June 27, 2024

John Mooney
Director, Air and Radiation Division
U.S. EPA, Region 5
77 West Jackson Blvd
Chicago, Illinois 60604

Re: Ohio's 2024 Annual SO_2 Emissions Review

Dear Director Mooney:

I am writing to submit Ohio's 2024 Annual SO_2 Emissions Review, in accordance with the Data Requirements Rule for the 2010 SO_2 standard [80 FR 51052, August 21, 2015]. This rule established ongoing data review requirements including, for areas where modeling of actual SO_2 emissions served as the basis for an attainment/unclassifiable designation, an annual review of emissions data and submittal of a report recommending whether updated modeling is necessary due to emissions increases.

Ohio's annual SO_2 emissions review for 2024, based on a review of emissions data reported through 2023, indicates that updated modeling is not necessary. Therefore, Ohio EPA does not recommend updated modeling.

Ohio EPA notified the public of the availability of the draft emissions review for public comment on May 9, 2024. The public comment period closed on June 10, 2024. No comments were received during the public comment period.

If you have questions, please contact Jennifer Van Vlerah in Ohio EPA's Division of Air Pollution Control at (614) 644-3696.

Sincerely,

Robert Hodanbosi

Robert Hodanbosi

Chief, Division of Air Pollution Control, Ohio EPA

Environmental Protection Agency

Ohio's

2024 Annual Sulfur Dioxide (SO_2) Emissions Review

Prepared by:

The Ohio Environmental Protection Agency

Division of Air Pollution Control

June 2024

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Background

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*, 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.

Ohio submitted recommendations for round three designations on January 13, 2017. U.S. EPA finalized designations for these areas on January 9, 2018 (83 FR 1098). Round three and four designations are informed by U.S. EPA's August 21, 2015 *Data Requirements Rule for the 2010 1-hr Sulfur Dioxide (SO_2) Primary National Ambient Air Quality Standard (NAAQS); Final Rule [80 FR 51052]* (herein referred to as the DRR), which required characterization of sources with actual emissions greater than 2,000 tons per year (TPY) of SO_2 through either modeling or monitoring.

The DRR also established ongoing data review requirements including, for areas where modeling of actual SO_2 emissions served as the basis for an unclassifiable/attainment

designation, an annual review of emissions data and submittal of a report recommending whether updated modeling is necessary due to emissions increases. The annual emissions review is due to U.S. EPA Region 5 by July 1, annually, beginning the calendar year after the effective date of designation. This document is Ohio's 2024 annual emissions review and recommendations for whether updated modeling is necessary. The 2024 review is due to U.S. EPA by July 1, 2024 and uses emissions data available through 2023.

Ongoing data requirements apply to all areas for which the initial modeling was based on actual emissions and the area was designated as attaining. Ongoing data requirements do not apply to sources where designations were based on 1) modeling using allowable emissions, or 2) enforceable emissions limits providing for an unclassifiable/attainment designation using modeling with updated allowable emissions limits.

The 2024 annual emissions review includes the following areas:

- William H. Zimmer facility (in the portion of Clermont County excluding Pierce Township) designated unclassifiable/attainment under round two designations.
- Carmeuse Lime Maple Grove (Seneca County) designated unclassifiable/ attainment under round three designations.
- Miami Fort Station (Hamilton County) designated unclassifiable/attainment under round three designations.
- Bay Shore Power Plant (Lucas County) designated unclassifiable/attainment under round three designations.

An emissions review for facilities designated under round one is not required as designations were based on monitored violations, as opposed to violations based on modeling of actual emissions. The area surrounding the General James M. Gavin and Kyger Creek Power Plants (Gallia County in its entirety and the portion of Meigs County including Bedford, Columbia, Rutland, Salem, Salisbury, and Scipio Townships), which was designated unclassifiable under round two, is not included in this review as it was monitored and a request for an attainment/unclassifiable designation was submitted under round four.

After discussion and agreement with U.S. EPA, ongoing review for the following areas has been terminated:

- First Energy W.H. Sammis (the portion of Jefferson County including Brush Creek, Island Creek, Knox, Mount Pleasant, Ross, Salem, Saline, Smithfield, Springfield, and

Wayne Townships), as described in Ohio's Recommended Area Designations for Round 3 submitted on January 13, 2017.

- American Electric Power Conesville Power Plant (Coshocton County), as described in Ohio's Recommended Area Designations for Round 3 submitted on January 13, 2017.
- J.M. Stuart and Killen facilities (Adams County) as described in Ohio's 2019 Annual SO_2 Emissions Review submitted on June 19, 2019.

Analytical Methodology

1. Determining if emissions have increased

To determine if an emissions increase has occurred since the initial modeling, Ohio EPA compared the total annual sum of modeled hourly actual emissions to more recent annual SO_2 emissions data obtained from the Clean Air Markets Program Division (CAMPD) where available, and from the state inventory database (i.e., Ohio's EIS database which serves as the basis for the National Emissions Inventory).

For the initial modeling, Ohio EPA attempted to use variable emissions at the finest temporal scale available for each unit. As described in Ohio's designation modeling protocol (Appendices to Ohio's Recommended Source Area Designation submittals), and in accordance with U.S. EPA's February 2016 draft SO_2 NAAQS Designations Modeling Technical Assistance Document (Modeling TAD), Part 75 emissions reporting data was used for the majority of hourly emissions, with data substitutions for some hours.

The Modeling TAD recognizes the unique and case-by-case nature of modeling analyses conducted for the purposes of designations. With respect to emissions, Section 5.2.1 of the Modeling TAD recommends that the reviewing authority work closely with each facility to determine the accuracy of emissions data. The guidance is not prescriptive with respect to substitution methodologies, but suggests averages of surrounding non-missing hours, peak emissions substitutions, use of emission factors, and others. Ohio EPA understands that data substitutions performed for the fulfillment of Part 75 monitoring and reporting requirements are in many instances conservative. To ensure that modeling presents the most accurate surrogate to monitoring for the purposes of designation, Ohio EPA used a case-by-case approach to data substitution, including, but not limited to, Part 75 substitutions, valid hour-before hour-after averaging, mathematical interpolation across valid surrounding hours, and engineering methods.

Ohio EPA's initial analysis to determine if emissions increased compares the modeled emissions to more recent annual SO_2 emissions data obtained from CAMPD, where available, and from the state inventory database (i.e., Ohio's EIS database which serves as the basis for the National Emissions Inventory). Data reported to CAMPD is done so for the accounting of emission allowance consumption, in accordance with Part 75 monitoring and reporting requirements. Accordingly, the data tends to overstate emissions when there are errors in the monitoring equipment or periods of missing data, as described in the Part 75 monitoring and reporting requirements. The data substitution methodologies employed via Part 75 requirements can lead to overestimations of emissions data. Therefore, this will provide a conservative estimate of the change in emissions, without necessitating the extensive analysis and substitution of variable emissions performed for the modeling. If it appeared based on this conservative analysis that emissions have increased and updated modeling may be warranted, Ohio EPA more closely evaluated the actual variable emissions and performed appropriate substitutions.

Ohio EPA also reviewed SO_2 emissions for any new sources and existing sources not explicitly modeled within 50 kilometers of the modeled source to determine if additional analysis is warranted.

2. Determining if updated modeling is warranted

If an emissions increase occurred, Ohio EPA describes the reason for emissions increases from the previous year and recommends whether the emissions increase warrants updated modeling. Whether an emissions increase necessitates modeling is determined on case-by-case basis.

U.S. EPA *generally recommends* updated modeling if:

- Original modeling was greater than or equal to 90% of standard (≥176.58 µg/m^3) and there is any increase in emissions; or
- Original modeling is 50-90% of standard (98.1-176.58 µg/m^3) and emissions increased by 15% or more.

Some additional considerations noted by U.S. EPA include:

- If the emissions increase is substantial and previous modeling was just under the standard, modeling should be updated; and
- If the emissions increased only slightly and previous modeling was well below the standard, judgment may be exercised.

There are other factors that might be considered on a case-by-case basis. For example, Ohio EPA relied upon other factors for an analysis in Ohio's Recommended Area Designations for Round 3, for Dayton Power and Light J.M. Stuart and Killen Stations (pp. 63-66). These included:

- Which year's emissions would dominate the three-year design value, and how the increased emissions are relative to that year (i.e., whether replacement of the current year's data with data used in the modeling would be likely to lead to significant increase in modeled design values); and
- Assessing the sensitivity of modeled impacts to changes in emissions (i.e., estimate how much the maximum design value would be increased by the increase in emissions).

William H. Zimmer Facility

The area surrounding the William H. Zimmer Facility (the portion of Clermont County excluding Pierce Township) was designated unclassifiable/attainment under round two designations by U.S. EPA effective September 12, 2016 (81 FR 45039) based on modeling using actual emissions and is therefore subject to the ongoing data requirements of the DRR.

Modeling was based on hourly variable emissions data for the 2012-2014 period submitted to Ohio EPA by Dynegy Zimmer, LLC for all SO_2 sources at the William H. Zimmer Facility. Modeled SO_2 emissions for 2012 to 2014 and reported SO_2 emissions from 2021 to 2023 are shown in Table 1 and Figure 1. The vast majority of emissions have been contributed by Unit 1 (B006). As shown in Table 2, facility total emissions decreased by 64.3% for the 2021-2023 time period compared to the 2012-2014 modeled emissions. It should be noted that on April 17, 2023, Ohio EPA was notified by Vistra Corp, the current owner of the William H. Zimmer Facility, that each of the three SO_2-emitting emissions units (B006, B007, and B008) had been permanently shut down on December 31, 2022, and therefore had zero SO_2 emissions for 2023. All air permits associated with these three emissions units were terminated effective April 17, 2023.

