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November 22, 2024

VIA ELECTRONIC MAIL (daq.publiccomments@deq.nc.gov**)**

Mr. Russell Braswell
Division of Air Quality
1641 Mail Service Center
Raleigh, NC 27699-1641

RE: Comments on Draft Air Quality Permit No. 01001T60 for Roxboro Steam Electric Plant

Dear Mr. Braswell,

The North Carolina Division of Air Quality ("DAQ") has solicited public comments on a draft permit modification ("Draft Permit") that would authorize Duke Energy Progress ("Duke" or "Duke Energy") to construct a new gas plant consisting of two combined-cycle power blocks (CC1 and CC2), which will each contain two combustion turbines, two heat recovery steam generators, and one steam turbine, in addition to supporting equipment (the "new gas plant").[1] The proposed gas plant would be located within the Person County Energy Complex ("Roxboro property"), where an existing coal plant is also located. The Southern Environmental Law Center, Southern Alliance for Clean Energy, Sierra Club, Natural Resources Defense Council, North Carolina Conservation Network, Environmental Defense Fund, National Parks Conservation Association, CleanAIRE NC, and Southern Coalition for Social Justice ("Commenters") respectfully submit

[1] DUKE ENERGY PROGRESS, LLC, APPLICATION—ROXBORO STEAM ELECTRIC PLANT, SEMORA, NORTH CAROLINA; PERSON COUNTY, AIR QUALITY PERMIT NO. 01001T58 2-4 (Mar. 28, 2024) [hereinafter "Application"].

the following comments detailing our serious concerns with the Draft Permit. Specifically, the Draft Permit unlawfully fails to require Duke to comply with the Clean Air Act's Prevention of Significant Deterioration ("PSD") requirements, is based on inadequate information, and lacks sufficient testing and monitoring requirements to ensure compliance with the Clean Air Act.

INTRODUCTION

The Project

According to Duke's March 28, 2024, application for this permit modification ("Application"), Duke plans to construct its new gas plant, including four new gas- and oil-fired turbines and supporting equipment[2] at the Person County Energy Complex, near an existing coal-fired power plant which consists of four electric generating units powered by six coal- and oil-fired boilers ("existing coal plant").[3] Duke asserts that it will retire the existing coal plant, including all four coal-fired units, at some yet-to-be-determined time after constructing and commencing operation of its new gas plant.[4] Duke claims that construction of the new gas plant will "facilitate the ultimate retirement of coal-fired generation at the facility in a multi-year process."[5]

Duke proposes to implement its plan in four phases:

1. Install and begin commercial operation of CC1;
2. Retire coal-fired Units 1 and 4;
3. Install and begin commercial operation of CC2;

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[2] This includes a gas-fired auxiliary boiler, two diesel-fired emergency generators, two diesel-fired emergency firewater pump engines, four gas-fired dew point heaters, and four diesel fuel storage tanks. *Id.* at 2-4.
[3] *Id.* at 2-1, 2-20 (showing map of the Roxboro Plant and the different locations of the existing coal plant and future gas plants).
[4] *Id.* at 2-4.
[5] *Id.* at 1 [in PDF].

4. At some unspecified point, retire coal-fired Units 2 and 3.[6]

Although the Application does not provide specific end-dates or durations for any of these phases, it notes that the "sequencing of these complex changes will require significant time to implement."[7] In addition, Duke acknowledges that the coal units will continue operating (again for an unspecified amount of time) concurrently with each gas power block over the course of this process.[8] The gas combustion turbines will run primarily on gas and will use No. 2 fuel oil as a backup fuel.[9] Each combined-cycle unit will have a capacity of 1,360 MW,[10] for a total of 2,720 MW in new generation capacity, compared to the coal plant's current total capacity of 2,462 MW.[11] Neither the Application nor the Draft Permit specify the manufacturer or model of the turbines (although Duke had completed its bid process by the time it filed the Application[12]).

Prevention of Significant Deterioration

The Clean Air Act's PSD program requires permit applicants constructing new major sources or proposing major modifications to existing major sources to determine and apply the best available control technology ("BACT") and complete air modeling to confirm that the additional emissions will not cause or contribute to an exceedance of any of the National Ambient Air Quality Standards ("NAAQS") or a significant deterioration of air quality.[13] A new "[f]ossil

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[6] *Id.* at 1-3.
[7] *Id.* at 1-3.
[8] *Id.* at 1-3 & n.1 ("[T]here will be a period during which the new CC2 will operate concurrently with the first power block, CC1, and existing Units 2 and 3. … There is a possibility also of a short period of time, in the interim period between the time when CC1 starts emitting and reaches commercial operations, during which CC1 would be operated concurrently with all four existing units.").
[9] *Id.* at 2-4.
[10] *Id.* at 6-9.
[11] N.C. DIV. OF AIR QUALITY, REVIEW OF APPLICATION 7300029.24A 3 [hereinafter "Application Review"].
[12] *See* Direct Testimony of John Robert Smith, Jr. On Behalf of Duke Energy Progress, LLC at 13–14, In the Matter of Application of Duke Energy Progress, LLC and North Carolina Electric Membership Corporation for a Certificate of Public Convenience and Necessity to Construct a 1,360 MW Natural Gas-Fueled Combined Cycle Electric Generating Facility in Person County, North Carolina, Dkt. Nos. E-2, SUB 1318/EC-67, SUB 55 (N.C.U.C. Mar. 28, 2024) [hereinafter "Smith Testimony"] (attached as Attachment 1).
[13] *See* 42 U.S.C. § 7475(a)(3) (2023); 40 C.F.R. § 51.166(k)(1) (2019).

fuel-fired steam electric plant" is "major" and therefore subject to PSD permitting and control requirements if it has a potential to emit 100 tons per year or more of any regulated PSD pollutant.[14] A physical or operational change to an existing major stationary source is a "major modification" if the increase in emissions attributable to the modification exceeds any regulated PSD pollutant's significant emissions rate ("SER," set by federal rules).[15]

Potential emissions from the new gas plant greatly exceed the 100-ton-per-year major source threshold for PSD applicability for a new fossil fuel-fired steam electric plant. However, Duke claims that the new gas plant is not a new source but is instead a modification to the existing coal plant (which the new gas plant purportedly will replace). Thus, Duke asserts that the new gas plant triggers PSD only if the resulting emission increase exceeds the significant emissions rate for a regulated PSD pollutant.

Even if classified as a modification, the emission increase from the new gas plant would exceed the significant emission rate for almost every regulated pollutant[16] (that is, potential emissions from the new gas plant are unambiguously high enough to constitute a major modification). But Duke goes one step further: Duke contends that the construction of the new gas plant and the shutdown of the existing coal plant qualify as a single "project" under the PSD regulations as amended by the "Project Emissions Accounting" rule promulgated by the Environmental Protection Agency ("EPA") in 2020.[17] Thus, in determining PSD applicability, Duke subtracts the emission decrease anticipated to be achieved by shutting down the existing coal

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[14] *Id.* § 51.166(b)(1)(i)(A) (2019) (incorporated by reference in 15A N.C. ADMIN. CODE 2D.0530(b)).
[15] *Id.* §§ 51.166(b)(2)(i), (b)(23), (b)(39), (b)(49) (2019) (incorporated by reference in 15A N.C. ADMIN. CODE 2D.0530(b)).
[16] In particular, the new units' potential emissions of NO_X, total PM, PM10, PM2.5, SO_2, VOC, CO, H_2SO_4, and CO_2e each exceed their respective SER. *See* Application at 3-11.
[17] Prevention of Significant Deterioration (PSD) and Nonattainment New Source Review (NNSR): Project Emissions Accounting (Final Rule), 85 Fed. Reg. 74,890 (Nov. 24, 2020).

plant from the potential emissions of the new gas plant—even though Duke is not subject to a legal obligation to shut down the coal units, and plans to keep two of the coal units operating for an indeterminate number of years after the new gas plant commences operation. According to Duke's calculation of overall "project emissions," the "project," whenever it is completed, will result in an emission decrease for all regulated pollutants except CO, VOC, and CO_2e.[18] To ensure the increase in emissions of these pollutants do not exceed the significant emission rates, and to account for the fact that the coal units will in fact not be shut down prior to the operation of the new gas plant but will, to varying degrees, operate together with the new gas plant over the indeterminate length of the "project," Duke proposed (and DAQ accepted) PSD Avoidance Limits "for the group of equipment included in this project."[19]

Importantly, the emission decreases that Duke anticipates from shutdown of the existing coal plant are not—and will not be under the final permit—enforceable or contemporaneous with the new gas plant's emission increases. Rather, the emission decreases from the coal-unit shutdowns, to the extent they ever actually occur, will occur well after the new gas plant is operating.

Environmental Justice

Duke's Application includes an EJScreen report for a 5-mile radius around the proposed gas plant site, which shows that the surrounding population is in the 72nd percentile nationally for heart disease; the 67th percentile for cancer; and the 52nd percentile for air toxics cancer risk.[20]

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[18] *See* Application at 3-9, 3-11.
[19] *Id.* at 3-11.
[20] *See id.* at 309-10.

DAQ, however, declined to review this information because it was "not required by statute or regulation."[21]

In addition, the Roxboro Steam Electric Plant sits directly across the street from Woodland Elementary School, which is located at 7391 Semora Road. According to Google Maps, the Roxboro facility's West Gate is 0.6 miles to the Northwest of the elementary school. The Application shows that the new gas turbines will be constructed even closer to the elementary school than the existing coal-fired units.[22]

COMMENTERS' CONCERNS REGARDING THE DRAFT PERMIT

I. DAQ Must Require the New Gas Plant to Comply with PSD Requirements.

A. The new gas plant is a new major stationary source, not a modification to the existing coal plant.

Contrary to the approach DAQ took in preparing the Draft Permit, the new gas plant constitutes a new major stationary source, not a modification to the existing coal plant. Accordingly, Duke cannot lawfully evade PSD requirements for the new gas plant by subtracting the emission decreases anticipated from the eventual shutdown of the existing coal plant from the new gas plant's emissions. When properly evaluated as a new stationary source, the new gas plant's emissions indisputably exceed the applicable PSD major source threshold of 100 tons per year of any PSD-regulated pollutant.

The Clean Air Act defines a "modification" for purposes of PSD applicability as "any *physical change in, or change in the method of operation of, a stationary source* which increases the amount of any air pollutant emitted by such source or which results in the emission of any air

[21] Application Review at 46.
[22] Application at 2-20.

pollutant not previously emitted."[23] As confirmed by federal regulations, the "stationary source" that is being changed must be an "*existing* major stationary source." [24]

Here, the "existing major stationary source" at issue is Duke's existing coal plant, which consists of four electric generating units powered by six coal- and oil-fired boilers. The new gas plant does not physically change any of the existing coal plant units, nor does it change the method of operation of any coal plant unit. Rather, Duke states that it will (1) install a *new* combined-cycle combustion turbine power block (CC1); (2) retire coal Units 1 and 4; (3) install a *new*, second power block (CC2); and (4) retire the two remaining coal-fired Units 2 and 3.[25] In other words, Duke will eventually retire all of the existing coal-fired units and construct new, separate units that use a different fuel for power generation. Duke is not seeking approval to upgrade or "repower" the four coal-fired units at the Roxboro property to burn gas; rather, Duke is planning to build a completely new gas plant. Construction of the new gas plant thus cannot be characterized as a modification of the existing coal plant. Indeed, Duke characterizes the two sources as the "Existing Coal Plant" and the "New Natural Gas Plants" in the Application[26] and specifies that the "new natural gas plants will be built on the existing Roxboro Plant *property*,"[27] not that the new natural gas plants are part of the existing Roxboro *plant*. In fact, because the new gas plant is designed to operate independently from the existing coal plant, there is no reason why the new gas plant could not be constructed and operated at an entirely different location from the existing coal plant. Duke's decision to locate the new gas plant near the site of the existing coal plant that it plans to

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[23] 42 U.S.C. § 7411(a)(4) (2023) (emphasis added).
[24] 40 C.F.R § 51.166(b)(51) (2019) (emphasis added) (incorporated by reference at 15A N.C. ADMIN. CODE 2D.0530(b)).
[25] Application at 1-3.
[26] Application at 2-20.
[27] *Id.* at 2-20 (emphasis added).

retire does not change the reality that the new gas plant is an entirely new major stationary source that must be subject to PSD preconstruction requirements.

