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December 14, 2020

The Honorable Andrew Wheeler
Administrator
U.S. Environmental Protection Agency
Mail Code 1101A
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460
(via email: wheeler.andrew@epa.gov)

RE: Proposed Rule: Revised Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS; Docket ID No. EPA-HQ-OAR-2020-0272.

The following comments are provided in response to the proposed rule, "Revised Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS," 85 Fed. Reg. 68964 (October 20, 2020) of behalf of the Midwest Ozone Group ("MOG").

MOG is an affiliation of companies and associations that draws upon its collective resources to seek solutions to the development of legally and technically sound air quality programs. MOG's primary efforts are to work with policy makers in evaluating air quality policies by encouraging the use of sound science. MOG has been actively engaged in a variety of issues and initiatives related to the development and implementation of air quality policy, including the development of transport rules such as the CSAPR Update, NAAQS standards, nonattainment designations, petitions under Sections 126, 176A and 184(c) of the Clean Air Act ("Act"), NAAQS implementation guidance, the development of Good Neighbor state implementation plans (SIPs) and related regional haze and climate change issues. MOG Members and Participants own and operate numerous stationary sources that are or could be affected by air quality requirements including transport rule such as the one being proposed. MOG seeks the development of technically and legally sound air pollution rules and actions that may impact on their facilities, their employees, their contractors, and the consumers of their products.

The comments which are offered by MOG with respect to this proposed have been significantly limited not only by the formal 45-day comment period that accompanied the proposed rule, but also by the fact that EPA did not make available on a timely basis the technical data to the rule that was critical to an independent review of EPA's analyses and to the development of these comments. On November 13, 2020, two weeks after the Federal Register notice was published, MOG's technical consultant, Alpine Geophysics, received some of the electronic data of the modeling platform used by EPA. Upon review and assessment, it was determined that the information made available did not include certain of the requested input files and associated run scripts, nor the complete set of input/output files for the attainment test tool used to estimate future year design values all of which is critical to assessing the proposal.

MOG's request to extend the comment period to allow time to analyze the proposal was denied by EPA on December 4, 2020 citing the court-ordered deadline of March 15, 2021. MOG objects to the assertion by EPA that the Court order provides it with a basis for advancing a proposed rule that does not provide an adequate opportunity for public input. This is particularly significant given the inadequacies in the development of this proposal that are cited in the attached comments.

In additional to its critique of the proposed rule as set forth in these comments, MOG again requests EPA to extend the public comment period to allow a full assessment of this proposal to be completed.

Very truly yours,

/s/ David M. Flannery

David M. Flannery
Legal Counsel
Midwest Ozone Group

cc: Submitted to Docket ID No. EPA-HQ-OAR-2020-0272

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MIDWEST OZONE GROUP COMMENTS ON PROPOSED REVISED CROSS STATE AIR POLLUTION RULE UPDATE FOR THE 2008 OZONE NAAQS

Docket ID No. EPA-HQ-OAR-2020-0272

(85 Federal Register 68964, October 30, 2020)

DECEMBER 14, 2020

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EXHIBITS

Exhibit A:

"Good Neighbor" Modeling Technical Support Document for 8-Hour Ozone State Implementation Plans Using MOG's 4kei Modeling Platform Final Technical Support Document Prepared by: Alpine Geophysics, LLC, March 2019 Revised: June 2019; http://midwestozonegroup.com/files/Final_TSD_-_Ozone_4kei_Modeling_Supporting_GN_SIP_Obligations.pdf

Exhibit B:

"Technical Comments on the Environmental Protection Agency (EPA) Revised Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS" by J. Edward Cichanowicz (Consultant), Michael C. Hein (Hein Analytics, LLC) and James Marchetti (Consultant), dated December 13, 2020; http://midwestozonegroup.com/files/Technical-Comments-on-the-Environmental-Protection-Agency-Revised-Cross-State-Air-Pollution-Rule-Update-for-the-2008-Ozone-NAAQS-by-Cichanowicz-Hein-and-Marchetti-Dec-13-2020.pdf

