by data from the National Weather Service station located at the Toledo Executive Airport in Wood County, Ohio. This meteorological station is located 14.8 kilometers to the south of the Bay Shore facility. Wind roses from this station, years 2012-2014, are shown in Figure 16, below.

2012 Toledo Met Data



2013 Toledo Met Data



2014 Toledo Met Data

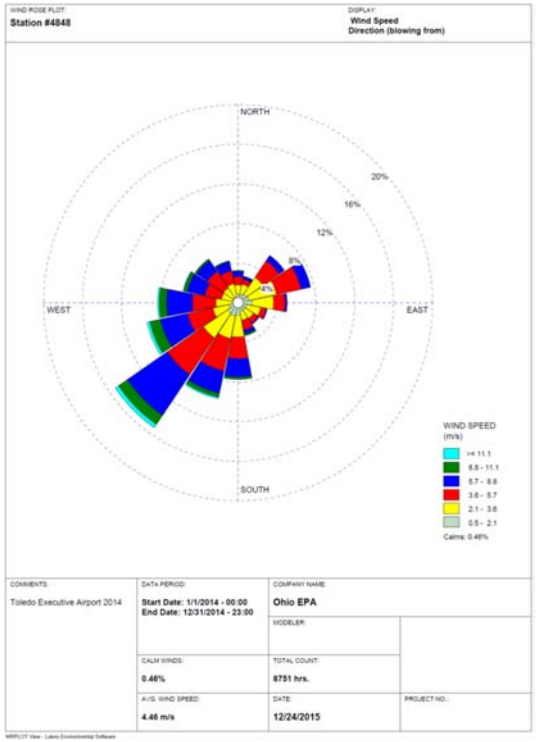


Figure 16: Toledo wind roses, 2012-2014.

The predominant wind directions were used, in part, to inform which facilities within 50 kilometers of Bay Shore facility, may potentially impact ambient SO2 concentrations in the Bay Shore source area not accounted for by background and therefore necessitate inclusion in the dispersion modeling analysis. This is discussed in more detail in Appendix W.

Factor 4: Topography and Land Use/Land Cover

Please refer to the general discussion of Factor 4 at the beginning of this document. Ohio, consistent with U.S. EPA guidance, understands that the topography and land use characteristics influencing meteorology and the dispersion of SO_2 emissions from the Bay Shore and BP Husky facilities are adequately accounted for via the dispersion modeling analysis. Ohio EPA also conducted a land use analysis of the area surrounding the Bay Shore facility over a 3-kilometer radius. This analysis indicated that rural dispersion coefficients should be utilized in the AERMOD model. Further analysis indicated that, even when those portions of the land use map representing the waters of Lake Erie are eliminated, the area is still classified as rural.

Factor 5: Jurisdictional Boundaries

The Toledo-Port Clinton, Ohio Combined Statistical Area includes Lucas, Wood, Fulton, and Ottawa Counties. Henry County is not a part of any larger statistical area. The Ohio EPA Central Office and the City of Toledo Division of Environmental Services are responsible for air quality planning within all areas of Lucas County. Lucas, Wood, Fulton, and Ottawa Counties are not currently nonattainment for the 2010 1-hour SO_2 standard.

Dayton Power and Light J.M. Stuart and Killen Stations

Discussion and Recommended Designation

The DP&L Stuart and DP&L Killen facilities are located in Adams County. Emissions sources from Brown, Highland, Pike and Scioto County were also considered in the dispersion modeling analysis conducted for DP&L Stuart and DP&L Killen facilities. In addition, portions of some of these counties were included in the modeling domain. Therefore, this section of analysis will address Ohio's recommended designation for all of these counties.

As detailed under Factor 1, Ohio EPA modeled actual SO_2 emissions from the DP&L Stuart and DP&L Killen facilities, years 2012-2014. An additional facility, Spurlock Station (Kentucky), was included to ensure Ohio's analysis was conservative. No exceedances of the standard were modeled, inclusive of a conservative background concentration. Ohio EPA also conducted an extensive analysis of SO_2 emissions and meteorology in

Adams County, as well as the counties surrounding it, to inform the recommended designations. Absent emissions from the DP&L Stuart and DP&L Killen facilities, emissions in Adams County are well below the 2,000 TPY significance threshold.