Allowing a permit applicant to avoid Clean Air Act PSD preconstruction requirements for a new major stationary source simply by constructing that new source at the site of an existing, to-be-retired source and calling the new source a "modification" of the retiring source is entirely at odds with Congressional intent. Under the Clean Air Act, "[n]o major emitting facility" may be constructed after August 7, 1977, without installing the "best available control technology" and demonstrating that its emissions will not cause or contribute to a violation of any NAAQS or cause air quality to significantly deteriorate.[28] In this way, Congress sought to, among other things:

- "protect public health and welfare" from the adverse impact of air pollution, "notwithstanding attainment and maintenance of all national ambient air quality standards;"
- "preserve, protect, and enhance the air quality in national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreational, scenic, or historic value;"
- ensure that emissions from a source in one state will not interfere with another state's efforts to prevent significant air quality deterioration.[29]

The *only* stationary sources emitting above the major source threshold that Congress chose to exempt from PSD requirements were older plants (constructed prior to August 7, 1977) thought to be on the verge of retirement—such as the coal-fired Roxboro Plant. But Congress did not grant

[28] *See* 42 U.S.C. § 7475(a)(3).
[29] *See id.* § 7470 (2023).

those existing sources "perpetual immunity" from PSD requirements.[30] Rather, Congress specified that existing major stationary sources must comply with PSD when they undertake a "modification" that increases the source's emissions. The idea was to ensure that these initially-exempted major sources install modern pollution controls when it makes sense to do so—specifically, at the time of new or modified construction.[31]

In issuing federal regulations to implement the Clean Air Act, EPA differentiated between mere "[r]outine maintenance, repair, and replacement," which it exempted from the definition of "major modification,"[32] and "life extension project[s]" that restore a deteriorating plant's lost generating capacity as an alternative to replacing it with a new plant that employs modern control technologies.[33] Over the last two decades, EPA as well as members of the public (through citizen suits) have sought to hold sources accountable for undertaking such life-extension projects without complying with PSD requirements.[34]

The longstanding debate over what source changes are "routine" versus which are unusual "life-extension" projects for purposes of determining PSD applicability seems absurd in the face of DAQ's proposal to allow Duke to entirely replace its existing coal plant with its new gas plant without undergoing PSD permitting. Obviously, if a company can replace an old plant in its entirety and avoid PSD when doing so, then it can maintain perpetual immunity from PSD

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[30] *Alabama Power Co. v. Costle*, 636 F.2d 323, 400 (D.C. Cir. 1979) (explaining that the "statutory scheme intends to 'grandfather' existing industries; but the provisions concerning modifications indicate that this is not to constitute perpetual immunity from all standards under the PSD program.").
[31] *See Wisconsin Elec. Power Co. v. Reilly*, 893 F.2d 901, 909 (7th Cir. 1990) ("*WEPCo*"). *See also* 116 CONG. REC. 32,918, (remarks of Sen. Cooper), *reprinted in* 1 SENATE COMMITTEE ON PUBLIC WORKS, A LEGISLATIVE HISTORY OF THE CLEAN AIR ACT AMENDMENTS of 1970 (1974), at 260.
[32] *See* 40 C.F.R. § 51.166(b)(2)(iii)(a) (2019) (defining "Major modification").
[33] *WEPCo*, 893 F.2d at 911.
[34] *See, e.g., U.S. v. Ohio Edison Co.*, 276 F. Supp. 2d 829 (S.D. Ohio 2003); *U.S. v. Southern Indiana Gas & Elec. Co.*, 245 F. Supp. 2d 994 (S.D. Ind. 2003); *U.S. v. Ameren Missouri*, 229 F. Supp. 3d 906 (E.D. Mo. 2017); *U.S. v. East Kentucky Power Coop.*, 498 F. Supp. 2d 976 (E.D. Ky. 2007).

requirements. Literally, forever. While it might be argued that such perpetual immunity is acceptable so long as the new plant emits only slightly more than the existing plant, such an argument ignores not only the Clean Air Act's plain language but also the PSD program's purposes. Congress didn't enact the PSD program to maintain the status quo; PSD aims to ensure that every new major stationary source reduces its emissions to the level achievable through use of BACT and also to ensure that if the source emits up to its maximum allowable emissions, those emissions will not cause or contribute to a NAAQS violation or significantly deteriorate air quality.[35] Duke's existing coal plant is not required to utilize BACT and has never had to comply with the PSD requirement that it model the impact of its source-wide emissions and demonstrate that it would not cause or contribute to a NAAQS violation or significantly deteriorate air quality. If DAQ finalizes this draft permit as written, the new gas plant likewise will not reduce its emissions to the level achievable with modern pollution controls and will not have to assess its impact on ambient air quality. And apparently, the same would be true for the next power plant constructed on this site when the new gas plant reaches the end of its useful life, and so on. Allowing such perpetual exemption from PSD requirements would contravene the plain language of the statute and regulations and the PSD program's fundamental purposes.[36]

Where, as here, an existing major stationary source is being retired, DAQ must not interpret PSD as allowing an entirely new replacement source to be evaluated as a "modification" to the retiring source. Under such circumstances, the new source must be evaluated for PSD applicability based solely on the amount of the new source's potential emissions. Emissions of regulated PSD

[35] *See* 42 U.S.C. § 7475.
[36] *Id.*

pollutants from Duke's new gas plant will far exceed the major source threshold.[37] Accordingly, DAQ must require Duke to comply with PSD permitting and control requirements.

B. Even if the new gas plant could be viewed as a modification to the existing, to-be-retired coal plant, Duke cannot avoid PSD review by subtracting the existing coal plant's emissions from the new gas plant's emissions.

As explained above, Commenters strongly disagree with Duke's contention that the new gas plant constitutes a modification to its existing coal plant. Even if DAQ treats the new gas plant as a modification, however, DAQ cannot allow Duke to avoid PSD review by subtracting the existing coal plant's emissions from the new gas plant's emissions.

1. Background on PSD applicability rules for determining whether PSD applies to a modification to a major stationary source.

EPA's regulations interpret the statutory definition of "modification" to require PSD for a physical or operational change that increases a source's emissions above the applicable significant emissions rate both when the change is considered alone and when the change is considered in combination with the emission impacts of all other "contemporaneous" and "creditable" changes at the source.[38] Throughout the PSD program's history, EPA has instructed sources and regulators to make that emission increase determination using a two-step process, which it memorialized in its PSD regulations in 2002.[39]

Under the two-step process, a source must first determine "[t]he increase in emissions from a particular change or change in the method of operation at a stationary source" (Step 1).[40] If the increase determined under Step 1 would exceed the significant emissions rate for any PSD-regulated pollutant, then the regulations instruct the source to determine whether the change would

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[37] *See* Application at 3-11.
[38] 40 C.F.R. § 52.166(b)(3)(i) (2024).
[39] 67 Fed. Reg. 80,186, 80,190 (Dec. 31, 2002).
[40] 40 C.F.R. § 52.166(b)(3)(i) (2024).

result in a "significant net emissions increase" at the source.[41] "Net emissions increase" is defined to mean the sum of the emission increase from the change (calculated under Step 1) and "[a]ny other increases or decreases in actual emissions at the major stationary source that are contemporaneous with the particular change and are otherwise creditable" (Step 2).[42] To be "creditable," a contemporaneous emission decreases must be, among other things, "enforceable as a practical matter at and after the time that actual construction on the particular change begins."[43]

Prior to 2020, EPA had long held that (as plainly stated in its regulations) under the two-step analysis, an emission *decrease* can be considered only at Step 2, regardless of whether the decrease results from the physical or operational change under consideration. EPA's pre-2020 position is memorialized in EPA's 1990 New Source Review Workshop Manual (the "1990 NSR Manual"),[44] which declares: "Emission decreases associated with a proposed project (such as a boiler replacement) are contemporaneous and may be considered along with other contemporaneous emissions changes at the source. However, they are not considered at [Step 1] in the analysis."[45] The 1990 NSR Manual further emphasizes that "[i]t is important to note that when *any* emissions decrease is claimed (including those associated with the proposed modification), *all* source-wide creditable and contemporaneous emissions increases and decreases of the pollutant subject to netting must be included" in the NSR applicability determination.[46] EPA reaffirmed that its current regulations do not permit consideration of decreases at Step 1 in a

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[41] *Id.* § 52.166(a)(7)(iv)(A) (2024).
[42] *Id.* § 52.166(b)(3)(i) (2024). *See also* 45 Fed. Reg. 52,676, 52,698 (Aug. 7, 1980).
[43] *Id.* § 52.166(b)(3)(vi) (2024).
[44] EPA, NEW SOURCE REVIEW WORKSHOP MANUAL, PREVENTION OF SIGNIFICANT DETERIORATION AND NONATTAINMENT AREA PERMITTING (DRAFT, OCT. 1990), https://www.epa.gov/sites/production/files/2015-07/documents/1990wman.pdf (attached as Attachment 2).
[45] 1990 NSR Manual at A.46.
[46] *Id.* at A.36 (emphasis in original).

lengthy analysis provided in response to a PSD permit application from HOVENSA in 2010.[47] EPA confirmed, therein, that the amendments made in its 2002 NSR Reform Rule did not alter "the historic two step NSR applicability test."[48]

In 2020, EPA finalized the "Project Emissions Accounting Rule," which fundamentally changed the nature of the two-step PSD applicability analysis by allowing permit applicants to take credit for emission decreases associated with an entire "project"—broadly interpreted—under Step 1.[49] The term "project" is defined in the revised federal PSD regulations as "a physical change in, or change in the method of operation of, an existing major stationary source."[50] Pursuant to the 2020 Project Emissions Accounting Rule, project-related emission decreases considered at Step 1 of the PSD applicability analysis do not need to meet the same criteria as decreases counted under Step 2. Specifically, unlike Step 2 decreases, Step 1 decreases do not need to be "contemporaneous" with the project-related emissions increases they are used to offset, meaning that they do not need to occur during a reasonable period "before the date that the increase from the particular change occurs."[51] In addition, Step 1 decreases are not subject to the Step 2 requirement that they be "creditable" (including that the decreases be "enforceable as a practical matter at or after the time that actual construction on the particular change begins").[52] Commenters believe that the Project Emissions Accounting Rule violates the text and purpose of the Clean Air

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[47] *See* Letter from Barbara A. Finazzo, U.S. EPA Region 2, to Kathleen Antoine, HOVENSA, LLC, RE: HOVENSA Gas Turbine Nitrogen Oxides (GT NO_x) Prevention of Significant Deterioration (PSD) Permit Application-Emission Calculation Clarification (Mar. 30, 2010) (Attached as Attachment 3).
[48] *Id.* at 3.
[49] *See generally* 85 Fed. Reg. 74,890.
[50] 40 C.F.R. § 51.166(b)(51) (2024).
[51] *Id.* § 51.166(b)(3)(ii) (2024).
[52] *Id.* § 51.166(b)(3)(vi) (2024).

Act. A petition for review of the Rule is pending before the U.S. Court of Appeals for the D.C. Circuit.[53]

While EPA's 2020 Project Emissions Accounting Rule revised the federal PSD regulations, it is up to each State to decide whether to revise its Clean Air Act State Implementation Plan ("plan") to incorporate Project Emissions Accounting. Notably, North Carolina did not amend its state regulations governing PSD applicability and has not otherwise incorporated the federal Project Emissions Accounting Rule into its federally-approved plan.[54] Indeed, the current version of North Carolina's plan expressly provides: "The version of the CFR incorporated in this Rule, with respect to 40 CFR § 51.166, is that as of July 1, 2019 . . . *and does not include any subsequent amendments or edition*."[55]

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[53] *Envtl. Def. Fund, et al., v. EPA*, No. 18-1149 (D.C. Cir. filed June 18, 2018) (Consolidated with Nos. 21-1033, 21-1039, and 21-1259).

