



July 11, 2022

Honorable Michael S. Regan  
Administrator  
U.S. Environmental Protection Agency  
EPA Docket Center  
1200 Pennsylvania Avenue, NW  
Washington, DC 20460

Attn: Docket No. EPA–R03–OAR–2022–0347; FRL–9333–01–R3

Re: Comments on EPA’s proposed rulemaking entitled “Federal Implementation Plan Addressing Reasonably Available Control Technology Requirements for Certain Sources in Pennsylvania” 87 Fed. Reg. 31,798 (May 25, 2022).

Dear Administrator Regan:

The Pennsylvania Department of Environmental Protection (Department) submits these comments in opposition to the United States Environmental Protection Agency’s (EPA) promulgation of the proposed Federal Implementation Plan (Proposed FIP) addressing Reasonably Available Control Technology (RACT) requirements for Certain Sources in Pennsylvania for the 1997 and 2008 ozone National Ambient Air Quality Standard (NAAQS) published in the *Federal Register* on May 25, 2022. (87 Fed. Reg. 31,798). The Proposed FIP: does not comply with Clean Air Act (CAA) RACT requirements and legal precedent; violates the Administrative Procedures Act (5 U.S.C. § 706(2)(A)); is technically inaccurate; and was developed based on an incomplete record. EPA did not request relevant information from the Department or the subject electric generating units (EGUs) in development of the Proposed FIP. Should EPA finalize the Proposed FIP, with or without substantial changes, it will not withstand legal scrutiny.

The Department has submitted a full State Implementation Plan (SIP) revision<sup>1</sup> to address this source category, which was prepared in accordance with the requirements set forth in the CAA, the EPA’s implementing regulations and applicable guidance. The Department expended tremendous resources—including over 1,000 employee-hours to prepare the SIP packages for each of the subject EGUs that are currently before the EPA. Our analysis includes numerous technical evaluations—such as determining the maximum ammonia injection rate for each facility—that the FIP completely lacks. The NO<sub>x</sub> emission limits for each EGU contained in our submitted SIP revision packages are based on technical evaluations as required under the CAA, not merely a statistical evaluation of historic data performed without any consideration of the technical capability of each facility’s equipment or potential upgrades. As the Third Circuit has recently acknowledged in *Sierra Club v. EPA*, 972 F.3d 290, 302 (3d Cir. 2020) (“*Sierra Club*”), mere data alone may not require a particular result.

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<sup>1</sup> The Department submitted case-by-case RACT SIP revision packages to EPA for the Conemaugh, Homer City and Keystone EGUs on May 26, 2022 and for the Montour EGU on June 8, 2022.

## I. EPA's Proposed FIP Does Not Meet the RACT Standard

The EPA's Proposed FIP seeks to address *Sierra Club* but fails because it does not meet the minimum legal standards of what is a RACT evaluation.<sup>2</sup> The Third Circuit in *Sierra Club* specified that a revised SIP or new FIP "proposal submitted must be technology forcing, in accordance with the agency's RACT standard." RACT is defined as "the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility." See 44 FR 53,762 (September 17, 1979). RACT for a particular source is determined on a case-by-case basis, considering the technological and economic circumstances of the individual source. *Id.*

EPA's Proposed FIP does not provide a source-specific analysis of technological feasibility for each unit, which is what the CAA RACT standard requires. See, E.P.A., State Implementation Plans; Nitrogen Oxides Supplement to the General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990, 57 Fed. Reg. 55,620, 55,624/3 (proposed Nov. 25, 1992); *Navistar Intern. Transp. Corp. v. E.P.A.*, 941 F.2d 1339, 1343 (6th Cir. 1991). In *Sierra Club*, the Court recited that "EPA explains the technological feasibility of applying an emission reduction method to a particular source should consider the source's process and operating procedures, raw materials, physical plant layout, and any other environmental impacts such as water pollution, waste disposal, and energy requirements." 972 F.3d at 295 (citing to E.P.A., State Implementation Plans; General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990; Supplemental, 57 Fed. Reg. 18,070, 18,073 (proposed Apr. 28, 1992) ([www3.epa.gov/ttn/naaqs/aqmguide/collection/cp2\\_old/19920428\\_57fr\\_10070-10077.pdf](http://www3.epa.gov/ttn/naaqs/aqmguide/collection/cp2_old/19920428_57fr_10070-10077.pdf)); see *Id.* at 18,073/3 and 18,074/1 (describing how to conduct a case-by-case RACT technological feasibility analysis).

Furthermore, the Court in *Sierra Club* provides "we do not suggest that Pennsylvania must achieve the absolute lowest level of emissions that is technologically possible for the approved limit to satisfy RACT" and "that 'mere' data alone may not require a particular result." *Id.* at 302. In the Proposed FIP, there is no explanation in the record as to how EPA's weighted rates analysis comports with the agency's previous direction on how a case-by-case RACT should be conducted. EPA does not point to any other examples of where this proposed approach has been employed for case-by-case RACT analyses for similar or other sources. Instead, EPA attempts to justify use of the weighted rates approach using the third-best ozone season because it used this approach in the Revised CSAPR Update (86 Fed. Reg. 23,054, April 30, 2021) and Proposed Interstate Transport FIP (87 Fed. Reg. 20,036, April 6, 2022) (see 87 Fed. Reg. 31805/2); however, RACT (sections 172, 182, and 184) and interstate transport (section 110(a)(2)(D)) are separate and distinct requirements under the federal Clean Air Act.<sup>3</sup>

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<sup>2</sup> The Court vacated and remanded EPA's approval of certain provisions of Pennsylvania's State Implementation Plan revision pertaining to presumptive reasonably available control technology (RACT) for coal-fired electric generating units (EGUs) with selective catalytic reduction (SCR) controls under the 1997 and 2008 ozone National Ambient Air Quality Standards (NAAQS). See 84 FR 20274 (May 9, 2019).