Table 1. William H. Zimmer Annual SO_2 Emissions (Tons)

Unit	Modeled SO_2 Emissions (Tons)			Reported SO_2 Emissions (Tons)		
	2012	**2013**	**2014**	**2021**	**2022**	**2023**
1 (B006)	10,094.79	18,399.83	13,516.86	8,719.71	6,286.00	0.00
Aux A (B007)	18.53	6.73	0.16	0.04	0.01	0.00
Aux B (B008)				0.04	0.01	0.00
Facility Total	**10,113.32**	**18,406.56**	**13,517.02**	**8,719.79**	**6,286.02**	**0.00**

Figure 1. William H. Zimmer Annual SO_2 Emissions (Tons)

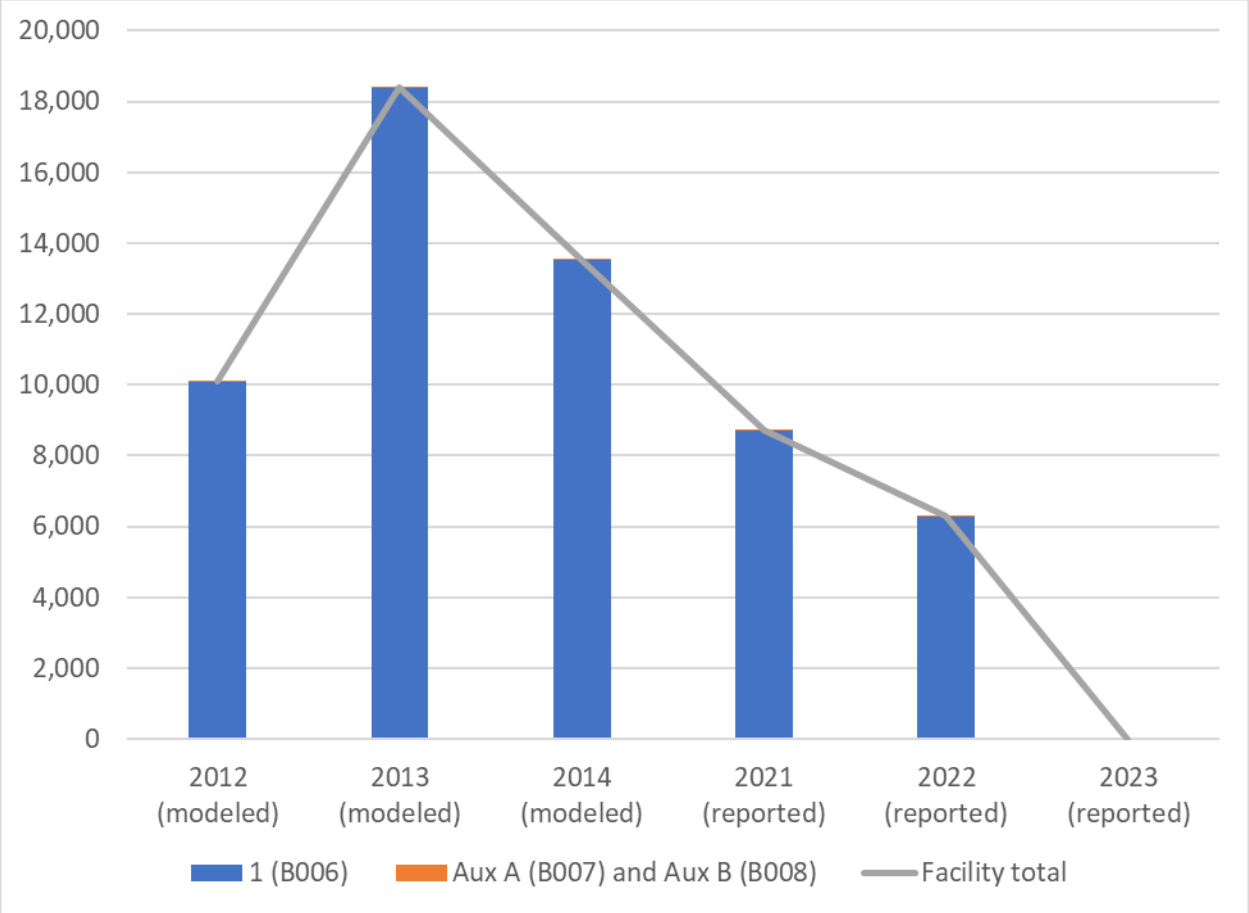

Table 2. Percent Change in Annual SO_2 Emissions at William H. Zimmer

Unit	2012-2014 Total Modeled SO_2 Emissions (Tons)	2021-2023	
		Total SO_2 Emissions (Tons)	% Change
1 (B006)	42,011.49	15,018.50	-64.3%
Aux A (B007) and Aux B (B008)	25.42	0.11	-99.6%
Facility Total	**42,036.91**	**15,018.61**	**-64.3%**

In the original modeling, the maximum modeled 3-year design value for 2012-2014 was 118.2265 µg/m^3 (147.0025 µg/m^3, with background). An area meets the standard of 75 ppb if a concentration of 196.2 µg/m^3 or lower is modeled. Therefore, the original modeling was 75% of the standard. For original modeling results between 50 and 90% of the standard, U.S. EPA generally recommends updated modeling if emissions increase by 15% or more. Emissions have not increased by 15% or more for any individual unit or for the facility as a whole.

The original analysis showed a design value of 25% below the standard. Lower 2021-2023 emissions mean that any new modeling would likely show even lower concentrations. The source configuration and release characteristics at the Zimmer facility have not changed significantly from those modeled. Additionally, there were no new sources or changes in existing sources not explicitly modeled within 50 kilometers that warrant additional analysis, with the exception of Carmeuse Lime Black River (Facility ID 2119100002) located 3.5 km from Zimmer in Pendleton County, KY. Emissions at this facility increased from 651.31 tons in 2014 to 1,003.36 tons in 2022 (2023 emissions are not yet available). Emissions from this facility were accounted for in the background concentration. Previously performed dispersion modeling of a similar facility, the Carmeuse Lime Maple Grove facility in Seneca County, indicated that a maximum impact of 146 µg/m^3 occurred 850 meters away from the source (see Appendix P of Ohio's 2010 Revised Sulfur Dioxide National Ambient Air Quality Standard Recommended Area Designations Round 3, submitted January 13, 2017). The Carmeuse Lime Black River facility in Pendleton County, KY that is in question here is approximately 7.5 times smaller than the source modeled in Seneca County, based on actual emissions in 2022, indicating that the maximum impact of the Pendleton County facility would roughly be in the 20 µg/m^3 range. As noted above, emissions from the Zimmer facility decreased by 64.3%, which scales to a maximum impact of roughly 52 µg/m^3. Even if the maximum impacts from

these two facilities coincide at the same location, which is unlikely given the size of the Carmeuse Lime Black River facility and distance between the two facilities, updated modeling would still not likely model an exceedance. The tallest stack at the Carmeuse Lime Black River facility in Pendleton County, KY is 36 meters high. Ohio EPA's experience indicates that the maximum SO_2 1-hour impacts occur within a distance of approximately 10 times the tallest stack height. Thus, the maximum impact would likely occur within approximately 400 meters of the Carmeuse Lime Black River facility, well short of the point of Zimmer's maximum impact.

Given the significant decrease in emissions at the Zimmer facility, including the permanent shutdown of the three SO_2-emitting emissions units at the Zimmer Facility, and the initial modeling 25% below the standard, Ohio EPA does not believe modeling would show nonattainment. Therefore, Ohio EPA does not recommend updated modeling.

Carmeuse Lime Maple Grove

The area surrounding the Carmeuse Lime Maple Grove facility (Seneca County) was designated unclassifiable/attainment under round three designations by U.S. EPA effective April 9, 2018 (83 FR 1098) based on modeling using actual emissions and is therefore subject to the ongoing data requirements of the DRR.

Originally, modeling was conducted using hourly variable emissions data from the 2012-2014 time period. However, under the 2019 annual review conducted by Ohio EPA, emissions increased by 61% (exceeding the 15% threshold) from the original 2012-2014 modeling, necessitating updated modeling. The new modeling conducted subsequent to the 2019 annual review was based on hourly variable emissions data for the 2016-2018 time period submitted to Ohio EPA by Carmeuse Lime Maple Grove for all SO_2 sources at the facility. This modeling was included in Appendix A of the 2020 SO_2 Annual Emissions Review.

Subsequently, under the 2022 annual review conducted by Ohio EPA, emissions increased by 16.1% (exceeding the 15% threshold) from the updated 2016-2018 time period modeling, necessitating updated modeling. The new modeling conducted subsequent to the 2022 annual review was based on hourly variable emissions data for the 2019-2021 time period submitted to Ohio EPA by Carmeuse Lime Maple Grove for all SO_2 sources at the facility, resulting in a modeled concentration equal to 99.95% of the standard. This modeling was included in Appendix A of the 2023 SO_2 Annual Emissions Review. For that submittal, Ohio EPA explicitly included emissions from Sunny Farms Landfill (Facility ID 0374010199), now

known as WIN Waste Innovations of Seneca County, in the modeling analysis, based on steadily increasing actual emissions from this facility since the 2012-2014 period.

Under the 2023 annual review conducted by Ohio EPA, emissions from Carmeuse Lime Maple Grove increased by 8.0% from the updated 2019-2021 time period modeling, necessitating updated modeling. The new modeling conducted subsequent to the 2023 annual review was based on hourly variable emissions data for the 2020-2022 time period submitted to Ohio EPA by Carmeuse Lime Maple Grove for all SO_2 sources at the facility. This modeling analysis is included in Appendix A of this document.

Modeled SO_2 emissions for 2020 to 2022 and reported SO_2 emissions from 2021 to 2023 are shown in Table 3 and Figure 2 for both Carmeuse Lime Maple Grove and WIN Waste Innovations of Seneca County. Both Carmeuse Lime Maple Grove units (P003 and P004) share a combined stack, so were not modeled individually. As shown in Table 4, Carmeuse Lime Maple Grove reported SO_2 emissions for the 2021-2023 time period that decreased 5.3% compared to the 2020-2022 modeled emissions.

