6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 52

[EPA-R05-OAR-2016-0644; FRL-9978-87-Region 5]

Air Plan Approval; Ohio; Cleveland, $PM_{2.5}$ Attainment Plan

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: On October 14, 2016, the Ohio Environmental Protection Agency (OEPA) submitted a State Implementation Plan (SIP) submission for the 2012 Fine Particle ($PM_{2.5}$) National Ambient Air Quality Standards ("NAAQS" or "standards") for the Cleveland nonattainment area. As required by the Clean Air Act (CAA), OEPA developed an attainment plan to address the Cleveland nonattainment area and evaluate the area's ability to attain the 2012 $PM_{2.5}$ NAAQS by the "Moderate" attainment date of December 31, 2021. The SIP submission addresses specific requirements as outlined in the CAA including: attainment demonstration; reasonable available control measure (RACM) analysis; emissions inventory requirements; reasonable further progress (RFP) with quantitative milestones; and nonattainment new source review (NNSR). Additionally, the SIP submission includes optional $PM_{2.5}$ precursor demonstrations for NNSR and attainment planning purposes. EPA has evaluated the SIP submission and is proposing to approve portions of the submission as meeting the applicable

CAA requirements for RACM, emissions inventory, attainment demonstration modeling, and precursor insignificance demonstrations for NNSR and attainment planning purposes. EPA is not acting on the other elements of the submission, including reasonable further progress (RFP), with quantitative milestones, and motor vehicle emission budgets (MVEBs).

DATES: Comments must be received on or before **[insert date 30 days after date of publication in the Federal Register]**.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA-R05-OAR-2016-0644 at http://www.regulations.gov, or via email to blakley.pamela@epa.gov. For comments submitted at Regulations.gov, follow the online instructions for submitting comments. Once submitted, comments cannot be edited or removed from Regulations.gov. For either manner of submission, EPA may publish any comment received to its public docket. Do not submit electronically any information you consider to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Multimedia submissions (audio, video, etc.) must be accompanied by a written comment. The written comment is considered the official comment and should include discussion of all points you wish to make. EPA will generally not consider comments or comment contents located outside of the primary submission (i.e. on the web, cloud, or other file sharing system). For additional

submission methods, please contact the person identified in the "For Further Information Contact" section. For the full EPA public comment policy, information about CBI or multimedia submissions, and general guidance on making effective comments, please visit http://www2.epa.gov/dockets/commenting-epa-dockets.

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SUPPLEMENTARY INFORMATION: Throughout this document, wherever "we", "us" or "our" is used, we mean EPA. This supplementary information section is arranged as follows:

I. Background for EPA's Proposed Action

A. History of the $PM_{2.5}$ NAAQS

B. CAA $PM_{2.5}$ Moderate Area Nonattainment SIP Requirements

II. EPA's Evaluation of Submission

III. EPA's Proposed Action

IV. Statutory and Executive Order Reviews

I. Background for EPA's Proposed Action

A. History of the 2012 $PM_{2.5}$ NAAQS

On December 15, 2012, EPA promulgated the 2012 $PM_{2.5}$ NAAQS, including a revision of the annual standard to 12.0 micrograms per cubic meter ($\mu g/m^3$) based on a 3-year average of annual mean

$PM_{2.5}$ concentrations, and maintaining the current 24-hour (or daily) standard of 35 µg/m^3 based on a 3-year average of the 98th percentile of 24-hour concentrations (78 FR 3086, January 15, 2013). EPA established the 2012 $PM_{2.5}$ NAAQS based on significant evidence and numerous health studies demonstrating the serious health effects associated with exposures to $PM_{2.5}$. The Cleveland, Ohio area was designated "Moderate" nonattainment for the 2012 $PM_{2.5}$ NAAQS based on ambient monitoring data showing that the area was above the 12.0 µg/m^3 standard. At the time of designations, the Cleveland area had a design value of 12.5 µg/m^3 for the 2011-2013 monitoring period (80 FR 2206, January 15, 2015).

To provide guidance on the CAA requirements for state and tribal implementation plans to implement the 2012 $PM_{2.5}$ NAAQS, EPA promulgated the "Fine Particle Matter National Ambient Air Quality Standard: State Implementation Plan Requirements; Final Rule" (81 FR 58010, August 24, 2016) (hereinafter, the "$PM_{2.5}$ SIP Requirements Rule"). As part of the $PM_{2.5}$ SIP Requirements Rule, EPA has interpreted the requirements of the CAA to allow the state to provide a "precursor demonstration" to EPA that supports the determination that one or more $PM_{2.5}$ precursors need not be subject to control and planning requirements in a given nonattainment area. EPA has determined that sulfur dioxide (SO_2), nitrogen oxides (NO_x), volatile organic compounds (VOC)

and ammonia (NH_3) are precursors to PM, and thus the attainment plan requirements of subpart 4 initially apply equally to emissions of direct $PM_{2.5}$ and all of its identified precursors. Section 189(e) of the CAA explicitly requires the control of major stationary sources of $PM_{2.5}$ precursors, unless there is a demonstration to the satisfaction of the EPA Administrator that such major stationary sources do not contribute significantly to PM levels that exceed the standards in the area. Accordingly, a state can also provide a precursor demonstration for attainment planning purposes which finds that reducing a precursor does not significantly reduce $PM_{2.5}$ concentrations, and therefore determines that controls are not needed for any sources of that precursor (not just major sources) for attainment purposes. EPA has long recognized the scientific basis for concluding that there are multiple precursors to PM_{10}, and in particular to $PM_{2.5}$ (Section III of Preamble of $PM_{2.5}$ SIP Requirements Rule).

