



ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 52

[EPA-R03-OAR-2017-0681; FRL-9984-98-Region 3]

**Approval and Promulgation of Air Quality Implementation Plans;
Pennsylvania; Attainment Plan for the Beaver, Pennsylvania Nonattainment Area for the
2010 Sulfur Dioxide Primary National Ambient Air Quality Standard**

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: The Environmental Protection Agency (EPA) is proposing to approve a state implementation plan (SIP) revision, submitted by the Commonwealth of Pennsylvania through the Pennsylvania Department of Environmental Protection (PADEP), to EPA on September 29, 2017, for the purpose of providing for attainment of the 2010 sulfur dioxide (SO₂) primary national ambient air quality standard (NAAQS) in the Beaver County, Pennsylvania SO₂ nonattainment area (hereafter referred to as the “Beaver Area” or “Area”). The Beaver Area is comprised of a portion of Beaver County (Industry Borough, Shippingport Borough, Midland Borough, Brighton Township, Potter Township and Vanport Township) in Pennsylvania. The SIP submission is an attainment plan which includes the base year emissions inventory, an analysis of the reasonably available control technology (RACT) and reasonably available control measure (RACM) requirements, a reasonable further progress (RFP) plan, a modeling demonstration of SO₂ attainment, contingency measures for the Beaver Area, and Pennsylvania’s new source review (NSR) permitting program. As part of approving the attainment plan, EPA is also proposing to approve into the Pennsylvania SIP new SO₂ emission limits and associated

compliance parameters for the FirstEnergy Generation, LLC (FirstEnergy) Bruce Mansfield Power Station (Bruce Mansfield Facility) and a consent order with Jewel Acquisition Midland steel plant (Jewel Facility). This action is being taken under the Clean Air Act (CAA).

DATES: Written 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-R03-OAR-2017-0681 at <http://www.regulations.gov>, or via email to spielberger.susan@epa.gov. For comments submitted at [Regulations.gov](http://www.regulations.gov), follow the online instructions for submitting comments. Once submitted, comments cannot be edited or removed from [Regulations.gov](http://www.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-dockts>.

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I. Background for EPA's Proposed Action

On June 2, 2010, the EPA Administrator signed a final rule establishing a new SO₂ NAAQS as a 1-hour standard of 75 parts per billion (ppb), based on a 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. *See* 75 FR 35520 (June 22, 2010), codified at 40 CFR 50.17 (a)-(b). This action also revoked the existing 1971 primary annual and 24-hour standards, subject to certain conditions.¹ EPA established the NAAQS based on significant evidence and numerous health studies demonstrating that serious health effects are associated with short-term exposures to SO₂ emissions ranging from 5 minutes to 24 hours with an array of adverse respiratory effects including narrowing of the airways which can cause difficulty breathing (bronchoconstriction) and increased asthma symptoms. For more information

¹ EPA's June 22, 2010 final action revoked the two 1971 primary 24-hour standard of 140 ppb and the annual standard of 30 ppb because they were determined not to add additional public health protection given a 1-hour standard at 75 ppb. *See* 75 FR 35520. However, the secondary 3-hour SO₂ standard was retained. Currently, the 24-hour and annual standards are only revoked for certain of those areas the EPA has already designated for the 2010 1-hour SO₂ NAAQS. *See* 40 CFR 50.4(e).

regarding the health impacts of SO₂, please refer to the June 22, 2010, final rulemaking. *See* 75 FR 35520. Following promulgation of a new or revised NAAQS, EPA is required by the CAA to designate areas throughout the United States as attaining or not attaining the NAAQS; this designation process is described in section 107(d)(1) of the CAA. On August 5, 2013, EPA promulgated initial air quality designations for 29 areas for the 2010 SO₂ NAAQS (78 FR 47191), which became effective on October 4, 2013, based on violating air quality monitoring data for calendar years 2009–2011, where there was sufficient data to support a nonattainment designation.²

Effective on October 4, 2013, the Beaver Area was designated as nonattainment for the 2010 SO₂ NAAQS for an area that encompasses several past and current sources of SO₂ emissions and the nearby SO₂ monitor (Air Quality Site ID: 42-007-0005). The October 4, 2013 final designation triggered a requirement for Pennsylvania to submit a SIP revision with an attainment plan for how the Area would attain the 2010 SO₂ NAAQS as expeditiously as practicable, but no later than October 4, 2018, in accordance with CAA section 192(a).

For a number of areas, including the Beaver Area, EPA published a notice on March 18, 2016, effective April 18, 2016, that Pennsylvania and other pertinent states had failed to submit the required SO₂ attainment plan by this submittal deadline. *See* 81 FR 14736. This finding initiated a deadline under CAA section 179(a) for the potential imposition of new source review and highway funding sanctions. However, pursuant to Pennsylvania's submittal of September 29, 2017, and EPA's subsequent letter dated October 5, 2017, to Pennsylvania finding the submittal

² EPA is continuing its designation efforts for the 2010 SO₂ NAAQS. Pursuant to a court-order entered on March 2, 2015, by the U.S. District Court for the Northern District of California, EPA must complete the remaining designations for the rest of the country on a schedule that contains three specific deadlines. *Sierra Club, et al. v. Environmental Protection Agency*, 13-cv-03953-SI (2015).

complete and noting the stopping of these sanctions' deadline, these sanctions under section 179(a) will not be imposed as a consequence of Pennsylvania's missing the SIP submission deadline. Additionally, under CAA section 110(c), the March 18, 2016 finding triggers a requirement that EPA promulgate a federal implementation plan (FIP) within two years of the finding unless, by that time the state has made the necessary complete submittal and EPA has approved the submittal as meeting applicable requirements. EPA's obligation to promulgate and implement a FIP will not apply if EPA makes final the approval action proposed here.

II. Requirements for SO₂ Nonattainment Area Plans

Attainment plans must meet the applicable requirements of the CAA, and specifically CAA sections 110, 172, 191, and 192. The required components of an attainment plan submittal are listed in section 172(c) of Title 1, part D of the CAA. The EPA's regulations governing nonattainment SIPs are set forth at 40 CFR part 51, with specific procedural requirements and control strategy requirements residing at subparts F and G, respectively. Soon after Congress enacted the 1990 Amendments to the CAA, EPA issued comprehensive guidance on SIPs, in a document entitled the "General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990," published at 57 FR 13498 (April 16, 1992) (General Preamble). Among other things, the General Preamble addressed SO₂ SIPs and fundamental principles for SIP control strategies. *Id.* at 13545-49, 13567-68. On April 23, 2014, EPA issued recommended guidance (hereafter 2014 SO₂ Nonattainment Guidance) for how state submissions could address the statutory requirements in SO₂ attainment plans.³ In this guidance, EPA described the statutory requirements for an attainment plan, which include: an accurate base year emissions

³ See "Guidance for 1-Hour SO₂ Nonattainment Area SIP Submissions" (April 23, 2014), available at https://www.epa.gov/sites/production/files/2016-06/documents/20140423guidance_nonattainment_sip.pdf.

inventory of current emissions for all sources of SO₂ within the nonattainment area (172(c)(3)); an attainment demonstration that includes a modeling analysis showing that the enforceable emissions limitations and other control measures taken by the state will provide for expeditious attainment of the NAAQS (172(c)); demonstration of RFP (172(c)(2)); implementation of RACM, including RACT (172(c)(1)); NSR (172(c)(5)); and adequate contingency measures for the affected area (172(c)(9)). A synopsis of these requirements is also provided in the notice of proposed rulemaking on the Illinois SO₂ nonattainment plans, published on October 5, 2017 at 82 FR 46434.

In order for the EPA to fully approve a SIP as meeting the requirements of CAA sections 110, 172 and 191-192 and EPA's regulations at 40 CFR part 51, the SIP for the affected area needs to demonstrate to EPA's satisfaction that each of the aforementioned requirements have been met. Under CAA sections 110(l) and 193, the EPA may not approve a SIP that would interfere with any applicable requirement concerning NAAQS attainment and RFP, or any other applicable requirement, and no requirement in effect (or required to be adopted by an order, settlement, agreement, or plan in effect before November 15, 1990) in any area which is a nonattainment area for any air pollutant, may be modified in any manner unless it ensures equivalent or greater emission reductions of such air pollutant.