[54] North Carolina has a federally approved State Implementation Plan ("SIP") for Clean Air Act permitting and public participation requirements. The current SIP-approved provisions for construction and operating permits, which are codified at 15A N.C. ADMIN. CODE 2Q.0300–.0317, were approved by the U.S. Environmental Protection Agency in 2021. *See Air Plan Approval; North Carolina; Revisions to Construction and Operation Permit (Final Rule)*, 86 Fed. Reg. 11,875, 11,876 (Mar. 1, 2021).The current version of North Carolina's SIP-approved PSD regulations, which are codified at 15A N.C. ADMIN. CODE 2D.0530, are available at https://www.epa.gov/system/files/documents/2024-05/02d.0500-clean.pdf. As shown on page 32, the last time North Carolina submitted an updated version of 15A N.C. ADMIN. CODE 2D.0530 to EPA for incorporation into its SIP was on April 23, 2021. EPA approved this submission on January 5, 2023. *See* Air Plan Approval; NC; Miscellaneous NSR Revisions and Updates; Updates to References to Appendix W Modeling Guideline (Final Rule), 88 Fed. Reg. 773, (Jan. 5, 2023). The preamble to EPA's approval of the submission specifies that the version of 15A N.C. ADMIN. CODE 2D.0530 being incorporated into the SIP went into effect under state law on October 1, 2020. *See id.* at 773–774. This pre-dated EPA's adoption of the PEA rule, which went into effect on December 24, 2020. *See* 85 Fed. Reg. 74,890.

[55] 15A N.C. ADMIN. CODE 2D.0530(v) (emphasis added).

2. Duke cannot count emission decreases anticipated from retirement of the existing coal plant at Step 1 of the PSD applicability analysis because North Carolina has not revised its State Implementation Plan to incorporate project emissions accounting.

Duke asserts that the retirement of the existing coal plant is part of the same "project" as the construction of its new gas plant.[56] Accordingly, Duke contends that it can count the anticipated decrease in emissions from retiring all four coal-fired units at Step 1 of the PSD applicability analysis when determining whether the "project" will cause a significant emissions increase.[57] However, as explained above, North Carolina's State Implementation Plan incorporates the 2019 version of the federal PSD rules, which pre-dates the Project Emissions Accounting Rule. The 2019 version of the federal rules does not allow for aggregation of separate modifications into a single "project," and it does not allow for an emissions increase attributable to one "particular change" to be offset by a decrease in emissions attributable to another "particular change" under Step 1 of the PSD applicability analysis. Instead, such emissions reductions may only be used for netting purposes under Step 2—where they must meet specific criteria such as being contemporaneous and otherwise creditable.

To the extent that DAQ may believe that it may simply interpret the 2019 version of the federal rules to allow for emission decreases to be netted out at Step 1, Commenters note that such an interpretation is wholly inconsistent with the plain language of the regulations and would therefore be arbitrary and capricious.

On its face, the rule expressly limits the analysis under Step 1 to consideration of an "increase" in emissions that is attributable to the proposed modification—whereas the analysis under Step 2 allows for the consideration of a "net emissions increase" that takes into account

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[56] *See, e.g.*, Application at 1-3.
[57] *See, e.g.*, *id.* at 3-11.

"other increases and decreases" that are attributable to other changes at the facility. [58] The rule's definition of a "net emissions increase" further clarifies the limited scope of the Step 1 analysis by specifying that "the increase" considered at that initial step must be attributable to "a *particular* physical change or change in the method of operation"[59] —whereas the "other increases and decreases" that can be netted out at Step 2 are those attributable to other changes at the facility that are "contemporaneous with the *particular* change" considered at Step 1.[60] Because the language of the rule discussing Step 1 refers only to an "increase" and the language discussing Step 2 expressly incorporates both "increases *and decreases*," well-established canons of interpretation dictate that any decreases may not be taken into account at Step 1.[61]

EPA's 2020 Project Emissions Accounting Rule fundamentally altered the application of this plain language in 40 CFR § 51.166 by amending the provision that applies the two-step analysis to "projects that involve multiple types of emissions units." In particular, EPA amended 40 CFR § 51.166(a)(7)(iv)(f) and added a new subsection, § 51.166(a)(7)(iv)(g). The latter provision expressly allows for the "sum of the difference"—as used in the former provision—to "include both increases *and decreases* in emissions."[62] Importantly, this provision does not appear in the 2019 version of the rule that is incorporated by reference into chapter 15A, subchapter 2D.0530 of North Carolina's Administrative Code and North Carolina's State Implementation Plan.[63] As a result, based on the plain language of the 2019 version of the rule, Duke cannot include

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[58] 40 CFR §§ 51.166(a)(7)(iv)(A), (b)(3)(i)(B) (2019).
[59] *Id.* at § 51.166(b)(3)(i)(A).
[60] *Id.* at § 51.166(b)(3)(i)(B).
[61] *See RadLAX Gateway Hotel v. Amalgamated Bank,* 566 U.S. 639, 644–45 (2012) (noting that a "well established canon of statutory interpretation" forbids reading by which "[one] clause … permits precisely what [an adjacent] clause … proscribes").
[62] 40 CFR § 51.166(a)(7)(iv)(g) (2024).
[63] 15A N.C. ADMIN. CODE 2D.0530.

emission decreases anticipated from retirement of the existing coal plant in its Step 1 determination as to whether its new gas plant will produce a significant emissions increase.[64]

To the extent that DAQ may believe that EPA's adoption of the Project Emissions Accounting Rule in December 2020 had the effect of automatically changing the rules that apply under North Carolina's State Implementation Plan, Commenters note that such an interpretation would be wholly inconsistent with case law addressing that very point. The only way for plan-approved rules to be updated is through the formal plan amendment process.[65] EPA simply cannot unilaterally amend the rules that have been incorporated into a state's plan, whether by informal interpretation or formal rulemaking.[66]

3. Even if North Carolina's State Implementation Plan can be interpreted as allowing project emissions accounting, the existing coal plant emission decreases cannot be considered under Step 1 of the PSD applicability analysis because retirement of the existing coal plant is not part of the same "project" as construction of the new gas plant.

Even if the proposed gas plants can be considered part of the same source as the coal plant Duke is closing, the closure of the coal plant cannot be considered part of the same "project" as the proposed new gas plant for Step 1 purposes. In EPA's 2020 Project Emissions Accounting

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[64] Indeed, when EPA promulgated the version of the PSD applicability rule that was in effect in 2019, the agency confirmed that the rule language was not intended to allow for decreases in emissions to be considered at Step 1. *See* Prevention of Significant Deterioration (PSD) and Nonattainment New Source Review (NSR): Baseline Emissions Determination, Actual-to-Future-Actual Methodology, Plantwide Applicability limitations, Clean Units, Pollution Control Projects (Final Rule), 67 Fed. Reg. 80,186, 80,190 (Dec. 31, 2002) (explaining that the revision to "the definition of major modification" merely "clarif[ied] what has always been our policy—that determining whether a major modification is a two-step process"); *id.* at 80,197 ("If your calculations show that a significant emissions increase will result from a modification, you have the option of taking into consideration any contemporaneous emissions changes that may enable you to net out of review," and "[t]he contemporaneous time period will not change").

[65] *See* 42 U.S.C. § 7410(i) (2023) (EPA cannot "modify[] any requirement of an applicable implementation plan … with respect to any stationary source" other than via specifically identified mechanisms).

[66] *See, e.g.*, *Sierra Club v. Tenn. Valley Auth.*, 430 F.3d 1337, 1346–48 (11th Cir. 2005) (stating that EPA may not "unilaterally revise [state implementation plans] without submitting the revision to the rigors of the SIP amendment process"); *Sierra Club v. Georgia Power,* 443 F.3d 1346, 1354 (11th Cir. 2006) ("Even if the EPA had intended its [policy statement] to alter the meaning of Georgia's existing [SIP] and similar provisions in other states' SIPS, the EPA would have been powerless to effect such a change absent a formal SIP revision.").

Rule, EPA explained that for multiple changes to be considered part of the same project, these changes need to be "substantially related" as defined in EPA's 2018 project aggregation action.[67] Specifically, to be "substantially related," there must be "an apparent technical or economical interconnection between the physical and operational changes."[68] Here, Duke's promised shutdown of the existing coal plant is neither technically nor economically interconnected with construction of the new gas plant. Obviously, the existing coal plant does not need the new gas plant to operate; to the contrary, Duke states that it will be retiring the existing coal plant at some point after the new gas plant is operating. Likewise, the new gas plant will do nothing to make the existing coal plant economically viable and vice versa. In fact, there is no reason Duke couldn't construct its proposed gas units at a completely different location.

Even if construction of the new gas plant and retirement of the existing coal plant *could* be considered "substantially related," Duke's Application and DAQ's Draft Permit render this argument irrelevant. First, the Application does not request *any* modifications to the facility's permit to reflect Duke's plans to eventually shut down the existing coal plant. Second, the Draft Permit does not include a single enforceable condition related to retirement of any of the coal-fired units. Not only does the Draft Permit fail to establish enforceable retirement dates for any of the four units, but it does not even require Duke to adhere to its own proposed "sequencing."[69] In particular, the Draft Permit imposes no requirements for coal-fired Units 1 and 4 to be shut down in between CC1 and CC2 coming online. Instead, the Draft Permit authorizes continued operation of the entire existing coal plant, effectively in perpetuity—that is, unless and until Duke applies

[67] 85 Fed. Reg. 74,890, 74,895, 74,898 n.73.
[68] *Id.*
[69] *See* Application at 1-3.

for *another* modification to reflect those units' decommissioning, at some unspecified date in the future.

It simply belies common sense to characterize the eventual retirement of the existing coal plant as part of the same "project" for which Duke requested a permit modification, when the permit modification itself does not reflect that retirement. It also belies the plain language of the PSD applicability rules in North Carolina's state implementation plan.[70] Even under the federal Project Emissions Accounting Rule, the analysis at Step 1 is required to consider the difference in emissions that are attributable to "a *particular* physical change or change in the method of operation."[71] In the absence of any detailed information regarding the coal-fired units' future retirement—in either the Application or the Draft Permit—there simply is no "particular" change to speak of.

4. Duke cannot apply the anticipated emissions decreases from retirement of the existing coal plant at Step 2 because those decreases are neither contemporaneous with the new gas plant's emissions increases nor creditable.

In light of the above arguments, the only possible way for Duke to avoid PSD based on emission decreases anticipated to occur from retirement of the existing coal plant would be to count the decreases at Step 2 (in calculating whether there is a significant *net* emissions increase). However, the coal units' emissions decreases cannot be counted at Step 2 because they fail to meet Step 2 criteria. Specifically, the emission decreases must be both "contemporaneous" and "creditable" for Duke to subtract them from the gas plant's potential emissions.[72] A decrease in emissions is "contemporaneous" only if it occurs within the seven-year period "*before* the date

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[70] *See generally* 15A N.C. ADMIN. CODE 2D.0530.
[71] 40 CFR § 51.116(b)(3)(i)(a) (2019) (emphasis added); the phrasing is the same in 40 CFR § 51.116(b)(3)(i)(a) (2024).
[72] *See* 40 C.F.R. § 51.166(b)(3)(i)(B) (2019).

that the emissions increase from the particular change occurs"[73]-—*i.e.*, when the new units begin operation.[74] Meanwhile, a decrease in emissions is "creditable" only if it happens within a seven-year period of the change; the old level of either actual or allowable emissions (whichever is lower) exceeds the new level of actual emissions; the decrease is enforceable as a practical matter at and after the time of construction; and the decrease has roughly the same significance for public health and welfare as that attributed to the increase in emissions from the particular change.[75]

a) The anticipated emissions decrease from retiring the existing coal plant will not occur contemporaneously with the emissions increase caused by the new gas plant.

Although Duke states it intends to retire coal Units 1 and 4 "with the commercial operation of the first power block," Duke notes that there may be a "period of time, in the interim period between the time when CC1 starts emitting and reaches commercial operations, during which CC1 would be operated concurrently with all four existing [coal-fired] units."[76] Although Duke suggests this period of time will likely be "short,"[77] neither the Application nor the Draft Permit include a specific duration for this period of simultaneous operations. Worse, the Draft Permit does not include any enforceable conditions requiring the shutdown of Units 1 and 4 *at any point*, much less immediately upon operation of CC1. In fact, the Draft Permit doesn't even require Units 1 and 4 to be retired before *CC2* is constructed and operational. As a result, the emissions reductions

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[73] *Id.* § 51.166(b)(3)(ii) (2019) (emphasis added); *see also* 15A N.C. ADMIN. CODE 2D.0530(b)(2) ("In the definition of 'net emissions increase,' the reasonable period specified in 40 CFR 51.166(b)(3)(ii) shall be seven years.").
[74] *See 40 C.F.R.* § 51.166(b)(3)(vii) (2019) ("An increase that results from a physical change at a source occurs when the emissions units on which construction occurred becomes operational and begins to emit a particular pollutant. Any replacement unit that requires shakedown becomes operational only after a reasonable shakedown period, not to exceed 180 days."); *see also* 15A N.C. ADMIN. CODE 2D.0530(a) ("The minimum requirements described in the portions of 4 CFR 51.166 are hereby adopted as requirements under this Rule, except as otherwise provided in this Rule.").
[75] *See* 40 C.F.R. §§ 51.166(b)(3)(iii), (vi) (2019).
[76] Application at 1-3, n.1.
[77] *Id.*

from the retirement of Units 1 and 4 will not, by definition, occur "contemporaneously" with—or even *before*—the increase in emissions from the construction of CC1 (or even CC2). It is therefore impermissible under North Carolina's State Implementation Plan for Duke to take credit for those eventual emission reductions to offset the potential emissions of the new gas plant at Step 2.