After Ohio's submission of the attainment plan by the CAA required date of October 14, 2016, EPA released a November 17, 2016 memorandum from Steve Page entitled "Draft $PM_{2.5}$ Precursor Demonstration Guidance" (precursor guidance), which provides guidance to states on methods to evaluate if sources of a particular precursor contribute significantly to $PM_{2.5}$ levels in the nonattainment area. The precursor guidance provides a detailed description of potential modeling approaches and

presents possible thresholds to use in determining whether sources of a particular precursor contribute significantly to $PM_{2.5}$ levels in the area. Although there is no explicit concentration which EPA has determined represents a significant contribution for $PM_{2.5}$ precursor demonstrations, the precursor guidance suggests that a contribution level of 0.2 $\mu g/m^3$, for annual average $PM_{2.5}$, could be considered an air quality change that is "insignificant." The specific methods and analysis utilized by Ohio regarding precursors are generally consistent with the $PM_{2.5}$ SIP Requirements Rule and precursor guidance and are described in detail in the sections below regarding planning requirements and NNSR requirements.

B. CAA $PM_{2.5}$ Moderate Area Nonattainment SIP Requirements

With respect to the requirements for an attainment plan for the 2012 $PM_{2.5}$ NAAQS, the general CAA part D nonattainment area planning requirements are found in subpart 1, and the Moderate area planning requirements specifically for particulate matter are found in subpart 4.

EPA utilizes a longstanding general guidance document that interprets the 1990 amendments to the CAA commonly referred to as the "General Preamble" (57 FR 13498, April 16, 1992). The General Preamble addresses the relationship between the subpart 1 and the subpart 4 requirements and provides recommendations to states for meeting statutory requirements for particulate matter

attainment planning. Specifically, the General Preamble explains that requirements applicable to Moderate area attainment plan SIP submissions are set forth in subpart 4, but such SIP submissions must also meet the general attainment planning provisions in subpart 1, to the extent these provisions "are not otherwise subsumed by, or integrally related to," the more specific subpart 4 requirements (57 FR 13538). Additionally, EPA finalized the $PM_{2.5}$ SIP Requirements Rule to clarify our interpretations of the statutory requirements that apply to Moderate and "Serious" $PM_{2.5}$ nonattainment areas under subparts 1 and 4.

The CAA requirements of subpart 1 for attainment plans include: (i) the section 172(c)(1) RACM/reasonably available control technology (RACT) and attainment demonstrations; (ii) the section 172(c)(2) requirement to demonstrate RFP; (iii) the section 172(c)(3) requirement for emission inventories; (iv) the section 172(c)(5) requirements for a NNSR permitting program; and (v) the section 172(c)(9) requirement for contingency measures.

The CAA subpart 4 requirements for Moderate areas are generally comparable with the subpart 1 requirements and include: (i) the section 189(a)(1)(A) NNSR permit program requirements; (ii) the section 189(a)(1)(B) requirements for attainment demonstration; (iii) the section 189(a)(1)(C)

requirements for RACM; and (iv) the section 189(c) requirements for RFP and quantitative milestones. Section 189(e) also requires that states regulate major sources of $PM_{2.5}$ precursors in a nonattainment area, unless EPA approves a demonstration excusing the state from regulating such sources. In addition, under subpart 4 Moderate areas must provide for attainment of the current $PM_{2.5}$ annual standard as expeditiously as practicable but no later than the end of the 6^{th} calendar year after designation, which is December 31, 2021.

II. EPA's Evaluation of the Submission

OEPA, in coordination with the Lake Michigan Air Directors Consortium (LADCO), developed the attainment plan SIP submission for the Cleveland area. This plan was subsequently put through public process, adopted by the state, and submitted by the OEPA to EPA. This section describes the relevant contents of the 2012 $PM_{2.5}$ NAAQS attainment plan SIP submission and EPA's rationale for proposing approval of the required SIP elements of RACM, attainment demonstration, emissions inventory, and precursor demonstrations for both NNSR and attainment planning purposes.

The 2012 $PM_{2.5}$ attainment plan contains SIP provisions to address the requirements for a Moderate $PM_{2.5}$ nonattainment area, including RACT/RACM, emissions inventory, modeling, attainment demonstration, transportation conformity and motor vehicle

emissions budgets, RFP with quantitative milestones, and contingency measures. EPA is proposing to approve the RACM, emissions inventory, attainment demonstration, and precursor demonstrations for NNSR and attainment planning purposes, as fully meeting the requirements of the CAA and the applicable Federal regulations. Preliminary monitoring data indicate that the area is attaining the standard for the 2015-2017 design value period. If confirmed, certain planning requirements may be suspended per the clean data policy (40 CFR 51.1015(a)). EPA will continue to review other elements of the attainment plan submission in order to determine if they are necessary for the area to attain the standard and act on them accordingly.

Emissions Inventory[1]

Section 172(c)(3) of the CAA requires the development of an emissions inventory for nonattainment areas. In addition, the planning and associated modeling requirements set forth in CAA section 189(a) make the development of an accurate and up-to-date emissions inventory a critical element of any viable attainment plan. EPA guidance specifies the best practices for developing an emissions inventory for $PM_{2.5}$ nonattainment areas per EPA's "Emissions Inventory Guidance for Implementation of

[1] Note that this guidance was also updated in 2017. See "Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations" (EPA-454/B-17-003, July 2017).

Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations" (EPA-454/B-07-002, April 2007). The 2012 $PM_{2.5}$ NAAQS SIP submission contains planning inventories of emission sources and emission rates for the base year of 2011 and the projected attainment year of 2021. OEPA selected the year 2011 as the base year because it is one of the three years for which air quality data was used to designate the area as nonattainment. Additionally, OEPA and LADCO determined that high-quality emissions information was already available from the National Emissions Inventory (NEI) for 2011. LADCO developed the base year emissions inventory for the nonattainment area using the NEI, with additional information for on-road and nonroad mobile sources, marine, aircraft, and rail sources. Table 1 provides a summary of the annual 2011 emissions inventory for the Cleveland nonattainment area for direct $PM_{2.5}$ and all $PM_{2.5}$ precursors.

OEPA's submission included detailed information for the sources in the emissions inventory including facility name, ID, location, and emissions, as well as documentation on mobile source model inputs for both on-road and nonroad sources (*See Docket submission and Appendix C).*

Table 1 – Annual emissions inventory for Cleveland area for direct $PM_{2.5}$ and precursors (tpy)

County/ Source Sector		**$PM_{2.5}$**		**NOx**	**SO_2**	**NH_3**	**VOC**
		Filterable	Condensable				
Cuyahoga	Area (nonpoint)	1143.13	234.61	4989.24	188.94	670.62	12116.58

	Marine, Aircraft, Rail (MAR)	96.88	0.02	2822.27	187.78	0.99	288.66
	Nonroad	508.69	0.00	6045.40	17.35	8.66	8349.38
	Onroad	800.00	0.00	18764.59	132.17	428.60	8568.15
	Point EGU	32.90	33.50	771.22	1941.86	0.10	11.40
	Point Non-EGU	599.48	407.26	2404.05	4461.80	65.87	986.52
	Prescribed Fire	4.92	0.00	1.20	0.54	0.88	12.61
Lorain	Area (nonpoint)	477.68	72.00	844.19	44.37	448.73	2721.24
	Marine, Aircraft, Rail (MAR)	44.39	0.00	1289.44	55.68	0.57	73.94
	Nonroad	160.82	0.00	1971.11	5.39	2.66	3009.78
	Onroad	195.49	0.00	4580.85	31.75	101.84	2177.01
	Point EGU	94.90	298.62	4673.50	32041.30	0.54	31.82
	Point Non-EGU	156.45	175.78	705.89	374.63	3.01	916.35
	Prescribed Fire	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**4615.72**	**1521.80**	**49862.95**	**39483.56**	**1736.07**	**39263.44**

EPA has reviewed the base-year emissions inventory and finds that it satisfies the CAA section 172(c)(3) requirement for a comprehensive, accurate and current inventory of actual 2011 emissions of the relevant pollutants for $PM_{2.5}$ in the Cleveland area. Thus, EPA proposes to approve the base year emissions inventory in the SIP submission.

Attainment Demonstration and Modeling

Section 189(a)(1)(B) requires that a $PM_{2.5}$ Moderate area SIP contain either a demonstration that the plan will provide for attainment by the applicable attainment date, or a demonstration that attainment by such date is impracticable. In the attainment demonstration of the 2016 SIP submission, OEPA described how the attainment plan would provide for attainment

of the 2012 $PM_{2.5}$ NAAQS by the attainment date of December 31, 2021.

Using air quality modeling, an attainment demonstration must project that future air quality levels in the nonattainment area will be below the standard. OEPA and LADCO conducted modeling in accordance with EPA's April 2007 (and where appropriate, draft December 2014) "Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze." (attainment demonstration modeling guidance) (EPA-454/B-07-002, April 2007). OEPA modeling is also consistent with the November 2005 Appendix W requirement used at the time by OEPA and is still consistent with the updated January 2017 (82 FR 5182) "Guideline on Air Quality Models." (CFR Title 40, Part 51, Appendix W.) In addition, OEPA submitted a precursor demonstration that is consistent with the recommendations contained in EPA's precursor guidance document released in November 2016. ("$PM_{2.5}$ Precursor Demonstration Guidance," memorandum issued by Steven Page, Director of EPA Office of Air Quality Planning and Standards, November 17, 2016).

Per the $PM_{2.5}$ SIP Requirements Rule, the attainment demonstration modeling guidance provides recommendations that include: developing a conceptual description of the problem to be addressed; developing a modeling/analysis protocol; selecting

an appropriate model to support the demonstration; selecting appropriate meteorological episodes or time periods to model; choosing an appropriate area to model with appropriate horizontal/vertical resolution; generating meteorological and air quality inputs to the air quality model; generating emissions inputs to the air quality model; and, evaluating performance of the air quality model. After these steps are completed, the state can apply a model to simulate effects of future year emissions and candidate control strategies.

OEPA and LADCO calculated the baseline design value for $PM_{2.5}$ using the procedures contained in appendix N to 40 CFR 50, "Interpretation of the National Ambient Air Quality Standards for Particulate Matter," and EPA attainment demonstration modeling guidance. Ambient $PM_{2.5}$ concentrations for the 2009–2013 time frame (a weighted average of the 2009-2011, 2010-2012, and 2011-2013 design value periods, as recommended by the Modeling Guidance) were used to calculate baseline design values ranging from 9.64-12.82 $\mu g/m^3$ for the seven $PM_{2.5}$ monitoring locations in the nonattainment area (see Table 2). Detailed methods for the baseline design value calculations are in Appendix B of the 2016 SIP submission (See Docket).