Table 3. Carmeuse Lime Maple Grove and WIN Waste Innovations of Seneca County Annual SO_2 Emissions (Tons)

Unit	Modeled SO_2 Emissions			Reported SO_2 Emissions		
	2020	**2021**	**2022**	**2021**	**2022**	**2023**
Carmeuse Lime Maple Grove (P003)	5,402.56	7,989.08	7,554.95	3,792.30	3,898.94	1,986.99
Carmeuse Lime Maple Grove (P004)				4,189.98	3,655.89	2,313.61
Carmeuse Lime Maple Grove (Facility Total)	*5,402.56*	*7,989.08*	*7,554.95*	*7,982.28*	*7,554.83*	*4,300.60*
WIN Waste Innovations of Seneca County (Facility Total)	*155.49*	*155.49*	*155.49*	*2,377.16*	*1,573.53*	*721.29*
Grand Total	**5,558.05**	**8,144.57**	**7,710.44**	**10,359.44**	**9,128.36**	**5,021.89**

Figure 2. Carmeuse Lime Maple Grove and WIN Waste Innovations of Seneca County Annual SO_2 Emissions (Tons)

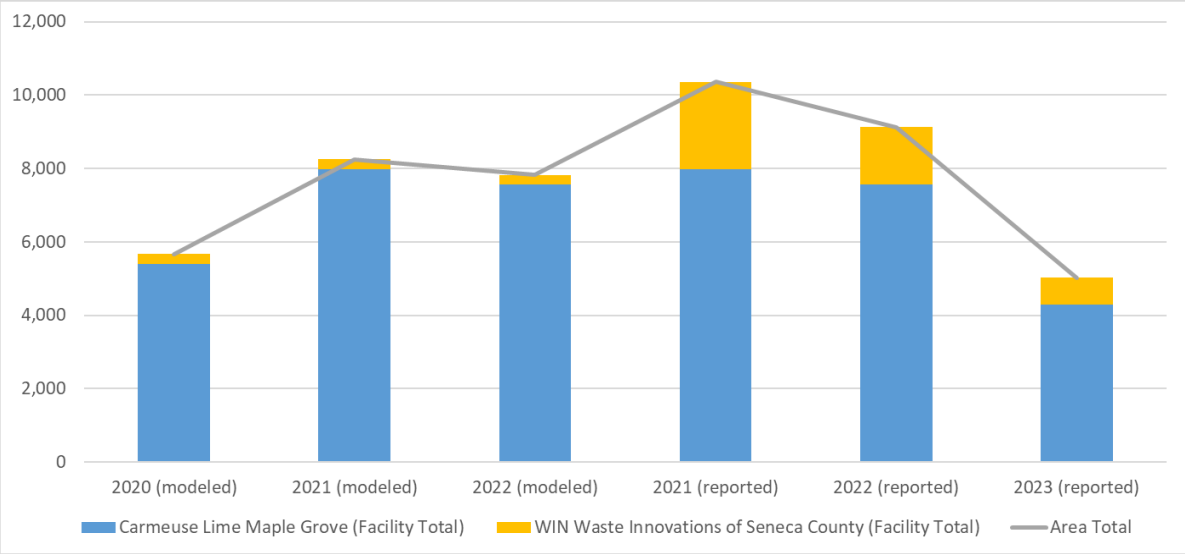

Table 4. Percent Change in Annual SO_2 Emissions at Carmeuse Lime Maple Grove

Unit	2020-2022 Total modeled emissions (Tons)	2021-2023	
		Total emissions (Tons)	% change
CLMG Facility Total	20,946.59	19,837.71	-5.3%

The source configuration and release characteristics at the Carmeuse Lime Maple Grove facility have not changed significantly from those modeled. Additionally, there were no new sources or changes in existing sources not explicitly modeled within 50 kilometers that warrant additional analysis.

In the scenario modeling only SO_2 emissions from the Carmeuse Lime Maple Grove facility over the 2020-2022 time period, the maximum modeled 3-year design value was 211.0027 $\mu g/m^3$, including background concentration, representing a modeled exceedance of the 2010 SO_2 NAAQS value of 196.2 $\mu g/m^3$.

Due to this modeled exceedance of the 2010 SO_2 NAAQS, Ohio EPA performed an updated modeling analysis for SO_2 around the Carmeuse Lime Maple Grove facility to assess the critical emission rate from the combined lime kiln stack that would allow the area to show

modeled compliance with the 2010 SO_2 NAAQS. The modeling analysis is also included in Appendix A of this document. This dispersion modeling was performed for the 2021-2023 time period using an SO_2 emission rate of 1,350.0 pounds per hour (lb/hr) as the critical emission rate from the combined lime kiln stack and an SO_2 emission rate of 88.21 lb/hr for each of the three SO_2-emitting flares at WIN Waste Innovations of Seneca County, a conservative value that accounted for potential future expansion of that facility. This updated modeling showed a maximum modeled 3-year design value for SO_2 of 192.2 µg/m^3, including background, approximately 98% of the 2010 SO_2 NAAQS value of 196.2 µg/m^3. In order to determine an allowable emission rate for SO_2 from the combined lime kiln stack, the ratio of the 99th percentile of hourly average SO_2 emission rates and the 99th percentile of 30-day average SO_2 emission rates from the combined lime kiln stack was calculated based on actual emissions data from 2017-2022, following guidance and methodology from U.S. EPA's April 2014 "Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions" and 40 CFR 63.10021, Equation 9, as discussed in Appendix A. This ratio was determined to be 0.8665, which when multiplied by the previously determined critical emission rate of 1,350.0 lb/hr, resulted in an allowable SO_2 emission rate of 1,170.0 lb/hr from the combined lime kiln stack at the Carmeuse Lime Maple Grove facility.

Ohio EPA is currently in the process of drafting Director's Final Findings and Orders (DFFOs) to establish an enforceable SO_2 emissions limit of 1,170.0 lb/hr as a rolling 30-day average from the combined lime kiln stack receiving and emitting SO_2 emissions from emissions units P003 and P004 at the Carmeuse Lime Maple Grove facility in order to ensure the area around the facility remains in future compliance with the 2010 SO_2 NAAQS. Ohio EPA will be submitting these DFFOs to U.S. EPA for incorporation into Ohio's SO_2 SIP after a separate notice and public participation process.

Given the 5.3% decrease in emissions at the Carmeuse Lime Maple Grove facility and the forthcoming implementation of an enforceable SO_2 emissions limit of 1,170.0 lb/hr from the combined lime kiln stack at the facility, Ohio EPA does not believe updated modeling would show nonattainment. Therefore, Ohio EPA does not recommend updated modeling. Additionally, given that the modeling analysis in Appendix A of this document demonstrates that the area around the Carmeuse Lime Maple Grove facility would meet the 2010 SO_2 NAAQS with allowable emissions, Ohio EPA is no longer required to submit future annual reports for this area, per 40 CFR 51.1205(c).

Miami Fort Station

The area surrounding Miami Fort Station (Hamilton County) was designated unclassifiable/attainment under round three designations by U.S. EPA effective April 9, 2018 (83 FR 1098) based on modeling using actual emissions and is therefore subject to the ongoing data requirements of the DRR.

Originally, modeling was conducted using hourly variable emissions data from the 2012-2014 time period. However, under the 2021 annual review conducted by Ohio EPA, emissions increased by 26% (exceeding the 15% threshold) from the original 2012-2014 modeling, necessitating updated modeling. The new modeling conducted subsequent to the 2021 annual review was based on hourly variable emissions data for the 2018-2020 time period submitted to Ohio EPA by Miami Fort for all SO_2 sources at the facility. A report detailing this modeling was included as Appendix A of the 2022 annual review document.

Subsequently, under the 2022 annual review conducted by Ohio EPA, emissions increased by 26.2% (exceeding the 15% threshold) from the updated 2018-2020 time period modeling, necessitating updated modeling. The new modeling conducted subsequent to the 2022 annual review was based on hourly variable emissions data for the 2019-2021 time period submitted to Ohio EPA by Miami Fort for all SO_2 sources at the facility. A report detailing this modeling was included as Appendix B of the 2023 annual review document.

Modeled SO_2 emissions for 2019-2021 time period and reported SO_2 emissions from the 2021-2023 time period are shown in Table 5 and Figure 3. As shown in Table 6, facility total emissions decreased by 14.0% in the 2021-2023 time period compared to the 2019-2021 modeled emissions.

Table 5. Miami Fort Station Annual SO_2 Emissions (Tons)

Unit	Modeled SO_2 Emissions			Reported SO_2 Emissions		
	2019	2020	2021	2021	2022	2023
Unit 7 (B015)	7,694.17	9,864.81	8,602.44	9,307.06	9,325.07	2,849.51
Unit 8 (B016)	6,206.57	5,981.87	8,136.43	8,430.75	7,633.61	2,425.24
Facility Total (excluding Unit 6)	**13,900.74**	**15,846.68**	**16,738.87**	**17,737.82**	**16,958.68**	**5,274.75**

Figure 3. Miami Fort Station Annual SO_2 Emissions (Tons)