In addition, Duke's Application fully contemplates that CC1 will operate at its full capacity while coal-fired Units 2 and 3 are still operating, for a much longer time. While Duke plans to bring CC1 online during the project's first phase, Duke does not plan on retiring Units 2 and 3 until the *fourth* phase.[78] Duke also notes that "there will be a period during which the new CC2 will operate concurrently with the first power block, CC1, and existing Units 2 and 3."[79] As with Units 1 and 4, the Draft Permit does not actually require Units 2 and 3 to be retired and instead authorizes their continued operation in perpetuity. Again, by definition, the emissions reductions from the eventual retirement of Units 2 and 3 cannot occur "contemporaneously" with the increase in emissions from the two new power blocks and thus may not be counted at Step 2.

Duke's plan to continue running the coal plant alongside the new gas plant also calls into question its "projected actual" emissions from the coal units. Duke notes that the new gas units will come online beginning in January 2029, which means at least two of the coal units will presumably operate through 2028.[80] In this respect, the projected actual emissions for the coal units should be those units' projected emissions in the years prior to 2028, just prior to their retirement. Duke has dispatch modeling available for every unit on its system as part of its planning process; it can, and should, use projected capacity factors for these coal units to properly assess

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[78] *See id.* at 1-3.
[79] *Id.* at 1-3.
[80] *See* Smith Testimony at 6 ("DEP plans to permanently retire Roxboro's coal-fired Units 1 and 4 and replace them with the Proposed Facility by January 1, 2029.").

total future emissions. Given the changing mix of fuels in the grid and increasing levels of renewable energy each year, it is likely that the capacity factors of the coal units will continue to decrease. Thus, even if Duke could permissibly subtract the coal units' emission reductions at Step 2, the proposed numbers are almost certainly wrong.

In sum: the Application does not provide, and the Draft Permit does not impose, any binding dates by which Duke must retire *any* of the coal units—meaning Duke cannot show, in its netting analysis, that any of those units will yield emissions reductions "contemporaneously" with the increase in emissions from the new gas plant. At best, Duke could only claim to retire Units 1 and 4 contemporaneously with construction of CC2. However, as explained below, that would only be permissible if the permit included an enforceable requirement for Units 1 and 4 to be permanently shut down before CC2 is brought online.

b) Duke may not apply the anticipated emission decreases from retiring the existing coal plant at Step 2 because those decreases are not creditable.

Even if Units 1 and 4 *were* going to be shut down before operation of the new gas plant, Duke still cannot show that the decreases in emissions from those units' retirement are *creditable* because the old level of emissions must exceed the new level of actual emissions and the new emissions must not result in more significant impacts to public health and welfare. [81] In addition, in order to be subtracted at Step 2, the decrease in emissions must be enforceable and durable.[82]

First, Duke's analysis indicates that the gas plants' potential emissions of CO, VOCs, lead, and CO_2e are higher than the coal plant's baseline emissions of those pollutants. Indeed, the potential emissions of CO, VOCs, and lead are *orders of magnitude* higher:

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[81] *See* 40 C.F.R. § 51.166(b)(3)(vi)(A), (C) (2019).
[82] *See id.* at § 51.166(b)(3)(vi)(B) (2019) (The decrease in emissions must be "enforceable as a practical matter at and after the time that actual construction on the particular change begins.").

Table 1: Gas Plant's Potential Emissions Compared to Coal Plant's Baseline Emissions

	VOC	CO	Pb	CO_2e
Baseline Emissions: Units 1–4 (tpy)[83]	80.60	675.80	0.0328	6,999,450
Potential Emissions: New Units (tpy)[84]	720.10	2,589.70	0.0724	12,855,867
Project's Increase in Emissions (tpy)	639.50	1,913.90	0.0396	5,856,417
Percent Increase Over Baseline	**793.42%**	**283.21%**	**120.73%**	83.67%

Even with the PSD Avoidance Limits that Duke requested for VOC and CO, the emissions of those pollutants from the new gas plant will still be permitted to exceed the coal plant's baseline emissions (and will presumably do so once the coal units are retired, given the potential emissions values shown above):

Table 2: Gas Plant's Emissions Percent Increase Over Baseline Emissions

	VOC	CO
Baseline Emissions: Units 1 - 4 (tpy)[1]	80.60	675.80
PSD Avoidance Limit (tpy)	120.50	775.70
Project's Increase in Emissions (tpy)	39.90	99.90
Percent Increase Over Baseline	49.50%	14.78%

Even if Duke's estimates didn't show that the new gas plant has the unrestricted potential to emit more lead and CO_2e than the existing coal plant, and even if the PSD Avoidance Limits didn't allow the new gas plant to emit more VOCs and CO than the coal plant, the emission reductions from shutting down the coal units would still not be "creditable" because Duke's retirement plans are not "enforceable as a practical matter at and after the time that actual

[83] Application at A-1, Table A-1.
[84] *Id.*

construction on [the new gas plant] begins."[85] As described above, the Draft Permit includes no enforceable requirements whatsoever related to retirement of the coal-fired units—much less does it require all four units to be permanently shut down upon commencement of construction (of either CC1 or CC2).

Finally, Duke cannot show that the new gas plant's emissions will have the same significance for public health as the old coal units' emissions because the Application includes no baseline studies on local public health for the areas in the vicinity of the Roxboro property. Moreover, given the potential increases in emissions of CO, VOC, and lead, it would be unreasonable to assume that the new gas plant will have the same or less negative impacts on the health and welfare of the surrounding community. Using Duke's own baseline,[86] potential emissions values and the PSD Avoidance Limits:

- The new gas plant will have the potential to emit more than twice the amount of lead as the existing coal plant.[87] There is no PSD Avoidance Limit to restrict this increase in lead emissions. Lead exposure can damage kidney function, impact the oxygen carrying capacity of blood, and adversely affect the reproductive, developmental, immune, and nervous systems.[88] Lead exposure is also known to cause neurological effects in children, including behavioral problems and learning deficits.[89]

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[85] 40 CFR § 51.166(b)(3)(vi)(B) (2019).
[86] Duke's proposed baseline emission values for VOC and CO are artificially inflated due to the company's unjustified use of an extended lookback period for those pollutants. *See* II.A.2.b, *infra*. When using emissions data from the default five-year lookback period, the difference between potential emissions and actual baseline emissions from the existing coal plant is even higher: VOC emissions increase by 640.59 tons per year (805.67% higher) and CO emissions increase by 1,92353 tons per year (288.75% higher).
[87] *See* Application at A-1, Table A-1.
[88] *See Basic Information about Lead Air Pollution*, EPA, https://www.epa.gov/lead-air-pollution/basic-information-about-lead-air-pollution (last visited Nov. 21, 2024).
[89] *See id.*

- The new gas plant will have the potential to emit more than three times the amount of CO than the existing coal plant.[90] Even with the PSD Avoidance Limit, the new gas plant will be permitted to emit almost 50% more CO than the coal plant's baseline. CO exposure reduces the amount of oxygen in the blood stream and can cause chest pain.[91]
- The new gas plant will have the potential to emit more than eight times the amount of VOCs than the existing coal plant.[92] Even with the PSD Avoidance Limit, the new gas plant will be permitted to emit almost 15% more VOCs than the coal plant's baseline. VOC emissions contribute to the formation of smog (or ground-level ozone),[93] exposure to which can cause respiratory distress, inflammation of the airways, and chronic obstructive pulmonary disease.[94]

The health risks associated with these increased emissions—especially of lead—are particularly concerning given the new gas plant's proximity to Woodland Elementary School. In sum, the existing coal plant is not the same source as the new gas plant. Even if it is, construction of the new gas plant and eventual retirement of the coal plant are not part of the same project, and Duke cannot use Step 2 netting because the Application does not show that the anticipated emission decreases from retiring the coal-fired units at the Roxboro property will be either

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[90] *See* Application at A-1, Table A-1. Using baseline emissions data from the default five-year lookback period, as described in n.56, *supra*, the new gas plant will emit almost *four times* the amount of CO than the existing coal plant.
[91] *See Basic Information about Carbon Monoxide (CO) Outdoor Air Pollution*, EPA, https://www.epa.gov/co-pollution/basic-information-about-carbon-monoxide-co-outdoor-air-pollution (last visited Nov. 21, 2024).
[92] *See* Application at A-1, Table A-1, PSD. Using baseline emissions data from the default five-year look-back period, as described in II.A.2.b, *infra*, the new gas plant will emit *more than nine times* the amount of VOC than the existing coal plant.
[93] *See Technical Overview of Volatile Organic Compounds*, EPA, https://www.epa.gov/indoor-air-quality-iaq/technical-overview-volatile-organic-compounds (last visited Nov. 21, 2024).
[94] *See Learn About How Mobile Source Pollution Affects Your Health – Smog and Your Health*, EPA, https://www.epa.gov/mobile-source-pollution/learn-about-how-mobile-source-pollution-affects-your-health#smog (last visited Nov. 21, 2024).

contemporaneous or creditable. As a result, DAQ should require PSD review for the new gas plant as a new major source—or, alternatively, DAQ must not permit Duke to apply the decreases in emissions anticipated from retiring the old coal plant and instead require PSD review for the proposed gas plant as a major modification.

II. The Draft Permit Does Not Ensure Compliance with Either North Carolina's State Implementation Plan or the Clean Air Act.

Permits under the Clean Air Act must ensure that the permitted source fully complies with the applicable State Implementation Plan and all other federal requirements.[95] The permit must not only include enforceable emission limits and/or operational requirements to guarantee this[96] but must also ensure monitoring requirements sufficient to assure compliance with the emission limitations and annual allowable emissions limits that apply to the source.[97]

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[95] *See, e.g.*, 15A N.C. ADMIN. CODE 2Q.0314(a) ("All emissions limitations, controls, and other requirements imposed by a permit issued pursuant to this Section shall be at least as stringent as any other applicable requirement as defined pursuant to 15A N.C. ADMIN. CODE 2Q.0103."); ENVTL. PROT. AGENCY, EPA COMMENTS ON THE DRAFT NAAQS SIP/MINOR NSR PERMITTING GUIDANCE DOCUMENT 1 (Jul. 2, 2015), https://www.adeq.state.ar.us/air/planning/sip/pdfs/epa_comments_draft_naaqs_sip_guidance_2015_july_2_3.pdf#:~:text=The%20EPA%20agrees%20with%20ADEQ's%20statement%20in,to%20an%20exceedance%20of%20the%20NAAQS%20or (agreeing that state environmental agency was "required to ensure that the construction of new stationary sources or modification of existing stationary sources, including Minor NSR permitting actions, do not cause or contribute to an exceedance of the NAAQS or interfere with the maintenance of the NAAQS."). *See also* 40 C.F.R. § 51.166(r)(1) ("The plan shall include enforceable procedures to provide that approval to construct shall not relieve any owner or operator of the responsibility to comply fully with applicable provisions of the plan and any other requirements under local, State or Federal law."); 15A N.C. ADMIN. CODE 2D.0530(a) ("Wherever the language [of] the portions of 40 CFR 51.166 adopted in this Rule speaks of the 'plan,' the requirements described therein shall apply to the source to which they pertain, except as otherwise provided in this Rule.").

[96] *See* 15A N.C. ADMIN. CODE 2Q.0314(b) ("Emissions limitations, controls, and requirements contained in permits issued pursuant to this Section shall be permanent, quantifiable, and otherwise enforceable as a practical matter [. . .]").