<sup>3</sup> See *NRDC v. EPA*, 571 F.3d 1245, 1253, 1256-1257 (D.C. Cir. 2009) (Holding EPA's interpretation of "reasonably available control technology," in Clean Air Act (CAA) provision relating to non-attainment plan

With respect to the application of control technology, EPA states that “our *presumption* is that the facilities have the flexibility to change their operations to emit less NO<sub>x</sub> per unit of heat input, and we identify these technologies as additional ways for the facilities to do so, rather than requiring them as RACT.” 87 Fed. Reg. 31,810. However, without conducting a source-specific engineering analysis, EPA’s mere presumption of what each of these facilities may or may not be able to do is speculative and of little value in terms of what case-specific RACT requires. *Nat’l Steel Corp., Great Lakes Steel Div. v. Gorsuch*, 700 F.2d 314, 322–323 (6th Cir. 1983) (“*Nat’l Steel*”) (Recognizing that “depending on site-specific considerations, such as geographic constraints, RACT can differ for similar sources.”). RACT requires an identification of potential control devices and techniques, a determination of each’s technical feasibility, the emission reductions that would occur from application of each, and then selection of the most effective control device or technique that is both technically feasible and reasonably available economically. Only after this occurs can an emission limit that captures the emission reductions be determined. The Proposed FIP merely presents a menu of potentially technically feasible control devices and techniques; no determination of actual technical feasibility for any EGU is performed and no determination of the emission reductions that the selected technology would achieve. In terms of the required analysis to determine if the selected control device or technique is “reasonably available”, no analysis of economic availability is conducted for any of the control technologies and techniques on EPA’s menu. The discussion of the cost of ammonia provides no support for any of the control technologies and techniques on EPA’s menu, especially those identified technologies and techniques that do not involve ammonia at all. To perform an economic analysis of the selected technology or technique, a selection must actually be made. Because the EPA’s weighted rates approach departs from its previous direction on evaluating source-specific technological and economic feasibility as part of a case-by-case RACT analysis, the Proposed FIP is inadequate to meet the RACT standard.

## II. EPA’s Proposed FIP Violates Legal Precedent

The EPA’s Proposed FIP seeks to establish emissions limitations for each of the four-remaining coal-fired power plants in Pennsylvania that are equipped with selective catalytic reduction (SCR) controls. The Proposed FIP fails to do that because it violates legal precedent as well as the Court’s order in the underlying case.<sup>4</sup> Specifically, the Court in *Sierra Club* directed that EPA “must either approve a revised, compliant SIP within two years or formulate a new federal implementation plan. That proposal must be technology forcing, in accord with the agency’s RACT standard....” 972 F.3d at 309. The EPA’s Proposed FIP proclaims that “[t]he consideration of the technical and economic feasibility of a given RACT limit should reflect to the extent possible, consideration of the past, current and future expected operating environment of a given unit.” 87 Fed. Reg. 31,805/1. Despite this statement, the EPA’s Proposed FIP is contrary to legal precedent in *Sierra Club* and is inconsistent with the RACT standard.

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provisions in general, construing “reasonably available” as meaning only control technologies that advanced attainment, was reasonable, in light of the statute’s accompanying text and structure and that EPA failed to demonstrate that NO<sub>x</sub> SIP Call compliance (“beyond RACT” controls regionally) can be equated to RACT compliance).

<sup>4</sup> The Proposed FIP is intended to meet the RACT requirements for the 1997 and 2008 8-hour ozone NAAQS to address the United States Court Appeals for the Third Circuit’s ruling in *Sierra Club*. 87 Fed. Reg. 31798.

### 1. EPA's Reliance on Historic Emissions Data

The Proposed FIP would employ a weighted emissions rate approach to determine an emission limit applicable on a 30-day rolling average basis for each of the 4 coal-fired power plants equipped with SCR controls. This weighted rates approach, which is tantamount to a statistical analysis of historical emissions data from 2003-2021, is flawed for multiple reasons.<sup>5</sup> First, in rejecting EPA's approval of Pennsylvania's presumptive RACT II emission limit of 0.12 lb/MMBtu, the Court in *Sierra Club* held that "an average of the current emissions being generated by existing systems will not usually be sufficient to satisfy the RACT standard." 972 F.3d at 300. The preamble of the Proposed FIP provides that "EPA calculated *average* "SCR-on" and "SCR-off" rates for each unit based on historic operating data for that unit, when available, from 2003 to 2021." 87 Fed. Reg. 31,805/2. Similarly, EPA explains that "[t]he third best ozone season was identified based on the unit's overall *average* NOx emission rate during each ozone season from 2003 to 2021." *Id.* Because the EPA employed emissions averaging, the weighted rates approach is at odds with legal precedent in *Sierra Club*.

Second, the EPA justifies the weighted rates approach using the third-best ozone season because it used this approach in the Revised CSAPR Update (86 FR 23054, April 30, 2021) and Proposed Interstate Transport FIP (87 Fed. Reg. 20036, April 6, 2022) (see 87 Fed. Reg. 31,805/2). However, for those interstate transport efforts, EPA used more recent and shorter data periods (87 Fed. Reg. 20,129/2) but does not do so for the Proposed FIP. In effect, EPA's data set selection is not driven by implementing RACT regulations nor is it supported by any agency RACT related guidance, and it does not establish an emission rate for a specific source considering operational characteristics and technical and economic feasibility. Rather, it is based on statistics and selective incorporation of certain aspects of the two referenced interstate transport measures.

Third, the EPA's proposed use of the weighted rates approach omits consideration or analysis of historic emissions data reflective of each power plants operational characteristics for seven months of the year (over 58% of the time) outside of the ozone season. In regards to the exclusive selection of the historic ozone season data, EPA explains that "[t]his is because ozone season data generally represent the time period over which emissions rate performance of these units is the best" and that "EPA has no reason to believe that achieving the same performance outside the ozone season would be technologically or economically infeasible." 87 Fed. Reg. 31,802/2. Notably, this approach by EPA excludes or omits emissions data for much of the year and does not conduct analyses of, or factor in, that data when establishing a RACT emissions rate for each EGU applicable on a year-round basis. *Sierra Club*, 972 F.3d at 300-301 (The Court discussed the omission of certain historic data when calculating a RACT emission average applicable on a year-round basis and acknowledged that Pennsylvania's presumptive limit did account for seasonal variation); see also *Motor Vehicles Mfrs. Ass'n of the U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) ("*State Farm*") (Providing that "the agency must examine the relevant data and articulate a satisfactory explanation for its action including a "rational connection between the facts found and the choice made.""). Yet here, EPA

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<sup>5</sup> For Homer City, Montour and Cheswick, EPA notes that it evaluated hourly data for ozone seasons 2002 through 2020, except for any years when the source did not have SCR installed. See 87 FR 31803/3.

acknowledges that “SCRs installed in the early 2000s were designed and built to work in tandem with a baseload boiler” and that “recent data indicates that these units are not operating as baseload units and are not likely to do so in the future.” 87 Fed. Reg. 31,804/1. Nor does EPA consider the fact that the PJM dispatch dictates when these EGUs have to adjust their operations to supply electricity based on market demand. Because the EPA failed to consider a majority of the operational emissions data in relation to the technical limitations of SCR controls at each power plant to account for seasonal variation, its conclusion that “the proposed limits are technologically and economically feasible during the entire year” (87 FR 31802/1) is inaccurate.