Exhibit C

"Capital Cost and Cost-Effectiveness of Electric Utility Coal-Fired Power Plant Emissions Control Technologies: 2017 Update" by Utility Air Regulatory Group, December 2017; http://midwestozonegroup.com/files/UARG_Control_Technology_Cost_Dec_2017.pdf

Exhibit D

Analysis of Ozone Trends in the East in Relation to Interstate Transport Norm Possiel, EPA/OAQPS, May 14, 2018; http://midwestozonegroup.com/files/2018-05-14_EPA_OAQPS_-_Analysis_of_O3_Trends_in_the_East_in_Relation_to_Interstate_Transport.pdf

Exhibit E:

Stationary and Area Sources Committee; OTC / MANE-VU Joint Committees' Meeting September 21, 2018; http://www.midwestozonegroup.com/files/MOG_OTC_SAS_Public_09212018.pdf

Exhibit F:

Midwest Ozone Group Comments Regarding Cleaner Truck Initiative; Advance Notice of Proposed Rulemaking; Docket ID No. EPA-HQ-OAR-2019-0055, February 20, 2020; http://midwestozonegroup.com/files/Midwest_Ozone_Group_Comments_on_CTI_2.20.20.pdf

Exhibit G

Midwest Ozone Group Supplemental Comments on Advanced Notice of Proposed Rulemaking Related to the Cleaner Truck Initiative; Docket ID No. EPA-HQ-OAR-2019-055, July 6, 2020;
http://midwestozonegroup.com/files/MOG_CTI_Supplemental_Comments.pdf

Exhibit H

Relative Impact of State and Source Category NOx Emissions on Downwind Monitors Identified Using the 2017 Cross State Air Pollution Rule Modeling Platform, prepared by Alpine Geophysics January 2016;
http://www.midwestozonegroup.com/files/RelativeImpactofStateandSourceCategoryNOxEmissionsonDownwindMonitorsIdentifiedUsingthe2017CrossStateAirPollutionRuleModelingPlatform.pdf

Exhibit I

4kei OSAT Modeling Results - Preliminary Report – prepared by Alpine Geophysics March 2019;
http://www.midwestozonegroup.com/files/Source_Apportionment_Scenario_Modeling_Results_of_MOG_4kei_Modeling_Platform.pdf

EXECUTIVE SUMMARY

The Midwest Ozone Group presents several key issues for consideration by EPA as it works on the factual and legal merit of the proposed Revised CSAPR Update rule. The proposed CSAPR Update rule offered for comment arrives with a backdrop of improving ozone air quality trends that show no indication of changing course. Measured emission reductions and monitored improvements in air quality in the eastern U.S. are closely aligned. Additionally, modeling projections of existing program elements independent of a CSAPR program demonstrate NOx emissions will continue to improve.

EPA's search for problem downwind monitors fails.

In its effort to identify air quality monitors that demonstrate a significant downwind impact related to the 2008 ozone NAAQS and therefore assert the facts needed to justify its proposal, EPA cites three Connecticut monitors and one Texas monitor. EPA's modeling, or more particularly lack of modeling, creates unreasonable gaps in reliable information needed to identify problem monitors.

- **There is much uncertainty about EPA's model performance along the shoreline of Connecticut.** The "no water" 12km modeling used by EPA, rather than 4km modeling, raises a question of agency judgement relative to these land and water interface locations present indicia of nonattainment. EPA's solicitation for comment highlights the known shortfall of 12km for these Connecticut monitors. MOG recommends the agency follow its own guidance for land-water interface and refine its modeling to a 4 km grid size. Such refined modeling would likely show attainment for the Connecticut monitors at issue and must be conducted by EPA to clarify the known uncertainty relative to the legal conclusion that these monitors serve as a basis for an ozone transport rule. Alpine Geophysics generated 4km modeling results and found where complex meteorology (land-water interface) is prevalent for the Connecticut monitors, future year design values were modeled at an average of 2.1 ppb lower.