Next, OEPA and LADCO compiled base-year emission inventories (as discussed above) and projected emission inventories for the attainment year 2021. LADCO utilized

emission inventories compiled by EPA for the years 2011, 2017, and 2025 as the starting point. EPA's 2011 emissions inventory (Version 2011eh) is based on the 2011 NEI, version 2 (2011NEIv2). The inventory uses hourly 2011 continuous emissions monitoring system (CEMS) data for electric generating units (EGUs) emissions, hourly on-road mobile emissions, and 2011 day-specific wild and prescribed fire data. Emissions include all criteria pollutants and precursors (CAPs), and a few hazardous air pollutants (HAPs). See EPA's Technical Support Document (EPA, 2015A) for a thorough description of the methodology used to develop the 2011 emissions inventory.

EPA projected future emission inventories for the years 2017 and 2025 based on the 2011 baseline inventory. The future-year scenarios incorporate current "on-the-books" regulations, and do not include any additional measures or controls. *See,* EPA (2015A) for a thorough description of the methodology used to project future emissions. For most emissions categories, LADCO developed the 2021 future-year emissions inventory by interpolating between EPA's 2017 and 2025 inventories. The interpolation was done for each model species at each model cell for every model hour. However, LADCO developed updated 2021 EGU emissions by using the Eastern Regional Technical Advisory Committee EGU Tool (ERTAC) and updated 2021 regional on-road mobile emissions using EPA's Motor Vehicle Emission Simulator

(MOVES2014) and Ramboll-Environ emissions (See Appendix B and C for detailed discussion).

For EGU projections, Ohio and LADCO relied on the U.S. Energy Information Administration's "High Oil and Gas Resource" (See Docket for detailed discussion). The projected emissions inventory not only accounts for growth in economic sectors, but also includes emissions controls (existing or future regulations) that will impact sources in the area. In this case, OEPA and LADCO only modeled controls that have been promulgated, with no new future controls being added since OEPA has determined that additional RACT and RACM would not be necessary for expeditious attainment, and that current controls in the area are sufficient to meet the RACM requirement. For modeling purposes no additional RACM/RACT was applied to future year inventories.

The base-year and projected emission inventories were used in a photochemical grid model, the Comprehensive Air Quality Model with extensions (CAMx), to project the expected change from base-year to future year design values. The modeled attainment demonstration results in a predicted future-year concentration at each $PM_{2.5}$ ambient monitor location within the Cleveland nonattainment area. The results from the CAMx modeling were then used as inputs to EPA's Modeled Attainment Test Software (MATS) to calculate the design values for each

monitored location in the attainment year 2021 using information on current $PM_{2.5}$ speciation. Modeled attainment year results show that the area is expected to meet the standard (all 2021 values at existing monitor locations are below 12.0 µg/m^3) by the 2021 attainment date (See Table 2).

Table 2. Projected $PM_{2.5}$ design values (µg/m^3) for 2021

County	Monitor ID	2011 Baseline Design Value	2021 Projected Design Value
Cuyahoga	39-035-0034	10.02	8.07
	39-035-0038	12.82	10.69
	39-035-0045	11.99	9.84
	39-035-0060	12.79	10.45
	39-035-0065	12.49	10.32
	39-035-1002	10.36	8.41
Lorain	39-093-3002	9.64	8.08

Based on the above, EPA is proposing to approve OEPA's demonstration of attainment for 2021 as meeting the statutory requirement in CAA 189(a)(1)(B).

RACM/RACT Requirements

The general SIP planning requirements for nonattainment areas under subpart 1 include CAA section 172(c)(1), which requires implementation of all RACM (including RACT). Section 172(c)(1) requires that attainment plans provide for the implementation of RACM (including RACT) to provide for attainment of the NAAQS. Therefore, what constitutes RACM and RACT is related to what is necessary for attainment, as well as expeditious attainment, in a given area.

Subpart 4 also requires states to develop attainment plans that evaluate potential control measures and impose RACM and RACT on sources within a Moderate nonattainment area that are necessary to expeditiously attain the NAAQS. Specifically, CAA section 189(a)(1)(C) requires that Moderate nonattainment plans provide for implementation of RACM and RACT no later than four years after the area is designated as nonattainment. As with subpart 1, the terms RACM and RACT are not defined within subpart 4. Nor do the provisions of subpart 4 specify how states are to meet the RACM and RACT requirements. However, EPA's longstanding guidance in the General Preamble provides recommendations for determining which control measures constitute RACM and RACT for purposes of meeting the statutory requirements of subpart 4 (57 FR 13540-13541).

For both RACM and RACT, EPA notes that an overarching principle is that if a given control measure is not needed to attain the relevant NAAQS in a given area as expeditiously as practicable, then that control measure would not be required as RACM or RACT because it would not be reasonable to impose controls that are not in fact needed for attainment purposes. Accordingly, a RACM and RACT analysis is a process to identify emission sources, evaluate potential emission controls, and impose those control measures and technologies that are reasonable and necessary to bring the area into attainment as

expeditiously as practicable, but by no later than the statutory attainment date for the area.

EPA has long applied a policy that states must evaluate the combined effect of reasonably available control measures that, if implemented collectively, would advance the attainment date by at least one year and should be adopted. Since the area's preliminary data indicate that it will attain the NAAQs based on the 2015-2017 design value period, it is not necessary to implement additional controls. The data indicates that the area is attaining the standard with current Federal, state, and local permanent and enforceable measures.