[97] *See, e.g.*, EPA, OPTIONS FOR LIMITING THE POTENTIAL TO EMIT (PTE) OF A STATIONARY SOURCE UNDER SECTION 112 AND TITLE V OF THE CLEAN AIR ACT 6 (Jan. 25, 1994) (practical enforceability for a source-specific permit means that the permit's provisions must specify, among other requirements, "the method to determine compliance including appropriate monitoring, recordkeeping, and reporting"); EPA, OFFICE OF ENF'T AND COMPLIANCE MONITORING, LIMITING POTENTIAL TO EMIT IN NEW SOURCE PERMITTING 6 (June 13, 1989) (permits containing operational limits "should also have recordkeeping requirements that allow a permitting agency to verify a source's compliance with its limits"); Letter from Richard G. Rhoads, Director, EPA Control Programs Development Division, to Thomas W. Devine, Director, EPA Air and Hazardous Materials Division, Region IV, RE: The Use of Permit Conditions to Define Potential to Emit 2 (Aug. 22, 1980) ("Permits must specify proper record keeping, reporting requirements, and any other conditions deemed necessary to ensure compliance with the operating restrictions.").

The Draft Permit does not meet these requirements. The PSD Avoidance Limits are not only informed by inaccurate baselines and flawed data but are also insufficient for purposes of (even assuming they were correct) ensuring compliance with the Clean Air Act. Indeed, the Draft Permit contains no enforceable limits or monitoring requirements for any of the new units other than the gas turbines to ensure they do not contribute to an exceedance of the facility-wide PSD Avoidance Limits Duke calculated. The turbines' potential emissions are also derived from either unreliable or unverifiable data. Finally, the Draft Permit lacks any conditions to ensure compliance with EPA's new rules limiting greenhouse gas emissions from power plants.

Commenters note that all the numerical fallacies discussed below also cast doubt on the accuracy of Duke's netting analysis (*see supra* at I.B).

A. The PSD Avoidance Limits are flawed and incomplete.

Duke's request for PSD Avoidance Limits effectively acknowledges that it is unlawful for the company to evade PSD review by taking credit for future emission reductions associated with retirement of the coal plant despite the fact that those units will operate simultaneously with the new gas plant. Indeed, the Application explains that Duke proposed accepting PSD Avoidance Limits for purposes of "operational flexibility"[98]—in other words, to avoid PSD review while also avoiding any enforceable deadline to actually retire any of the coal-fired units, and to instead continue operating the coal plant long after the new gas plant comes online.

However, the PSD Avoidance Limits established in Condition 2.2 E.1.a are not sufficient to ensure that total facility-wide emissions do not ultimately result in a significant increase over the facility's baseline emissions.

[98] Application at 3-11 n.1, A-1 n.5.

1. The Draft Permit lacks enforceable operating limits or monitoring requirements to ensure compliance with PSD Avoidance Limits for Permit Tracking.

Duke's Draft Permit sets emissions limits for most of the regulated PSD pollutants but does not include adequate operational limits or monitoring requirements to ensure compliance with those limits. In Section E (Emission sources subject to PSD Avoidance) the Draft Permit simply states:

> In order to avoid applicability of 15A NCAC 02D.0530(g) for major stationary sources and major modifications, the Permittee shall limit emissions of NO_x, PM, PM10, PM2.5, SO_2, VOC, CO, and H_2SO_4 from the project consisting of the coal-fired boilers . . . combustion turbines . . . , auxiliary boiler . . . dewpoint heaters . . . , and emergency generators . . . such that the [PSD Avoidance] emission limits are not exceeded (following the initial startup of any turbine).[99]

The Draft Permit, however, only requires the new gas turbines to use Continuous Emissions Monitoring Systems ("CEMS") to monitor for NO_x and CO;[100] coal-fired Boiler units 1, 2, and 3 are required to use CEMS to monitor for PM, NO_x, and SO_2;[101] and coal-fired Boiler unit 4 is required to use CEMS to monitor for PM, SO_2, NO_x, and CO_2.[102] And notably, none of the required CEMS cover VOCs, one of the criteria pollutants for which net emissions are set to *increase* as a result of this Project.

In addition, although the limits set forth in Condition 2.2 E.1.a are relied upon to "avoid applicability" of PSD review for *all* of the new units, the Draft Permit specifically applies these limits only to the coal-fired boilers and new gas turbines.[103] Duke specifically requested this "[i]n

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[99] N.C. Dep't of Env't Quality, Div. of Air Quality, Draft Permit No. 01001T60 81 (Oct. 10, 2024) [hereinafter "Draft Permit"].
[100] *See id.* at 11, 42, 81–82.
[101] *Id.* at 13, 81–83.
[102] *Id.* at 17 (citing 40 C.F.R. § 60.45(a)), 81–83.
[103] *Id.* at 81 (applying the PSD avoidance limits specifically to "the coal-fired boilers (ID Nos. ES-Unit 1 through ES-Unit 4B), and combustion turbines (ID Nos. ES-Turbine1 through ES-Turbine4) combined").

order to simplify tracking against the limits."[104] Duke calculated these limits by subtracting its estimates for potential emissions from the other new units (the auxiliary boiler, emergency engines, dew point heaters, diesel tanks, and cooling towers) from the facility-wide PSD avoidance values.[105] However, Duke's estimates for potential emissions from these other new units are not reliable and likely underestimate actual future emissions. In the first instance, the Draft Permit does not have adequate monitoring requirements for these units;[106] as a result, there will be no way to track and confirm whether Duke's estimated PTE for this equipment is accurate. Second, although estimates for "potential" emissions must be based on "the *maximum* capacity of a stationary source to emit a pollutant under its physical and operational design,"[107] the Application reveals that Duke's calculations for several of the new units rely on assumptions that they will not operate at their maximum capacity year-round:

- Potential emissions from the new auxiliary boiler are "based on operation at maximum capacity *for 10% of the year* (*i.e.*, 876 hours)."[108]
- Potential emissions from the new diesel-fired emergency generator and emergency firewater pump engine are "based on *500 hours per year* of operation for each unit."[109]
- Potential emissions from the new diesel fuel storage tanks are "based on maximum calculated throughput, assuming *250 hours per year* of operation for each of the four new turbines."[110]

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[104] Application at A-1 n.5.
[105] *See id.*
[106] *See* Draft Permit at 51–54, 56–57, 60–61.
[107] 40 C.F.R. § 51.166(b)(4) (emphasis added)
[108] Application at 3-8 (emphasis added).
[109] *Id.* at 3-8 (emphasis added).
[110] *Id.* at 3-8 (emphasis added).

Worse, the Draft Permit fails to ensure compliance with many of these assumptions. For example, the Draft Permit characterizes the emergency firewater pump engine and the diesel storage tanks as insignificant activities and thus does not establish any enforceable permit conditions to limit their operation or emissions.[111] And although there is an operational limit for the new emergency generator of 100 hours per year for purposes of "maintenance checks and readiness testing,"[112] the Draft Permit specifically provides that "[t]here is no time limit on the use of emergency stationary ICE in emergency situations."[113] While it would not be appropriate to limit the hours of operation of this generator in emergency situations, the final permit could impose a PSD Avoidance Limit on the combined emissions from all of the new auxiliary units such that increased operation of the emergency generator could be offset by reduced operation of the other units as needed to prevent a significant increase in emissions.

As written, the Draft Permit cannot ensure compliance with the facility-wide PSD Avoidance Limits Duke calculated. First, DAQ must impose adequate monitoring requirements for the coal-fired boilers and the new gas turbines to ensure compliance with the Draft Permit's avoidance limits. The best way to ensure this compliance would be to require CEMS in the turbines and the coal-fired boilers for NO_x, PM, PM10, PM2.5, SO_2, VOC, CO, and H_2SO_4, along with ammonia (which will be used as a reagent for NO_x control). These CEMS should be required not only in the main stacks but also in the bypass stacks. While CEMS would provide the most reliable information for monitoring, Commenters note that other monitoring measures could potentially be used if DAQ and Duke demonstrate that such monitoring is sufficient to assure Duke's compliance with the PSD Avoidance Limits.

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[111] Draft Permit at 96.
[112] *Id.* at 61 (Condition 2.1 O.3.j.ii.(A)).
[113] *Id.* at 61 (Condition 2.1 O.3.j.i.).

In addition, DAQ must amend the Draft Permit to ensure that actual emissions from the other new units will not exceed their respective PTE values or otherwise contribute to an exceedance of the facility-wide PSD avoidance limits Duke calculated. DAQ could accomplish this by establishing: (1) enforceable *facility-wide* PSD avoidance limits; (2) enforceable PSD Avoidance Limits applicable to the combined emissions from the auxiliary boiler, emergency engines, dew point heaters, and diesel storage tanks; or (3) enforceable operational limits for these units as needed to limit their emissions to their respective PTE values. The Draft Permit must also include adequate monitoring, recordkeeping, and reporting requirements to ensure compliance with those limits.

2. In setting the PSD Avoidance Limits, Duke used (and DAQ accepted) an inaccurate baseline.

According to Duke, this Project would require PSD review but for the requested PSD Avoidance Limits.[114] But the use of improper baseline emissions numbers results in artificially inflated PSD Avoidance Limits; without using the correct baseline values for all of the regulated pollutants, the PSD Avoidance Limits cannot ensure the Project's emissions will remain below the applicable PSD SERs. As set forth below, to issue a permit that ensures compliance with North Carolina's State Implementation Plan and the Clean Air Act, DAQ must adjust the baseline actual emissions for several pollutants to reflect the amount that the coal units have actually been emitting, and then lower the PSD Avoidance Limits accordingly to prohibit emissions increases in excess of the relevant SERs.

[114] *See, e.g.*, Application at 2-4, 3-1.

a) Duke and DAQ relied on flawed data to determine the coal units' baseline emissions.

In the Application, Duke states that to calculate emission factors for purposes of estimating baseline emissions for which it does not have site-specific data, it relied on AP-42 factors, including Section 1.1, Bituminous and Subbituminous Coal Combustion,[115] along with emission factors from the Electric Power Research Institute ("EPRI").[116] Neither of these provide DAQ sufficient information to ensure that the terms of the permit ensure compliance with the Clean Air Act. In the first instance, EPA has cautioned against the use of AP-42, even when emission factors are better rated (*i.e.*, ratings of A or B) for single source potential to emit estimates.[117] With respect to the EPRI emission factors, the Application has not provided the underlying documentation. Specifically, the Application cites to the EPRI Report, Guidelines for Estimating Trace Substance Emissions from Fossil-Fuel-Fired Steam Electric Power Plants, 2014 Technical Report.[118] This emissions data, including how such data were derived from testing, are not publicly available. As such, their representativeness of Roxboro's coal units, for example, cannot be assessed—and could not have been assessed by DAQ. It is improper to rely on emission factors whose basis simply cannot be determined by the agency or the public.

Duke also relied on flawed data for the coal units' condensable PM baseline emissions. In the Application, Duke used stack test data from 2010 for its condensable emissions for both coal and oil firing.[119] These test data or reports, however, were not made available until late in the

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[115] *Id.* at 3-1.
[116] *Id.* at 3-1 through 3-2.
[117] *See generally* EPA, OFFICE OF ENF'T & COMPLIANCE ASSURANCE, ENFORCEMENT ALERT—EPA REMINDER ABOUT INAPPROPRIATE USE OF AP-42 EMISSION FACTORS (Nov. 2020), https://www.epa.gov/sites/default/files/2021-01/documents/ap42-enforcementalert.pdf.
[118] Application at 3-2.
[119] *See id.* at A-7, Table A-7.

comment period.[120] Moreover, their relevance to the current 2018–2022 baseline time periods Duke has used is unclear, given that the testing was completed in 2010.[121] Condensable PM emissions can be affected by many factors such as the presence of sulfur compounds in the fuel, organics, combustion conditions, and others. To presume that the condensable PM measured for a few hours in 2010 properly represent condensable PM for both coal units for all hours of operation is incorrect.

Similarly, Duke has relied on prior, unspecified stack test data to determine the fractions of PM that are PM10 and PM2.5. As with the condensable PM emissions, here again there is no reason to believe that a particular stack test (or even a few stack tests) can provide a reasonable basis for this fraction. The answer not only depends on the fuel, but also is substantially determined by how the particulate control device was operating during the stack test hours, rather than the day-in and day-out operational condition of the control device.

It is particularly important that the final permit require more accurate information from Duke on PM. In May, EPA lowered the annual NAAQS for PM2.5 from 12.0 $\mu g/m^3$ to 9.0 $\mu g/m^3$.[122] DAQ must ensure that the terms of the final permit do not authorize emissions that will cause or contribute to an exceedance of this lower standard.