- **EPA's shortcut linear extrapolation for ozone air quality does not make- up for EPA's failure to conduct air quality modeling of 2021.** EPA failed to conduct air quality modeling of 2021 ambient ozone concentrations and instead used a linear interpolation (a short cut) of the 2016 base year and 2023 projection year modeling platforms. EPA's estimate wrongly presumes ozone air quality chemistry and air emissions (NOx and VOCs) from year to year and source to source are uniform, which ignores known and unique qualities for states, sources, and local air quality. EPA's linear interpolation for 2021 when compared against EPA's own IPM projections for EGU emissions in 2021 illustrates EPA has over-estimated projected emissions of EGUs in 2021 by 33,750 tons NOx in the ozone season, an amount that would influence significant contribution to ozone nonattainment.

- **EPA's incomplete model inputs such as missed power plant retirements undermine the basis for the proposed rule.** EPA has not included in its projections past unit retirements or announced future retirements and therefore the estimated air quality concentrations and associated significant contribution calculations for all upwind states is factually incorrect. These details have an essential role in model inputs and therefore results.

- **EPA's assessment of problem monitors failed to recognize the impact of demonstrated "Exceptional Events."** EPA's analysis failed to remove critical air quality data impacted by "exceptional events" consistent with the Clean Air Act Section 319(b)(2)(B). The targeted nonattainment monitors in Connecticut have had a history of significant change in ozone design values due to exceptional events as was the case for the wildfire event during the months of May and July 2016. All relevant exceptional events should have been examined as a matter of law and fact by EPA, prior to determining nonattainment status of these relevant monitors.

- **EPA's analysis overlooks the fact that air quality nonattainment is significantly influenced by international emissions.** The impact of international emissions when identifying nonattainment at Step 1 should have been considered by EPA consistent with its past assessments. EPA's own analysis using OSAT/APCA demonstrates agency knowledge about international emissions measured at the Connecticut and Texas monitors that are the target of this proposal. It is not reasonable that the agency would fail to take into consideration these values when proposing the CSAPR Update. For example, at each Connecticut nonattainment monitor, the incremental contribution from the Canadian and Mexican emission category alone is enough to demonstrate 2021 average design values at or below the 75.9 ppb nonattainment threshold necessary to meet the 2008 ozone NAAQS.

- **EPA's proposal fails to consider existing regulatory program and in doing so over-states air quality concerns and contributions.** EPA failed to account for on-the-books emission reduction programs (some of which are in process of implementation) that are of sufficient magnitude to have a material effect on the factual and legal conclusions EPA is required to make. There are significant regulatory program developments in the New York – New Jersey – Connecticut nonattainment area that must be assessed in EPA's Step 1 analysis to properly determine whether there will be nonattainment or maintenance areas in 2021 with respect to the 2008 ozone NAAQS. MOG has listed those Ozone Transport Commission model rules adopted by New York, New Jersey, Connecticut, and Maryland as well as other state and federal programs that are or will reduce relevant emissions. An assessment of the model rules and other programs these states have on the books or on the way is essential to understanding the nonattainment conditions for ozone, but EPA arbitrarily failed to do that.

- **EPA fails the CAA tests of what is nonattainment and what is maintenance**. EPA has not properly identified maintenance areas in Connecticut and Texas. EPA's proposal inappropriately applies the nonattainment area significance test to maintenance areas and provides the same weight to the development of controls programs to address maintenance areas as it does nonattainment areas. MOG objects to this proposal both because maintenance areas should not be subject to the same "significance" test as applies to nonattainment areas and because maintenance areas do not require the same emission reduction response as nonattainment areas. While EPA states that it is "not reopening the definition of nonattainment and maintenance receptors promulgated in the CSAPR Update" (85 Fed Reg 68979), that comment ignores the fact that EPA, subsequent to issuance of the CSAPR Update, released guidance on a more flexible approach to making a determination about maintenance monitors. EPA's departure from its own guidance raises the *Chevron* question about whether an agency can articulate "a rational connection between the facts found and the choice made."