The predominant factor relevant to Ohio's recommended designations for Brown, Highland, Pike and Scioto Counties was Factor 2, emissions data. Combined, SO_2 emissions in these counties were below the 2,000 TPY significance threshold. The other factors did not refute the recommended designations of each of these counties.

In addition to the five factors, it is worth noting that Adams and Scioto Counties contains several ambient air monitors attaining the standard (see Table 1 and Figure 1).

Based on the five factor analysis below, Ohio is recommending Adams County be designated as unclassifiable/attainment. Further, Ohio EPA is recommending Brown, Highland, Pike and Scioto Counties, which border Adams County, be designated unclassifiable/attainment. Ohio EPA is recommending these counties be individually designated as unclassifiable/attainment at each distinct county level. Counties in Ohio have well-established boundaries and jurisdictions.

Factor 1: Dispersion Modeling and Air Quality Data

Ohio EPA modeled actual emissions from the DP&L Stuart and DP&L Killen facilities in Adams County, as well as Spurlock Station in Kentucky, years 2012-2014, inclusive of background. The full details of the modeling analysis are presented in Appendix Y of this submittal. Derivation of the background for all sources explicitly modeled for the purposes of recommended designations are presented in Appendix O of this submittal. Ohio EPA reviewed SO_2 emissions sources within 50 kilometers of the DP&L Stuart and DP&L Killen facilities and determined the only sources necessitating inclusion in the modeling analysis were the DP&L Stuart and DP&L Killen facilities and the remaining sources are represented via the background concentrations. Regardless, one additional facility in Kentucky, Spurlock Station, was included explicitly in the modeling to ensure conservatism. Spurlock Station is located to the northwest of the DP&L Stuart and DP&L Killen facilities, and although it is 29 kilometers away, emitted less than a quarter of the emissions analyzed for the area, and is not suspected to impact the analysis area, Ohio EPA elected to explicitly include the source in the modeling to be conservative.

For this analysis, the maximum modeled 3-year design value, years 2012-2014, was 186.26472 $\mu g/m^3$, or 71.2 ppb, including background. Note that Ohio ensured that the maximum impacts were captured by the finest receptor grid included in the modeling domain, as described in Appendix Y of this submittal. An area meets the standard of 75 ppb if a concentration of 196.2 $\mu g/m^3$ or lower is modeled, inclusive of background. Thus, no exceedance of the standard was modeled. The results of this analysis are shown in Figure 17. Note that for clarity, only design values of 150 $\mu g/m^3$ or greater, inclusive of background, are displayed.