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[120] *See* E-mail from Shawn Taylor, Public Information Officer, Division of Air Quality, to Munashe Magarira, Senior Attorney, Southern Environmental Law Center (Nov. 14, 2024, 9:05 AM EST) (confirming that the Duke Roxboro Coal Unit Tests are now available on Laserfiche) (attached as Attachment 4).

[121] *See* Application at A-8 through A-11, Tables A-7 through A-10.

[122] *See, e.g.*, *2024 PM2.5 Annual Standard*, N.C. DEP'T OF ENVTL. QUALITY, https://www.deq.nc.gov/about/divisions/air-quality/air-quality-planning/attainment/2024-pm25-annual-standard#:~:text=In%20May%202024%2C%20EPA%20tightened,of%20an%20independent%20scientific%20panel . (last visited Nov. 17, 2024).

b) The Draft Permit accepts, without support, Duke's arbitrary look-back periods for the coal units' baseline actual emissions.

As part of both its netting analysis and the PSD Avoidance Limits, Duke purports to calculate the difference between the baseline actual emissions from retiring the coal units and the potential to emit of the new gas plant. Even assuming Duke's netting analysis can stand (and it cannot), Duke must recalculate baseline actual emissions of NO_x, CO, VOC, and H_2SO_4 for coal-fired Units 1 through 4. Under 15A NCAC 2D.0530(b)(1)(A):

> For an existing emissions unit, baseline actual emissions means the average rate, in tons per year, at which the emissions unit actually emitted the pollutant during any consecutive 24-month period selected by the owner or operator within the five year period immediately preceding the date that a complete permit application is received by the Division for a permit required under this Rule. The Director shall allow a different time period, not to exceed 10 years immediately preceding the date that a complete permit application is received by the Division, if the owner or operator demonstrates that it is more representative of normal source operation."[123]

Duke claims that it used a look-back period beginning in 2018 "for some pollutants" because it doesn't consider Unit 4's operations during the default baseline period to have been representative of normal operations.[124] According to Duke, it was "required to derate Unit 4" in January 2020 due to supply chain issues that persisted during the COVID-19 pandemic, which "prevented the Facility from performing necessary repairs to equipment related to Unit 4."[125] DAQ approved the use of this longer look-back period with no further discussion in its review of the Application.[126] Because Duke has not adequately explained the look-back periods it uses for NO_x, CO, VOC, and H_2SO_4, approving the Draft Permit as-is would be arbitrary and capricious.

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[123] 15A N.C. ADMIN. CODE 2D.0530(b)(1)(A).
[124] Application at 3-5.
[125] *Id.* at 3-5.
[126] Application Review at 40.

First, Duke has offered no explanation for why the extended look-back period is more representative for certain pollutants but not others, if Unit 4's operations were in fact "abnormal" throughout the entire default five-year look-back period that the rule sets. Second, the look-back period Duke has proposed is likely not "more representative" of "normal" operations for Unit 4 because it immediately precedes the date on which Duke "was required to derate" that unit.[127] As Duke explains, there was a "steep decline in firing rate beginning approximately January 2020" because "supply chain issues" prevented the company from "performing necessary repairs" to that unit's equipment.[128] In other words, the extended look-back period Duke used reflects emissions from a period of time when Unit 4 *was in need of repair*—as a result, Unit 4 was *not* operating normally for at least some of that 24-month period. And because this period reflects emissions from abnormal operation of a unit that was still operating at full capacity (*i.e.*, before the derating), it likely inflates baseline emissions over what would be "more representative of normal source operation."[129]

Because Duke's Application fails to provide any explanation for why a period of malfunction could possibly be characterized as "more representative of normal source operation," DAQ should require the baseline emissions for NO_x, CO, VOC, and H_2SO_4 to be recalculated using data from the default five-year look-back period. Assuming Duke would select the 24-month period within this default look-back period that had the highest average emissions of these pollutants, the corrected baseline emissions—and the corresponding changes to the PSD Avoidance Limits—would be as follows:

Table 3: Avoidance Limits According to Look-Back Period

[127] Applications at 3-5.
[128] *Id.* at 3-5.
[129] 15A N.C. ADMIN. CODE 2D.0530(b)(1)(A).

	CO	**NO_x**	**H_2SO_4**	**VOC**
Application/Draft Permit (Extended Lookback)				
Baseline (tpy)	675.8	5,249.3	88.3	80.6
PSD SER (tpy)	100.0	40.0	7.0	40.0
Avoidance Limit (tpy)	**775.7**	**5,289.2**	**95.2**	**120.5**
Default (5-year Lookback)				
Baseline (tpy)	666.2	4,528.2	71.0	79.5
PSD SER (tpy)	100.0	40.0	7.0	40.0
Avoidance Limit (tpy)	**766.1**	**4,568.1**	**77.9**	**119.4**

In the alternative, the look-back period for these pollutants should extend even further back to ensure the baseline includes only those months in which Unit 4 was operating normally. However, Duke has not provided any supporting documentation to establish exactly when Unit 4's equipment started failing or when the company first identified the need for repairs. Without this information, it is impossible for Commenters to evaluate how much further back this analysis would need to go. Accordingly, DAQ should require Duke to provide a detailed explanation and supporting documentation regarding the timeline of Unit 4's failing equipment prior to January 2020. (That said, DAQ should also request data from 2023 and 2024 to determine whether post-repair operations would be "more representative," obviating the need for an extended look-back period in the first place—presuming that Unit 4 was eventually repaired in the years since COVID-19 impacted supply chains.)

B. The turbines' potential emissions estimates are likely inaccurate.

The turbines' emissions estimates are also poorly supported, and the Application lacks critical information without which the final permit cannot ensure compliance with the Clean Air Act as a result.

DAQ may not rely on any of Duke's emissions estimates for the gas turbines because Duke never specified a manufacturer in the Application, depriving DAQ of critical information. The Draft Permit claims that it does not specify the manufacturer or model of the gas turbines because Duke has not formally retained a vendor.[130] But this is inaccurate. Duke initiated a competitive procurement long before submitting its application in April 2024.[131] In his testimony before the N.C. Utilities Commission in March 2024, Mr. John Smith, Jr., the General Manager for New Gas Generation Development at Duke, stated that Duke received bids from three major turbine manufacturers during this process—General Electric Vernova, Siemens Energy, and Mitsubishi Powers Americas, Inc.[132] Mr. Smith also testified that the bid process had concluded, and that Duke was negotiating commercial terms with the one of these three companies.[133] The permit record, however, does not contain any further details as to which of these three companies will actually supply the turbines for the new gas plant at Roxboro.[134]

Air emissions estimates for the proposed gas plant will depend on the selected turbines because the different models do not have the same potential emissions for *any* pollutant. Moreover,

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[130] *See* Application Review at 10 ("At the time [Duke] prepared this application, the specific vendor and model of the turbines was not known.").
[131] *Id. See also* Smith Testimony at 13.
[132] *See* Smith Testimony at 13.
[133] *Id.*
[134] Duke also represented to the Utilities Commission that it would award the turbine generator contract in the third quarter of 2024. *See* Joint Application for a Certificate of Public Convenience and Necessity—Person County Energy Complex Combined-Cycle Combustion Turbine Addition Project, Ex. 4 at 2, N.C. Utilities Comm'n, Dkt. Nos. E-2, SUB 1318/EC-67, SUB 55 (Mar. 28, 2024) (attached as Attachment 5).

the gas turbines will emit highly toxic air contaminant ("TAC") emissions such as formaldehyde in substantial quantities at lower loads;[135] Duke cannot plausibly claim accurate representations about these emissions, including during bypass, without specifying a manufacturer and a model, and providing the supporting data. DAQ's approval of the turbines' emissions estimates without any specified turbine manufacturer is tantamount to providing Duke with a blank check.

The lack of manufacturer data is particularly concerning because, under the terms of the Draft Permit, the turbines' emissions will be virtually unverifiable. Other than just the few pollutants for which CEMS will be required[136] (*i.e.*, NO_x and CO[137]), the vast majority of the air pollutants (including but not limited to PM, PM_{10}, $PM_{2.5}$, SO_2, VOC, H_2SO_4) are not continuously monitored. The emission factors for some of the pollutants, such as PM and VOCs, will be verified *once* by stack testing[138]—which is typically only conducted at high loads—while other pollutants, such as SO_2 and H_2SO_4, have no such condition. (We note that these scarce requirements in the Draft Permit undermine Duke's claim that "the bypass stacks will be fully monitored just like the combined cycle stacks."[139])

Duke instead relies on emission factors of dubious quality. As with the coal-fired units, Duke has used EPA's AP-42 compilation of air pollution emissions factors, specifically Section 1.4 (Natural Gas Combustion) and Section 3.1 (Stationary Gas Turbines),[140] along with EPRI estimates,[141] for the turbines. These sources are unreliable (*see supra* at II.A.2.a). But there are

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[135] This is a concern because the oxidation catalyst that is included to reduce emissions of CO and unspecified VOCs (such as formaldehyde) will not be operational and effective below unknown minimum operating temperatures.
[136] The permit specifies that Duke must monitor emissions of PM and SO_2 from the coal-fired boilers using a CEMS but does not specify a similar requirement for the new gas units. *See* Draft Permit at 81–82.
[137] *See* Draft Permit at 81–82.
[138] *See id.* at 81 (Condition 2.2.E.1.b.ii).
[139] Application Review at 3.
[140] *See* Application at 3-1.
[141] *See id.* at 3-1.

other problems with Duke's emission factors. For example, Duke's Application provides the following rationale for its source of condensable PM emissions numbers:

> U.S. EPA provides a spreadsheet named "Emissions Factors for Particulate Matter from Natural Gas Combustion (xls)" on its 2014 National Emissions Inventory (NEI) documentation page. The reference section states that the "EPA believes that the current AP-42 factors for condensable emissions are too high based on limited data from a pilot-scale dilution sampling method that is similar to EPA's CTM 39." U.S. EPA's Roy Huntley developed corrected emissions factors from preliminary test data gathered by Ron Myers (U.S. EPA) who was the lead on the development of a condensable PM test method at the time. The spreadsheet was last updated in 2012 and provides adjusted particulate matter emissions factors for natural gas, process gas, and liquified petroleum gas (LPG) combustion in boilers, engines (including turbines), and heaters as listed. Rich Mason of U.S. EPA confirmed with U.S. EPA emissions factor experts that natural gas emission factors posted to the NEI/WebFIRE pages are valid replacements to the old AP-42 (and WebFIRE) emission factors.[142]

Duke does not explain why any of this should apply to the unspecified turbine models that it had ostensibly not yet selected. Before DAQ allows Duke to use the condensable PM emission factor per its rationale above, Duke must demonstrate that the emission factor was determined in a manner representative—for all loads—of whichever model of turbine it plans to use at Roxboro. Instead, it seems Duke has simply selected a low value of condensable PM in order to artificially lower the emissions of this pollutant from the CC gas units.

The Application also states that emissions factors for the turbines were derived from vendor data.[143] But a close look at the Application reveals that such data appear to be compilations by Duke's engineering contractor, Burns and McDonnell.[144] In the Application, Duke states as follows:

> Vendor-supplied emissions factors were used to calculate emissions from the new turbines for the following compounds: NO_x, CO, SO_2, volatile organic compounds (VOC), sulfuric acid (H_2SO_4), carbon dioxide (CO_2), methane (CH_4), nitrous oxide

[142] *Id.* at 3-2.
[143] *See id.* at 3-3.
[144] *See id.* at A-31 through A-41.

> (N_2O), and ammonia (NH_3). Ranges of emissions factors were provided based on the turbine vendor and the specific operating scenario. Ranges were also provided based on the removal efficiency of the control devices. For example, the NO_x emissions factors were based on an 85% to 95% SCR NO_x removal efficiency, and the CO emissions factors were based on an 84% to 90% removal efficiency. For conservatism, one set of emissions factors was selected for each fuel (natural gas and No. 2 fuel oil) by selecting the maximum factor for each compound across the different vendors and operating scenarios. Additionally, the H_2SO_4 factors provided by the turbine manufacturers assumed 100% conversion of sulfur in the fuel to H_2SO_4. This is an overly conservative and unrealistic assumption; therefore, the sulfur to H_2SO_4 conversion rate was set to 5% based on turbine manufacturer operating experience.[145]

An inspection of the Application materials shows, however, that none of the turbine vendors provide any assurances or guarantees for their supposed emissions levels under any operating conditions.