- **EPA's perception of significance fails to account for EPA's own guidance.** EPA's decision not to consider significance levels of 1 ppb and 2 ppb is inconsistent with its own guidance and with its own work in assessing significance when in 2018 EPA compared two additional ozone contribution thresholds. Given the uncertainties about the reasonableness of the predictions of EPA's modeling, MOG strongly urges that the significance level established in CSAPR and in this proposal be reconsidered and be increased to take account of these modeling limitations. In addition, setting a higher significance level is a useful approach for assurance that there is no unlawful over-control of emissions from upwind states. For example, EPA's use of a one-percent-of-NAAQS threshold ignores the limits of the capability of the agency's air quality modeling techniques – and of ambient monitoring – to meaningfully detect and measure ambient-air contributions at the extremely low levels represented by one percent of current or possible future NAAQS. As the court noted in *Michigan v. EPA*, ". . .*EPA must first establish that there is a measured [air quality] contribution.* Interstate contributions cannot be assumed out of thin air." (emphasis in original).

<u>EPA should have concluded that there are no cost effective controls available for sources in upwind states.</u>

- **EPA misunderstood its assignment from the court about EGU controls.** EPA has erroneously interpreted the remand as a directive to find additional controls and reductions from the EGU sector. EPA has neither a legal nor technical basis at Step 3 for proposing additional controls on sources in upwind states. The *Wisconsin v. EPA* court determined that EPA's CSAPR Update was reasonably based, but for the need to align the deadlines for action by upwind and downwind states.

- **No cost effective emission reductions are available for EGUs.** Relative to costs of controls and ability to implement such controls, MOG engaged the services of nationally renowned experts J. Edward Cichanowicz, Michael C. Hein and J.P. Marchetti who find that at Step 3 EPA was in error in determining that the cost of short term EGU controls was less than $1,600 per ton of NOx removed and that such controls could be implemented in the time period provided in the proposed CSAPR Update Revision.

- **EPA has failed to recognize that EGUs do not have time to implement the controls being proposed.** EPA has erroneously concluded that advanced combustion controls can be installed by the start of the 2022 ozone season. The time required for design, procurement, and installation of combustion controls for four typical example units is at least 13 and up to 19 months. combustion controls could not be deployed in time for either the 2021 or 2022 ozone season.

- **EPA has correctly determined that there are no cost effective non-EGU or long term EGU controls available.** EPA has properly applied its Step 3 multi factor test in rejecting the need for additional controls on large industrial boilers. OTC cost estimates support EPA's Step 3 conclusion that there is no justification for imposing additional controls on any non-EGU sources. The result of the OTC analysis was a finding that cost of per ton of NOx removed through use of all of the control technologies reviewed was significantly above the proposed rule cost of $1600. Moreover, retrofits for non-EGU sources confound implementation as a matter of fact.

- **EPA must require local sources to clean up their air act before directing others to do so.** Local sources must be addressed first as a matter of law, before EPA can advance a regional transport rule such as the proposed Revised CSAPR Update rule. The *Wisconsin* court provides that "By imposing a first-order obligation to attain the NAAQS "as expeditiously as practicable," Congress "made clear that the States could not procrastinate . . ." EPA must determine whether downwind states would experience non-attainment of the NAAQS even if no transport occurred at all. EPA's authority to adopt a transport rule of this kind is limited by several factors including being prohibited from imposing any emission reductions on upwind states that would be more than would be necessary to eliminate nonattainment in downwind areas. Before finalizing the rule, EPA is obligated to address these local controls. If, upon review, EPA determines that recognition of these local controls would bring about attainment, EPA has no authority to proceed further with the rule as proposed since doing so would result in prohibited over-control. EPA itself recognizes that the cause of remaining air quality concerns in the Northeast is local sources.

- **EPA properly recognized that there is a critical need to impose additional near-term controls on the units in New York that operate on HEDD.** EPA has correctly identified several significant sources in New York as mitigation techniques that need to be addressed in this rule – effectively resolving all downwind nonattainment. Those technologies target certain local sources to include simple cycle combustion turbines (SCCT); municipal waste combustion (MWC) and Distributed Generation (DG). These sources have been demonstrated to operate on high energy demand days (HEDD) and alone are causing nonattainment in Connecticut. MOG urges that EPA recognize that imposing controls on SCCT, MWC, and DG units is an appropriate mitigation measure that effectively resolves all CSAPR Update remand issues for all upwind states that would otherwise be linked to the Connecticut monitors.