OEPA provided a RACM and RACT analysis in Appendix E of the 2012 $PM_{2.5}$ attainment plan SIP submission. Ohio has found that existing measures for $PM_{2.5}$, SO_2 and NO_x for area sources, mobile sources and stationary sources constitute RACT/RACM (80 FR 68253; 81 FR 58402; 82 FR 16938). Some of the current controls for the area that are sufficient to meet the RACM/RACT requirement include: existing $PM_{2.5}$ and ozone RACT rules, mobile source controls, SO_2 reductions from 2010 SO_2 nonattainment areas including a large EGU in neighboring Lake County, Federal interstate transport rules, and regional haze.

OEPA provided an attainment analysis that consisted of: first, a modeling demonstration that the area would attain by the attainment date in 2021 with current on-the-books controls

and measures; and second, a demonstration showing that by interpolating modeled future values from 2021 with 2016 design values at the monitored sites, the area would be attaining the standard in both 2020 (at 11.0 µg/m^3) and 2019 (at 11.3 µg/m^3) at the design value monitor prior to the 2021 statutory attainment date. The interpolation suggested that the area would attain at the end of 2017, similar to EPA modeling analysis discussed below, and is now verified by the preliminary 2015-2017 design values that indicate the area is likely attaining as of the end of 2017. In addition, the $PM_{2.5}$ SIP Requirements Rule outlines the option for states to do an additional modeling demonstration to show that specific $PM_{2.5}$ precursors are not significant contributors to $PM_{2.5}$ levels that exceed the standard in the area. OEPA provided a precursor demonstration modeling analysis that was intended to demonstrate that emissions of NH_3 and VOC are not significant $PM_{2.5}$ precursors for attainment planning purposes.

Precursor Demonstration for Attainment Planning Purposes

For the precursor demonstration, OEPA and LADCO initially performed a "concentration-based" contribution analysis using speciated monitoring data to determine whether NH_3 or VOC contribute significantly to $PM_{2.5}$ concentrations in the area, based on monitored values alone. However, using the assumption suggested in the draft precursor demonstration guidance that all

NH_3 emissions are associated with the nitrate portion of $PM_{2.5}$ mass, and that all VOC emissions are associated with the organic carbon portion of $PM_{2.5}$ mass, the state could not determine that these precursors did not make a significant contribution. Therefore, the state proceeded with a sensitivity analysis to determine the impact of reducing NH_3 and VOC emissions on $PM_{2.5}$ concentrations in the nonattainment area. OEPA and LADCO performed a modeled sensitivity analysis for attainment planning purposes using the 2021 attainment year concentrations at each monitor in the Cleveland area. LADCO applied a 40% emission reduction to anthropogenic sources of NH_3 and VOC emissions for all source categories in the Cleveland nonattainment area. The OEPA submission indicated that the 40% comprehensive reduction was chosen because it was within the range of a previously published, comprehensive sensitivity analysis done in photochemical modeling which typically uses 30-50% when applying the reduction across all emission sectors – as done for this analysis[2].

The submission was made by the state prior to the date that the precursor guidance was issued by EPA; however, the modeled

[2] EPA examined examples in the published literature of general sensitivity modeling studies that look at the impact of across-the-board percentage reductions in precursor emissions on secondary pollutants (including $PM_{2.5}$, PM_{10}, and ozone) (Vieno, 2016; Megaritis, 2013; Harrison,2013; Derwent, 2014; Liu, 2010; Pun, 2001). The majority of studies have used across the board percentage precursor emissions reductions of between 30% and 60%, with the most common reduction percentages being 30% and 50%.

reduction levels are still within the suggested range of 30-70% reductions found in the precursor guidance.

The results of the 2021 attainment planning sensitivity analyses show modeled impacts from reducing NH_3 by 40% on $PM_{2.5}$ concentrations at the monitors ranging from 0.10-0.21 $\mu g/m^3$, and modeled impacts from reducing VOC ranging from 0.0-0.01 $\mu g/m^3$. Although there is no explicit concentration which EPA has determined represents a significant contribution, the current draft precursor guidance suggests that a contribution level of 0.2 $\mu g/m^3$ is an appropriate recommended threshold to identify an air quality change that is "insignificant" for annual average $PM_{2.5}$. In this case, all modeled impacts for VOC emissions are well below the recommended threshold, and most of the modeled NH_3 impacts are at or below the threshold as well, with only one ambient air quality monitor showing modeled ambient $PM_{2.5}$ levels slightly above the recommended threshold (at 0.21 $\mu g/m^3$).

EPA's precursor guidance noted that there may be cases where precursor emissions have an impact above the recommended contribution thresholds, yet do not "significantly contribute" to levels that exceed the standard in the area (pursuant to section 189(e)). Under the $PM_{2.5}$ SIP Requirements Rule, the significance of a precursor's contribution is to be determined "based on the facts and circumstances of the area." Air agencies may thus provide EPA with information related to other

factors they believe should be considered in determining whether the contribution of emissions of a particular precursor to levels that exceed the NAAQS is "significant" or not. Such factors may include: the amount by which a precursor's contribution exceeds the recommended contribution thresholds; the severity of nonattainment at relevant monitors and/or grid cell locations in the area; trends in ambient speciation data and precursor emissions; and any other relevant information.