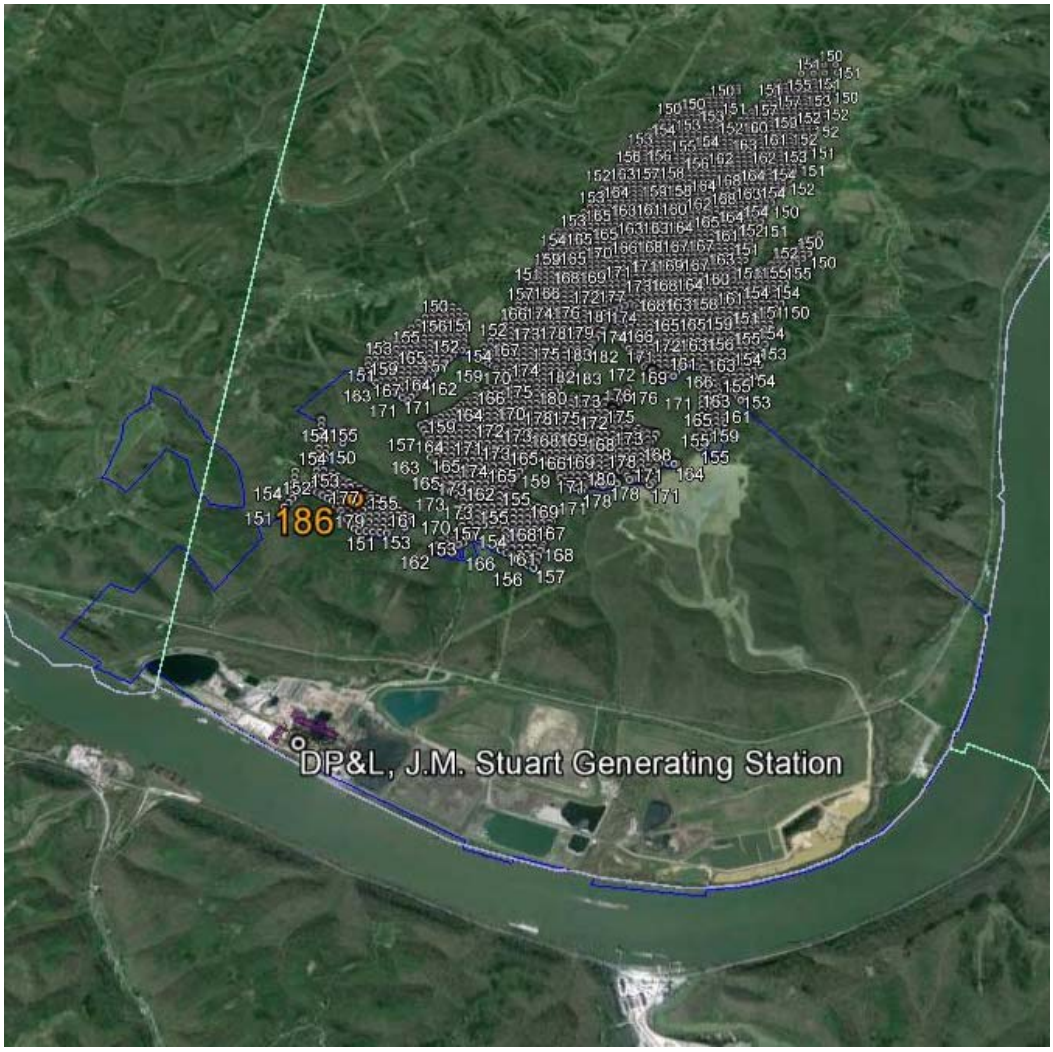


Figure 17: Maximum SO_2 impacts, DP&L Stuart and Killen Stations, 2012-2014. Concentrations are shown in μg/m³ including background.

The maximum modeled 3-year design value concentration, 186.26472 μg/m³, or 71.2 ppb, including background, was modeled approximately 1.9 kilometers to the north of the largest egress point of the DP&L Stuart facility. Modeled 3-year design values greater than or equal to 150 μg/m³ did not extend beyond 7.5 kilometers from the DP&L Stuart facility. The highest modeled concentrations were modeled near to the DP&L Stuart facility. Emissions from the DP&L Stuart facility contribute approximately 87% to the maximum modeled design value.

Ohio EPA conducted a separate modeling analysis to examine the impacts of the Spurlock Station on the five county area included in this source area. The results of this analysis indicate that the maximum design value resulting from the Spurlock Station in the five county area is 16 ppb (without background). This concentration was modeled

approximately 1.2 kilometers to the northeast of Spurlock Station, and approximately 13 kilometers to the northwest of the DP&L Stuart facility. Given the predominant wind directions in the source area, limited extent of the maximum impacts of the DP&L Stuart and Killen facilities, and the relatively low impacts of Spurlock Station in the five county area, Ohio EPA believes that it is unnecessary to further consider emissions from this source in the DP&L Stuart and Killen source area.