MIDWEST OZONE GROUP COMMENTS ON PROPOSED REVISED CROSS STATE AIR POLLUTION RULE UPDATE FOR THE 2008 OZONE NAAQS

DECEMBER 14, 2020

I. Introduction.

The Midwest Ozone Group (MOG) is pleased to have the opportunity to comment on the proposed rule by the U.S. Environmental Protection Agency (EPA) to revise the Cross-State Air Pollution Rule (CSAPR) Update for the 2008 ozone National Ambient Air Quality Standard (NAAQS). (85 Fed. Reg. 68964, October 30, 2020).[1]

MOG is an affiliation of companies and associations that draws upon its collective resources to seek solutions to the development of legally and technically sound air quality programs.[2] MOG's primary efforts are to work with policy makers in evaluating air quality policies by encouraging the use of sound science. MOG has been actively engaged in a variety of issues and initiatives related to the development and implementation of air quality policy, including the development of transport rules, NAAQS standards, nonattainment designations, petitions under Sections 126, 176A and 184(c) of the Clean Air Act ("Act"), NAAQS implementation guidance, the development of Good Neighbor state implementation plans (SIPs) and related regional haze and climate change issues. MOG Members and Participants own and operate numerous stationary sources that are affected by air quality requirements including the ozone NAAQS. MOG seeks the development of technically and legally sound air pollution rules and actions that may impact on their facilities, their employees,

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1 These comments were prepared with the technical assistance of Alpine Geophysics, LLC. Comments or questions about his document should be directed to David M. Flannery, Kathy G. Beckett or Edward L. (Skipp) Kropp, Legal Counsel, Midwest Ozone Group, Steptoe & Johnson PLLC, 707 Virginia Street East, Charleston, West Virginia 25301; 304-353-8000; dave.flannery@steptoe-johnson.com; kathy.beckett@steptoe-johnson.com; or skipp.kropp@steptoe-johnson.com, respectively.

2 The members of and participants in the Midwest Ozone Group include: American Electric Power, American Forest & Paper Association, American Wood Council, Ameren, Alcoa, Appalachian Region Independent Power Producers Association (ARIPPA), ArcelorMittal, Associated Electric Cooperative, Big Rivers Electric Corp., Citizens Energy Group, Cleveland Cliffs, Council of Industrial Boiler Owners (CIBO), Duke Energy, East Kentucky Power Cooperative, ExxonMobil, FirstEnergy, Indiana Energy Association, Indiana Utility Group, LGE / KU, Marathon Petroleum, National Lime Association, Ohio Utility Group, Olympus Power, and City Water, Light and Power (Springfield IL).

their contractors, and the consumers of their products.

As will be pointed out in these comments, EPA's proposed rule is fatally flawed to the extent that it seeks to impose any new controls on coal-fired EGU sources in any upwind states for the purpose of addressing Good Neighbor requirements of the Clean Air Act with respect to the 2008 ozone NAAQS. As these comments will point out, there are serious questions about whether there is any significant contribution by upwind states to downwind nonattainment or maintenance monitors in the East. These comments will also demonstrate that, even if there were such significant contribution, EPA has incorrectly and illegally sought to impose controls on upwind EGU's rather than to address the local sources in the vicinity of the Connecticut monitors that EPA recognizes are the cause of any residual air quality concerns that exist with respect to those monitors. These comments will also point out that even under EPA's own guidance, there would be no remaining maintenance monitors in the East.

II. Comments.

1. Emission reductions and improvements in air quality in the eastern U.S. in recent years related to existing rules are all that is needed to attain the 2008 ozone NAAQS.