## 2. EPA’s Assignment of an SCR Operating Threshold

The Proposed FIP would assign a threshold for the operation of SCR control technology at each EGU in terms of Megawatts (MW). 87 Fed. Reg. 31,805. However, the approach of replacing a set temperature threshold with a MW threshold for the operation of SCR pollution controls still runs into the same issue that the Court addressed in *Sierra Club*. In *Sierra Club*, the Court vacated and remanded EPA’s approval of Pennsylvania’s RACT II 600° F temperature threshold in 25 Pa. Code § 129.97(g)(1)(viii) for EGUs to operate their SCR pollution controls due to the lack of factual support and evidence in the administrative record to justify the 600° F threshold. 972 F.3d at 305-306. In doing so, the Court explained:

The EPA also offers a telling chart of SCR peak performance, which demonstrates that as the reaction temperature declines, the efficiency of NOx reduction also falls. Although it can operate at over 90% efficiency at 750 degrees, SCR is reduced to approximately 77.5% efficiency at 600 degrees and 62.5% efficiency at 550 degrees. Yet the agency fails to provide any information to support the crucial next step of its reasoning: whether and how 77.5% compares in terms of economic and technical viability with 62.5% efficiency.

This Court is left to infer that whereas 77.5% efficiency is worthwhile, at 62.5% efficiency, SCR controls no longer add value to the pollution control process. That is not an impossible conclusion, but there is simply no evidence, nor any effort to supply such evidence, in this record. Further, it directly contradicts the agency’s suggestion that operating below 600 degrees “cannot result in lower NOx emissions rates.”

While this shows that efficiency does decline at an increasing rate below 600 degrees, the same is true of 650 degrees, and 700 degrees. Further, nothing in the record before the agency demonstrates why the 65% efficiency at 550 degrees is inadequate or, in the terms of RACT, economically or technologically infeasible. The EPA’s case here boils down to showing that there is a general connection between setting a limit and lower NOx removal efficiency, which the record supports, and then asking us to trust their “technical judgment” as to the proper limit.

*Id.* at 972 F.3d at 304-305.

In the Proposed FIP, the EPA similarly assigns a MW threshold for each EGU based on their statistical analysis of historical data, but fails to demonstrate both why this is the economically or technologically correct threshold, and its connection to setting the limit in regards to NOx removal efficiency. *Id.*; see also *State Farm.*, 463 U.S. at 43. While EPA points out that it has limited facility information to analyze establishment of a SCR operation threshold (87 Fed. Reg. 31,803), the fact that EPA did not seek to obtain the appropriate information in development of its own separate Proposed FIP is a fatal flaw to the Proposed FIP. Specifically, to this point, EPA states in the Proposed FIP that “[s]ince the date of the Third Circuit decision [August 27, 2020], EPA has obtained from DEP a few redacted pages of the SCR Operator’s Manual for Conemaugh and Keystone, as well as hourly flue gas temperature, reagent injection amounts, and NOx emission data for the years 2017 through 2020 for those same facilities.” *Id.* at 31,803/1. EPA also states “[b]ecause these two facilities provided only a few select pages of their SCR manuals, EPA cannot be certain whether there are, or are not, other operating scenarios and/ or SCR inlet temperatures at which reagent could be injected.” *Id.* at 31,803/2. Finally, the Proposed FIP states that “[a]bsent more complete temperature data and operating manuals for all facilities, EPA then analyzed historical operating data submitted to EPA by each of these facilities in order to determine the operating threshold at which Cheswick, Montour, and Homer City could inject reagent and run their SCRs to develop the same MW measure for these three facilities as for Conemaugh and Keystone.” *Id.* at 31,803/2. Without this information (and any outreach or inquiry to obtain this information), EPA’s ability to conduct a meaningful and comprehensive analysis to determine the appropriate MW threshold for the economically or technologically feasible operation and efficiency of SCR controls is impossible. EPA’s confession that it did not seek out or use relevant technical information is admirable but does not rectify the issue at hand. Because EPA did not analyze different MW thresholds in terms of technological and economic feasibility and did not seek to obtain the information needed to do so when developing its separate FIP, the MW threshold and subsequent NOx emission limits for each EGU in the Proposed FIP are not adequately supported. EPA failed to meet its legal obligation to obtain and support its Proposed FIP with adequate data and analysis. EPA, as the entity attempting to promulgate the FIP, is responsible for obtaining all relevant information, and its failure to request or acquire any information from the facilities does not excuse EPA’s failure to conduct a proper and lawful RACT analysis.