Commenters note that the Draft Permit does require an initial stack test to be performed "on one of the turbines" in order to "verify" the emission factors that will be used to monitor compliance with the PSD Avoidance Limits for total PM, PM_{10}, $PM_{2.5}$, and VOCs.[146] We commend DAQ for requiring this confirmational testing and for requiring a permit modification to be submitted if the testing reveals that actual emissions are higher than presumed by the emission factors.[147] However, DAQ should require this confirmation testing to be performed on *both* turbines instead of just one—and periodically over time, instead of just once. In addition, DAQ should impose a similar set of requirements to verify (and modify, as needed) the emission factors that will be used to monitor compliance with the PSD Avoidance Limits for SO_2 and H_2SO_4.[148]

Finally, the emissions ascribed to startup and shutdown are completely unsupported. Per the Application, the event emissions factors came from the maximum hourly emissions "between

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[145] *Id.* at 3-3.
[146] *See* Draft Permit at 81 (Condition 2.2 E.1.b.ii).
[147] *See id.* at 81 (Condition 2.2 E.1.b.iii(B)).
[148] *See id.* at 86, 89 (Condition 2.2 E.1.e.v., viii.).

the three turbine models."[149] However, the record lacks any supporting documents or tests by any of the turbine manufacturers for the turbines' hourly or per-event startup or shutdown emissions. Even though Duke may have used a "conservative" number of annual events in estimating annual startup or shutdown emissions, the lack of any support for the per-event emissions estimates makes Duke's figures unreliable.

C. The final permit must ensure compliance with rules adopted under Clean Air Act Rules Sections 111(b) and (d).

In May 2024, EPA finalized new rules limiting greenhouse gas emissions from fossil fuel-fired electric generating units.[150] Relevant to this permitting action, the final rule established New Source Performance Standards ("NSPS") for new fossil fuel-fired combustion turbines with a capacity of at least 250 MMBtu/hour and that commenced construction on or after May 23, 2023 ("Subpart TTTTa"), as well as emission guidelines for existing coal-fired steam electric generation units that were constructed before January 8, 2014 ("Subpart UUUUb") .[151] The final rule took effect on July 8, 2024.[152]

Under the new emission guidelines, EPA determined that the best system of emissions reduction ("BSER") for existing coal-fired steam generating units is to implement carbon capture and storage ("CCS") with 90% capture.[153] Furthermore, under the NSPS, new fossil fuel-fired base load combustion turbines must implement two phases of BSER: (1) "highly efficient generation (based on the emission rates that the best performing units are achieving)" and (2) "utilization of CCS with 90 percent capture."[154] As with the presumptive standard for existing coal-fired power

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[149] *See* Application at A-17, Table A-14.b.
[150] *See* 89 Fed. Reg. 39,798 (May 9, 2024).
[151] *See id.* at 39,801, 39,806, 39,842, 39,907
[152] *Id.* at 39,798.
[153] *Id.* at 39,801
[154] *Id.* at 39,802-03.

plants, the "compliance deadline" for new combustion turbines to implement CCS with 90% capture is January 1, 2032.[155]

Duke concedes that the new gas turbines will be subject to Subpart TTTTa,[156] which EPA finalized about two months after the Application was filed. Duke also states in the Application that, "[f]ollowing promulgation of the final rule, Duke will either amend this permit application or submit an additional permit application, as necessary, to address the final standards."[157] However, the Application Review unequivocally states that the Project "would not comply with the lower future CO_2 standard" that will go into effect in 2032 under Subpart TTTTa, and that "[i]f NSPS Subpart TTTTa continues to apply in its current form, [Duke] must modify the facility in the future in order to comply with NSPS Subpart TTTTa."[158] Commenters note that DAQ is responsible for issuing permits that ensure compliance with the applicable laws that are in effect *now*; it is arbitrary and capricious for DAQ to punt on this legal obligation based on speculation as to the laws that may or may not exist in the future. Before issuing a final permit, DAQ should require Duke to submit adequate information demonstrating that the proposed units will be capable of full compliance with the NSPS. At a bare minimum, the final permit must include an enforceable requirement for Duke to provide that information—and apply for a permit modification if needed—well ahead of the 2032 compliance deadline for the "lower future standard."

In addition, neither the Application nor the Draft Permit address compliance with the new emission guidelines for existing coal-fired steam generating units. While Commenters maintain that construction of the new gas turbines is not a "modification" of the existing coal-fired power

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[155] *Id.* at 39,803.
[156] Application at 4-8.
[157] *Id.* at 4-9.
[158] Application Review at 33.

plant, the Draft Permit treats it as such. If DAQ maintains that coal-fired Units 1–4 are indeed being modified by this permitting action, then the final permit must include enforceable conditions to ensure those units comply with the BSER and presumptive standard set forth in Subpart UUUUb. If nothing else, the final permit must establish an enforceable deadline for all of the existing coal-fired units to be fully retired by the compliance deadline of January 1, 2032.

III. The Draft Permit Does Not Adequately Address Hazardous Air Pollutants, Even Though Duke's Proposed New Gas Plant Would Unambiguously be a Major Source of These Dangerous Pollutants.

The proposed new gas plant would undisputedly constitute a major source of hazardous air pollutants ("HAPs").[159] As DAQ's Application Review itself acknowledges, however, the Application does not contain enough information to be considered complete. The Review notes:

> [B]efore operating in bypass mode (when the turbines will not exhaust through the oxidation catalyst), [Duke] must petition DAQ for acceptable operating parameters *before* conducting an emission test without the oxidation catalyst (see [40 C.F.R.] § 63.6120(e)). [Duke] did not include a such a petition in the application.[160]

DAQ correctly points out that this petition is required under the federal Clean Air Act regulations.[161]

The Application, moreover, must include more details about the new gas plant's HAP emissions than just the operating parameters. The Draft Permit correctly notes that Duke must

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[159] *See id.* at 34.
[160] *Id.* at 34 (emphasis in original).
[161] *See* 40 C.F.R. § 63.6120(e) ("If your stationary combustion turbine is not equipped with an oxidation catalyst, you must petition the Administrator for operating limitations that you will monitor to demonstrate compliance with the formaldehyde emission limitation . . . You must measure these operating parameters during the initial performance test and continuously monitor thereafter. Alternatively, you may petition the Administrator for approval of no additional operating limitations. If you submit a petition under this section, you must not conduct the initial performance test until after the petition has been approved or disapproved by the Administrator.").

comply with the applicable provisions of 40 C.F.R. 63 Subpart A;[162] these provisions include section 63.5(d)(2), which states:

> Each application for approval of construction must include, in addition to the information required in paragraph (d)(1)(ii) of this section, technical information describing the proposed nature, size, design, operating design capacity, and method of operation of the source, including an identification of each type of emission point for each type of hazardous air pollutant that is emitted (or could reasonably be anticipated to be emitted) and a description of the planned air pollution control system (equipment or method) for each emission point. The description of the equipment to be used for the control of emissions must include each control device for each hazardous air pollutant and the estimated control efficiency (percent) for each control device. The description of the method to be used for the control of emissions must include an estimated control efficiency (percent) for that method. Such technical information must include calculations of emission estimates in sufficient detail to permit assessment of the validity of the calculations.[163]

The new gas plant will emit an extremely high quantity of HAPs—the turbines alone will emit, in some operating scenarios, more than double the Clean Air Act's threshold for a new major source, as shown in the table below.[164] But the appendices to the Application do not include descriptions of control devices for each HAP emitted or *any* control efficiency estimates for the turbines. The turbines' estimated emissions during startup do not include HAPs at all.[165] And the Draft Permit's operating limitations (for applying maximum achievable control technology, "MACT") only discuss formaldehyde.[166]

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[162] Draft Permit at 53 ("The Permittee shall comply with the requirements of 40 CFR 63 Subpart A General Provisions according to the applicability of Subpart A to such sources as identified in Table 10 to 40 CFR Part 63, Subpart DDDDD. [40 CFR 63.7565]").
[163] 40 C.F.R. § 63.5(d)(2).
[164] Numbers and operating scenarios are taken from Table A-13.a Summary of Potential Annual Pollutant Emissions Rates for Four New Natural Gas/No. 2 Fuel Oil-Fired Combined Cycle Turbines, Continuous Operation, Application at A-14. EPA has listed all of the organic compounds in this table as HAPs. *See Initial List of Hazardous Air Pollutants with Modifications,* EPA, https://www.epa.gov/haps/initial-list-hazardous-air-pollutants-modifications#mods (last visited Nov. 12, 2024); *see also* 40 C.F.R. pt. 63, Table 1 to subpart DD of Part 63—List of Hazardous Air Pollutants (HAP) for Subpart DD (64 Fed. Reg. 38,981 (Jul. 20, 1999)). I have omitted Antimony in this table because most of the emissions rates in Table A-13.a in the Application are blank.
[165] Application at A-18, A-35 through A-37.
[166] Draft Permit at 46.

Table 4: Potential Annual HAP Emissions from Four New Gas Turbines (tons per year)

	Natural Gas	Fuel Oil and NG	8,760 hours on NG	Max
Acetaldehyde	3.55	3.55	3.65	3.65
Acrolein	0.568	0.568	0.585	0.585
Arsenic	0.017	0.04	0.018	0.04
Benzene	1.07	1.18	1.10	1.18
Beryllium	0.00104	0.00168	0.00107	0.00168
Butadiene, 1,3-	0.038	0.071	0.039	0.071
Cadmium	0.096	0.106	0.099	0.106
Chromium (Total)	0.122	0.144	0.125	0.144
Cobalt	0.00731	0.011	0.00752	0.011
Ethylbenzene	2.84	2.84	2.92	2.92
Formaldehyde	19.40	20.00	20.00	20.00
Lead	0.044	0.072	0.045	0.072
Manganese	0.033	1.65	0.034	1.65
Mercury	0.023	0.025	0.023	0.025
Nickel	0.183	0.192	0.188	0.192
Propylene Oxide	2.57	2.57	2.65	2.65
Selenium	0.00209	0.053	0.00215	0.053
Toluene	11.50	11.50	11.90	11.90
Xylenes	5.68	5.68	5.85	5.85

TOTAL	**47.74444**	**50.25368**	**49.23674**	**51.10068**

IV. The Draft Permit Does Not Address Environmental Justice, Even Though Duke Provided Relevant Information in Its Application.

While DAQ asserts that it is not required to assess environmental justice,[167] North Carolina's General Assembly has clearly stated that air pollution control standards are meant to (among other purposes) protect human health.[168] In this respect, even though Duke may not have been legally required to provide information on environmental justice, DAQ erred in choosing to ignore the information already in the record when it completed its Application Review.

Even a cursory review of the information Duke provided should raise serious environmental justice concerns. For example, the EJScreen report Duke includes for a 5-mile radius around the proposed site for the new gas plant shows that the surrounding population is in the 72nd percentile nationally for heart disease; the 67th percentile for cancer; and the 52nd percentile for air toxics cancer risk.[169] (And in fact, the proposed gas plant site is located right across the street from an elementary school.[170]) This alone suggests Duke's conclusion that there "are no overburdened/underserved communities close enough to be disproportionately impacted by the Project"[171] is inaccurate. But even though it highlights relevant environmental justice concerns,

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[167] Application Review at 4, 46 ("It is DAQ's position that [Duke] was not required by rule to include this [environmental justice assessment] information.").
[168] N.C. Gen. Stat. § 143-211(c) (2015) ("It is the intent of the General Assembly, through the duties and powers defined herein, to confer such authority upon the Department of Environmental Quality as shall be necessary to administer a complete program of water and air conservation, pollution abatement and control . . . Standards of water and air purity shall be designed to *protect human health* . . ." (emphasis added)).
[169] *See* Application, App. F—EJScreen Community Report at 3–4.
[170] *See* GOOGLE MAPS, http://maps.google.com (measuring distance between Woodland Elementary School, 7381 Semora Road, Semora, NC 27343 and "Roxboro (Hyco) Plant Main Gate," 1700 Dunnaway Road, Semora, NC 272343, for a total distance of 1.27 miles). The Application Review gives the 1700 Dunnaway Road address for the plant, *see* Application Review at 1, but Commenters note that the actual location of the gas turbines could be closer to the school.
[171] Application at 2-14.

the Application gives a flawed assessment of toxic air pollutants ("TAPs"),[172] which include known human carcinogens like formaldehyde—the emissions of which will actually *increase* with gas combustion as compared to coal. And as discussed above, Duke has used poor-quality or unsupported emission factors to estimate emissions in general, including emissions of TAPs.