Long-term reductions in ambient ozone concentrations have been occurring for decades. This downward trend in air quality is directly related to a downward trend in emissions from rules that are already "on-the-books" which are projected to continue for years to come This has been demonstrated by air quality modeling performed by both EPA and MOG. EPA's own analysis demonstrates the significant reduction that has occurred in downwind problem monitors. This is evidenced by the fact that when the CSAPR Update rule was adopted in 2016 EPA found that there were a total of 6 nonattainment monitors and 13 maintenance monitors in the East[3] as compared with the current proposal where EPA's analysis finds that there are just 2 nonattainment and 2 maintenance monitors in the East. This improvement in air quality has eliminated all problem monitors in the State of Wisconsin – the lead state in the challenge to the CSAPR Update which gave rise to the remand. It is no longer necessary to be concerned about the status of any monitor in Wisconsin with respect to the 2008 ozone NAAQS. As will be explained in these comments, because EPA has erroneously concluded that any problem monitors will remain in 2021 – there is no sound technical justification for this proposal.

The factual details of this proposal raise questions about EPA's actions when considered relative to Section 706(2)(A) of the Administrative Procedure Act that requires agency decisions to be factually based and not "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with the law." Review of EPA's queries and solicitation for comment in this proposal serve to illustrate the questionable foundation of the underlying premise for the proposal. Deference afforded to EPA consistent with *Chevron USA, Inc. v. NRDC, 467 U.S. 837, 104 S.Ct. 2778, 81 L.Ed.2d 649 (1984)* and related federal Clean Air Act court decisions, requires application of scrutiny as to "whether EPA's actions reasonably interpret the governing provisions of the Clean Air Act." *Maryland v. EPA* at 1198. EPA's actions are arbitrary and capricious if the result is to subject

3 81 Fed. Reg.74533 (October 26, 2016).

certain states and a targeted subset of already well controlled emission sources to additional, ill-defined and unjustified regulatory burden, while ignoring the impact of nearby emission sources that have a larger impact on nonattainment. MOG's analysis supports a finding that documented improvements in air quality related to existing rules will result in attainment of the 2008 ozone NAAQS at all remaining monitors in the eastern U.S. in 2021. Therefore, none of the proposed emission reductions in this rulemaking are necessary to attain the 2008 ozone NAAQS, raising serious concern about EPA's stated justifications for its proposal.

a. Ozone precursor NOx emissions have been steadily decreasing in recent years

EPA's National Air Pollutant Emission Trends data[4] indicate that on a national level, NOx emissions for EGUs and other source categories have decreased, and air quality is significantly improved as a result of regulations already in place. This data also confirms that air quality will continue to improve as existing regulations are fully implemented in the near future.

EPA data indicate that in 2019, the principal sources of NOx emissions contributing to ozone were mobile sources (55%), industrial and other fuel combustion (17%), other industrial and area sources (30%), and electric generating units (EGUs) (11%). These emissions are presented in Figure 1 below.

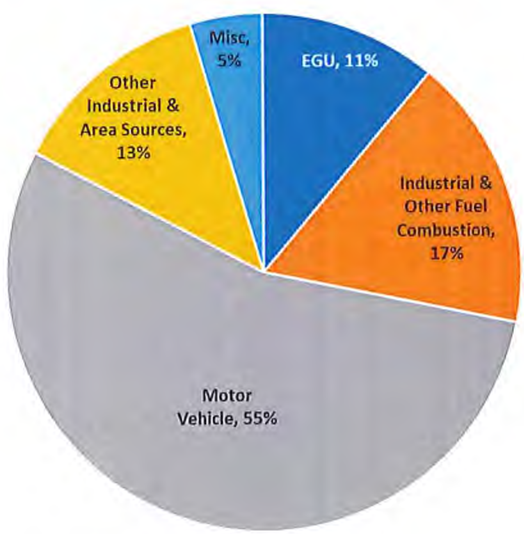


Figure 1. Annual 2019 emissions distribution for NOx

Further, EPA data indicate that individually, the vast majority of states have achieved significant reductions of NOx and volatile organic compounds (VOCs), the primary ozone precursors, and have seen improved air quality over the past decade. EPA projections include further air quality improvements over the next several years due to the implementation of existing Clean Air Act programs.

Figure 2 presents graphical displays of national NOx emissions as provided by EPA. These

4 https://www.epa.gov/air-emissions-inventories/air-pollutant-emissions-trends-data

Figures show the resultant NOx emission trends, by major category, for the 1999 through 2019 timeframe. Consistent with findings on state and regional scales, emissions from EGU and mobile source categories show the greatest declines over time as the result of ongoing implementation of various federal, state, and local regulations largely driven by the Clean Air Act.