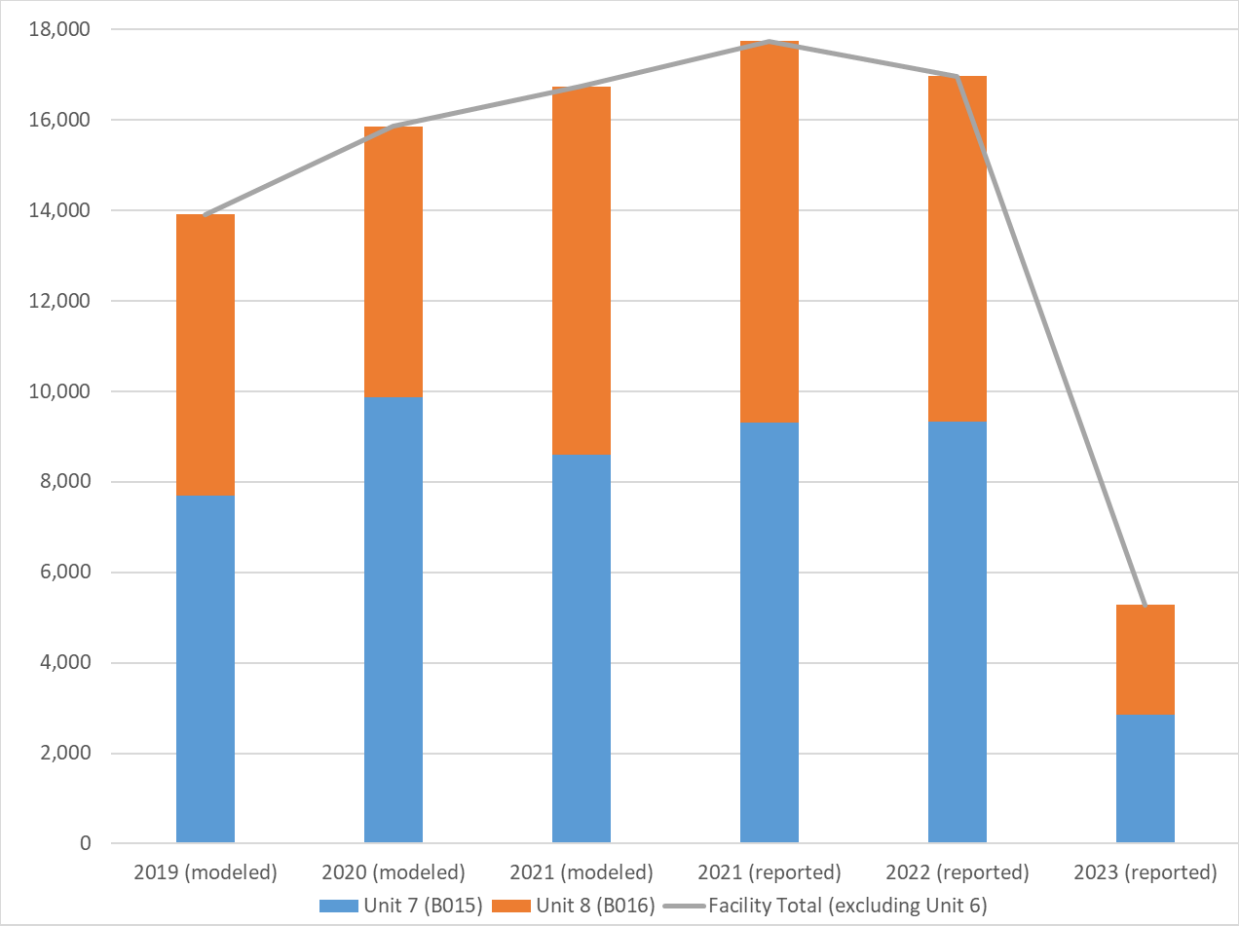

Table 6. Percent Change in Annual SO_2 Emissions at Miami Fort Station

Unit	2019-2021 Total modeled emissions (Tons)	2021-2023	
		Total emissions (Tons)	% change
Unit 7 (B015)	26,161.42	21,481.64	-17.9%
Unit 8 (B016)	20,324.87	18,489.60	-9.0%
Facility Total (excluding Unit 6)	**46,486.29**	**39,971.24**	**-14.0%**

In the updated modeling conducted subsequent to the 2022 annual review, the maximum modeled 3-year design value for SO_2 for the time period 2019-2021 was 162.10351 µg/m^3, including background. An area meets the standard of 75 ppb if a concentration of 196.2 µg/m^3 or lower is modeled. Therefore, the modeling was 82.6% of the standard. For original modeling results between 50 and 90% of the standard, U.S. EPA generally recommends updated modeling if emissions increase by 15% or more. Emissions have decreased during this review period by 14.0% for the facility as a whole.

The modeling analysis showed a design value of 17.4% below the standard. The source configuration and release characteristics at the Miami Fort facility have not changed significantly from those modeled. There were no new sources or changes in existing sources not explicitly modeled within 50 kilometers that warrant additional analysis.

Given the 14.0% decrease in emissions at the Miami Fort facility and the initial modeling result of 17.4% below the standard, Ohio EPA does not believe updated modeling would show nonattainment. Therefore, Ohio EPA does not recommend updated modeling.

Bay Shore Power Plant

The area surrounding the Bay Shore Power Plant (Lucas County) was designated unclassifiable/attainment under round three designations by U.S. EPA effective April 9, 2018 (83 FR 1098) based on modeling using actual emissions and is therefore subject to the ongoing data requirements of the DRR.

Modeling was based on hourly variable emissions data for the 2012-2014 time period submitted to Ohio EPA by First Energy for the single SO_2 source at the facility (B006 circulating fluidized bed pet-coke fired boiler). The coal fired boilers located at the Bay Shore plant permanently ceased operation in September of 2012 and were therefore not included in Ohio EPA's modeling analysis. The modeling also included two nearby sources: the Ohio Refining Company facility (formerly known as the BP Husky facility), located approximately 2.5

kilometers to the southwest of the Bay Shore plant and an additional source, Chemtrade Refinery Solutions, which is co-located with the Ohio Refining Company facility.

Modeled SO_2 emissions for the 2012-2014 time period and reported SO_2 emissions from the 2021-2023 time period are shown in Table 7 and Figure 4. As shown in Table 8, facility total emissions at the Bay Shore Power Plant decreased by 5.7% in the 2021-2023 time period compared to the 2012-2014 modeled emissions. Area-wide total emissions for all facilities included in the modeling decreased by 27.6% in the 2021-2023 time period compared to modeled emissions.

Table 7. Bay Shore Power Plant, Ohio Refining Company, and Chemtrade Refinery Solutions Annual SO_2 Emissions (Tons)

Unit	Modeled SO_2 Emissions (Tons)			Reported SO_2 Emissions (Tons)		
	2012	2013	2014	2021	2022	2023
Bay Shore Power Plant (B006)	2,546.78	2,824.60	1,998.52	2,373.87	2,239.95	2,337.62
Ohio Refining Company (Facility Total)	1,016.80	1,436.69	1,599.69	593.18	453.03	256.02
Chemtrade Refinery Solutions (Facility Total)	34.57	34.57	34.57	30.05	30.52	26.04
Area Total	**3,598.15**	**4,295.86**	**3,632.78**	**2,997.09**	**2,723.50**	**2,619.69**

Figure 4. Bay Shore Power Plant, Ohio Refining Company, and Chemtrade Refinery Solutions Annual SO_2 Emissions (Tons)

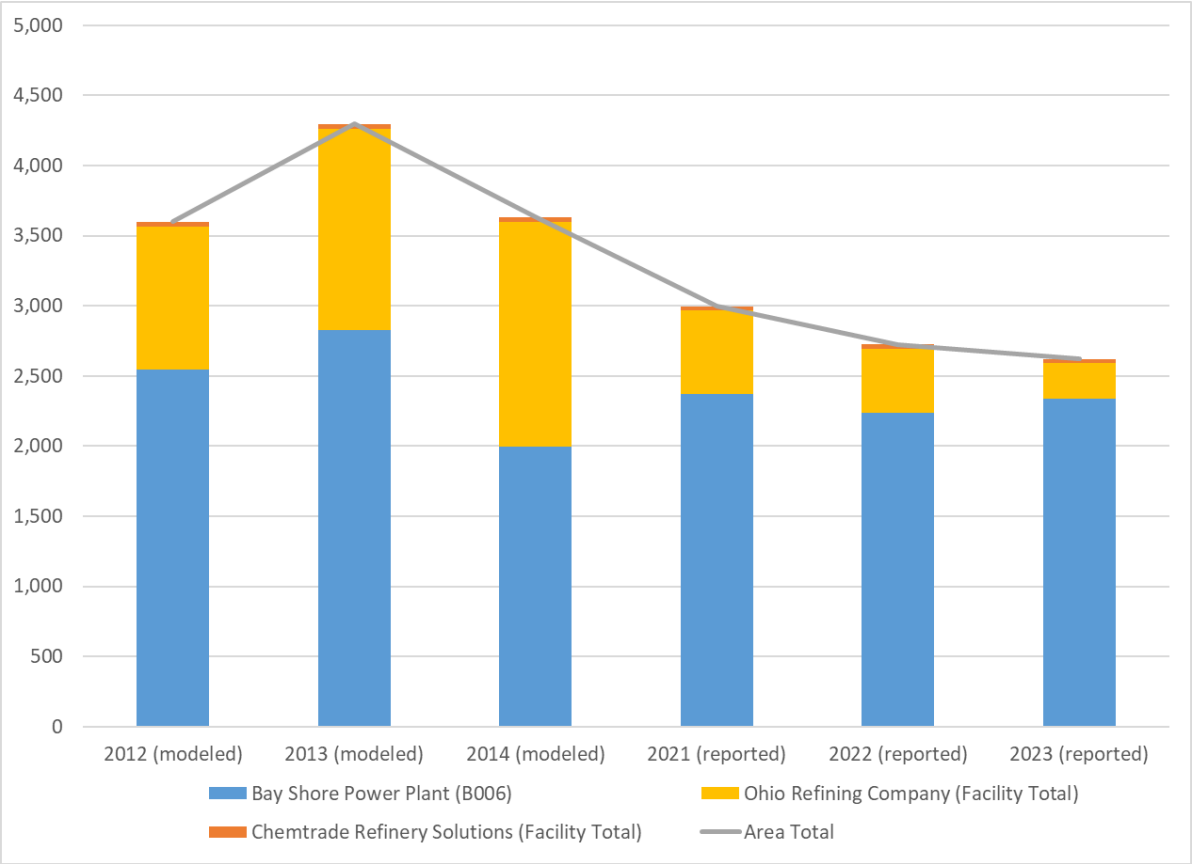

Table 8. Percent Change in Annual SO_2 Emissions in the Bay Shore Area

Unit	2012-2014 Total modeled emissions (Tons)	2020-2022	
		Total emissions (Tons)	% change
Bay Shore Power Plant (B006)	7,369.90	6,951.44	-5.7%
Ohio Refining Company (Facility Total)	4,053.18	1,302.23	-67.9%
Chemtrade Refinery Solutions (Facility Total)	103.71	86.61	-16.5%
Area total	**11,526.79**	**8,340.28**	**-27.6%**

In the original modeling, the maximum modeled 3-year design value for 2012-2014 was 175.29812 µg/m^3, including background. An area meets the standard of 75 ppb if a concentration of 196.2 µg/m^3 or lower is modeled. Therefore, the original modeling was

89.3% of the standard. For original modeling results between 50 and 90% of the standard, U.S. EPA generally recommends updated modeling if emissions increase by 15% or more. Emissions have not increased by 15% or more for the entire combined area. The original analysis showed a design value of 10.7% below the standard. Lower 2021-2023 emissions mean that any new modeling would likely show even lower concentrations.