Even aside from the flawed use of emission factors, given the lack of control (*i.e.*, oxidation catalysts) at low loads and temperatures, the emissions of TAPs will likely be far greater than what the Application currently assumes. And yet Duke provides no characterization of these emissions from the gas units across the entire load range of how these units will operate. In fact, Duke's analysis (which DAQ appears to unquestioningly accept) exacerbates the issue by "optimizing" TAP emissions levels—*i.e.*, allowing emissions rates up to 98% of North Carolina's Acceptable Ambient Levels ("AALs") for each TAP.[173] Benzene, for example, is estimated and modeled to be at a level of 1.71% of its AAL—but DAQ is allowing Duke to emit 57.4 times more than that because, even at that excessive quantity, the emissions' impact would be within 98% of the AAL.[174] The Draft Permit, moreover, requires no monitoring for any of the state-specific TAPs. DAQ's reliance on Duke's flawed assessment of TAPs will undoubtedly result in harm to the communities who live near the new gas plant—but neither Duke nor DAQ have acknowledged this, let alone examined the problem.

V. The Draft Permit Exacerbates the Deficiencies in North Carolina's Pending State Implementation Plan Submission for the Regional Haze Program.

As explained above, the Draft Permit does not include any requirements related to *when* Duke must retire the existing coal plant. If DAQ were to issue a final permit without establishing

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[172] Toxic air pollutant control programs are designed and administered by states. TAPs may also be HAPs (which are regulated by the Clean Air Act), and vice versa.
[173] *See* Application at 5-9; D-135, Table D-55.
[174] *See id.* at D-135, Table D-55.

an enforceable deadline for Duke Energy to retire the existing coal plant—or at least impose lower emission limits for haze-causing pollutants—that action would severely undermine the representations made by the State to the federal government in North Carolina's State Implementation Plan submission for the Second Implementation Period of the Regional Haze Program, which is currently pending before EPA.[175]

Emissions from the Roxboro coal plant have significant visibility impacts on local Class 1 areas. In particular, the Roxboro facility is already one of the state's top ten contributors to sulfate impacts at the Swanquarter National Wildlife Refuge and the James River Face Wilderness.[176] The National Park Service's comments on North Carolina's draft plan submission noted that the Roxboro facility also impacts visibility at the Great Smoky Mountains National Park.[177]

Despite this clear connection between emissions from the existing coal plant and visibility impacts in multiple Class 1 areas, the State failed to perform a "four-factor analysis" for the Roxboro facility.[178] The State relied in part on existing and expected measures as a basis to exclude the facility from this required analysis.[179] These measures specifically included Duke Energy's "projected" retirement of "Units 3 and 4 . . . in 2028" and "Units 1 and 2 . . . in 2029."[180] However, EPA has clearly explained that for a state to rely upon existing or expected measures to make the required demonstration of achieving reasonable progress without performing a four-factor analysis, those measures must be legally enforceable and must be "adopted into the regulatory

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[175] *See* Air Plan Approval; North Carolina; Second Period Regional Haze Plan (Proposed Rule), 89 Fed. Reg. 67,341 (Aug. 20, 2024).
[176] *Id.* at 67,359; *see also* N.C. DEP'T OF ENVT'L QUALITY, DIV. OF AIR QUALITY, FINAL REGIONAL HAZE STATE IMPLEMENTATION PLAN FOR NORTH CAROLINA CLASS I AREAS (2019–2028 PLANNING PERIOD) (Apr. 4, 2022) ["Regional Haze SIP"] at 220 (attached as Attachment 6).
[177] Regional Haze SIP at 339.
[178] *See id.* at 254. Notably, the state's exclusion of the Roxboro facility from this analysis contravened a specific recommendation by the National Park Service. *See id.* at 339.
[179] *See id.* at 254, 261, 339–40.
[180] *Id.* at 261.

portion of the [State Implementation Plan]."[181] Unless DAQ establishes an enforceable deadline for full retirement of all of the coal-fired units through this permit, and supplements its plan submission[182] to formally incorporate that retirement schedule, the State's Regional Haze plan will be legally deficient. If EPA ultimately approves North Carolina's plan, that approval may be appealed by interested parties.

Similarly, North Carolina's Regional Haze submission relies on projected 2028 emissions for NO_x and SO_2 as a basis to exclude the Roxboro facility from the required four-factor analysis.[183] In particular, the State cites projections that NO_x and SO_2 emissions from the facility will decrease to 1,532 tons per year and 2,258 tons per year, respectively, by the end of the Second Implementation Period.[184] However, the Draft Permit proposes to authorize emissions of NO_x and SO_2 far above those levels:

Table 5: Roxboro Emissions' Percent Increase Over Regional Haze SIP

Source	**NO_x**	**SO_2**
Regional Haze Projections (tpy)[185]	1,532.0	2,258.0
Draft Permit Limits (tpy)[186]	5,247.5	3,973.8

[181] U.S. ENVT'L PROTECTION AGENCY, CLARIFICATIONS REGARDING REGIONAL HAZE STATE IMPLEMENTATION PLANS FOR THE SECOND IMPLEMENTATION PERIOD 8–10 (July 8, 2021).
[182] In August 2024, EPA proposed to "conditionally approve in part" North Carolina's Regional Haze SIP submission. *See* 89 Fed. Reg. at 67,341. EPA explained that the basis for its proposed approval being "conditional" was "due to concerns with the legal and practicable enforceability of certain permit conditions identified in the Haze Plan for incorporation into the SIP." *Id.* at 67,342, 67,368. If EPA's proposed conditional approval is finalized, North Carolina will have one year from EPA's final action to submit a SIP revision that "adequately addresses" the deficiencies in its original submission. *Id.* at 67,342.
[183] *See* Regional Haze SIP at 256, 258, 339–40
[184] *Id.* at 256, 258.
[185] *Id.*
[186] Draft Permit at 81. Notably, the draft permit only applies these PSD avoidance limits to a subset of emission units at the facility. *See id.* These limits specifically do not restrict NO_x or SO_2 emissions from "the non-turbine sources." Application Review at 42. If Duke Energy's estimates for potential emissions from the new auxiliary boiler, dewpoint heaters, and emergency generators are accurate (*i.e.*, not underestimating maximum potential emissions), facility-wide NO_x emissions may increase to a total of 5,289.2 tons per year without violating the conditions of the draft permit. *See id.* at 41–42, Table 6. This represents a 245.25% increase over the NO_x emission projections relied upon in the state's Regional Haze SIP submission.

Percent Increase Over RH SIP	242.53%	75.99%

Based on the PSD Avoidance Limits included in the Draft Permit, it is unreasonable for the State to continue to rely on its previous 2028 emission projections for purposes of avoiding a four-factor analysis for the Roxboro facility. Accordingly, DAQ should establish through the final permit enforceable facility-wide emission limits of 1,532 tons per year of NO_x and 2,258 tons per year of SO_2, effective in 2028, and supplement the State's pending Regional Haze plan to formally incorporate those emission limits.

VI. The Public Notice Issued for the Draft Permit Was Deficient and Misleading.

North Carolina's State Implementation Plan requires DAQ to provide public notice of any draft permit for a "source that may be designated by the Director based on significant public interest relevant to air quality."[187] This public notice is required to "identify" specific information related to the draft permit, including "the activity or activities involved in the permit action" and "any emissions change involved in any permit modification."[188] Written comments must then be accepted for "at least 30 days" after the date of the notice.[189]

Due to significant public interest in the Roxboro facility and its impacts on local and regional air quality, DAQ provided public notice of the Draft Permit on October 10, 2024.[190] However, the public notice did not comply with the requirements of North Carolina's State Implementation Plan. First, the notice failed to provide any information regarding the "emissions change involved" in the Draft Permit modification.[191] Second, the notice failed to fully and

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[187] 15A N.C. ADMIN. CODE 2Q.0306(a)(1).
[188] *Id.* at 2Q.0307(c)(5)–(6).
[189] *Id.* at 2Q.0307(d).
[190] Mark J. Cuilla, *NOTICE FOR PUBLIC HEARING; PRELIMINARY DETERMINATION REGARDING APPROVAL OF AN AIR PERMIT APPLICATION FOR Duke Energy Progress, LLC – Roxboro Steam Electric Plant* (Oct. 10, 2024).
[191] 15A N.C. ADMIN. CODE 2Q.0307(c)(6).

accurately identify the "activities involved in the permit action."[192] Indeed, the entirety of the notice's description of these activities was as follows: "Duke Energy Progress, LLC – Roxboro Steam Electric Plant has applied . . . for a permit modification to retire existing coal-fired boilers and replace them with new natural gas-fired turbines."[193]

The public notice's description of the "activities involved in the permit action" was incomplete because it failed to "identify" the new auxiliary boiler, dewpoint heaters, and emergency engines for which construction would be authorized, in addition to the natural gas-fired turbines. Worse, the notice's description was misleading because it expressly characterizes the Application as having requested "a permit modification to retire existing coal-fired boilers." Although the permit Application references Duke Energy's tentative plan for the "eventual" retirement of the existing coal plant,[194] it does not request to memorialize those retirement plans through permit conditions. Similarly, the Draft Permit for which the notice was issued contains no requirements whatsoever related to retirement of the existing coal plant. Instead, as described above, the permit Application requests—and the Draft Permit includes—facility-wide emission limits that are specifically designed to enable the existing coal plant to continue operating indefinitely and still allow Duke to evade more stringent permitting requirements that would otherwise apply to construction of the new gas plant.

Taken together with the lack of information provided in the notice regarding the change in emissions and the failure to identify all of the new units to be constructed, the inaccurate description regarding retirement of the existing coal plant was a substantial and material

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[192] *Id.* at 2Q.0307(c)(5).
[193] Mark J. Cuilla, *NOTICE FOR PUBLIC HEARING; PRELIMINARY DETERMINATION REGARDING APPROVAL OF AN AIR PERMIT APPLICATION FOR Duke Energy Progress, LLC – Roxboro Steam Electric Plant* (Oct. 10, 2024).
[194] *See, e.g.*, Application at 2-4, 3-9, 4-11, 5-9, 6-2, 6-9.

misrepresentation of the permit action on which DAQ solicited public comments. Members of the public likely relied upon this serious deficiency in the public notice to conclude that the Draft Permit was not worth reviewing and/or commenting on. Accordingly, Commenters respectfully request that DAQ publish an updated public notice that addresses these deficiencies and accept comments for an additional 30 days, in order to ensure the public has a meaningful opportunity to review and provide comment on the true substance of the Draft Permit.

CONCLUSION

For the foregoing reasons, we respectfully request that DAQ either deny the permit or, alternatively, obtain the necessary information from Duke and include sufficient requirements in the final permit to ensure compliance with the Clean Air Act. Contrary to Duke's contention, the proposed new gas plant is a brand-new source with emissions that far exceed the PSD applicability threshold. Thus, construction of the new gas plant cannot reasonably be permitted as a minor modification to the existing coal plant. Furthermore, even if it were lawful for DAQ to permit the new gas plant as a modification, Duke has not provided sufficient detail about the data, guarantees, and assumptions underlying its emission calculations to enable DAQ to verify either the netting analysis in the Application or determine whether the PSD Avoidance Limits actually ensure compliance with the Clean Air Act. DAQ, in turn, has not included sufficient monitoring in the Draft Permit to ensure that Duke complies with the PSD Avoidance Limits. Additionally, the Draft Permit does not adequately address HAPs or the serious environmental justice concerns Duke's Application raises and undermines North Carolina's pending State Implementation Plan submission for regional haze. Finally, DAQ's public notice for the Draft Permit was deficient.

Attachments List

1. Direct Testimony of Robert Smith, Jr.
2. New Source Review Workshop Manual, Draft, Oct. 1990
3. Letter from Barbara A. Finazzo, U.S. EPA Reg. 2, to Kathleen Antoine, HOVENSA
4. E-mail from S. Taylor, PIO, NCDAQ, to M. Magarira, SELC
5. Joint Application for CPCN, Person County Energy Complex
6. North Carolina Second Regional Haze Plan

Respectfully submitted,

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