Ohio EPA does not believe it is necessary to model actual emissions for years 2013-2015 at DP&L Stuart and DP&L Killen facilities. As seen in Table 17, combined emissions from both facilities in 2012 were 14,226 tons, and 14,728 tons in 2015. This represents a 3.5% increase in emissions. The difference in total emissions between 2012-2014 and 2013-2015 is an increase of 0.58% for DP&L Stuart and 1.2% for DP&L Killen, or a combined increase of 0.86%. The Data Requirements Rule provides general guidelines on when it may be necessary to conduct additional modeling based upon more recent actual emissions. Specific criteria were not promulgated as U.S. EPA felt it was best judged on a case-by-case basis. The general guideline for modeling results within 90% or more of the standard was for re-modeling if there is any emission increase. The general guideline for modeling results between 50% and less than 90% of the standard was for re-modeling if there is a 15% or more increase in emissions. The modeling results, 186.26472 $\mu g/m^3$, were 95% of the standard. Because the Data Requirements Rule guidelines are general and this emissions increase is so small, Ohio EPA, in consultation with U.S. EPA Region 5, performed an additional analysis to determine if remodeling would be warranted.

Annual emissions, years 2012-2015, for the DP&L Stuart and Killen facilities are shown in Table 17, below.**SO2 Tons**

	2012	2013	2014	2015	2012-2014	2013-2015
Stuart - 1	2,941.7	3,655.1	2,382.7	2,251.8	8,979.5	8,289.6
Stuart - 2	2,191.5	2,122.1	3,663.8	2,135.8	7,977.4	7,921.7
Stuart - 3	1,458.5	2,806.1	2,410.8	2,025.3	6,675.4	7,242.2
Stuart - 4	2,272.6	2,958.7	2,394.9	2,632.8	7,626.2	7,986.4
Facility wide	8,864	11,542	10,852	9,046	31,259	31,440

SO2 Tons

	2012	2013	2014	2015	2012-2014	2013-2015
Killen	5,362	7,884	13,095	5,682	26,341	26,661

Table 17: 2012 to 2015 emissions, DP&L Stuart and Killen Plants.

The data presented in Table 17 demonstrates that 2015 SO_2 emissions were very similar to 2012 emissions for both DP&L Stuart and Killen facilities. Both years were relatively low in emissions relative to 2013 and 2014, which suggests that the maximum fourth-highest daily values modeled for 2013 and 2014 would dominate the three-year design value. The replacement of 2012 data with 2015 data would not be expected to change the modeled outcome significantly. Ohio EPA contends that this slight increase in total emissions is not likely to lead to a significant increase in modeled design values if 2013-2015 were modeled.

To assess the sensitivity of modeled impacts to changes in emissions, Ohio EPA first analyzed the MAXDCONT output from the 2012 to 2014 recommended designations modeling. This analysis was limited to the one-hundred highest 4th high maximum daily values across the receptor grid. Emissions from the DP&L Stuart facility were the largest contributor to these design values, accounting for 83 to 91% of the design value concentration. Background was the next largest contributor, accounting for 9 to 16% of the modeled design values. Contributions from the DP&L Killen and Spurlock Station are less than 1% combined at the highest design values.

Based on the results above, Ohio EPA limited the second portion of the sensitivity analysis to the DP&L Stuart plant. In this analysis, Ohio EPA modeled fixed, normalized emissions at the DP&L Stuart plant. Emission rates were normalized to the facility-wide 2015 emissions. To reflect the decreased utilization of the bypass stacks, discussed below, Ohio EPA modeled the stack parameters for the flue-gas desulfurization stacks. These stacks have lower temperatures and exit velocities relative to the bypass, and likely represent a more conservative representation of the ground-level impacts. As with the previous analysis, Ohio EPA limited the analysis to the first one-hundred highest 4th high maximum daily values across the receptor grid. This analysis indicates that the 0.58% increase in emissions from the DP&L Stuart facility increases maximum design values by approximately 2.05%. As a conservative approximation, a 2.05% increase in the maximum modeled design value, 186.26472 $\mu g/m^3$, would result in a design value of 190.083 $\mu g/m^3$, which is still below the standard. It should be noted that the 2.05% increase applied here is overly conservative, as no attempt was made to eliminate background or the minor contributions of the other facilities. While this analysis does not fully account for potential differences in hourly meteorological conditions, its conservative nature supports Ohio EPA's contention that 2013 to 2015 emissions modeling is not necessary.