III. Attainment Demonstration and Longer Term Averaging

CAA section 172(c)(1) directs states with areas designated as nonattainment to demonstrate that the submitted plan provides for attainment of the NAAQS. 40 CFR part 51, subpart G further delineates the control strategy requirements that SIPs must meet, and EPA has long required that all SIPs and control strategies reflect four fundamental principles of quantification, enforceability, replicability, and accountability. General Preamble, at 13567-68. SO₂ attainment

plans must consist of two components: (1) emission limits and other control measures that assure implementation of permanent, enforceable and necessary emission controls, and (2) a modeling analysis which meets the requirements of 40 CFR part 51, Appendix W which demonstrates that these emission limits and control measures provide for timely attainment of the primary SO₂ NAAQS as expeditiously as practicable, but by no later than the attainment date for the affected area. In all cases, the emission limits and control measures must be accompanied by appropriate methods and conditions to determine compliance with the respective emission limits and control measures and must be quantifiable (i.e., a specific amount of emission reduction can be ascribed to the measures), fully enforceable (specifying clear, unambiguous and measurable requirements for which compliance can be practicably determined), replicable (the procedures for determining compliance are sufficiently specific and non-subjective so that two independent entities applying the procedures would obtain the same result), and accountable (source specific limits must be permanent and must reflect the assumptions used in the SIP demonstrations).

EPA's 2014 SO₂ Nonattainment Guidance recommends that the emission limits established for the attainment demonstration be expressed as short-term average limits (e.g., addressing emissions averaged over one or three hours), but also describes the option to utilize emission limits with longer averaging times of up to 30 days so long as the state meets various suggested criteria. *See* 2014 SO₂ Nonattainment Guidance, pp. 22 to 39. The guidance recommends that—should states and sources utilize longer averaging times— the longer term average limit should be set at an adjusted level that reflects a stringency comparable to the 1-hour average limit at the critical emission value shown to provide for attainment that the plan otherwise would have set.

The 2014 SO₂ Nonattainment Guidance provides an extensive discussion of EPA's rationale for

concluding that appropriately set comparably stringent limitations based on averaging times as long as 30 days can be found to provide for attainment of the 2010 SO₂ NAAQS. In evaluating this option, EPA considered the nature of the standard, conducted detailed analyses of the impact of use of 30-day average limits on the prospects for attaining the standard, and carefully reviewed how best to achieve an appropriate balance among the various factors that warrant consideration in judging whether a state's plan provides for attainment. *Id.* at pp. 22 - 39, Appendices B, C, and D.

As specified in 40 CFR 50.17(b), the 1-hour primary SO₂ NAAQS is met at an ambient air quality monitoring site when the 3-year average of the annual 99th percentile of daily maximum 1-hour concentrations is less than or equal to 75 ppb. In a year with 365 days of valid monitoring data, the 99th percentile would be the fourth highest daily maximum 1-hour value. The 2010 SO₂ NAAQS, including this form of determining compliance with the standard, was upheld by the U.S. Court of Appeals for the District of Columbia Circuit in *Nat'l Env't'l Dev. Ass'n's Clean Air Project v. EPA*, 686 F.3d 803 (D.C. Cir. 2012). Because the standard has this form, a single exceedance does not create a violation of the standard. Instead, at issue is whether a source operating in compliance with a properly set longer term average could cause exceedances, and if so the resulting frequency and magnitude of such exceedances, and in particular, whether EPA can have reasonable confidence that a properly set longer term average limit will provide that the average fourth highest daily maximum value will be at or below 75 ppb. A synopsis of how EPA evaluates whether such plans "provide for attainment," based on modeling of projected allowable emissions and in light of the NAAQS' form for determining attainment at monitoring sites follows.

For plans for SO₂ based on 1-hour emission limits, the standard approach is to conduct modeling using fixed emission rates. The maximum emission rate that would be modeled to result in attainment (i.e., an “average year”⁴ shows three, not four days with maximum hourly levels exceeding 75 ppb) is labeled the “critical emission value.” The modeling process for identifying this critical emissions value inherently considers the numerous variables that affect ambient concentrations of SO₂, such as meteorological data, background concentrations, and topography. In the standard approach, the state would then provide for attainment by setting a continuously applicable 1-hour emission limit at this critical emission value.

EPA recognizes that some sources have highly variable emissions, for example due to variations in fuel sulfur content and operating rate, that can make it extremely difficult, even with a well-designed control strategy, to ensure in practice that emissions for any given hour do not exceed the critical emission value. EPA also acknowledges the concern that longer term emission limits can allow short periods with emissions above the “critical emissions value,” which, if coincident with meteorological conditions conducive to high SO₂ concentrations, could in turn create the possibility of a NAAQS exceedance occurring on a day when an exceedance would not have occurred if emissions were continuously controlled at the level corresponding to the critical emission value. However, for several reasons, EPA believes that the approach recommended in its guidance document suitably addresses this concern. First, from a practical perspective, EPA expects the actual emission profile of a source subject to an appropriately set longer term average limit to be similar to the emission profile of a source subject to an analogous 1-hour average

⁴ An “average year” is used to mean a year with average air quality. While 40 CFR 50 Appendix T provides for averaging three years of 99th percentile daily maximum values (e.g., the fourth highest maximum daily concentration in a year with 365 days with valid data), this discussion and an example below uses a single “average year” in order to simplify the illustration of relevant principles.

limit. EPA expects this similarity because it has recommended that the longer term average limit be set at a level that is comparably stringent to the otherwise applicable 1-hour limit (reflecting a downward adjustment from the critical emissions value) and that takes the source's emissions profile into account. As a result, EPA expects either form of emission limit to yield comparable air quality.

Second, from a more theoretical perspective, EPA has compared the likely air quality with a source having maximum allowable emissions under an appropriately set longer term limit, as compared to the likely air quality with the source having maximum allowable emissions under the comparable 1-hour limit. In this comparison, in the 1-hour average limit scenario, the source is presumed at all times to emit at the critical emission level, and in the longer term average limit scenario, the source is presumed occasionally to emit more than the critical emission value but on average, and presumably at most times, to emit well below the critical emission value. In an "average year," compliance with the 1-hour limit is expected to result in three exceedance days (i.e., three days with hourly values above 75 ppb) and a fourth day with a maximum hourly value at 75 ppb. By comparison, with the source complying with a longer term limit, it is possible that additional exceedances would occur that would not occur in the 1-hour limit scenario (if emissions exceed the critical emission value at times when meteorology is conducive to poor air quality). However, this comparison must also factor in the likelihood that exceedances that would be expected in the 1-hour limit scenario would not occur in the longer term limit scenario. This result arises because the longer term limit requires lower emissions most of the time (because the limit is set well below the critical emission value), so a source complying with an appropriately set longer term limit is likely to have lower emissions at critical times than would be the case if the source were emitting as allowed with a 1-hour limit.

As a hypothetical example to illustrate these points, suppose a source that always emits 1000 pounds of SO₂ per hour, which results in air quality at the level of the NAAQS (i.e., results in a design value of 75 ppb). Suppose further that in an “average year,” these emissions cause the 5-highest maximum daily average 1-hour concentrations to be 100 ppb, 90 ppb, 80 ppb, 75 ppb, and 70 ppb. Then suppose that the source becomes subject to a 30-day average emission limit of 700 pounds per hour. It is theoretically possible for a source meeting this limit to have emissions that occasionally exceed 1000 pounds per hour, but with a typical emissions profile emissions would much more commonly be between 600 and 800 pounds per hour. In this simplified example, assume a zero background concentration, which allows one to assume a linear relationship between emissions and air quality. (A nonzero background concentration would make the mathematics more difficult but would give similar results.) Air quality will depend on what emissions happen on what critical hours, but suppose that emissions at the relevant times on these 5 days are 800 pounds/hour, 1100 pounds per hour, 500 pounds per hour, 900 pounds per hour, and 1200 pounds per hour, respectively. (This is a conservative example because the average of these emissions, 900 pounds per hour, is well over the 30-day average emission limit.) These emissions would result in daily maximum 1-hour concentrations of 80 ppb, 99 ppb, 40 ppb, 67.5 ppb, and 84 ppb. In this example, the fifth day would have an exceedance that would not otherwise have occurred, but the third and fourth days would not have exceedances that otherwise would have occurred. In this example, the fourth highest maximum daily concentration under the 30-day average would be 67.5 ppb.