### **III. Pennsylvania’s RACT II Case-by-Case SIP Submittals**

The EPA’s Proposed FIP explains that on September 15, 2021, EPA proposed disapproval of those portions of the prior approval which were vacated by the Court in *Sierra Club* (86 Fed. Reg. 51,315) stating that it did so in part to ensure the agency has the authority to promulgate a FIP if Pennsylvania does not submit a timely approvable SIP revision addressing the Third Circuit’s decision. 87 Fed. Reg. 31,801. As EPA is aware, the Department has been working diligently to submit case-by-case RACT SIP revisions to EPA that address the Third Circuit’s decision. As documented in correspondence to EPA on March 25, 2022 (Enclosure 1), the Department invested over 1,000 employee hours performing the legally mandated required technical and economic analysis and preparing amended Title V Operating Permits to implement Pennsylvania’s RACT determinations. The Department and EPA held biweekly meetings for close to a year so that EPA could consult on the permits to be included in the SIP. The Department submitted 3 case-by-case RACT SIP revision packages to EPA for the Conemaugh,

Homer City, and Keystone EGUs on May 26, 2022 and one SIP revision package to EPA for the Montour EGU on June 8, 2022. The Department's submittal of these SIP revisions was delayed at the request of EPA. These constitute the remaining coal-fired EGUs in Pennsylvania subject to the Court's order in *Sierra Club*. The Department is not aware any action taken by EPA regarding Pennsylvania's May 26, 2022 or the June 8, 2022 SIP revision submittals other than acknowledging receipt of the submittals. Consistent with section 110(c)(1) of the federal CAA (42 U.S.C. § 7410(c)(1)), as well as EPA's reasoning explained in the preamble of the Proposed FIP (87 Fed. Reg. 31,801), EPA must take action on Pennsylvania's SIP revision submittals before or concurrent with any finalization of the FIP.

#### **IV. Incomplete Records**

As mentioned above, EPA attempted no outreach to either the EGU operators or the Department in the development of the Proposed FIP. EPA did not take into account important information obtained by the Department during our case-by-case RACT analyses that is vital for the correct determination of RACT for the EGUs. EPA admitted to not having important data (e.g., catalyst data) and ignored essential information obtained by the Department, including confidential business information, ammonia injection rates, and information regarding equipment failures. (87 Fed. Reg. 31,803). Obtaining this information is necessary to conduct a source-specific technological feasibility analysis.

On August 26, 2021, Department staff presented preliminary data and analysis to staff members in EPA Region III. Without prior notice, David Mackintosh, from EPA Region 1, also attended the call. Mr. Mackintosh was introduced as leading an internal EPA workgroup relating to coal-fired EGUs. At that meeting, Mr. Mackintosh made several incorrect statements regarding operations of the EGU's in question, which were corrected by the Department. Subsequent to August 26, 2021, the Department learned that Mr. Mackintosh had been meeting with the Maryland Department of the Environment ("MDE") regarding RACT requirements for Pennsylvania's EGU facilities. It is our understanding, based on the Ozone Transport Commission's meeting notes from September 1, 2021, that MDE had extensive, detailed discussions with Mr. Mackintosh and submitted its own analysis of what should constitute RACT for the Pennsylvania EGU's. None of this information has been included in the docket. The Department contacted Mr. Mackintosh and requested to attend a scheduled meeting between Mr. Mackintosh and MDE. Mr. Mackintosh did not allow the Department to attend. Subsequent to that communication, the Department has not been contacted from Mr. Mackintosh.

#### **V. The EPA's Proposed NO<sub>x</sub> Emission Limits Are Not RACT**

The determination of NO<sub>x</sub> RACT limit(s) for coal-fired EGUs varies depending on unit-specific factors, including technical feasibility of controls and associated economic feasibility. EPA states in the Proposed FIP that "creating an enforceable RACT limit is a highly technical, unit-specific determination that depends on several varying factors" (87 Fed. Reg. 31,804/2). This is a fundamental and long-standing RACT principle. None of the proposed NO<sub>x</sub> emission limits for any of the units in the Proposed FIP are determined based on unit-specific technical and cost-effectiveness analysis. Instead, EPA relied on a statistical analysis of the emission rates from the existing controls already installed and did not analyze or consider any other emissions control

technologies. Similarly, EPA did no technical analysis of the capabilities of the existing controls whatsoever and relied on a fleet-wide cost analysis performed in 2015 Good Neighbor Plan, consistent with cost estimation in the revised CSAPR update for SCR.

Additionally, EPA determined each unit's proposed observed SCR Threshold according to two compounding arbitrary judgments, one of which was by estimating the load threshold by visual inspection of scatter plots and the other by assuming that SCR is operating when an EGU achieves emission rates below 0.20 lb/MMBtu. EPA has applied this rate for all EGU units without properly considering individual units' age, condition, configuration, operating characteristics, and effectiveness and limitations of associated control equipment. This process does not satisfy a RACT evaluation and determination of NO<sub>x</sub> emission limits for individual units. It is not a technical evaluation, nor does it rely on a scientific, replicable, or mathematical/statistical methodology.

By contrast, the Department analyzed Continuous Emissions Monitoring System data for unit individually for the last five years to determine NO<sub>x</sub> emissions rates for each specific unit at varying specific operating loads. The Department then used data of historic ammonia injection rates—data which the Proposed FIP does not consider—in conjunction with load operating data and NO<sub>x</sub> emissions rates to determine the maximum ammonia injection rate. The Department used the maximum injection rate to determine the emission rate that would occur at 100% load with 100% ammonia injection. From these data points, the technically feasible emission reduction rate was determined from the existing equipment based on each unit's specific characteristics. The results were then interpolated to derive the emission rate and associated emission reduction that would occur based on ammonia injection rate at loads less than 100%. The Department also conducted an extensive unit-specific technical and economic analysis for existing controls—such as Low NO<sub>x</sub> Burners (LNB)—in our proposed RACT SIP, considering, among other factors, unit-specific source configuration, NO<sub>x</sub> control technology retrofit and operation feasibility, and operating procedures.

The Proposed FIP's NO<sub>x</sub> emission limits analysis does not satisfy RACT because EPA did not determine proposed NO<sub>x</sub> emission limits based on a unit-specific case-by-case technical and economic evaluation, relied on a fleet-wide cost analysis performed in 2015 Good Neighbor Plan that was consistent with cost estimation in the revised CSAPR update for SCR, and determined load threshold through visual inspection of plots that EPA created comparing hourly NO<sub>x</sub> emission rates for overall ozone season average rate of each unit's three best performing ozone seasons.