The source configuration and release characteristics at the Bay Shore Power Plant, Ohio Refining Company, and Chemtrade Refinery Solutions facilities have not changed significantly from those modeled. Additionally, there were no new sources or changes in existing sources not explicitly modeled within 50 kilometers that warrant additional analysis, except for the Evergreen Recycling and Disposal Facility (Facility ID 0387000259) in Northwood, OH and Carleton Farms Landfill (Facility ID N5986) in Wayne County, MI. Evergreen Recycling, located 11.5 km southwest of the Bay Shore facility, experienced an increase in SO_2 emissions to 66.94 tons in 2023, up from 2.12 tons in 2014, representing an increase of 3058%. Carleton Farms Landfill, located 45.0 km north of the Bay Shore Power Plant, emitted 20.62 tons of SO_2 in 2014 and emitted 112.09 tons of SO_2 in 2022, representing an increase of 444%. Emissions from these facilities were accounted for in the background concentration. Given the distance and small magnitude of these increases relative to the total modeled emissions, Ohio EPA does not expect significantly different modeled results. Therefore, Ohio EPA does not recommend updated modeling.

Public Participation

Ohio published solicitation for public comment concerning the draft 2024 Annual Sulfur Dioxide (SO_2) Emissions Review on May 9, 2024. The public comment period closed on June 10, 2024. No comments were received during the public comment period. Appendix B includes a copy of the public notice.

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Appendix A:

Dispersion Modeling Analyses for the Carmeuse Lime Maple Grove Facility & 2010 SO_2 NAAQS Continued Compliance Demonstration

Introduction

Pursuant to the third round of designations and in accordance with the August 21, *2015 Data Requirements Rule for the 2010 1-Hour Sulfur Dioxide (SO_2) Primary National Ambient Air Quality Standard (NAAQS); Final Rule* (DRR), Ohio EPA is submitting an analysis demonstrating continued compliance of the original and promulgated designation for the Carmeuse Lime Maple Grove source area based on refined dispersion modeling.

Per U.S. EPA's guidance (February 2016 *Draft SO_2 NAAQS Designations Modeling Technical Assistance Document* (herein referred to as "Modeling TAD"), "The primary objective of the modeling would be to determine whether an area currently meets the SO_2 NAAQS". Ohio EPA is including this refined dispersion modeling analysis in accordance with the DRR, in which a source for which the original modeling demonstrated impacts between 50 to 90% of standard (98.1-176.58 µg/m^3) and emissions increased by 15% or more from the original modeling might necessitate re-modeling to demonstrate continued compliance with the NAAQS. The original modeling for the Carmeuse Lime Maple Grove facility was 74% of the standard (146.01914 µg/m^3) using total 2012-2014 modeled emissions of 10,967.18 tons (Appendix P of the State of Ohio 2010 Revised Sulfur Dioxide National Ambient Air Quality Standard, Recommended Area Designations, Round 3, submitted to U.S. EPA January 13, 2017). Total reported emissions for the 2020-2022 period were 20,946.59 tons.

The dispersion modeling analysis was conducted for the 2020-2022 period, using actual hourly variable emissions from the Carmeuse Lime Maple Grove facility. This was done per the Modeling TAD, in which U.S. EPA recommends modeling the most recent 3 years of actual emissions.

Hourly variable emissions data for the 2020-2022 period were submitted to Ohio EPA by Carmeuse Lime and Stone for all SO_2 sources at the Carmeuse Lime Maple Grove facility. As described in Ohio's designation modeling protocol (Appendix B of the State of Ohio 2010 Revised Sulfur Dioxide National Ambient Air Quality Standard, Recommended Area Designations, Round 3, submitted to U.S. EPA on January 13, 2017), hourly SO_2 emissions for Carmeuse Lime Maple Grove were based on fuel usage and fuel sulfur content calculations. Only a single SO_2 egress point is present at the Carmeuse Lime Maple Grove facility. This single egress point serves two emission units, kilns P003 and P004.

Ohio EPA's 2023 annual emissions review indicated that WIN Waste Innovations of Seneca County (Facility ID 0374010199, formerly named Sunny Farms Landfill), located approximately 22 km southwest of the Carmeuse Lime Maple Grove facility, emitted 460.48 tons of SO_2 in 2018 and emitted 2,855.57 tons of SO_2 in 2020. This represents a 520.1% increase in SO_2 emissions. As described in Appendix P of the State of Ohio 2010 Revised Sulfur Dioxide National Ambient Air Quality Standard, Recommended Area Designations, Round 3,

submitted to U.S. EPA January 13, 2017, WIN Waste Innovations of Seneca County was not explicitly modeled in prior DRR submittals due to its relatively low emissions (318 tpy) and considerable distance from the Carmeuse Lime Maple Grove facility. Based on the significant increase in emissions from the original DRR submittal, Ohio EPA included WIN Waste Innovations of Seneca County in the modeling evaluation for both the 2019-2021 and 2020-2022 periods. Due to the ongoing installation of controls, changes to stack configurations and egress points, and the receipt of an application for the expansion of WIN Waste Innovations of Seneca County, Ohio EPA elected to model WIN Waste Innovations of Seneca County at maximum permitted emission rates for normal operations, reflective of the anticipated final stack configuration and emission limits, post expansion. Ohio EPA notes that the landfill expansion and additional egress points included in this model have not been approved in a final permit. Therefore, the permitted emission rates for WIN Waste Innovations of Seneca County represent a highly conservative emissions scenario that is approximately 88 TPY greater than what is currently approved in the facility's current operating permit.

Based on a modeled exceedance of the NAAQS using 2020-2022 emissions and meteorological data, Ohio EPA is also including in this report modeling results that will be used to develop federally enforceable emission limits at the Carmeuse Lime Maple Grove facility.

Modeling Approach

Per U.S. EPA's Modeling TAD, "Since the purpose here pertains to designations, this guidance supports analyses of existing air quality rather than analyses of emissions limits necessary to provide for attainment. Consequently, the guidance in this TAD differs in selected respects from the guidance published in Appendix W. These differences include:

- Placement of receptors only in areas where it is feasible to place a monitor vs. all ambient air locations (NSR, PSD, and SIP)
- Use of the most recent 3 years of actual emissions (designations) vs. maximum allowable emissions (NSR, PSD, and SIP)
- Use of 3 years of meteorological data (designations) vs. one to five years (NSR, PSD, and SIP)
- Use of actual stack height for designations using actual emissions vs. Good Engineering Practice (GEP) stack height for other regulatory applications (NSR, PSD, and SIP)"

Ohio EPA incorporated the differences listed above and followed Appendix W guidance where applicable to modeling for designation purposes. The averaging period for the 2010 SO_2

NAAQS is the 99th percentile of maximum monitored daily 1-hour values, averaged over three years. Per the Modeling TAD, three years of National Weather Service data is sufficient to allow the modeling to simulate a monitor. Thus, the modeled form of the standard is expressed as the 99th percentile of maximum daily 1-hour values averaged over three years (herein referred to as "design value") for the purposes of demonstrating continuing compliance with the NAAQS and the promulgated designation.

The recommended dispersion model for modeling for SO_2 designations is the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) modeling system. There are two input data processors that are regulatory components of the AERMOD modeling system: AERMET, a meteorological data preprocessor that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, and AERMAP, a terrain data preprocessor that incorporates complex terrain using United States Geological Survey (USGS) Digital Elevation Data. Additionally, Ohio EPA utilized the AERMINUTE module to incorporate 1-minute ASOS meteorological data into the hourly surface input file. Ohio EPA utilized the most up-to-date versions of AERMOD and the associated preprocessors available at the time of the modeling analyses. These are as follows: AERMOD version 23132, AERMET version 23132, AERMINUTE version 15272, and AERMAP version 18081. All dispersion modeling for this submittal was conducted following Ohio EPA's original designation modeling protocol. AERMOD and all associated preprocessors were run in the default regulatory mode.

Meteorological Data

In order to generate meteorological input data for use with AERMOD, AERMET, along with AERMINUTE and AERSURFACE preprocessing for the modeling domain, was conducted to generate the surface (.sfc) and profile (.pfl) files. Ohio EPA used the AERMINUTE pre-processing module. This module accepts as input 1-minute ASOS meteorological surface observations, calculates an hourly average for each hour in the modeled time period, and substitutes any missing values from the collocated ISHD surface data. Use of AERMINUTE reduces the number of calm hours present in the input files, and these enhanced hourly files are therefore considered more representative of local meteorological conditions.

Meteorological data from 2020-2022 from surface station #14825 located at the Findlay Airport (KFDY) and upper air station #13841 located at the Wilmington Air Park (KILN) were used for the modeling of actual emissions from Carmeuse Lime during the contemporaneous time. Modeling conducted for the development of a new SO_2 limit at Carmeuse Lime was conducted using a full five years of meteorology from the same surface and upper air stations, years 2019-2023. These sites were determined to be representative of Seneca

County, OH and the Carmeuse Lime Maple Grove facility. AERSURFACE was run using twelve sectors and monthly surface characteristics, centered on the location of the surface meteorological station. Monthly precipitation values from the surface station were compared to the 30-year climatological averages to inform monthly surface characteristics. A composite wind-rose of annual trends and distribution of wind directions for years 2019-2021 from the surface station are shown in Figure A1.