This simplified example illustrates the findings of a more complicated statistical analysis that EPA conducted using a range of scenarios using actual plant data. As described in Appendix B

of EPA's 2014 SO₂ Nonattainment Guidance, EPA found that the requirement for lower average emissions is highly likely to yield better air quality than is required with a comparably stringent 1-hour limit. Based on analyses described in Appendix B of its 2014 SO₂ Nonattainment Guidance, EPA expects that an emission profile with maximum allowable emissions under an appropriately set comparably stringent 30-day average limit is likely to have the net effect of having a *lower* number of exceedances and better air quality than an emission profile with maximum allowable emissions under a 1-hour emission limit at the critical emission value. This result provides a compelling policy rationale for allowing the use of a longer averaging period, in appropriate circumstances where the facts indicate this result can be expected to occur.

The question then becomes whether this approach, which is likely to produce a lower number of overall exceedances even though it may produce some unexpected exceedances above the critical emission value, meets the requirement in section 110(a)(1) and 172(c)(1) for SIPs to "provide for attainment" of the NAAQS. For SO₂, as for other pollutants, it is generally impossible to design a nonattainment plan in the present that will guarantee that attainment will occur in the future. A variety of factors can cause a well-designed attainment plan to fail and unexpectedly not result in attainment, for example if meteorology occurs that is more conducive to poor air quality than was anticipated in the plan. Therefore, in determining whether a plan meets the requirement to provide for attainment, EPA's task is commonly to judge not whether the plan provides absolute certainty that attainment will in fact occur, but rather whether the plan provides an adequate level of confidence of prospective NAAQS attainment. From this perspective, in evaluating use of a 30-day average limit, EPA must weigh the likely net effect on air quality. Such an evaluation must consider the risk that occasions with meteorology conducive to high concentrations will have elevated emissions leading to exceedances that would not otherwise have occurred, and

must also weigh the likelihood that the requirement for lower emissions on average will result in days not having exceedances that would have been expected with emissions at the critical emissions value. Additional policy considerations, such as in this case the desirability of accommodating real world emissions variability without significant risk of violations, are also appropriate factors for EPA to weigh in judging whether a plan provides a reasonable degree of confidence that the plan will lead to attainment. Based on these considerations, especially given the high likelihood that a continuously enforceable limit averaged over as long as 30 days, determined in accordance with EPA's guidance, will result in attainment, EPA believes as a general matter that such limits, if appropriately determined, can reasonably be considered to provide for attainment of the 2010 SO₂ NAAQS.

The 2014 SO₂ Nonattainment Guidance offers specific recommendations for determining an appropriate longer term average limit. The recommended method starts with determination of the 1-hour emission limit that would provide for attainment (i.e., the critical emission value), and applies an adjustment factor to determine the (lower) level of the longer term average emission limit that would be estimated to have a stringency comparable to the otherwise necessary 1-hour emission limit. This method uses a database of continuous emission data reflecting the type of control that the source will be using to comply with the SIP emission limits, which (if compliance requires new controls) may require use of an emission database from another source. The recommended method involves using these data to calculate a complete set of emission averages, computed according to the averaging time and averaging procedures of the prospective emission limitation. In this recommended method, the ratio of the 99th percentile among these long term averages to the 99th percentile of the 1-hour values represents an adjustment factor that may be multiplied by the candidate 1-hour emission limit to determine a longer term average

emission limit that may be considered comparably stringent.⁵ The 2014 SO₂ Nonattainment Guidance also addresses a variety of related topics, such as the potential utility of setting supplemental emission limits, such as mass-based limits, to reduce the likelihood and/or magnitude of elevated emission levels that might occur under the longer term emission rate limit. Preferred air quality models for use in regulatory applications are described in Appendix A of EPA's *Guideline on Air Quality Models (40 CFR part 51, Appendix W)*.⁶ In 2005, EPA promulgated the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) as the Agency's preferred near-field dispersion modeling for a wide range of regulatory applications addressing stationary sources (for example in estimating SO₂ concentrations) in all types of terrain based on extensive developmental and performance evaluation. Supplemental guidance on modeling for purposes of demonstrating attainment of the SO₂ standard is provided in Appendix A to the April 23, 2014 SO₂ nonattainment area SIP guidance document referenced above. Appendix A provides extensive guidance on the modeling domain, the source inputs, assorted types of meteorological data, and background concentrations. Consistency with the recommendations in this guidance is generally necessary for the attainment demonstration to offer adequately reliable assurance that the plan provides for attainment.

As stated previously, attainment demonstrations for the 2010 1-hour primary SO₂ NAAQS must demonstrate future attainment and maintenance of the NAAQS in the entire area designated as nonattainment (*i.e.*, not just at the violating monitor) by using air quality dispersion modeling (*see* Appendix W to 40 CFR part 51) to show that the mix of sources and enforceable control measures and emission rates in an identified area will not lead to a violation of the SO₂ NAAQS.

⁵ For example, if the critical emission value is 1000 pounds of SO₂ per hour, and a suitable adjustment factor is determined to be 70 percent, the recommended longer term average limit would be 700 pounds per hour.

⁶ The EPA published revisions to the *Guideline on Air Quality Models* on January 17, 2017.

For a short-term (*i.e.*, 1-hour) standard, EPA believes that dispersion modeling, using allowable emissions and addressing stationary sources in the affected area (and in some cases those sources located outside the nonattainment area which may affect attainment in the area) is technically appropriate, efficient and effective in demonstrating attainment in nonattainment areas because it takes into consideration combinations of meteorological and emission source operating conditions that may contribute to peak ground-level concentrations of SO₂.

The meteorological data used in the analysis should generally be processed with the most recent version of AERMET. Estimated concentrations should include ambient background concentrations, should follow the form of the standard, and should be calculated as described in section 2.6.1.2 of the August 23, 2010 clarification memo on “Applicability of Appendix W Modeling Guidance for the 1-hr SO₂ National Ambient Air Quality Standard” (U. S. EPA, 2010a).

IV. Pennsylvania’s Attainment Plan Submittal for the Beaver Area

In accordance with section 172(c) of the CAA, the Pennsylvania attainment plan for the Beaver Area includes: (1) an emissions inventory for SO₂ for the plan’s base year (2011); (2) an attainment demonstration including an analysis that locates, identifies, and quantifies sources of emissions contributing to violations of the 2010 SO₂ NAAQS and a dispersion modeling analysis of an emissions control strategy for the primary remaining SO₂ sources in the area and which also accounts for smaller sources within the Area in the background concentration, showing attainment of the SO₂ NAAQS by the October 4, 2018 attainment date; (3) a determination that the control strategy for the primary remaining SO₂ sources within the nonattainment area constitutes RACM/RACT; (4) requirements for RFP toward attaining the

SO₂ NAAQS in the Area; (5) contingency measures; and (6) the assertion that Pennsylvania's existing SIP-approved NSR program meets the applicable requirements for SO₂. The Pennsylvania attainment plan for the Beaver Area also includes the request that emission limitations and compliance parameters contained in a consent order with Bruce Mansfield and a consent order with Jewel be incorporated into the SIP.

V. EPA's Analysis of Pennsylvania's Attainment Plan for the Beaver Area

Consistent with CAA requirements (*see* section 172), an attainment demonstration for a SO₂ nonattainment area must show that the area will attain the 2010 SO₂ NAAQS as expeditiously as practicable. The demonstration must also meet the requirements of 40 CFR 51.112 and 40 CFR part 51, Appendix W, and include inventory data, modeling results, and emissions reductions analyses on which the state has based its projected attainment. EPA is proposing that the attainment plan submitted by Pennsylvania is sufficient, and EPA is proposing to approve the plan to ensure ongoing attainment.

A. Pollutants Addressed

Pennsylvania's SO₂ attainment plan evaluates SO₂ emissions for the Area within the portion of Beaver County (Industry Borough, Shippingport Borough, Midland Borough, Brighton Township, Potter Township and Vanport Township) that is designated nonattainment for the 2010 SO₂ NAAQS. There are no precursors to consider for the SO₂ attainment plan. SO₂ is a pollutant that arises from direct emissions, and therefore concentrations are highest relatively close to the sources and much lower at greater distances due to dispersion. Thus, SO₂ concentration patterns resemble those of other directly emitted pollutants like lead, and differ from those of photochemically-formed (secondary) pollutants such as ozone.

B. Emissions Inventory Requirements

States are required under section 172(c)(3) of the CAA to develop comprehensive, accurate and current emissions inventories of all sources of the relevant pollutant or pollutants in the nonattainment area. These inventories provide detailed accounting of all emissions and emissions sources by precursor or pollutant. In addition, inventories are used in air quality modeling to demonstrate that attainment of the NAAQS is as expeditious as practicable. The 2014 SO₂ Nonattainment Guidance provides that the emissions inventory should be consistent with the Air Emissions Reporting Requirements (AERR) at Subpart A to 40 CFR part 51.⁷

For the base year inventory of actual emissions, a “comprehensive, accurate and current” inventory can be represented by a year that contributed to the three-year design value used for the original nonattainment designation. The 2014 SO₂ Nonattainment Guidance notes that the base year inventory should include all sources of SO₂ in the nonattainment area as well as any sources located outside the nonattainment area which may affect attainment in the area.