In addition to emissions data, Ohio EPA examined the use of the Flue Gas Desulfurization (FGD) bypass stack at the DP&L Stuart plant. The annual percent usage of the FGD bypass is shown in Table 18.

	2012	2013	2014	2015	2012-2014	2013-2015
Stuart - 1	3.9%	2.8%	0.5%	0.7%	2.4%	1.4%
Stuart - 2	2.3%	1.6%	3.1%	0.5%	2.3%	1.7%
Stuart - 3	2.8%	2.0%	1.8%	1.0%	2.2%	1.6%
Stuart - 4	2.4%	1.5%	1.3%	1.1%	1.7%	1.3%
Facility wide	2.8%	2.0%	1.6%	0.9%	2.2%	1.5%

Table 18: Annual FGD bypass utilization, DP&L Stuart.

As shown in Table 18, utilization of the FGD bypass stack has decreased considerably. Based on facility outreach, Ohio EPA understands that recent upgrades to facility automation will further reduce the utilization of the bypass stack in 2016 and beyond. Decreased use of the bypass stack helps to decrease SO_2 emissions, even during periods of increased boiler utilization, by routing all emissions through the FGD equipment.

Lastly, if Ohio EPA were to perform a modeling analysis of 2013-2015 emissions, likewise it would be necessary to perform a reanalysis of the variable background applied in the model. Background concentrations for the source area were derived from ambient air quality data collected at monitor 39-001-0001. Fourth-highest maximum daily values (99th percentile) recorded at the monitor, years 2012-2015, are presented in Table 19.

	2012 99th Percentile (ppb)	2013 99th Percentile (ppb)	2014 99th Percentile (ppb)	2015 99th Percentile (ppb)
39-001-0001	29	24	24	12

Table 19: 99th percentile monitored values, monitor 39-001-0001.

The data presented in Table 19 indicate a substantial reduction in the 99th percentile maximum daily value recorded at monitor 39-001-0001. Ohio EPA contends that if an updated background was derived for years 2013-2015, that background would be considerably less than the background applied in the 2012-2014 modeling analysis conducted for this recommended designation. Therefore, it is Ohio EPA's judgement that the emission increase does not necessitate further modeling, nor would such an exercise likely lead to a modeled exceedance of the standard.

In addition to the dispersion modeling analysis of the DP&L Stuart and DP&L Killen facilities, Ohio EPA is presenting data from the ambient SO_2 monitoring site in Adams County, monitor 39-001-0001 and the 3 monitors located in Scioto County. Table 20 summarizes the 2012-2014 and 2013-2015 SO_2 design values at these monitors. Attainment is monitored at all locations for both design value periods.

County	Site	3-Year Average	
		2012 to 2014	2013 to 2015
Adams	39-001-0001	26	20
Scioto	39-145-0013	9	11
Scioto	39-145-0020	27	26
Scioto	39-145-0022	19	19

Table 20: 2012-2014 and 2013-2015 SO_2 design values.

The location of the above monitors, as well as those sources explicitly modeled, are shown in Figure 18.

Figure 18: Adams and Scioto County monitoring locations.

These monitors provide additional evidence that portions of Adams and Scioto Counties, beyond what is immediately impacted by those facilities explicitly modeled, are attaining the standard. This is particularly true when emissions in the remainder of the five county area are considered, as described in Factor 2, below.

Factor 2: Emissions

As part of the modeling analysis of the DP&L Stuart and DP&L Killen facilities, Ohio EPA examined emissions within 50 kilometers of the facilities. It was determined additional sources did not necessitate modeling but were represented by the background concentrations (Appendix Y). Regardless, as noted above, one additional facility in Kentucky, Spurlock Station, was included explicitly in the modeling to ensure the modeling would remain conservative. The entirety of the domain modeled demonstrated attainment.