## **VI. EPA's Proposed FIP Ignores Equipment Failure Issues and the Effect of Excess Ammonia Injection**

EPA does not discuss both technological limitations and negative economic consequences to both equipment and the environment which is unlawful. *State Farm.*, 463 U.S. at 43. Increasing reagent injection rates increase the occurrence of side reactions in the SCR. The products formed from these side reactions will poison the catalyst bed, reduce the effectiveness of the mercury emission pollution controls, cause the formation of ammonium bisulfate downstream of the SCR resulting in damage to the air preheater and other downstream equipment, and cause

significantly increased ammonia emissions that have detrimental effects on vegetative, animal, and human health. Keystone and Conemaugh generating stations performed engineering studies documenting the effects of varying the rates of ammonia injection. The Department performed a detailed evaluation of these studies. EPA does not consider these issues and uses a “presumption is that the facilities have the flexibility to change their operations to emit less NOx per unit of heat input, and we identify these (DEP proposed) technologies as additional ways for the facilities to do so, rather than requiring them as RACT.” The Proposed FIP fails to identify, analyze, and quantify the technological limitations and associated negative impacts.

## **VII. Concerns with EPA’s Proposed NOx Emission Limits Analysis**

Not only is the methodology used to select the Proposed FIP’s emission limits unlawful, its structure is fundamentally flawed as a matter of fact and science. The methodology results in emission limits that do not constitute RACT, as evidenced by the fact that they are unattainable for significant periods of time. The specific issues identified by the Department are described below.

Historically, these units operated as “baseload” units with near continuous operation at or near maximum load conditions. Due to changes in the electric market, all of these units now “cycle”—operating only some of the days during the year, operating at a variety of loads during the days when they are operating, and undergoing frequent changes in load during the day. The units and their SCR control devices were designed and built to work together as baseload units. This does not excuse the owner/operators of the units from achieving RACT level emission rates; rather, it heightens the importance of performing an accurate technical analysis of the equipment.

a. The emission limits are established as monthly and daily average emission rates in an effort to properly account for cycling operations. The monthly and daily emission limits are based on a much longer time scale—the five-month ozone season—which grossly underestimates the level of cycling that occurs during monthly and daily periods. Using the five-month average emission rate to set daily and monthly emission limits results in emission rates that fail to account for the short-term effects of cycling, making it infeasible to achieve compliance during periods of cyclical operation. To analogize, this is akin to using your personal vehicle’s miles per gallon (MPG) of gasoline consumption to determine your daily MPG, which fails to account for the differences in driving patterns on a day-to-day basis (city v. highway driving, etc.).

b. The Proposed FIP’s reliance on ten years of historical data to develop emission limits is not representative of future operating/cycling patterns. Selection of emission limits that account for future operation of the units in terms of cycling cannot be accomplished by mere statistical and visual analysis of historic emissions. The historical data used in the Proposed FIP to account for the evolution of the units from baseload to cycling units is flawed as the units were in transition from baseload to cycling units, and the transition in operations was incremental, not binary. As a result, the emission limits do not factor in technical feasibility of SCR based on current and future operation of the units as primarily/exclusively cycling units.

Should the operation of the units becomes more cyclical in nature as compared to the amount of cycling, on average, over the ten-year period, the basis for the Proposed FIP emission limits is unrepresentative of the level of emission control possible and overly restrictive. Similarly, in the unlikely event that the units revert to being more of a baseload operation, the Proposed FIP emission limits are unrepresentative of the level of emission control possible and not sufficiently restrictive. The Proposed FIP's approach tries to predict the frequency and duration of cycling operations in the future through use of a flawed data set to establish a single emission limit. In contrast, the Department established a tiered emission limit structure that accounts for all possible cycling operating scenarios and more accurately reflects the emission control capabilities of the units.

c. EPA's approach to establishing the proposed emission limits by using the third-best year from ozone seasons does not constitute RACT. It involves no analysis of the current technological capabilities of the equipment, changes in facility operation including cycling, the effect of mercury and other emission controls added over time. EPA incorrectly states that using the third-best year accounts for equipment degradation. EPA shows no evidence to demonstrate that the third-best year bears any connection to age or condition of equipment. *State Farm.*, 463 U.S. at 43. Also, during the ozone season, EGUs generally operate at more of a steady state mode at or near baseload. Less cycling results in lower emission rates as compared to periods with more cycling. Use of data from only the five-month ozone season skews the results to indicate less cycling than occurs. This results in NO<sub>x</sub> emission rates that are substantially less compared to when EGUs operate outside of the ozone season at a time when they may not be operating at baseload and with more shutdowns. Pennsylvania analyzed a significant amount of data to determine that a tiered emission approach best represents RACT. Additionally, EPA's analysis using only ozone season data does not account for seasonal effects that DEP has identified through contact with facility operators, which EPA failed to do.

d. A biased data set used for analysis because EPA arbitrarily chooses data in its determination of emission limits. For example: Observed SCR Thresholds (2002-2020), SCR-on emission rates (2003-2021; third-best ozone season for Units at three facilities but second-best ozone season for Units at the Conemaugh facility), SCR-off emission rates (2003-2021; all years), weights (2011-2021; "third best weight"), and assumption of SCR operation at and below 0.20 lb/MMBtu. In addition, the Proposed FIP emission limits use only five months data out of each calendar year (ozone season) even though the Proposed FIP explicitly recognizes that the ozone season data is *not* representative of year-round operations. Although the Proposed FIP provides an explanation for why data were chosen for individual parameters (i.e. thresholds, SCR-on rates, etc.), the explanations are inconsistent and not supported by an actual analysis performed to verify any assumptions made. As such, EPA's selection of data periods used for its statistical analysis lack actual statistical grounding (including but not limited to selection bias), ignores technical data, context, and implications, and represents a theoretical expectation based on hypothetical circumstances.

e. The Proposed FIP's attempt to compare Pennsylvania EGU emissions and operations to EGUs in select surrounding states is superficial and unreliable. *Nat'l Steel*, 700 F.2d at 322–323. EPA compares historical NO<sub>x</sub> emission rates rather than unit specific configuration, operating characteristics, and effectiveness and limitations of associated control technologies.