Pennsylvania appropriately elected to use 2011 as the base year, as the Area was designated nonattainment with monitor data from 2009-2011. Actual emissions from all the sources of SO₂ in the Beaver Area were reviewed and compiled for the base year emissions inventory requirement. One additional source located outside the area was included in the inventory due to its proximity to the Area. The source is IPSCO Koppel Tubular (Koppel) with 2011 emissions of 130.42 tons per year (tpy). Table 1 shows the level of emissions, expressed in tpy, in the Beaver Area for the 2011 base year by emissions source category. The point source category includes all sources within the nonattainment area and one source (Koppel) just outside the area.

Table 1. 2011 Base Year SO₂ Emissions Inventory for the Beaver Area

⁷ The AERR at Subpart A to 40 CFR part 51 cover overarching federal reporting requirements for the states to submit emissions inventories for criteria pollutants to EPA’s Emissions Inventory System. EPA uses these submittals, along with other data sources, to build the National Emissions Inventory.

Emission Source Category	SO₂ Emissions (tpy)
Point	26,591.051
Area	29.784
Non-road	0.111
On-road	1.530
Total	26,622.476

Table 2. Point Source 2011 Actual Sulfur Dioxide Emission Inventory

Facility	SO₂ Emissions (tpy)
AES BEAVER VALLEY	3,085.634
BRUCE MANSFIELD	21,195.710
HORSEHEAD	2,014.920
IPSCO KOPPEL TUBULARS/KOPPEL*	130.420
JEWEL	162.100
SHELL	0.000
All Other Point Sources Combined	2.267
Total	26,591.051
*IPSCO KOPPEL TUBULARS/KOPPEL is not physically in the Beaver Area, but modeling shows it has a small impact on it. Another source located near the Area, Anchor Hocking/Monaca, which had 2011 SO ₂ emissions of 26.068 tons, was also evaluated. Based on the modeling analysis, Anchor Hocking/Monaca does not have significant impacts in the Beaver Area and is not included in the inventory.	

A more detailed discussion of the emissions inventory for the Beaver Area can be found in Pennsylvania's September 29, 2017 submittal, as well as, the emissions inventory Technical Support Document (TSD), which can be found under Docket ID No. EPA-R03-OAR-2017-0681 and is available online at www.regulations.gov. EPA has evaluated Pennsylvania's 2011 base year emissions inventory for the Beaver Area and has made the determination that this inventory was developed consistently with section 172(c)(3) and EPA's guidance as discussed in detail in the inventory TSD. Therefore, EPA is proposing to approve Pennsylvania's 2011 base year emissions inventory for the Beaver Area.

The attainment plan also provides for a projected attainment year inventory that includes

estimated emissions for all emission sources of SO₂ which are determined to impact the Beaver Area for the year in which the area is expected to attain the NAAQS. Pennsylvania provided a 2018 projected emissions inventory for all known sources included in the 2011 base year inventory and one additional source, Shell Chemical Appalachia LLC's recently permitted petrochemicals complex. This source will not start operation until after 2018 but has been included to provide assurance that the NAAQS will be attained and maintained notwithstanding commencement of its operation.

The projected 2018 emissions are shown in Table 3 and Table 4. Projected allowable emissions for 2018 exceed the 2011 emissions inventory; however, projected actual emissions for 2018 are below the 2011 emissions inventory. It should be noted that the sources most likely causing impacts at the previously violating monitor, including AES Beaver Valley and Horsehead, have closed or remain idled such as the Jewel Facility's Meltshop. The remaining primary SO₂ sources with their new allowable emissions may be above the total 2011 actual emissions in the Area; however, the remaining primary sources were modeled using emissions above their new allowable emissions (as listed in Table 4) and demonstrate attainment as discussed subsequently in this Notice. SO₂ impacts are very source specific and assumptions cannot be made merely related to the total amount of emissions in an area. Also, as discussed in the submittal, the projected actual emissions are based on business projections of 2018 operations, and allowable maximum 2018 emissions are assuming that the plant is operating 8,760 hours per year and in compliance with the comparably stringent longer term average limit. The allowable maximum provides the worst-case emissions for the facilities versus the actual anticipated emissions which are based on typical operating hours and on projected business demand. In this case, the modeled maximum SO₂ emissions were not set equal to the allowable maximum emissions, but

were greater than the allowable maximum emissions. For Bruce Mansfield, the 2018 maximum modeled emissions were 45,038.226 tpy. The 2018 modeled maximum emissions for Koppel and Shell were 306.6 tpy and 22.0 tpy, respectively.

Reductions in projected 2018 SO₂ emissions in the onroad, nonroad and nonpoint source categories can be attributed to lower sulfur content limits for gasoline and diesel fuels for the onroad and nonroad sector, and more stringent sulfur content limits on home heating oil and other distillate/residual fuel oils for the nonpoint sector which limits are included in the Pennsylvania SIP. A detailed discussion of projected emissions for the Beaver Area can be found in Pennsylvania's September 29, 2017 submittal which can be found under Docket ID No. EPA-R03-OAR-2017-0681 and online at www.regulations.gov.

Table 3. 2018 Projected SO₂ Emission Inventory for the Beaver Area

Emission Source Category	SO₂ Emissions (tpy) Anticipated Actual	SO₂ Emissions (tpy)*includes Allowable Emissions for all point sources
Point	14,679.771	32,420.050
Area	22.586	22.586
Non-road	0.057	0.057
On-road	0.590	0.590
Total	14,703.004	32,443.283

Table 4. 2018 Projected Point Source Emissions for the Beaver Area

Facility	2018 Allowable Max SO ₂ (tpy)	2018 Anticipated Actual SO ₂ (tpy)
AES BEAVER VALLEY	0.000	0.000
BRUCE MANSFIELD	32,245.560	14,542.309
HORSEHEAD	0.000	0.000
IPSCO KOPPEL TUBULARS/KOPPEL*	149.500	133.472
JEWEL	1.603	1.603
SHELL**	21.000	0.000
All Other Point Sources Combined	2.387	2.387
Total	32,420.050	14,679.771
<p>*IPSCO KOPPEL TUBULARS/KOPPEL is not physically in the nonattainment area, but modeling shows it has a small impact on it. It is included in the 2011 base year and 2018 attainment year inventories.</p> <p>**Shell does not anticipate startup to occur prior to the end of 2018. Annual emissions after startup are limited by the facility's Plan Approval to less than 21 tons SO₂ per year.</p>		

C. Air Quality Modeling

The SO₂ attainment demonstration provides an air quality dispersion modeling analysis to demonstrate that control strategies chosen to reduce SO₂ source emissions will bring the Area into attainment by the statutory attainment date of October 4, 2018. The modeling analysis, conducted pursuant to recommendations outlined in Appendix W to 40 CFR part 51 (EPA's Modeling Guidance), is used for the attainment demonstration to assess the control strategy for a nonattainment area and establish emission limits that will provide for attainment. The analysis requires five years of meteorological data to simulate the dispersion of pollutant plumes from multiple point, area, or volume sources across the averaging times of interest. The modeling demonstration typically also relies on maximum allowable emissions from sources in the nonattainment area. Though the actual emissions are likely to be below the allowable emissions, sources have the ability to run at higher production rates or optimize controls such that emissions approach the allowable emissions limits. A modeling analysis that provides for attainment under all scenarios of operation for each source must therefore consider the worst-case scenario of both

the meteorology (e.g. predominant wind directions, stagnation, etc.) and the maximum allowable emissions. In this case, the modeled maximum SO₂ emissions were greater than the allowable maximum SO₂ emissions.

PADEP's modeling analysis was developed in accordance with EPA's Modeling Guidance and the 2014 SO₂ Nonattainment Guidance, and was prepared using EPA's preferred dispersion modeling system, AERMOD. A more detailed discussion of PADEP's modeling analysis for the Beaver Area can be found in Pennsylvania's September 29, 2017 submittal as well as the modeling TSD, which can be found under Docket ID No. EPA-R03-OAR-2017-0681 which is available online at www.regulations.gov.