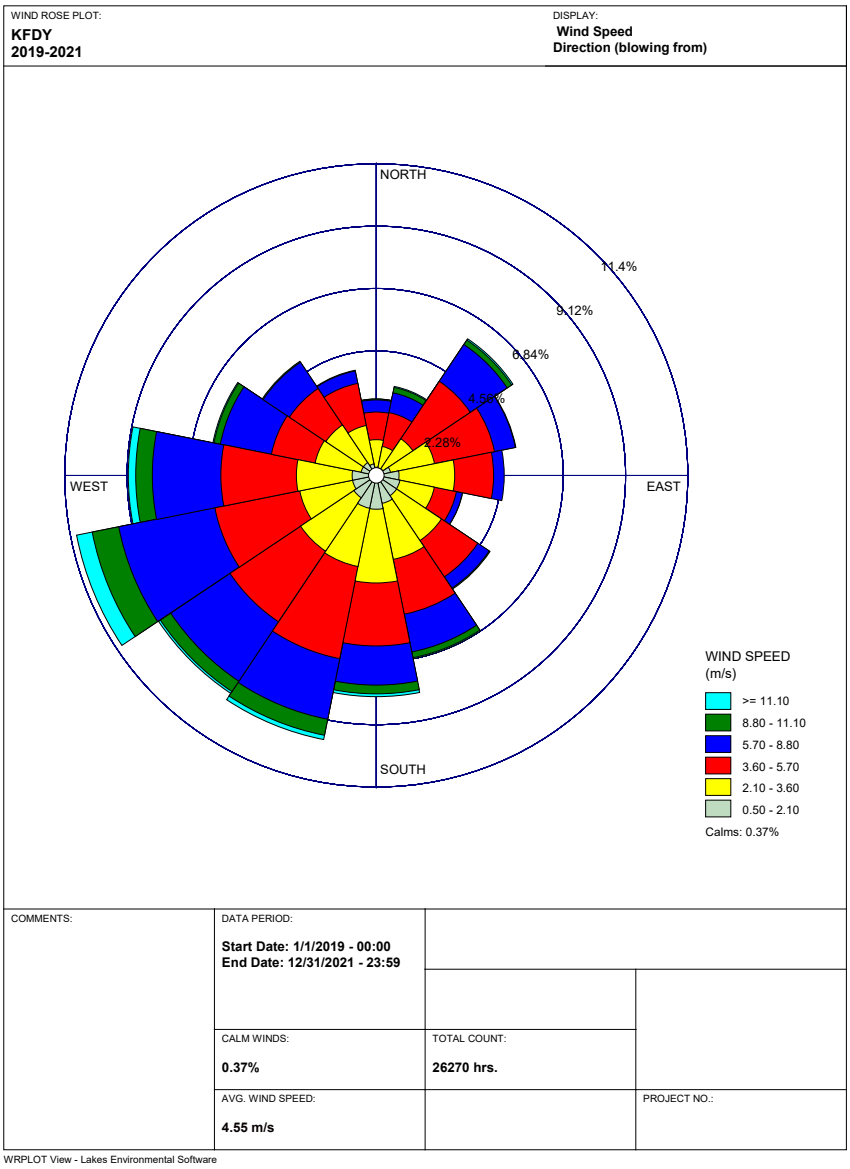

Figure A1: Wind roses, years 2019-2021, Findlay met station.

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. As shown in Figure A1, the predominant winds in the source area originate from the south and southwest, with some degree of contribution from northeasterly winds. Figure A2 shows the location of all facilities within 50 kilometers of the Carmeuse Lime Maple Grove facility, as well as a composite wind rose for years 2019-2021 from the Findlay meteorological station.

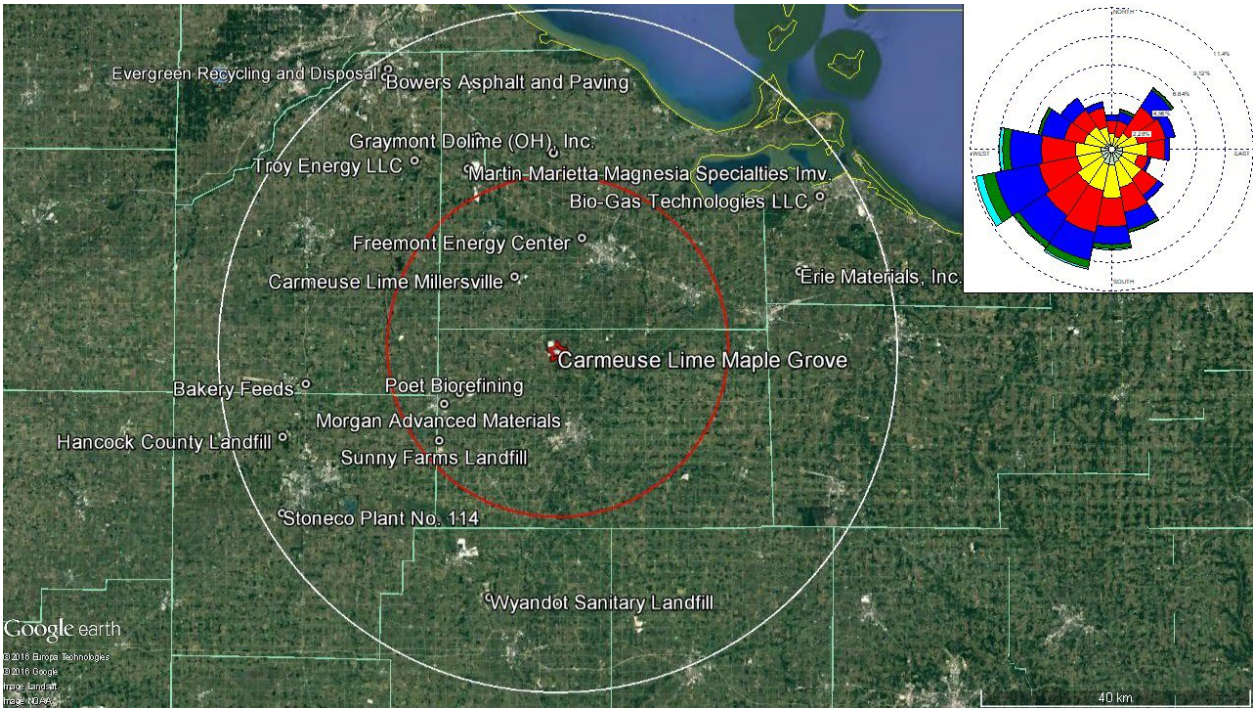

Figure A2: SO_2 sources in the Carmeuse Lime Maple Grove source area, with 2019-2021 composite wind rose.

Considering the predominant wind directions, Ohio does not conclude that the emissions from those sources located to the north and northwest of the Carmeuse Lime Maple Grove facility impact ambient SO_2 concentrations in the Carmeuse Lime Maple Grove source area. Ohio does not conclude that emissions from these sources impact ambient SO_2 concentrations beyond the background level accounted for in the refined dispersion modeling analysis, nor, given the emissions levels of the facilities and the considerable distance between these facilities and the Carmeuse Lime Maple Grove facility, are the combined emissions from these facilities likely to model an exceedance of the standard. Wind direction suggests that emissions from WIN Waste Innovations of Seneca County could potentially impact ambient SO_2 concentrations. Due to the significant distance (22

kilometers) and historical low levels of emissions (460 tpy in 2018), WIN Waste Innovations of Seneca County was excluded from prior Data Requirements Rule modeling analyses. As stated above, recent significant increases in SO_2 emissions from WIN Waste Innovations of Seneca County prompted Ohio EPA to include this facility in the Carmeuse Lime Maple Grove source area analyses. Ultimately, Ohio EPA recognizes that only a small number of hours of unusual or atypical meteorological conditions can cause or contribute to an exceedance of the standard, an understanding the predominant wind patterns of a source area is a strong indicator of the probability of such atypical events occurring. Although an analysis of predominant wind directions is also beneficial here and used as a part of the factor analysis to inform designations, Ohio's assessment of sources to included or exclude from explicit modeling is based primarily on emission levels and distance.

Background

Ohio EPA applied background concentrations of SO_2 to all modeled results under all scenarios. Note that there are no ambient air quality monitors located sufficiently close to the source area to allow a site-specific representative background to be determined from monitored data. The background concentration originally utilized for this source area was 12 ppb, equivalent to 31.392 µg/m^3, and was developed from the Lake Michigan Air Directors' Consortium's regional background of 8 ppb and informed by SCREEN3 modeling of WIN Waste Innovations of Seneca County (460 tons, 22 kilometers distant) (Appendix O of the State of Ohio 2010 Revised Sulfur Dioxide National Ambient Air Quality Standard, Recommended Area Designations, Round 3, submitted to U.S. EPA on January 13, 2017). It is important to note here that Ohio EPA's experience with modeling for the 1-hour SO_2 has greatly increased since the promulgation of the DRR. Given the rural nature and approximately 80% agricultural land use in Seneca County and surrounding counties, Ohio EPA contends that the original background was extremely conservative. Moreover, Ohio has experienced a continuous decrease in SO_2 emissions due primarily to the shuttering of multiple coal-fired electric generating units. It is therefore prudent that the background be reexamined to reflect this improvement in air quality statewide.

In Ohio's original submittal, the facilities within 50 kilometers of Carmeuse Lime emitted 3,078.60 tons of SO_2. In 2020, those same facilities emitted 4,043.57 tons of SO_2. Excluding emissions from all explicitly modeled sources, total SO_2 emissions in 2020 in the Carmeuse Lime source area were 1,188 tons. This represents a decrease in background source emissions of approximately 61%. Since the time of the submittal of the modeling for the purposes of designation, Ohio EPA has expanded the number of "background" SO_2 monitors around the State. These background monitors indicate that a design value-based background level of SO_2 of approximately 2-6 ppb, equivalent to 5.232-15.696 µg/m^3, would be appropriate for most of the non-industrialized areas in Ohio. In July of 2015, Ohio EPA began operating a

preconstruction monitoring site in Belmont County, Ohio (site 39-013-0006). Based on the location of this monitor, Ohio EPA considers this a true background monitor. This monitor has a 2019-2021 1-hour SO_2 design value of 2 ppb (5.232 µg/m^3), and all quarters of the years 2019-2021 meet data completeness requirements. Ohio EPA contends that, based on the emission reductions in the surrounding area and statewide, it is not unrealistic to consider a background of 2 ppb (5.262 µg/m^3) for this area. It should be noted that the Belmont County monitor is situated approximately 17 kilometers to the north (downwind) of the American Electric Power Mitchell Plant, a large coal-fired electric generating unit that emitted 814 tons of SO_2 in 2020, somewhat less than the 1,188 tons emitted by all sources not explicitly modeled within 50 kilometers of the Carmeuse Lime Facility, both upwind and downwind. It should be emphasized that 2020 emissions for all sources within 17 kilometers of the Carmeuse Lime Maple Grove facility were only 3.43 tons. This would indicate that a background concentration of 2 ppb (5.262 µg/m^3) would provide a necessary degree of conservatism. However, for several recent permitting actions in this area of the state, Ohio EPA has utilized background values from monitor 39-003-0009 located in Allen County, approximately 80 kilometers downwind of the center of the Carmeuse Lime/WIN Waste Innovations of Seneca County modeling domain. This monitor had a 2021-2023 SO_2 design value of 3 ppb (7.848 µg/m^3). To maintain consistency with more recent permitting activities, Ohio EPA chose to use 3 ppb (7.848 µg/m^3) as a background concentration in all modeling analyses in the source area.