As part of the Factor 2 analysis, Ohio EPA analyzed SO_2 emissions from Adams County and those Ohio counties not analyzed elsewhere in this submittal and that are surrounding Adams County for which Ohio EPA is recommending a designations of unclassifiable/attainment, absent those emissions from DP&L Stuart and DP&L Killen facilities explicitly modeled. Portions of the surrounding Ohio counties were also part of the modeled domain. These counties include Brown, Highland, Pike and Scioto. Table 17 Shows county-wide total SO_2 emissions from stationary sources with reported actual SO_2 emissions of 1 TPY or greater. Combined, these counties are all below the 2,000 TPY significance threshold.

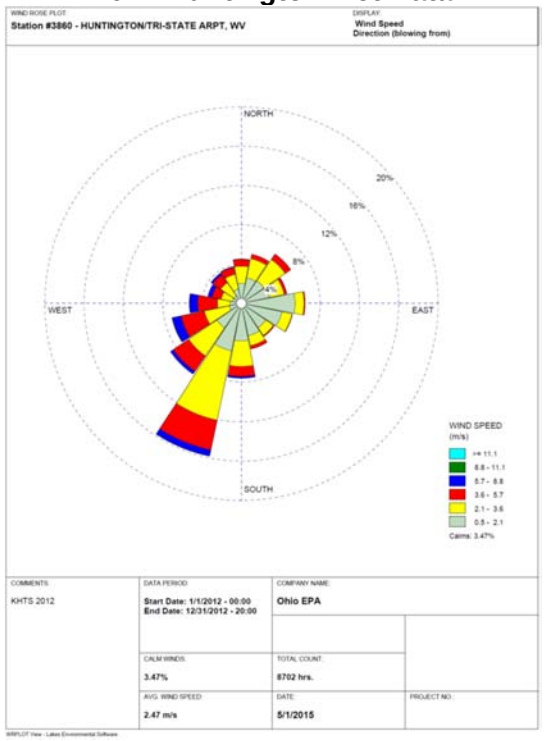
County	2014	Modeled	2014 Absent Modeled	2015	Modeled	2015 Absent Modeled
Adams	23,866.60	23,863.70	2.90	14,732.27	14,727.82	4.45
Brown	10.23	0	10.23	10.56	0	10.56
Highland	<1	0	<1	1.32	0	1.32
Pike	<1	0	<1	<1	0	<1
Scioto	1,937.37	0	1,937.37	1,459.37	0	1,459.37

Table 21: County Totals of SO_2 Point Source Emissions 1 TPY or Greater Adams, Brown, Highland, Pike and Scioto Counties.