For its modeling demonstration, PADEP evaluated SO₂ emissions from the Bruce Mansfield Facility located in Shippingport Borough and potential SO₂ emissions from Shell Chemical Appalachia LLC's (Shell Chemical Appalachia) planned petrochemicals complex to be located in Potter and Center Townships. SO₂ emissions from Koppel, located outside the Beaver Area were also included in the modeling. The Jewel Facility Meltshop was idled in 2015 and its emissions were not included in the attainment modeling demonstration. To resume operation, the Meltshop must comply with a Consent Order and Agreement (COA) described in section D of this notice.

EPA has reviewed the modeling that Pennsylvania submitted to support the attainment demonstration for the Beaver Area and has determined that this modeling is consistent with CAA requirements, Appendix W, and EPA's Guidance for SO₂ attainment demonstration modeling. The modeling properly characterized source limits, local meteorological data, background concentrations, and provided an adequate model receptor grid to capture maximum modeled

concentrations. Using the EPA conversion factor for the SO₂ NAAQS, the modeled design values for the Beaver Area are less than 75 ppb as shown in Table 5 below.⁸ EPA's analysis of the modeling is discussed in more detail in EPA's modeling TSD, which can be found under Docket ID No. EPA-R03-OAR-2017-0681. EPA proposes to conclude that the modeling provided in the attainment plan shows that the Beaver Area will attain the 2010 1-hour primary SO₂ NAAQS by the attainment date and proposes to approve the attainment demonstration.

D. RACM/RACT

CAA section 172(c)(1) requires that each attainment plan provide for the implementation of all RACM as expeditiously as practicable for attainment of the NAAQS. EPA interprets RACM, including RACT, under section 172, as measures that a state determines to be both reasonably available and contribute to attainment as expeditiously as practicable "for existing sources in the area." In addition, CAA section 172(c)(6) requires plans to include enforceable emission limitations and control measures as may be necessary or appropriate to provide for attainment by the attainment date.

Pennsylvania's September 29, 2017 submittal discusses federal and state measures that will provide emission reductions leading to attainment and maintenance of the 2010 SO₂ NAAQS. With regards to state rules, Pennsylvania cites its low sulfur fuel rules, which were SIP-approved on July 10, 2014 (79 FR 39330). Pennsylvania's low sulfur fuel oil provisions apply to refineries, pipelines, terminals, retail outlet fuel storage facilities, commercial and industrial

⁸ The SO₂ NAAQS level is expressed in ppb but AERMOD gives results in micrograms per meter cubed ($\mu\text{g}/\text{m}^3$). The conversion factor for SO₂ (at the standard conditions applied in the ambient SO₂ reference method) is 1ppb = approximately 2.619 $\mu\text{g}/\text{m}^3$. See Pennsylvania's SO₂ Round 3 Designations Proposed Technical Support Document at https://www.epa.gov/sites/production/files/2017-08/documents/35_pa_so2_rd3-final.pdf.

facilities, and facilities with units burning regulated fuel oil to produce electricity and domestic home heaters. These low sulfur fuel oil rules reduce the amount of sulfur in fuel oils used in combustion units, thereby reducing SO₂ emissions and the formation of sulfates that cause decreased visibility.

Pennsylvania's attainment plan submittal discusses facility closures and facility-specific control measures. Pennsylvania's submittal indicates that two of the three largest sources in the Beaver Area were permanently shut down prior to January 2, 2017. The Horsehead facility closed in the spring of 2014 and has been demolished. AES Beaver Valley was a coal fired power plant that permanently shut down in the fall of 2015. Appendix A of the state submittal includes PADEP's approval letters of Emission Reduction Credits for these facilities which indicate permanent facility closure. The Jewel Facility is currently idled and has agreed in a Consent Order and Agreement with PADEP that its Meltshop cannot emit any SO₂ emissions unless additional modeling is done to support attainment and new SO₂ emissions limitations are established for the SIP as necessary. This restriction is established in a COA (*see* Appendix C of the September 29, 2017 submittal) between PADEP and the Jewel Facility which PADEP seeks to have incorporated by reference into the SIP, thereby making it permanently federally enforceable under the CAA. In addition to these actual emission reductions in the Area of 5,100.554 tpy, new SO₂ emission limits were developed through air dispersion modeling (AERMOD) submitted by PADEP as discussed below, and in section IV.C. Air Quality Modeling of this proposed rulemaking as well as in the modeling TSD.

In order to ensure that the Beaver Area demonstrates attainment with the SO₂ NAAQS, PADEP asserts that the following combination of emission limits at the Bruce Mansfield Facility are

sufficient for the Beaver Area to meet the SO₂ NAAQS and serve as RACM/RACT. For the Bruce Mansfield Facility, the new emission limits are established in a COA (*see* Appendix C of the September 29, 2017 submittal) between PADEP and FirstEnergy for the Bruce Mansfield Facility, which PADEP has also submitted for incorporation into the SIP as permanently federally enforceable limits under the CAA.

The Facility's SO₂ emission sources include three coal-fired boilers (Unit 1, Unit 2, and Unit 3) that were included in the air dispersion modeling. The SO₂ emissions from each of the three boilers are controlled by three individual Flue Gas Desulfurization (FGD) systems. Unit 1 and Unit 2 each vent through two flues within a common stack. Unit 3 vents through two flues in the other stack. To demonstrate compliance with the 2010 1-hour SO₂ NAAQS, FirstEnergy requested that the Unit 1 and Unit 2 combined emission limit be established as a function of the Unit 3 emission limit. On and after October 1, 2018, FirstEnergy shall begin calculating a pound per hour (lb/hr) 30-operating day rolling average SO₂ emission rate for Unit 1 (Source ID 031) and Unit 2 (Source ID 032) from Chimney 1 (Stacks S01-S04), and a lb/hr 30-operating day rolling average SO₂ emission rate for Unit 3 (Source ID 033) from Chimney 2 (Stacks S05 and S06), using data from the PADEP-certified Continuous Emission Monitoring Systems (CEMS) at the Bruce Mansfield Facility. The 30-operating day rolling average SO₂ emissions rates shall be calculated using the procedures outlined in the Mercury and Air Toxics Standards (MATS) regulations in 40 CFR Parts 60 and 63. The 30-operating day rolling average SO₂ emissions rate for Units 1 and 2 cannot exceed the result of equation one (EQ-1), below, with Chimney 1 (CH1) and Chimney 2 (CH2) in service, calculated daily. In addition, the 30-operating day rolling average emissions rate cannot exceed 7,362 lb/hr for Units 1 and 2 combined. The 30-operating day rolling average SO₂ emissions rate cannot exceed 3,584 lb/hr

for Unit 3. The results of EQ-1 are only valid when Unit 3 emissions are less than or equal to 3,584 lb/hr.

$$\text{EQ-1: CH1SO}_2 \text{ Lim} = -1.38\text{E-}04 \times \text{CH2SO}_2^2 - 0.920 \times \text{CH2SO}_2 + 7100$$

Where:

CH1SO₂ Lim: Chimney 1 SO₂ lb/hr 30-day rolling average Limit

$$\text{CH1SO}_2 \text{ Lim} \leq 7,362 \text{ lb/hr}$$

CH2SO₂: Chimney 2 SO₂ lb/hr 30-day rolling average.

$$\text{CH2SO}_2 \leq 3,584 \text{ lb/hr}$$

Also, FirstEnergy is required by the COA to use its PADEP-certified CEMS to demonstrate compliance with the new emission restrictions as detailed in the COA (Paragraph 3.a. of the COA). In accordance with the current version of PADEP's Continuous Source Monitoring Manual, FirstEnergy is required by the COA to continue to provide quarterly reports of emissions data as recorded by the CEMS to PADEP.

Additionally, FirstEnergy shall achieve as detailed in the COA at least a 95% removal efficiency from the FGDs following the general requirements contained in 25 Pa. Code Chapter 139.11. FirstEnergy shall annually test for removal efficiency of the FGDs by using a combination of CEMS data and coal sampling in accordance with the procedures outlined in 40 CFR Part 60, Appendix A, Method 19. Three test runs shall be conducted concurrently in the two flues that feed each unit during the annual tests. Each test run shall be a minimum of sixty minutes in duration. A report of the efficiency test shall be provided annually to PADEP. The first report shall be submitted within one (1) year of the final execution of this COA and annually thereafter.

FirstEnergy shall maintain records of the operation of and emissions monitoring from the FGDs, including the annual efficiency report.