Furthermore, the comparisons are outcome determinative in that they ignore loopholes and other exceptions to the emission limits in the other states' RACT regulations, such as the exclusion of all emissions that occur during start-up, shutdown and malfunction, exclusion for low load operation, and use of emission targets in lieu of legally enforceable emission limits. In each case where differences in the calculation of the emissions and determination of compliance with the emission limits are not taken into account, the result is that the other state's emission limits are less stringent than Pennsylvania.

f. There is no basis to exclude most emission data in calculation of a single proposed RACT limit that will always apply when the data is readily available. Use of the ozone season data and the exclusion of all non-ozone season data significantly skews EPA's statistical analysis due to cycling and other issues. A single emission limit imposing RACT level control under all operations and all seasons of the year must be based on data from all operations and all seasons. The exclusion of 58% of all data—specifically the data from seven specified months each year—is arbitrary given EPA's own voluntarily supplied statements in the Proposed FIP that the ozone season emission data is essentially different than the emission data from the majority of the year. The resulting limit would not be protective of the environment or constitute RACT.

### **VIII. The Technical and Economic Analyses That are the Core of the RACT Requirements are Absent and/or Flawed**

The Proposed FIP purports to include an economic analysis used to determine if control technology and techniques are reasonably available. As an initial matter, the Proposed FIP does not identify any specific control technology or technique as being technically feasible. It merely provides a list of things that might be feasible and presumes the owner/operators will figure it out on their own. This approach violates the essential core of the RACT technical feasibility analysis. Implicit in EPA's explanation that unspecified control technologies and techniques are technically feasible is the assumption that the SCR is capable of lower NO<sub>x</sub> emissions simply by raising the ammonia injection rate. The amount of additional ammonia is not calculated, nor is the ability for the equipment to inject the additional ammonia or the effects of extra ammonia injection. Instead, the Proposed FIP states that the cost of the additional ammonia is economically reasonable based on a national fleet-wide cost analysis performed as part of the proposed 2015 Good Neighbor Plan, which is based on the cost estimation in the revised CSAPR update for SCR controlled units. The Proposed Rule neglects the technical limitations of additional ammonia injection, fails to identify the amount of additional ammonia that would need to be injected, and does not identify the collateral effects of the additional but unquantified ammonia injection. The Department developed information on each of these issues, including the ability of the equipment to inject additional ammonia, in support of the RACT permits issued to each of the four facilities and included in the docket for this proposed rule.

Keystone and Conemaugh operated in the 0.040 -0.050 lb NO<sub>x</sub>/MMBtu range during parts of the 2017 ozone season. The Department requested specific technical and operational data from facility owners/operators for this time period. The facilities provided the technical and operational data as well as additional information regarding their operations during this time period. The data and additional information demonstrated that the ammonia injection rates that were used to achieve those emission rates lead directly to significant and costly adverse effects

on the equipment. For the units at the Keystone facility, one suffered from significant catalyst poisoning after approximately 2 weeks of operation in the 0.050 lb NO<sub>x</sub>/MMBtu range. The other unit managed to hold the targeted emission rate for slightly longer, but the ammonium bisulfate generated by the heightened level of ammonia injection fouled the downstream air preheater. As a result, the ammonia injection rate was reduced, and the air preheater was subject to extensive remediation during the unit's subsequent maintenance shutdown. Conemaugh attempted operation in both units of approximately 0.045 lb NO<sub>x</sub>/MMBtu but found that mercury emissions steadily increased as a result of the increased ammonia injection rate.

This information is listed in the Proposed FIP's docket, although there appears to be no reference or use of the information in the Proposed FIP. This information demonstrates the importance of conducting a proper RACT analysis—requesting and receiving information and data from the entities to be regulated, including effects on the equipment for achieving the proposed RACT limit, as opposed to relying solely on a statistical analysis of unit emissions from a database. This is particularly important in the case of highly complex operations such as a large coal-fired power station. This information, obtained by the Department from the owner/operators, was available to EPA and listed in the rulemaking docket. The fact that the Proposed FIP neither identifies nor evaluates any of this information in its analyses violates the legal requirements governing preparation of a RACT evaluation. Unlike the Department, EPA did not communicate with owners or operators of EGUs in preparation of the Proposed FIP, which further highlights its deficiency in determining technical feasibility and economic costs.

## **IX. Res Ipsa Loquitur: The Proposed FIP's Irreconcilable and Absurd Results**

The emission limits in the Proposed FIP demonstrate the failure of the statistical method of accurately determining RACT emission limits. The proposed emission limit for the Conemaugh EGUs are the highest as compared to all the units regulated under the FIP even though the units are technically capable of the best level of control and lowest emission levels.

The SCR at the Conemaugh EGU is the newest of the FIP affected sources and can control emissions better than every unit at the other three facilities—Keystone, Homer City, and Montour—subject to the Proposed FIP. The Conemaugh EGU's ability to achieve the lowest emission levels is demonstrated by technical analysis, including the Department's determination of the maximum ammonia injection rate and the resulting NO<sub>x</sub> emissions of each of the units that would be subject to the RACT. Keystone and Conemaugh share a common owner (KEYCON), which has indicated before the Proposed FIP was published that the level of control achievable at Conemaugh is not achievable at Keystone. More than a year ago, KEYCON submitted a unified RACT analysis for both facilities to the Department and proposed a lower limit for Conemaugh than for Keystone.

In addition, the Conemaugh emission limits included in the Proposed FIP were selected based on the second-best ozone season, whereas the emission limits at all other units are based on the third-best ozone season. This should bias the Conemaugh emission limits lower than the units at the other facilities.

Calculation of the emission limits in the Proposed FIP are entirely driven by statistical analysis of historical data, and technical capability and feasibility were not examined nor factored into the selection of the emission limits.

The Department proposed the lowest emission limits for the Conemaugh units based on the units' emission profile, ammonia injection rates from 2016 to 2020, and the Department's evaluation of the engineering study submitted by Conemaugh. The Department's analysis determined that the maximum ammonia injection at maximum load for Unit 2 would result in an emission rate of 0.055-0.07 lb NO<sub>x</sub>/MMBtu. The Department's technical analysis demonstrated that emission rates below 0.05 lb NO<sub>x</sub>/MMBtu clearly result in an unacceptable level of excess mercury emissions. As a result, an emission rate of 0.07 lb NO<sub>x</sub>/MMBtu was established as the appropriate RACT limit.

The Keystone study indicated that the SCR ran into difficulties sooner than Conemaugh, indicating that the controls at Keystone were not as effective or robust as Conemaugh's. Keystone experimented with lowering emissions during the 2018 ozone season but was less effective, likely because Keystone's LNB is not as effective at reducing NO<sub>x</sub> as Conemaugh's. A less effective LNB results in higher NO<sub>x</sub> emissions entering the SCR. Notably, the Conemaugh SCR is 11 years newer than the Keystone SCR having been installed in 2014 (vs 2003 for Keystone).