Based on a number of factors, in this case EPA believes that NH_3 is not a significant precursor. The relevant factors include: the magnitude of the amount above the threshold is small compared to the total threshold amount (5% of the total threshold amount); the area continues to trend downward in both ambient monitoring data and emissions in direct $PM_{2.5}$ and precursors; current preliminary monitoring data shows the area is attaining the standard; and additionally, this small amount of $PM_{2.5}$ resulting from NH_3 would not interfere with the area's ability to attain the standard, as evidenced by the fact that the preliminary 2015-2017 design value is 0.7 $\mu g/m^3$ below the NAAQS. Regardless of the finding of significance for these precursors, the area is expected to attain (based on preliminary design values) with only current controls in place, and it would not be required to control any sources further. Additionally, the area has preliminary 2015-2017 data indicating that it has a

three-year design value below the level of the NAAQS, so that any additional controls would not be implemented until well after the area has attained the standard.

Based on the above, EPA agrees with the determination by Ohio that for attainment planning purposes, additional controls on existing sources of NH_3 and VOC emissions do not need to be imposed.

RACM/RACT Analysis

OEPA conducted a six-step RACM analysis that focused on direct $PM_{2.5}$, NOx, and SO_2: 1) identify sources in the area for $PM_{2.5}$, NOx, and SO_2 - that comprised over 90% of the emissions for each pollutant over all source categories; 2) identify potential control measures; 3) evaluate technological feasibility; 4) evaluate economic feasibility; 5) determine if the measures can be implemented within both four and five years; 6) evaluate the earliest practical year for attainment.

As detailed in OEPA's RACT/RACM analysis in Appendix E, many of the sources are already well controlled. The state then identified current controls for each source as well as any additional measures or controls that are potentially available to each of the identified sources using EPA's "Menu of Control Measures" document, available online at http://www.epa.gov/air/criteria.html and the RACT/BACT/LAER Clearinghouse (RBLC) at http://cfpub.epa.gov/rblc/. OEPA then

determined if any of the identified controls were technologically or economically feasible using EPA's the method outlined in the $PM_{2.5}$ SIP Requirements Rule, which can include factors such as a source's process and operating procedures, raw materials, physical plant layout, and potential environmental impacts such as increased water pollution, waste disposal and energy requirements (*see* 40 CFR 51.1009(a)(3)(i)).

In regard to area and mobile sources, a state may tailor the analysis to the considerations that are relevant to the local circumstances, such as the condition and extent of needed infrastructure, population size, and workforce type and habits, all of which may impact the availability of potential control measures in the area. (81 FR 58010)

OEPA also determined economic feasibility of each identified measure or technology. That analysis included consideration of the cost of reducing emissions in the area and the difference between the cost of an emissions reduction measure at a particular source in the area and the cost of emissions reduction measures that have been implemented at similar sources in the same or other areas.

OEPA determined that the technologically feasible measures that were identified were not economically feasible. For example, the state determined that the cost-effectiveness ranged from $5800 per ton to more than $40,000 per ton for measures

that were found to be technologically feasible for major stationary sources. In addition, the highest costs of reductions were generally linked to controls of direct $PM_{2.5}$, and OEPA has determined that reductions in direct $PM_{2.5}$ would be the most effective at reducing the monitored concentrations in the Cleveland area. Thus, the state found that the most effective controls are not reasonable to implement based on cost.

Finally, OEPA analyzed the implementation time frame of controls within four years and the earliest applicable attainment date, which by interpolation would be the end of 2017, and determined that the area would attain the standard prior to the state rulemaking and implementation of additional controls in the area. In fact, the area has preliminary 2015-2017 data indicating that it has a three-year design value below the level of the NAAQS, making implementation of additional controls to achieve attainment moot.

As noted by OEPA, both the Federal and state "on the books" controls have led to additional control and will lead to additional emissions reductions in the future. Because of the historic nonattainment status of this area for both ozone and $PM_{2.5}$, the Cleveland nonattainment area is one of the most well controlled areas in the state for pollutants contributing to formation of both $PM_{2.5}$ and ozone. Ohio's current rules, current controls and the Federal "on the books" controls continue to

satisfy RACT/RACM for the annual $PM_{2.5}$ standard. Some of the current controls that are sufficient to meet the RACT/RACM requirement are Ohio's current RACT program found in Ohio Administrative Code (OAC) Chapter 3745-17, which controls NO_x; rules under OAC Chapter 3745-18 which control SO_2 sources for the state; and the inspection and maintenance program contained in OAC Chapter 3745-26, which reduces emissions of NO_x and VOC from on-road vehicles. OEPA has determined that no additional controls are feasible to implement as RACM/RACT in the Cleveland area, and that current controls meet the requirement for RACM under 172(c)(1) and 189(a)(1)(C).

EPA finds OEPA's determination reasonable, and is proposing to approve OEPA's determination that current controls meet the RACM/RACT requirement and that additional controls are not reasonable for other sources in the area or necessary to expeditiously attain the NAAQS.

As noted above, the attainment demonstration modeling analysis reflecting 2021 projected emissions based on only current controls shows that projected 2021 air quality values at monitoring sites in the area range from 8.07–10.69 $\mu g/m^3$, well below the standard. Monitoring data for the 2014-2016 design values show only one monitor in the area is above the standard at 12.2 $\mu g/m^3$, and is trending downward. Interpolation between current and projected monitor values indicates that the area is

likely to attain the standard with current controls by the end of the 2017 calendar year. Current, preliminary monitored design values for the years 2015-2017 shows the highest values being monitored in the Cleveland area is 11.3 µg/m^3. EPA also conducted modeling in 2015 in support of regulatory initiatives regarding the revised ozone NAAQS and interstate transport (Appendix B), and these analyses also indicate that the Cleveland area will attain the $PM_{2.5}$ NAAQS well before the outermost attainment date of December 31, 2021.