The auxiliary boilers located at the Bruce Mansfield Facility are limited by an existing federally enforceable operating permit to a capacity factor of less than 5% in any 12-consecutive month period. PADEP stated this existing federally enforceable limitation has reduced the potential to emit SO₂ to levels at which additional SO₂ controls are not feasible. Thus PADEP concluded the permit restrictions are RACM and no further control is needed from these auxiliary boilers for the Area to attain the NAAQS or to reflect RACT from these boilers. EPA finds Pennsylvania's conclusion for the auxiliary boilers reasonable given the existing permit limitations and low potential to emit SO₂.

Operating restrictions are also placed on the Jewel Facility as RACM/RACT. To ensure that the Beaver Area will demonstrate attainment with the 2010 1-hour SO₂ NAAQS, the Jewel Facility has agreed to conditions in a COA which specifies zero SO₂ emissions from the Meltshop, which is the Jewel Facility Source ID 106. Other SO₂ emission sources at the facility were addressed in the modeling analysis as part of the "background" sources as discussed in section V. C. of this notice. The COA also requires additional modeling and SO₂ emission limitations for the SIP as necessary to assure attainment before the Jewel Facility would be able to operate the Meltshop. EPA is proposing here to approve the requirement for zero emissions from the Meltshop as RACM/RACT; any authorization of nonzero emissions from this Meltshop source would need to be subject to EPA review as a SIP revision with required modeling analysis showing continued attainment of the NAAQS.

Based on the modeling analysis discussed in section V.C. Air Quality Modeling above, the

collective emission limits and related compliance parameters for the Bruce Mansfield Facility, along with the operating restrictions at the Jewel Facility, have been proposed as RACM/RACT and for incorporation into the SIP, therefore making them federally enforceable. PADEP asserts that this proposed control strategy as demonstrated by the modeling analysis is sufficient for the Beaver Area to attain the 2010 SO₂ NAAQS.

To establish the emission limit equation (EQ-1) described earlier in this section, Pennsylvania conducted a modeling analysis that included eleven modeling runs, supplemented with six additional modeling runs performed by FirstEnergy, to determine the range of emission rates for the three Units at the Bruce Mansfield Facility that provide for attainment. In each of these runs, the model demonstrates that the respective set of hourly emissions would result in the 5-year average of the 99th percentile of daily maximum hourly SO₂ concentrations below the level of the 1-hour NAAQS. The modeling results are presented in Table 5.

Table 5: Summary of Air Dispersion Modeling Results for FirstEnergy Bruce Mansfield 1-hour SO₂ Modeled Emission Values

Model Run	Unit 1 & Unit 2 Combined 1-hour SO ₂ Rate (lb/hr)	Unit 3 1-hour SO ₂ Rate (lb/hr)	Maximum Modeled 1-hour SO ₂ Design Concentration (µg/m ³)
1	10,282.70	0.00	196.17563
2	9,254.43	761.19	196.18089
3	8,226.16	1,482.72	196.17966
1FE*	7,484.24	2,006.14	196.18033
4	7,197.89	2,206.62	196.17977
2FE*	6,765.97	2,507.57	196.14426
5	6,169.62	2,885.44	196.18044
3FE*	5,952.47	3,009.17	196.07897
6	5,141.35	3,469.90	196.17912
4FE*	5,051.66	3,510.68	196.11106
7	4,113.08	3,985.46	196.17974
5FE*	4,015.93	4,012.20	196.04158
8	3,084.81	4,407.53	196.18032
6FE*	2,857.18	4,513.72	196.10031
9	2,056.54	4,743.88	196.18082
10	1,028.27	4,956.43	196.18081
11	0.00	5,041.58	196.17832

*FirstEnergy model run.

FirstEnergy developed adjustment factors to convert the 1-hour emission rates (Table 5) to comparably stringent 30-operating day emission rates for each unit at the Bruce Mansfield Facility. To do this, historic operating data for 2012-2016 from EPA's Clean Air Markets Database (CAMD) were used in accordance with the methods EPA recommended in Appendix C and Appendix D of EPA's 2014 SO₂ Nonattainment Guidance. The SO₂ emission limit adjustment factor was calculated as 0.59 for Unit 1, 0.717 for Unit 2, and 0.794 for Unit 3. The adjustment factor for Unit 2 was applied to Unit 1 as First Energy deemed it a more representative correction factor for Unit 1. It was noted in Pennsylvania's submittal that Unit 2's hourly emissions have a tendency to be higher more frequently than Unit 1. Given this fact, Pennsylvania asserted that applying the adjustment factor developed for Unit 2 (higher frequency

of higher emissions) to Unit 1 will continue to protect the NAAQS. EPA's SO₂ Nonattainment Guidance allows for using a unit more representative of planned operations going forward under the newly established emission limits stating "... data from other sources of comparable source type, size, operation, fuel, and control type may be more useful for these comparisons." In addition, Unit 2's adjustment factors of 0.717 is very similar to the average adjustment factor for 30-day emission values (0.71) listed in Appendix D of EPA's SO₂ Nonattainment Guidance for sources with wet scrubbers (the same control technology that Unit 1 and 2 have in place). For these reasons, EPA believes it is appropriate to utilize 0.717 as the adjustment factor for Unit 1.

The unit specific adjustment factors (0.717 for Units 1 and 2, and 0.794 for Unit 3) were multiplied by the 1-hour modeled emission rates shown in Table 5, resulting in the corresponding 30-day average emission rates shown in columns three and five in Table 6. These corresponding 30-day average emission rates show a series of 30-day average limits for Units 1 and 2 combined emissions and for Unit 3 emissions, respectively. Pennsylvania then determined an equation (EQ-1), identified above, that can be used to interpolate additional combinations of emissions that would also result in attainment.

Table 6 addresses the relationship between the modeling results and Pennsylvania's emission limit in particular addressing whether the modeling demonstrates that Pennsylvania's compliance equation provides for attainment throughout the range of possible combinations of allowable emissions. For each model run, Table 6 shows the modeled emission rates for Units 1 + 2 (reflecting the sum of emissions from the two units) and for Unit 3, along with the corresponding 30-day average emission rates. EPA calculated the sixth column of Table 6 by plugging in the Unit 3 30-day average emission rates (from the fifth column, Table 6) into the equation, and

determining the limit for Units 1 and 2. In three cases, the entry in the sixth column is “Disallowed,” because the emission rate for Unit 3 is higher than the 30-operating day average limit (3,584 lbs/hr) that independently applies to Unit 3. An important feature of Table 6 is that the limit on the sum of emissions from Units 1 and 2 computed using the equation (EQ-1), in all cases is lower than the 30-day average sum of Units 1 and 2 emissions that was calculated as comparably stringent to the modeled 1-hour sum of Units 1 and 2 emissions. For a full range of cases, Pennsylvania demonstrated that its equation required a level of emissions that is lower than the level (adjusted to reflect comparable stringency) demonstrated to result in attainment. In other words, the equation (EQ-1) used to calculate the 30-day average limits is slightly more stringent than the comparably stringent adjusted 30-day average limits. By this means, Pennsylvania demonstrated that the compliance equation that it adopted, supplemented by independent limits on the emissions of Unit 3 and on the sum of emissions from Units 1 and 2, provides for attainment.

Table 6: FirstEnergy Bruce Mansfield 30-Day Average SO₂ Emission Limits

Model Run	Modeled Emissions for Units 1 + 2 (lb/hr)	Corresponding 30-day Average Emissions for Units 1 + 2 (lb/hr)**	Modeled Emissions for Unit 3 (lb/hr)	Corresponding 30-day Average Emissions for Unit 3 (lb/hr)**	30-Day Average SO₂ Limit for Units 1 + 2 based on 30-day average equivalent to modeled Unit 3 emissions (lb/hr)***
1	10,282.70	7,372.70	0.00	0.00	7100.0
2	9,254.43	6,635.43	761.19	604.38	6493.6
3	8,226.16	5,898.16	1,482.72	1,177.28	5825.6
1FE*	7,484.24	5,366.20	2,006.14	1,592.88	5284.4
4	7,197.89	5,160.89	2,206.62	1,752.06	5064.5
2FE*	6,765.97	4,851.20	2,507.57	1,991.01	4721.2
5	6,169.62	4,323.62	2,885.44	2,291.04	4267.9
3FE*	5,952.47	4,267.92	3,009.17	2,389.28	4114.1
6	5,141.35	3,686.35	3,469.90	2,755.10	3517.8
4FE*	5,051.66	3,622.04	3,510.68	2,787.48	3463.3
7	4,113.08	2,949.08	3,985.46	3,164.46	2806.8
5FE*	4,015.93	2,879.42	4,012.20	3,185.69	2768.7
8	3,084.81	2,211.81	4,407.53	3,499.58	2190.3
6FE*	2,857.18	2,048.60	4,513.72	3,583.89	2030.3
9	2,056.54	1,474.54	4,743.88	3,766.64	Disallowed
10	1,028.27	737.27	4,956.43	3,935.41	Disallowed
11	0.00	0.00	5,041.58	4,003.01	Disallowed

*FirstEnergy model run

** Corresponding 30-day average emission rates were calculated by multiplying the modeled 1-hour emission rates from Table 5 by PADEP's adjustment ratios (0.717 for Units 1 and 2; 0.794 for Unit 3).