Similarly, based on an analysis of Homer City's Units 1 and 2, it was determined that an emission limit of 0.08 lb NO<sub>x</sub>/MMBtu represented RACT. The different and higher emission rate than Conemaugh was based on the technical facts and analysis of the existing LNB at Homer City as well as the emission reductions that would result from using the maximum ammonia rate at maximum load.

The Homer City technical analysis indicated that RACT level of controls at Homer City's Unit 1 and Unit 2 were less effective than the RACT level of controls of Conemaugh. The result was driven entirely based on the different technical abilities and limitations of each unit, i.e., LNB control capabilities, gross ammonia injection capability, unit-specific source configuration, NO<sub>x</sub> control technology retrofit and operation feasibility, and operating procedures.

Homer City's Unit 3 is capable of more effective control than either Homer City Unit 1 or Unit 2, primarily because the LNB at Unit 3 is considerably more effective than the LNBs on Unit 1 and Unit 2. For this reason, the Department set lower emission limits to Unit 3 versus the emission limits on Unit 1 and Unit 2. Because better control of NO<sub>x</sub> emissions is technically feasible at Unit 3 than Unit 1 and Unit 2, the emission limit for Unit 3 is lower. By way of comparison, the Proposed FIP assigns the same emission limit for all three units without evaluating the technical capabilities of the units. The Proposed FIP's assignment of emission limits was not based on the technical feasibility or capability of each unit. Emission limits were assigned based on conflating the statistical analysis of the various units. Intentionally assigning identical emission limits to three units even though the emission units cannot achieve the same level of control contradicts how a RACT analysis must be conducted. Furthermore, the statistical database analysis submitted by EPA during the comment period for Homer City's RACT permit did not include any technical analysis.

Unlike Keystone and Conemaugh, Homer City did not submit a post-application technical evaluation indicating that the units could not achieve the Department's emission limits in the proposed RACT permit. This choice did not result in a failure to submit a proper technical analysis. It was merely a decision by the owner/operator not to contest the emission limits proposed by the Department.

Comparing the emission limits calculated for the Montour facility with those for Conemaugh, the Montour has a higher emission limit (0.08 lb NO<sub>x</sub>/MMBtu) because its SCR, at maximum ammonia injection, has a higher emission rate than the units at Conemaugh. In addition, a technical analysis of Montour's LNB performance determined that it could not achieve the emission rate of the LNBs on the Conemaugh units.

The Proposed FIP's statistical approach to setting RACT level emission rates results in irreconcilable results. The units with the best controls and lowest emission rates received the highest emission limits. All three units at Homer City received identical emission limitations, even though Unit 3 is capable of a lower emission rate than either Unit 1 or Unit 2. RACT must be determined based on technical feasibility and availability and not a statistical analysis of historical emissions that fail to account for technically feasible levels of controls for individual units.

#### **X. EPA's statistical analysis results in impractical limits**

EPA's methodology results in limits which are infeasible because an emission limit cannot be set that results in the maximum degree of environmental protection without extensively monitoring operations at the facility. Per 87 Fed. Reg. 31804, EPA did not consider a tiered limit as it is not possible to monitor the facility to the extent necessary to ensure that all limits are being met when technically possible. Tiered limits will result in the facilities optimizing emission reductions.

For the Keystone facility, emissions of NO<sub>x</sub> expressed as NO<sub>2</sub> for Boiler 1 and Boiler 2 are individually limited to a maximum of 0.080 lb NO<sub>x</sub>/MMBtu on a daily average basis. This limit excludes: emissions during start-up and shut-down; operation pursuant to emergency generation required by PJM, including any necessary testing for such emergency operations; and operation during periods in which compliance with this emission limit would require operation of any equipment in a manner inconsistent with technological limitations, good engineering and maintenance practices, and/or good air pollution control practices for minimizing emissions. Emissions of NO<sub>x</sub> expressed as NO<sub>2</sub> from Boiler 1 and Boiler 2 are individually limited to a maximum of 0.30 lb NO<sub>x</sub>/MMBtu on a daily average basis under all operating conditions. Emissions of NO<sub>x</sub> expressed as NO<sub>2</sub> from Boiler 1 and Boiler 2 (Source ID 031 and 032) are individually limited to a maximum 770 lbs NO<sub>x</sub>/hr on a 30-operating day rolling average basis under all operating conditions.

For the Conemaugh facility, emissions of NO<sub>x</sub> expressed as NO<sub>2</sub> for Boiler 1 and Boiler 2 are individually limited to a maximum of 0.070 lb NO<sub>x</sub>/MMBtu on a daily average basis. This limit excludes: emissions during start-up and shut-down; operation pursuant to emergency generation

required by PJM, including any necessary testing for such emergency operations; and operation during periods in which compliance with this emission limit would require operation of any equipment in a manner inconsistent with technological limitations, good engineering and maintenance practices, and/or good air pollution control practices for minimizing emissions. Emissions of NO<sub>x</sub> expressed as NO<sub>2</sub> from Boiler 1 and Boiler 2 are individually limited to a maximum of 0.27 lb NO<sub>x</sub>/MMBtu on a daily average basis under all operating conditions. Emissions of NO<sub>x</sub> expressed as NO<sub>2</sub> from Boiler 1 and Boiler 2 (Source ID 031 and 032) are individually limited to a maximum 700 lbs NO<sub>x</sub>/hr on a 30-operating day rolling average basis under all operating conditions.