Based on the above, EPA is proposing to find that current controls on sources in the nonattainment area meet the requirements of section 172(c)(1) and section 189(a)(1)(C) of the CAA. Accordingly, EPA is proposing to approve current controls: Federal mobile source standards, transport rules, Regional Haze plans, and state VOC RACT rules as meeting the RACM/RACT provisions.

Nonattainment NSR precursor demonstration

In addition to the attainment planning precursor demonstrations, which showed that neither existing sources of VOC nor existing sources of NH_3 have a significant contribution to $PM_{2.5}$ concentrations, OEPA provided an analysis for both VOC and NH_3 intended to show that increases in emissions of these precursors that may result from new or modified sources would not make a significant contribution to $PM_{2.5}$ concentrations in

the area. This demonstration is intended to justify the state's determination that major stationary sources of these precursors do not need to be regulated under the NNSR program for the area. For NNSR permitting purposes, CAA section 189(e), as interpreted by the $PM_{2.5}$ SIP Requirements Rule, provides an option for the state to provide a precursor demonstration intended to show that increases in emissions from potential new and existing major stationary sources of a particular precursor would not contribute significantly to levels that exceed the 2012 $PM_{2.5}$ NAAQS in a particular nonattainment area. 40 CFR 51.1006(a)(3). In particular, EPA's regulations provide that a state choosing to submit an NNSR precursor demonstration should evaluate the sensitivity of $PM_{2.5}$ levels in the nonattainment area to an increase in emissions of the precursor. If the state demonstrates that the estimated air quality changes determined through such an analysis are not significant, based on the facts and circumstances of the area, the state may use this information to identify new major stationary sources and major modifications of a precursor that will not be considered to contribute significantly to $PM_{2.5}$ levels that exceed the standard in the nonattainment area under CAA section 189(e). *Id.* 51.1006(a)(3)(i). If EPA approves the state's NNSR precursor demonstration for a nonattainment area, major sources of the relevant precursor can be exempted from the NNSR major source

permitting requirements for $PM_{2.5}$ with respect to that precursor. *Id.* 51.1006(a)(3)(ii).

For NNSR permitting purposes, sensitivity analyses examine potential increases in emissions through a model simulation that evaluates the effect on $PM_{2.5}$ concentrations in the area resulting from a given set of precursor emission increases from one or more new or modified stationary sources. Ohio's 2011 and 2021 comprehensive modeling inventories were used for this analysis. To help determine a theoretical growth scenario as a result of major source expansion (new or modified), Ohio first prepared inventories for VOC and NH_3 for 2008 to 2014 for the entire State from Ohio's annual emissions reporting program. Ohio used inventories for the entire State in order to determine what types of major sources/source categories are likely to expand (new or modified) within the Cleveland area and at what magnitude (tons per year) those expansions are likely to occur. These inventories and the full detailed analysis are contained in Appendix F of Ohio's submission.

Consistent with EPA's regulation and draft guidance, OEPA and LADCO have performed sensitivity analyses of potential increases in emissions through a model simulation that evaluates the effect on $PM_{2.5}$ concentrations in the nonattainment area (including unmonitored areas) resulting from a given set of hypothetical NH_3 or VOC precursor emission increases from

modified major stationary sources of the respective precursors in the nonattainment area. The inventories and the full detailed analysis are contained in Appendix F of Ohio's submission. For the NH_3 analysis, Ohio assumed emissions increases at three existing locations of NH_3 in the area, as these would be the most likely future areas of growth in the Cleveland area. EPA believes that the use of the historical inventories to predict growth is reflective of the future potential increases specific to the Cleveland area given the current types of facilities and their respective locations, the urban density and ability to expand or build, as well as the types of state regulation or other Federal requirements (such as National Emission Standards for Hazardous Air Pollutants) on facility types and controls required for other pollutants. EPA believes that this is an acceptable approach to estimating potential future growth.

In addition to the modeled emissions increases based on historical growth at sources, LADCO and OEPA did an additional NH_3 modeling analysis (submitted July 18, 2017) based on a 100 tpy emissions increase (to represent major sources) in each modeled grid cell in the nonattainment area. EPA believes that this is a sufficiently conservative analysis that exceeds the level of actual potential NH_3 emissions growth likely to occur in the area. Both of these approaches are consistent with

suggested modeling in EPA's precursor guidance. Thus, EPA finds that this analysis serves as a reasonable evaluation of the sensitivity of $PM_{2.5}$ concentrations to a large emissions increase across the spatial area.

For the VOC analysis, Ohio added 1,486 tpy of VOC emissions at 3 existing source locations where VOC emissions increases potentially could occur in the nonattainment area. Compared to the 2011 inventory, this represents a 75% increase in VOC emissions from existing stationary sources (EGU and non-EGU). Compared to the 2021 projected inventory, this represents an 80% increase in stationary source emissions. For the NH_3 analysis, Ohio added 325 tpy of NH_3 emissions (scenario 1) to 3 existing source locations where NH_3 emissions increases potentially could occur in the nonattainment area. Compared to the 2011 inventory, this represents a 447% increase in NH_3 emissions from existing stationary sources. Compared to the 2021 projected inventory, this represents a 449% increase in NH_3 from stationary sources. The additional NH_3 analysis (scenario 2) had a total emissions increase of 1,700 tpy, which is over 500% higher growth than the historical NH_3 growth (scenario 1).