***The limit that would result from the compliance equation (EQ-1) using the Unit 3 30-operating day average emission rate that corresponds to the modeled 1-hour rate (from fifth column of this table).

EPA's guidance for longer term average limits states that plans based on such limits can be considered to provide for attainment where appropriate as long as the longer term limit is comparably stringent to the 1-hour limit that would otherwise be set, and as long as EPA can have reasonable confidence that occasions of emissions above the CEV will be limited in frequency and magnitude. To address this latter criterion, Pennsylvania has provided an analysis of historic emissions, assessing the frequency of elevated emissions. This analysis used 2012-

2016 CAMD data. Pennsylvania established a limit based on an equation involving the emissions from multiple units. The equation was derived from the modeled CEV values (from Table 5). These values were used to develop a polynomial equation which was plotted on a graph and compared to the 2012-2016 CAMD data. This comparison demonstrates that during 2012-2016, the Bruce Mansfield Facility only exceeded the 1 hour emissions formula for 0.50 % of the hours.⁹ PADEP's CEV analysis is provided in an excel spreadsheet in the Docket at www.regulations.gov.

Accordingly, EPA believes that PADEP has demonstrated that its limit for the Bruce Mansfield facility will assure that occasions of emissions exceeding critical levels will be limited. More generally, EPA believes that PADEP has met EPA's recommended criteria for longer term average limits and believes that the emission limits proposed by PADEP for the Bruce Mansfield Facility will provide reasonable assurance that the Area will attain the standard.

Additional information on the development of the adjustment factor and limits, including statistical analyses performed to develop the limits in accordance with the 2014 SO₂ Nonattainment Guidance, can be found in Section IV: Control Strategies and in Appendices D and E of the Pennsylvania attainment plan submittal of September 29, 2017. These adjustment factors are reasonably consistent with the average adjustment factor identified in Appendix D of the 2014 SO₂ Nonattainment Guidance for units controlled with wet FGDs (an adjustment factor of 0.71). EPA reviewed the modeling which shows the Beaver Area attaining the NAAQS with

⁹ Appendix E-1 of Pennsylvania's September 29, 2017 submittal included a statement that "[p]rior to the implementation of the new emissions limits associated with the 2010 standard, the occasions when emissions have exceeded the proposed CEVs have been relatively few. In fact, it has only occurred 13% of the time during the period of 2012-2016." Pennsylvania submitted a correction to this statement and the corresponding emissions analysis on June 11, 2018 via email which is included in Docket ID No. EPA-R03-OAR-2017-0681. EPA has reviewed the correction and agrees with the assessment.

these limits at the Bruce Mansfield Facility and reviewed the methodology used to develop the 30-operating day limits and agrees that the limits are reasonable and follow EPA's 2014 SO₂ Nonattainment Guidance. EPA is proposing to approve the emission limits for the Bruce Mansfield Facility Units 1, 2 and 3 as representing RACM/RACT.

EPA finds that the proposed SO₂ control strategy at the Bruce Mansfield Facility and Jewel Facility, the only remaining significant SO₂ sources in the Area after the closure of Horsehead and AES Beaver Valley, constitute RACM/RACT for sources in the Beaver Area based on the modeling analysis previously described which demonstrates the Beaver Area is projected to attain the SO₂ NAAQS by the 2018 attainment date. Furthermore, with our final approval of Pennsylvania's attainment plan, the emission limits described for the three units at the Bruce Mansfield Facility and corresponding compliance parameters found in the COA for the Bruce Mansfield Facility as well as the operating restrictions on the Jewel Facility will become permanent and enforceable SIP measures to meet the requirements of the CAA. EPA proposes that Pennsylvania has satisfied the requirements in CAA sections 172(c)(1) and 172(c)(6) to adopt and submit all RACM and enforceable emission limitations and control measures as needed to attain the standard as expeditiously as practicable.

E. RFP Plan

Section 172(c)(2) of the CAA requires that an attainment plan includes a demonstration that shows reasonable further progress (i.e. RFP) for meeting air quality standards will be achieved through generally linear incremental improvement in air quality. Section 171(1) of the CAA defines RFP as "such annual incremental reductions in emissions of the relevant air pollutant as are required by this part (part D) or may reasonably be required by EPA for the purpose of

ensuring attainment of the applicable NAAQS by the applicable attainment date.” As stated originally in the 1994 SO₂ Guidelines Document¹⁰ and repeated in the 2014 SO₂ Nonattainment Guidance, EPA continues to believe that this definition is most appropriate for pollutants that are emitted from numerous and diverse sources, where the relationship between particular sources and ambient air quality are not directly quantified. In such cases, emissions reductions may be required from various types and locations of sources. The relationship between SO₂ and sources is much more defined, and usually there is a single step between pre-control nonattainment and post-control attainment. Therefore, EPA interpreted RFP for SO₂ as adherence to an ambitious compliance schedule in both the 1994 SO₂ Guideline Document and the 2014 SO₂ Nonattainment Guidance. The control measures for attainment of the 2010 SO₂ NAAQS included in Pennsylvania’s submittal have been modeled to achieve attainment of the NAAQS. The SO₂ emission reductions from the permanent shutdowns at Horsehead and AES Beaver Valley along with the COAs including specific emission limits and compliance parameters which are effective at the Bruce Mansfield Facility on October 1, 2018, and operating restrictions on the Jewel Facility effective on October 1, 2018, show the resulting emission reductions to be achieved as expeditiously as practicable for the Area. EPA guidance recommends a compliance date of January 1, 2017 for purposes of providing for a calendar year of meeting the standard, however in this plan some sources in the area did not have any emissions for several years while other sources still in operation such as the Bruce Mansfield and Jewel facilities will have new limits effective October 1, 2018. However, air quality data in this area has shown attainment of the NAAQS since 2015. Also based on air quality modeling reviewed by EPA, the new limits and shutdowns result in modeled attainment of the SO₂ NAAQS for the Beaver Area. Therefore,

¹⁰ SO₂ Guideline Document, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, N.C. 27711, EPA-452/R-94-008, February 1994. Located at: <http://www.epa.gov/ttn/oarpg/t1pgm.html>.

EPA has determined that PADEP's SO₂ attainment plan for the Beaver Area fulfills the RFP requirements for the Area. EPA does not anticipate future nonattainment, or that the Area will not meet the October 4, 2018 attainment date. EPA proposes to approve Pennsylvania's attainment plan with respect to the RFP requirements.

F. Contingency Measures

In accordance with section 172(c)(9) of the CAA, contingency measures are required as additional measures to be implemented in the event that an area fails to meet the RFP requirements or fails to attain the standard by its attainment date. These measures must be fully adopted rules or control measures that can be implemented quickly and without additional EPA or state action if the area fails to meet RFP requirements or fails to meet its attainment date, and should contain trigger mechanisms and an implementation schedule. However, SO₂ presents special considerations. As stated in the final 2010 SO₂ NAAQS promulgation on June 22, 2010 (75 FR 35520) and in the 2014 SO₂ Nonattainment Guidance, EPA concluded that because of the quantifiable relationship between SO₂ sources and control measures, it is appropriate that state agencies develop a comprehensive program to identify sources of violations of the SO₂ NAAQS and undertake an aggressive follow-up for compliance and enforcement.

The Bruce Mansfield Facility COA (*see* Appendix C of the September 29, 2017 submittal) contains the following measures that are designed to keep the Area from triggering an exceedance or violation of the SO₂ NAAQS: (1) If the SO₂ emissions from Units 1, 2 or 3 exceed 99% of the limits set forth in paragraph 3A of the COA, FirstEnergy shall, within 48 hours, begin a full system audit of Units 1, 2, and 3 SO₂ controls. The audit shall document the operating parameters of the sources and their control devices and evaluate whether the units and control

devices were operating effectively. If the units and/or control devices were not operating effectively, FirstEnergy shall identify corrective actions to be implemented to ensure that the limits in Paragraph 3(a) of the COA are not exceeded. Only one audit in a seven operating day period is required if SO₂ emissions from Units 1, 2, and 3 exceed 99% of the limits in Paragraph 3(a) of the COA. The audit shall be documented and records maintained on site, and a report documenting the audit provided to PADEP within 45 days of completing the audit.