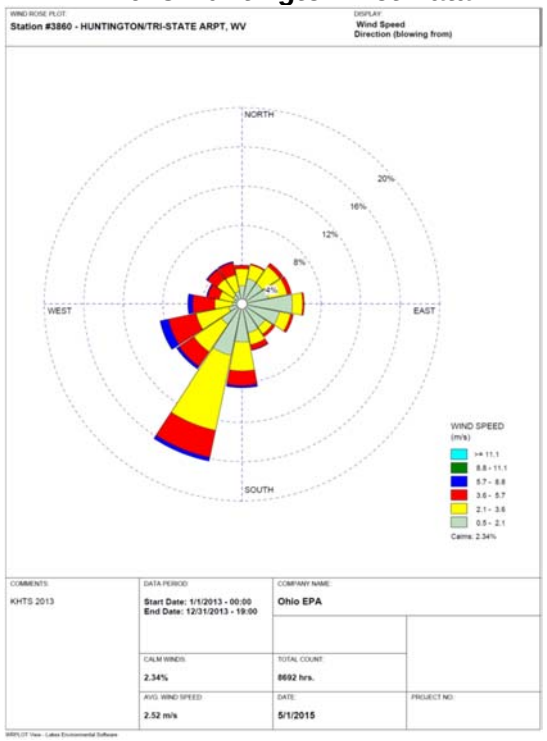
Factor 3: Meteorology

Please refer to the Factor 3 general discussion at the beginning of this document for general meteorological information applicable to Adams County and the DP&L Stuart and Killen facilities. Per relevant U.S. EPA guidance, dispersion modeling accounts for the majority of topographical and land use features that influence the meteorology of the analysis area. Of particular importance in Ohio's designation recommendation for this area are the annual trends and distribution of wind directions in this area, which are best represented by data from the National Weather Service station located at the Huntington Tri-State Airport in Wayne County, West Virginia. Wind roses from this station, years 2012-2014, are shown in Figure 19, below.

2012 Huntington Met Data



2013 Huntington Met Data



2014 Huntington Met Data

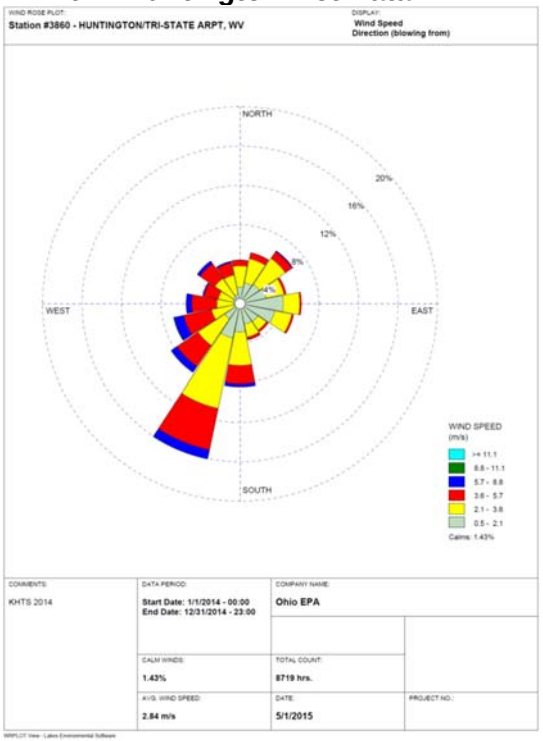


Figure 19: Huntington wind roses, 2012-2014.

The predominant wind directions were used, in part, to inform which facilities within 50 kilometers may potentially impact ambient SO_2 concentrations in the DP&L Stuart and Killen facility area not accounted for by background and therefore necessitate inclusion in the dispersion modeling analysis. This is discussed in more detail in Appendix Y.

Factor 4: Topography and Land Use/Land Cover

Please refer to the general discussion of Factor 4 at the beginning of this document. Ohio, consistent with U.S. EPA guidance, understands that the topography and land use characteristics influencing meteorology and the dispersion of SO_2 emissions from the major SO_2 sources impacting air quality in the analysis area is adequately accounted for via the dispersion modeling analysis. Although Ohio EPA did not explicitly conduct a land use analysis for this source area, a cursory examination of the included maps (Figures 17 and 18) indicate that the sources are clearly located in a rural location, and thus rural dispersion coefficients were used in the AERMOD modeling analysis.

Factor 5: Jurisdictional Boundaries

Adams, Highland, and Pike Counties are not part of any larger combined statistical area. Scioto County is part of the Charleston-Huntington-Ashland, WV-OH-KY combined statistical area. Brown County is part of the Cincinnati, OH-KY-IN Metropolitan statistical area. The Ohio EPA Central Office and the Portsmouth Local Air Agency are responsible for air quality planning within all areas of Adams, Brown, and Scioto Counties. The Ohio EPA Central Office and Ohio EPA Southeast District Office are responsible for air quality planning within all areas of Pike County. The Ohio EPA Central Office and Ohio EPA Southwest District Office are responsible for air quality planning within all areas of Highland County. Adams, Brown, Highland, Pike, and Scioto Counties are not currently nonattainment for the 2010 1-hour SO_2 standard.