Emission Sources

The singular SO_2 emission source at the Carmeuse Lime Maple Grove facility was included in the modeling analysis as a single egress point. This egress point represents the combined stack for the two rotary lime kilns at the Carmeuse Lime Maple Grove facility. Three SO_2 emission sources at WIN Waste Innovations of Seneca County were included as three separate egress points. Each egress point at WIN Waste Innovations of Seneca County represents an enclosed flare emission source, which are represented as standard point sources in the modeling domain (EF1, EF2, and EF3). Variable emissions for all egress points in the pre-control scenario were included in the model via the HOUREMIS input pathway for years 2020-2022. Ohio EPA utilized the 1-hour SO_2 design value output option internal to the AERMOD code to simplify post processing and eliminate the need to generate large hourly output files. Ohio EPA included background as a separate source in the model, to simplify the inclusion of the background applied in the modeling domain and to ease the determination of a compliant emission limit at Carmeuse Lime Maple Grove. The relevant release point parameters for all egress points included in the modeling domain are presented in Table A1.

Facility	Source ID	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
Carmeuse	KILN 1 & 2	314903.67	4566022.93	218	60.3504	476.48	14.5531	3.048
WIN Waste	EF1	296816.7	4551967.1	247.21	18.288	1172.039	7.86	3.84048
	EF2	296816.3	4551941.6	247.12	18.288	1172.039	7.86	3.84048
	EF3	296772.7	4551851.4	247.21	18.288	1172.039	7.86	3.84048

Table A1: Modeled source parameters, Carmeuse Lime source area, 2020-2022.

Ohio EPA's experience in modeling for both the 1-hour SO_2 and NO_2 standards suggests that sources located beyond 25 kilometers are unlikely to interact or contribute significantly to a concentration gradient. Those sources within 25 kilometers warrant further discussion. Figure A3 shows those sources located within 25 kilometers of the Carmeuse Lime Maple Grove facility.

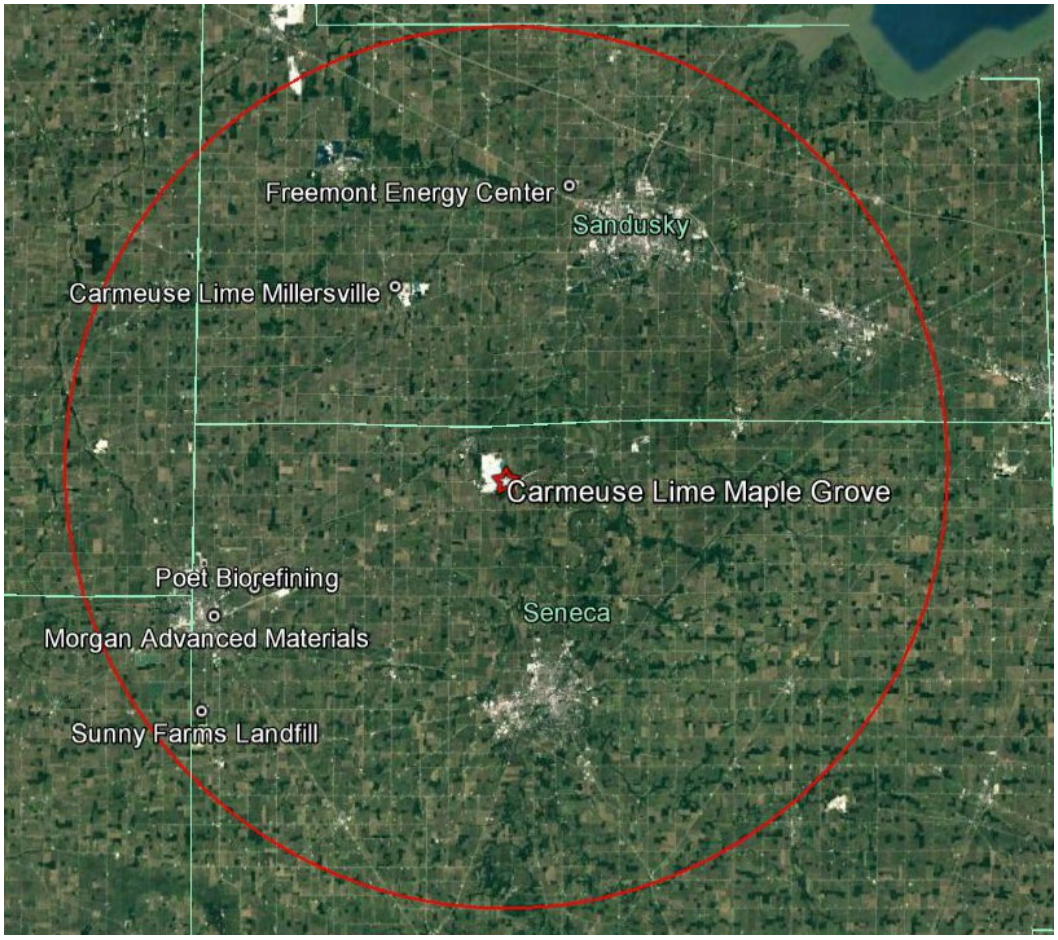

Figure A3: Sources within 25 km of the Carmeuse Lime Maple Grove facility.

Five sources of SO_2 are located within 25 kilometers of the Carmeuse Lime Maple Grove facility. The Fremont Energy Center (4.47 tpy, 17 kilometers) and Carmeuse Lime Millersville (0 tpy, 12.5 kilometers) are located to the north and northwest of the Carmeuse Lime Maple Grove facility. Considering the predominant wind direction, low emissions, and distance between these sources and the Carmeuse Lime Maple Grove facility, it is highly unlikely that these sources would together or individually contribute to a concentration gradient beyond what is accounted for in the background applied in the modeling analysis. Poet Biorefining (3.43 tpy, 15 kilometers) and Morgan Advanced Materials (7.86 tpy, 18 kilometers) have very low emissions and are located at sufficient distance that it is again unlikely that these sources will contribute to a concentration gradient beyond what is accounted for in background. The largest nearby source, WIN Waste Innovations of Seneca County, is located approximately 22 kilometers distant and was explicitly modeled in both the actual emissions and new limit scenarios.

Table A2 presents 2022 SO_2 emissions for all sources greater than 1 tpy of SO_2 within 50 kilometers of the Carmeuse Lime Maple Grove facility. Seneca County and the surrounding region are primarily un-industrialized, agricultural counties. Ohio EPA considered all sources with 2022 SO_2 emissions greater than 1 tpy for this analysis, with a particular focus on those sources with the potential to cause a significant concentration gradient in the source area beyond what is accounted for in background. Based on the data shown in Table A2, explicitly modeled emissions from the Carmeuse Lime Maple Grove facility account for 73% of all SO_2 emissions within the 50-kilometer source area.

State	County	Facility ID	Facility Name	2022 SO_2 Emissions (TPY)	Distance from Carmeuse Lime Maple Grove (km)
OH	Seneca	0374000010	Carmeuse Lime, Inc. - Maple Grove Operations	7,554.83	N/A
OH	Seneca	0374010199	WIN Waste Innovations of Seneca County	1,573.53	22.2
OH	Seneca	0374010109	Morgan Advanced Materials	5.84	18.1
OH	Seneca	0374010235	Poet Biorefining – Fostoria LLC	1.47	15.5
OH	Seneca	0374020242	Maple Grove Materials, Inc. – Tiffin Plant	1.11	0.3
			Seneca County Total	***9,136.78***	
OH	Sandusky	0372000127	Martin Marietta Magnesia Specialties Inc.	827.97	29.8
OH	Sandusky	0372030241	AMP Fremont Energy Center	2.32	17.2
			Sandusky County Total	***830.29***	
OH	Wyandot	0388000039	Wyandot Sanitary Landfill	1.27	36.1
			Wyandot County Total	***1.27***	
OH	Hancock	0332012032	Energy Developments Hancock County, LLC	9.80	41.4
			Hancock County Total	***9.80***	
OH	Ottawa	0362000079	Graymont Dolime (OH), Inc.	195.05	33.7
OH	Ottawa	0362000009	Materion Brush Inc.	10.61	29.2
OH	Ottawa	0362010118	Port Clinton Landfill	28.90	36.1
			Ottawa County Total	***234.56***	
OH	Wood	0387000386	Darling Ingredients Inc. (dba Bakery Feeds)	2.86	36.9
OH	Wood	0387000377	Troy Energy, LLC	3.29	34.8
OH	Wood	0387002042	NSG Glass North America, Inc.	44.73	34.0
OH	Wood	0387000259	Evergreen Recycling and Disposal Facility	83.13	48.7
			Wood County Total	***134.01***	
OH	Erie	0322020211	Erie Materials, Inc.	11.78	42.1
OH	Erie	0335010058	Gerken Materials Inc Plant #10	5.02	37.8
			Erie County Total	***16.80***	
			Grand Total within 50 km of Carmeuse Lime Maple Grove, Exclusive	***2,808.69***	

Table A2: SO_2 source facilities and 2022 emissions within 50 km of Carmeuse Lime Maple Grove.

Based on an analysis of emissions sources within 50 kilometers of the Carmeuse Lime Maple Grove source area, it was determined that the only sources necessitating inclusion in the modeling analysis were the Carmeuse Lime Maple Grove facility and the WIN Waste Innovations of Seneca County facility. The remaining sources are conservatively represented via the background concentration.

Analyses

The continuing-compliance modeling analyses consisted of two separate modeling runs. The first reflects actual emissions from Carmeuse Lime Maple Grove and permitted normal operations for WIN Waste Innovations of Seneca County, years 2020-2022 and is referred to as the "actual emissions" scenario in the remainder of this document. The second reflects a compliant emission rate for Carmeuse Lime Maple Grove and permitted normal operations for WIN Waste Innovations of Seneca County and is referred to as the "compliant emissions" scenario in the remainder of the is document. The results of these analyses will be used to inform a federally enforceable SO_2 at Carmeuse Lime Maple Grove.