For the Montour facility, emissions of NO<sub>x</sub> expressed as NO<sub>2</sub> for Boiler 1 and Boiler 2 are individually limited to a maximum of 0.080 lb NO<sub>x</sub>/MMBtu on a daily average basis. This limit excludes: emissions during start-up and shut-down; operation pursuant to emergency generation required by PJM, including any necessary testing for such emergency operations; and operations during periods in which compliance with this emission limit would require operation of any equipment in a manner inconsistent with technological limitations, good engineering and maintenance practices, and/or good air pollution control practices for minimizing emissions. Emissions of NO<sub>x</sub> expressed as NO<sub>2</sub> from Unit 1 and Unit 2 when firing coal are individually limited to a maximum of 0.30 lb NO<sub>x</sub>/MMBtu on a daily average basis under all operating conditions. The owner or operator may exclude emissions during the startup not to exceed eight hours from initial firing of the unit. The owner or operator may exclude emissions during the shutdown not to exceed two hours. Emissions of NO<sub>x</sub> expressed as NO<sub>2</sub> from Unit 1 and Unit 2 are individually limited to a maximum of 0.35 lb NO<sub>x</sub>/MMBtu on a daily average basis under all operating conditions. All hours during any calendar day are subject to this limit, even if only one full operating hour qualifies. Emissions of NO<sub>x</sub> expressed as NO<sub>2</sub> from Unit 1 and Unit 2 when firing coal are individually limited to a maximum 650 lbs NO<sub>x</sub>/hr on a 30-operating day rolling average basis under all operating conditions.

For the Homer City facility, emissions of NO<sub>x</sub> expressed as NO<sub>2</sub> for Boiler 1 and Boiler 2 are individually limited to a maximum of 0.080 lb NO<sub>x</sub>/MMBtu while Boiler 3 is limited to a maximum of 0.070 lb NO<sub>x</sub>/MMBtu on a daily average basis. These limits exclude: emissions during start-up and shut-down; operation pursuant to emergency generation required by PJM, including any necessary testing for such emergency operations; and operation during periods in which compliance with this emission limit would require operation of any equipment in a manner inconsistent with technological limitations, good engineering and maintenance practices, and/or good air pollution control practices for minimizing emissions. Emissions of NO<sub>x</sub> expressed as NO<sub>2</sub> from Units 1 and 2 are individually limited to a maximum of 0.45 lb NO<sub>x</sub>/MMBtu on a daily average basis under all operating conditions. Emissions of NO<sub>x</sub> expressed as NO<sub>2</sub> from Unit 3 are limited to a maximum of 0.27 lb NO<sub>x</sub>/MMBtu on a daily average basis under all operating conditions. For the 0.45 and 0.27 lb/MMBtu, all hours during a calendar day which are subject to this limit shall be included in calculating the daily average, even if only one full operating hour qualifies. Emissions of NO<sub>x</sub> expressed as NO<sub>2</sub> from Unit 1 and Unit 2 are individually limited to a maximum 600 lbs NO<sub>x</sub>/hr on a 30-operating day rolling average basis under all operating conditions. Emissions of NO<sub>x</sub> expressed as NO<sub>2</sub> from Unit 3 are limited to a maximum 560 lbs NO<sub>x</sub>/hr on a 30-operating day rolling average basis under all operating conditions.

**XI. EPA states that DEP did not Consider the Effects of Reduced NOx Emissions from the LNB in our Cost Analysis**

In the Proposed FIP, the EPA stated that the Department did not consider the effects of reduced NOx emissions from the LNB in its cost analysis (87 Fed. Reg. 31810), which is inaccurate. EPA is responsible for preparing the Proposed FIP, including performing the technical feasibility and availability analysis. EPA is also responsible for performing the necessary information gathering, analysis, and calculations.

The Department prepared Comment and Response documents for each of the RACT permits for the four facilities. EPA submitted a comment which indicated that in the proposed permits, the Department did not consider the effects from the LNB in its cost analysis. In the four Comment and Response documents, the Department explained how it evaluated the technical and economic feasibility of LNB upgrades. The Comment and Response document states that the Department contacted each facility and requested additional information regarding the technical feasibility of LNB upgrades on each of the units. Each facility responded, as documented in the Comment and Response document.

In the case of Keystone's units, Conemaugh's units, and Homer City's Unit 3, each owner/operator submitted a response showing that upgrading the LNB on their existing boilers would result in minimal marginal improvements in NOx emission levels ranging from about 10%-20% on average. The NOx emissions from the LNB travel through the SCR, where they are reduced further. The cost effectiveness of replacing any of the LNBs fell considerably short of the level which would be reasonable and qualify as RACT. Montour indicated that no LNB upgrades were available for their boilers. Homer City stated that small upgrades were available for Unit 1 and Unit 2 but more significant upgrades to bring the units performance in line with Unit 3 would require boiler modifications which are so significant as to warrant replacement of the boilers. In addition, it is worth noting that because all of these facilities have SCR, the practical effect of installing an improved LNB is significantly reduced when the SCR is operational.

It is unclear as to how the technical and economic analysis performed by the Department for these facilities and included in the SIP revision submittals is relevant to the Proposed FIP. EPA performed no technical feasibility analysis or economic availability analysis for replacement of any of the LNBs located on any of the units. EPA's statement that the Department did not perform a technical analysis of the feasibility and emission reduction potential of LNB replacement is inaccurate, and EPA's did not conduct any analysis of LNB replacement.

**XII. The Proposed FIP is Technically Inaccurate, Violates the CAA and its Implementing Regulations, Violates the Court's Order, and Relies on an Incomplete Record**

The Proposed FIP: does not comply with CAA RACT requirements and legal precedent; violates the Administrative Procedures Act (5 U.S.C. § 706(2)(A)); is technically inaccurate; and was developed based on an incomplete record. EPA did not request relevant information from

the Department or the subject EGUs in development of the Proposed FIP. Should EPA finalize the Proposed FIP, with or without substantial changes, it will not withstand legal scrutiny.

In summary, there are significant legal, technical, and administrative deficiencies with the Proposed FIP that cannot be remedied without an additional comment period. The Department recommends that EPA not finalize the Proposed FIP and instead work to evaluate and finalize the pending case-by-case RACT SIP revisions that satisfy the legal requirements of the CAA and its implementing regulations. The pending SIP revisions meet all the conditions set forth in the Third Circuit's decision in *Sierra Club*, but the Proposed FIP does not. Should you have any questions or comments, please contact Mark Hammond, Director of the Bureau of Air Quality, by e-mail at [mahammond@pa.gov](mailto:mahammond@pa.gov) or by telephone at 717.787.9702.

Sincerely,



Ramez Ziadeh, P.E.  
Acting Secretary

Enclosure