(2) At any time after October 1, 2018, if any PADEP SO₂ monitor within the Beaver Area measures a 1-hour concentration exceeding 75 ppb, PADEP will notify the Jewel Facility, Koppel, Shell, and FirstEnergy in writing. A 1-hour SO₂ concentration that exceeds 75 ppb at any PADEP SO₂ monitor in the Beaver Area will be a “daily exceedance.” FirstEnergy shall identify whether Unit 1, Unit 2, and/or Unit 3 were running at the time of the exceedance and within a reasonable time period leading up to the exceedance. If Unit 1, Unit 2, and/or Unit 3 were running at the time of the exceedance, and within a reasonable time period leading up to the exceedance, FirstEnergy shall perform an analysis of meteorological data on the day the daily exceedance occurred to ensure that the daily exceedance was not due to SO₂ emissions from that source. The meteorological data analysis may include trajectories run at three different heights (one at stack height and two more within the boundary layer) by NOAA’s Hysplit program or an equivalent program, hourly meteorological data collected at the FirstEnergy Beaver Valley nuclear power station to determine stability parameters within the river valley, and/or an analysis of Pittsburgh International Airport’s radiosonde data and modeled upper air data. The overall goal of the meteorological data analysis is to investigate if emissions from the source could have potentially mixed down to the SO₂ monitor measuring the exceedance. The source’s finding must be submitted in writing to PADEP within 45 days of PADEP notifying FirstEnergy. These

measures will be incorporated into the Pennsylvania SIP upon EPA's final approval of this attainment plan.

There is also one contingency measure pertaining to the Jewel Facility. According to the COA with the facility, if the Jewel Facility Meltshop is reactivated and if any of PADEP's monitors in the Beaver Area measure a 1-hour SO₂ concentration of 75 ppb or greater, PADEP will notify the Jewel Facility both verbally and in writing. The Jewel Facility shall notify PADEP of the operational status of the Meltshop within 10 days of the notice.

Additionally, PADEP states in its attainment plan that if PADEP identifies a 1-hour daily maximum concentration at a PADEP operated SO₂ ambient air quality monitor in the Beaver Area that registers a concentration exceeding 75 ppb, PADEP would proceed with the following actions and enforcement as appropriate: (1) Within 5 business days, the PADEP Bureau of Air Quality Monitoring Division will contact the Air Resource Management Division Chief and the Southwest Regional Office (SWRO) Air Program Manager to report the monitored value. (2) Within 5 business days, SWRO staff will contact FirstEnergy and the Jewel Facility, if reactivated, to trigger the implementation of their contingency measures found in the COAs. If necessary, section 4(27) of the Pennsylvania Air Pollution Control Act (APCA), 35 P.S. § 4004(27), authorizes PADEP to take any action it deems necessary or proper for the effective enforcement of the APCA and the rules and regulations promulgated under the APCA. Such actions include the issuance of orders (i.e., enforcement orders and orders to take corrective action to address air pollution or the danger of air pollution from a source) and the assessment of civil penalties. A more detailed description of the contingency measures can be found in section VIII of the September 27, 2017 submittal as well as in the COAs included in the submittal and

included for incorporation by reference into the SIP.

EPA is proposing to find that Pennsylvania's September 29, 2017 submittal includes sufficient measures to expeditiously identify the source of any violation of the SO₂ NAAQS and for aggressive follow-up including enforcement measures within PADEP's authority under the APCA as necessary. Therefore, EPA proposes that the contingency measures submitted by Pennsylvania follow the 2014 SO₂ Nonattainment Guidance and meet the section 172(c)(9) requirements.

*G. New Source Review*¹¹

Section 172(c)(5) of the CAA requires that an attainment plan require permits for the construction and operation of new or modified major stationary sources in a nonattainment area. Pennsylvania has a fully implemented Nonattainment New Source Review (NNSR) program for criteria pollutants in 25 Pennsylvania Code Chapter 127, Subchapter E, which was originally approved into the Pennsylvania SIP on December 9, 1997 (62 FR 64722). On May 14, 2012 (77 FR 28261), EPA approved a SIP revision pertaining to the pre-construction permitting requirements of Pennsylvania's NNSR program to update the regulations to meet EPA's 2002 NSR reform regulations. EPA then approved an update to Pennsylvania's NNSR regulations on July 13, 2012 (77 FR 41276). These rules provide for appropriate new source review as required

¹¹ The CAA new source review (NSR) program is composed of three separate programs: Prevention of significant deterioration (PSD), Nonattainment NSR (NNSR), and Minor NSR. PSD is established in part C of title I of the CAA and applies in undesignated areas and areas that meet the NAAQS—designated “attainment areas”—as well as areas where there is insufficient information to determine if the area meets the NAAQS—designated “unclassifiable areas.” The NNSR program is established in part D of title I of the CAA and applies in areas that are not in attainment of the NAAQS—“nonattainment areas.” The Minor NSR program addresses construction or modification activities that do not qualify as “major” and applies regardless of the designation of the area in which a source is located. Together, these programs are referred to as the NSR programs. Section 173 of the CAA lays out the NNSR program for preconstruction review of new major sources or major modifications to existing sources, as required by CAA section 172(c)(5). The programmatic elements for NNSR include, among other things, compliance with the lowest achievable emissions rate and the requirement to obtain emissions offsets.

by CAA sections 172(c)(5) and 173 and 40 CFR 51.165 for SO₂ sources undergoing construction or major modification in the Beaver Area without need for modification of the approved rules. Therefore, EPA concludes that the Pennsylvania SIP meets the requirements of section 172(c)(5) for this Area.

VI. EPA's Proposed Action

EPA is proposing to approve Pennsylvania's SIP revision, its attainment plan for the Beaver Area, as submitted through PADEP to EPA on September 29, 2017, for the purpose of demonstrating attainment of the 2010 1-hour SO₂ NAAQS. Specifically, EPA is proposing to approve the base year emissions inventory, a modeling demonstration of SO₂ attainment, an analysis of RACM/RACT, an RFP plan, and contingency measures for the Beaver Area and is proposing that the Pennsylvania SIP has met requirements for NSR for the 2010 1-hour SO₂ NAAQS. Additionally, EPA is proposing to approve into the Pennsylvania SIP specific SO₂ emission limits and compliance parameters and control measures established for the SO₂ sources impacting the Beaver Area.

EPA has determined that Pennsylvania's SO₂ attainment plan for the 2010 1-hour SO₂ NAAQS for Beaver County meets the applicable requirements of the CAA and EPA's 2014 SO₂ Nonattainment Guidance. Thus, EPA is proposing to approve Pennsylvania's attainment plan for the Beaver Area as submitted on September 29, 2017. EPA's analysis for this proposed action is discussed in Section V of this proposed rulemaking. EPA is soliciting public comments on the issues discussed in this document. These comments will be considered before taking final action. Final approval of this SIP submittal will remove EPA's duty to promulgate and implement a FIP for this Area.

VII. Incorporation by Reference

In this document, EPA is proposing to include regulatory text in a final rule that includes incorporation by reference. In accordance with requirements of 40 CFR 51.5, EPA is proposing to incorporate by reference the portions of the COAs entered between Pennsylvania and FirstEnergy and Pennsylvania and Jewel included in the PADEP submittal of September 29, 2017 that are not redacted. This includes emission limits and associated compliance parameters, recording-keeping and reporting, and contingency measures. EPA has made, and will continue to make, these materials generally available through <http://www.regulations.gov> and at the EPA Region III Office (please contact the person identified in the “For Further Information Contact” section of this preamble for more information).

VIII. 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 proposed 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
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- 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, this proposed rule, concerning the SO₂ attainment plan for the Beaver nonattainment

area in Pennsylvania, does not have tribal implications as specified by Executive Order 13175 (65 FR 67249, November 9, 2000), because the SIP is not approved to apply in Indian country located in the state, and EPA notes that it will not impose substantial direct costs on tribal governments or preempt tribal law.

List of Subjects in 40 CFR Part 52

Environmental protection, Air pollution control, Incorporation by reference, Reporting and recordkeeping requirements, Sulfur oxides.

Authority: 42 U.S.C. 7401 et seq.

Dated: September 24, 2018.

Cosmo Servidio,
Regional Administrator,
Region III.

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