Annual total emissions from the hourly emissions file used in the first analysis scenario described above are as follows: 5,403 tons in 2020; 7,989 tons in 2021; and 7,555 tons in 2022. It should be noted that modeled annual emissions differ from those reported to Ohio EPA's emissions inventory system as the methodology for determining hourly emissions suitable for modeling is a more refined and accurate approach. The Appendix A document submitted alongside Ohio's 2019 annual review document describes the methodology used by Carmeuse Lime Maple Grove for estimating hourly emissions used in the modeling, as well as the annual emissions reported to the state EIS inventory database (referred to as the "Fee Report SO_2 Emissions Fee Report" in the 2019 Appendix A document).

Receptors

A total of 19,267 receptors were included in the modeling domain for both modeling scenarios. The modeling grid consisted of several nested receptor grids, with increased spacing for grids located further from the sources. Based on prior DRR modeling analyses for both the Carmeuse Lime Maple Grove and WIN Waste Innovations of Seneca County facilities, the nested receptor grid was extended to approximately 7 kilometers from the fenceline of Carmeuse Lime Maple Grove, with maximum impacts modeled within 100 to 500 meters of the fenceline.

Actual Emissions Scenario Results

The dispersion modeling analysis for the actual emissions scenario evaluated the impact of the Carmeuse Lime Maple Grove facility, WIN Waste Innovations of Seneca County, and background as a design value. As stated previously, actual hourly emissions from Carmeuse Lime Maple Grove were modeled with fixed emission rates from WIN Waste Innovations of

Seneca County that are reflective of both the facility's current operating permit with the addition of an additional flare proposed in a recent permit application. Any maximum impact exceeding 196.2 µg/m^3 would represent a modeled exceedance, inclusive of background, which was included as a source in the modeling domain. For this analysis, the maximum modeled 3-year design value for years 2020-2022 was 219.8719 µg/m^3. Thus, an exceedance of the standard was modeled. The results of this analysis are shown in Figure A4. Note that for clarity, only those receptors exceeding the NAAQS are displayed.

Figure A4: Actual Emissions Scenario maximum SO_2 impacts, Carmeuse Lime Maple Grove and WIN Waste Innovations of Seneca County, 2020-2022. Concentrations in µg/m^3, including background.

The maximum modeled concentration, 219.8719 µg/m^3, or 84.05 ppb including background, was modeled at a receptor approximately 640 meters from the Carmeuse Lime Maple Grove egress point.

Compliant Emissions Scenario Results

The dispersion modeling analysis for the compliant emissions scenario evaluated the impact of the Carmeuse Lime Maple Grove facility, WIN Waste Innovations of Seneca County facility, and background as a design value when modeled with fixed emission rates from WIN Waste Innovations of Seneca County that are reflective of both the facility's current operating permit with the addition of a third flare proposed in a recent permit application. As described previously, a full five years of representative meteorological data was used in this analysis as the compliant emission rate will be used to develop a federally enforceable SO_2 emission limit at Carmeuse Lime Maple Grove. The fixed emission rate at Carmeuse Lime Maple Grove

calculated to achieve compliant design values at every receptor in the modeling domain, inclusive of background and impacts from WIN Waste Innovations of Seneca County was 1,350 pounds SO_2 per hour. The maximum modeled 5-year design value for years 2019-2023 was 192.2 µg/m^3. Thus, no exceedance of the standard was modeled for this scenario. The results of this analysis are shown in Figure A5. Note that for clarity, only those receptors exceeding 175 µg/m^3 are shown.

Figure A5: Compliant Emissions Scenario maximum SO_2 impacts, Carmeuse Lime Maple Grove and WIN Waste Innovations of Seneca County, 2019-2023. Concentrations in µg/m^3, including background.

The dispersion modeling analysis for the area surrounding the Carmeuse Lime Maple Grove facility inclusive of a conservative background demonstrates modeled exceedances of the 2010 SO_2 standard based on the 2020-2022 period. Based on this modeled exceedance, Ohio EPA determined a compliant emission rate for Carmeuse Lime Maple Grove which will be used to develop a federally enforceable emission rate for Carmeuse Lime Maple Grove. Ohio EPA contends that these actions will provide for continued compliance with the 1-hour SO_2 standard in the Carmeuse Lime Maple Grove source area. Dispersion modeling performed

with the AERMOD model accounts for multiple aspects of the five-factor analysis emphasized by U.S. EPA in designating areas. As such, Ohio EPA asserts that the modeling results presented here and subsequent development of additional SO_2 limits at the Carmeuse Lime Maple Grove facility should carry significant weight in demonstrating the continued compliance of the facility and surround area with the 2010 1-hr SO_2 NAAQS.

Derivation of 30-day Rolling Average Emission Rate

The compliant emission rate modeling analysis presented previously in this report indicates that a 1,350 pounds SO_2 per hour emission rate from the singular egress point at Carmeuse Lime Maple Grove and the existing permitted emission rates at WIN Waste Innovations of Seneca County provide for attainment of the 1-hour SO_2 standard throughout the modeling domain. Ohio EPA intends to utilize the emission rate of 1,350 pounds SO_2 per hour to develop a federally enforceable longer-term emission rate at the Carmeuse Lime Maple Grove Facility. To derive a long-term emission limit, Ohio EPA followed the procedures and examples presented in the April 23, 2014 U.S. EPA guidance document "*Guidance for 1-hour SO_2 Nonattainment Area SIP Submissions*". This guidance document is referred to hereafter in this report as the "SIP Submissions" document.

The SIP Submissions document established a six-step methodology for deriving long-term average emission rates based on modeled short-term emission rates that can be considered protective of the 1-hour SO_2 standard. This six-step processed is summarized as follows:

1. Establish a critical value short-term emission rate that demonstrates compliance with the 1-hour SO_2 standard.
2. Compile available and representative short-term emissions data.
3. Calculate a longer-term emission rate from the short-term emissions data for the desired averaging period. U.S. EPA used a 30-day rolling average as the example in the SIP Submissions guidance.
4. Calculate the 99th percentile value of both of the 1-hour emission rates.
5. Calculate the ratio of the 99th percentile values.
6. Multiply the critical emission rate from Step 1 by the ratio determined in Step 5.

Using this six-step methodology, Ohio EPA determined a rolling 30-day emission rate from the critical emission rate of 1,350 pounds SO_2 per hour determined in the Compliant Emissions scenario described previously and actual hourly emissions data from Carmeuse Lime Maple Grove, years 2017-2022. The derivation is described in the remainder of this section.

The critical value emission rate of 1,350 pounds SO_2 per hour for Carmeuse Lime Maple Grove was determined in the Compliant Emissions modeling scenario, with a maximum design value of 192.2 µg/m^3. This is consistent with Step 1 of U.S. EPA's methodology. For Step 2, Ohio EPA compiled 1-hour emissions data from Carmeuse Lime Maple Grove, years 2017-

2022. Using these emissions data, the 99th percentile 1-hour emission rate was calculated to be 313.5 grams SO_2 per second and the 99th percentile 30-day rolling average emission rate was calculated to be 271.6 grams SO_2 per second. The 30-day rolling averages used to inform the 99th percentile value were calculated using the methods and Equation 9 of the Mercury and Air Toxics Standards (MATS) Rule, per the SIP Submissions guidance. Per the MATS Rule, total mass emissions over a 30-operating day period are divided by the total operating hours during a 30-operating day period to arrive at an average emission rate. Determination of the 30-day rolling averages and subsequent calculation of the 99th percentile short and long-term emission rates fulfill Steps 3 and 4 of U.S. EPA's methodology. Ratioing the two 99th percentile emission rates yields a value of 0.8665 per Step 5. Multiplying the modeled critical emission rate of 1,350 pounds SO_2 per hour by 0.8665 yields a 30-day rolling average emission rate of 1,170.0 pounds SO_2 per hour. Per U.S. EPA's SIP Submissions guidance and past SIP approvals, the derived 30-day rolling average emission rate of 1,170.0 pounds SO_2 per hour should be considered protective of the 1-hour SO_2 standard.

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Appendix B:

Public Notice

Public Notice
Ohio Environmental Protection Agency
Annual Review of Sulfur Dioxide (SO_2) Data Requirements Rule Source Emissions

The Ohio Environmental Protection Agency (Ohio EPA) is soliciting comments on the draft 2024 Annual Sulfur Dioxide (SO_2) Emissions Review. On August 21, 2015, the United States Environmental Protection Agency (U.S. EPA) finalized the Data Requirements Rule for the 2010 SO_2 standard [80 FR 51052]. This rule established ongoing data review requirements including, for areas where modeling of actual SO_2 emissions served as the basis for an unclassifiable/attainment designation, an annual review of emissions data and submittal of a report recommending whether updated modeling is necessary due to emissions increases. The annual emissions review is due to U.S. EPA Region 5 by July 1, annually, beginning the calendar year after the effective date of designation.

Ohio EPA is now soliciting comments on the draft annual SO_2 emissions review for 2024. Preliminary results based on a review of emissions data reported through 2023 indicate that updated modeling is not necessary. The comments received will be used to formulate the State's formal recommendation to U.S. EPA.

These actions must be noticed to allow public comment and to satisfy U.S. EPA requirements for public involvement in state implementation plan related activities. Comments should be submitted on or before **Monday, June 10, 2024** at the following address:

E-mail: DAPC-Comments@epa.ohio.gov

Mailing address: Reyna Knight
Ohio Environmental Protection Agency, DAPC
Lazarus Government Center
P.O. Box 1049
Columbus, Ohio 43216-1049

Phone: (614) 644-1961

All comments submitted by the close of business on June 10, 2024, will be considered by Ohio EPA prior to submittal of this annual review. Comments submitted after June 10, 2024, may be considered as time and circumstances permit but will not be part of the official record.

The draft 2024 Annual Sulfur Dioxide (SO_2) Emissions Review is available on Ohio EPA's webpage for electronic downloading at: https://epa.ohio.gov/divisions-and-offices/air-pollution-control/state-implementation-plans/state-implementation-plan-sip-2010-one-hour-so2-standard.

Questions regarding accessing the website should be directed to Chris Brown at (614) 705-1148, Chris.Brown@epa.ohio.gov; other questions or comments about this document should be directed to either Reyna Knight at (614) 644-1961, Reyna.Knight@epa.ohio.gov or Jennifer Van Vlerah at (614) 644-3696, Jennifer.VanVlerah@epa.ohio.gov or mailed to Reyna Knight or Jennifer Van Vlerah at the above address.