Ohio found the addition of the NH_3 emissions (approximately 350 tpy) into the model based on historical growth (scenario 1) would result in a peak impact of 0.08 $\mu g/m^3$, and the addition of the above VOC emissions would result in a peak impact of 0.02

$\mu g/m^3$. The modeled impacts are well below the recommended significance contribution threshold of 0.2 $\mu g/m^3$; for VOC it is an order of magnitude difference, and for NH_3 the maximum value is less than half the recommended significant contribution threshold level. The results of NH_3 modeling for scenario 2 indicate that, even with a conservatively large NH_3 increase, the maximum impact was 0.24 $\mu g/m^3$, which is only slightly above the recommended contribution threshold of 0.2 $\mu g/m^3$.

While the increase is slightly above the recommended contribution threshold, EPA believes that it is reasonable to conclude that NH_3 emissions from major stationary sources (in the context of a NNSR precursor demonstration) do not contribute significantly to $PM_{2.5}$ concentrations in the nonattainment area for the following reasons: historical growth of NH_3 sources in the area are significantly less than what was modeled for scenario 2; the only likely future increases of NH_3 emissions from major sources in the area are from the increased use of NH_3 for EGU NO_x control (ammonia slip) and would likely occur at existing EGUs (as modeled in scenario 1); the area continues to trend downward in both monitored $PM_{2.5}$ concentrations and $PM_{2.5}$ (direct and precursor) emissions; current preliminary monitoring data shows the area is attaining the standard; and, this small amount of additional ambient $PM_{2.5}$ concentration, based on the modeling analysis, would therefore not interfere

with the area's ability to attain the standard given that the current preliminary design value for 2015-2017 is 11.3 µg/m^3; and the additional modeled increase of 0.24 µg/m^3 would not impact the area's ability to attain or maintain the NAAQS.

Based on the results of the modeling demonstration and the additional factors described in this section, EPA is proposing to approve Ohio's determination that emissions increases of either VOC or NH_3 from new and modified major stationary sources would not contribute significantly to $PM_{2.5}$ levels that exceed the 2012 $PM_{2.5}$ NAAQS in the Cleveland nonattainment area. Accordingly, new or modified major sources of VOC and NH_3 may be exempted from the state's NNSR program requirements for $PM_{2.5}$ in the Cleveland $PM_{2.5}$ nonattainment area.

III. EPA's Proposed Action

Ohio's attainment demonstration modeling, and precursor analysis for both attainment planning RACM and nonattainment NNSR determined that VOCs and NH_3 do not significantly contribute to $PM_{2.5}$ concentrations in the area. EPA finds that Ohio's analysis is reasonable and well supported. EPA is thus proposing to approve the following elements of the 2012 SIP submission: the base year 2011 emissions inventory to meet the section 172(c)(3) requirement for emission inventories; the demonstration of attainment for 2021 as meeting the statutory

requirement in CAA 189(a)(1)(B); current controls as meeting RACM requirements of 172(c)(1) and 189(a)(1(C).

IV. Statutory and Executive Order Reviews.

Under the CAA, the Administrator is required to approve a SIP submission that complies with the provisions of the CAA and applicable Federal regulations. 42 U.S.C. 7410(k); 40 CFR 52.02(a). Thus, in reviewing SIP submissions, EPA's role is to approve state choices, provided that they meet the criteria of the CAA. Accordingly, this action merely approves state law as meeting Federal requirements and does not impose additional requirements beyond those imposed by state law. For that reason, this action:

- Is not a significant regulatory action subject to review by the Office of Management and Budget under Executive Orders 12866 (58 FR 51735, October 4, 1993) and 13563 (76 FR 3821, January 21, 2011);
- Is not an Executive Order 13771 (82 FR 9339, February 2, 2017) regulatory action because SIP approvals are exempted under Executive Order 12866;
- Does not impose an information collection burden under the provisions of the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*);

- Is certified as not having a significant economic impact on a substantial number of small entities under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*);
- Does not contain any unfunded mandate or significantly or uniquely affect small governments, as described in the Unfunded Mandates Reform Act of 1995 (Public Law 104-4);
- Does not have Federalism implications as specified in Executive Order 13132 (64 FR 43255, August 10, 1999);
- Is not an economically significant regulatory action based on health or safety risks subject to Executive Order 13045 (62 FR 19885, April 23, 1997);
- Is not a significant regulatory action subject to Executive Order 13211 (66 FR 28355, May 22, 2001);
- Is not subject to requirements of Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (15 U.S.C. 272 note) because application of those requirements would be inconsistent with the CAA; and
- Does not provide EPA with the discretionary authority to address, as appropriate, disproportionate human health or environmental effects, using practicable and legally permissible methods, under Executive Order 12898 (59 FR 7629, February 16, 1994).

In addition, the SIP is not approved to apply on any Indian reservation land or in any other area where EPA or an Indian tribe has demonstrated that a tribe has jurisdiction. In those areas of Indian country, the rule does not have tribal implications and will not impose substantial direct costs on tribal governments or preempt tribal law as specified by Executive Order 13175 (65 FR 67249, November 9, 2000).

List of Subjects in 40 CFR Part 52

Environmental protection, Air pollution control, Incorporation by reference, Nitrogen dioxide, Ozone, Particulate matter, Reporting and recordkeeping requirements, Sulfur oxides, Volatile organic compounds.

Dated: May 21, 2018.

Cathy Stepp,
Regional Administrator, Region 5.

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