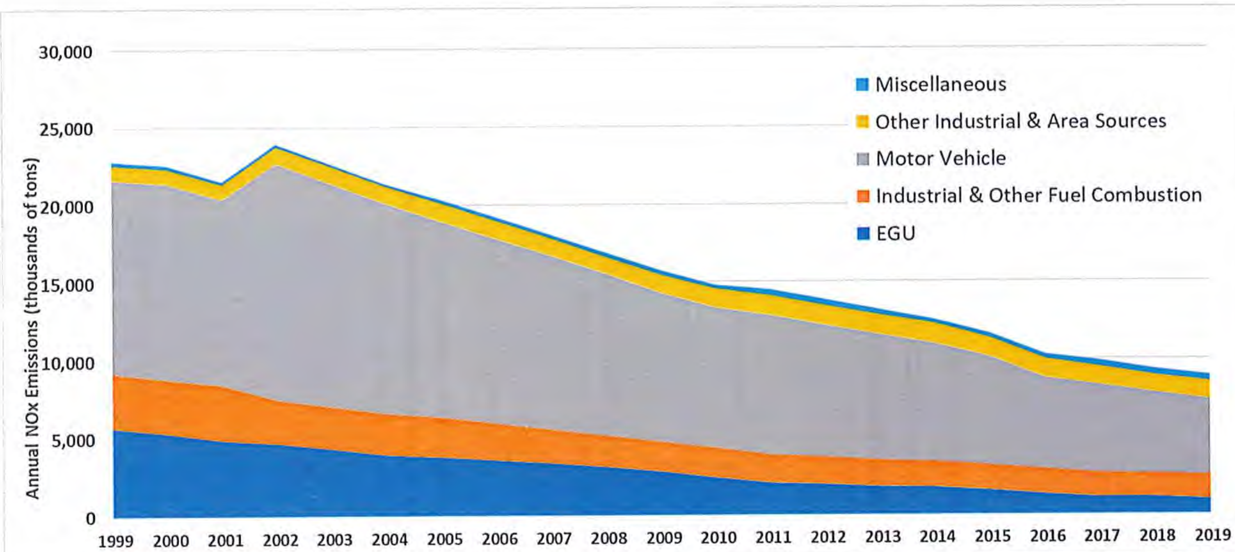


Figure 2. Annual NOx emission trends by major source category.

NOx emission reductions during the period of 1999 to 2019 range from an eighty-three percent (83%) decrease in electric utility fuel combustion to an increase of sixty-three percent (63%) in miscellaneous source emissions. VOC reductions range from a sixty-eight percent (68%) decrease in the transportation sector, a fifteen percent (15%) decrease in industrial and other processes, and a noted increase in the miscellaneous category.

Table 1 below presents national NOx emission changes from 1990 and between 1999 and 2019 as reflected in Figure 2. Only the three-year National Emission Inventory cycle of years including 1990 and most current data from 2019 are presented. NOx emissions during the period of 1999 to 2019 for all source categories show a reduction by 61%. Stationary source fuel combustion emission reductions over the same period were 73%.

Table 1. Annual NOx emissions (thousand tons) by category and year.

	Annual NOx Emissions (Thousand Tons)				
Year	EGU	Stationary Fuel Combustion	Motor Vehicle	Industrial and Other Processes	Miscellaneous
1990	6,663	4,231	13,373	891	369
1999	5,721	3,477	12,456	940	251
2002	4,709	2,779	15,201	1,059	211
2005	3,792	2,550	12,612	1,129	271
2008	3,144	1,984	10,426	1,094	262
2011	2,090	1,814	8,952	1,264	399
2014	1,770	1,684	7,559	1,282	294
2017	1,158	1,526	5,675	1,139	409
2019	996	1,526	4,880	1,139	409

These findings are consistent with EPA's most recent trends[5] publication. As reported in the 2020 trends publication, since 1970, the combined emissions of criteria and precursor pollutants have dropped by 77%; emissions dropped by 7% since 2017 alone. Emissions of NOx are among the largest emission declines (65%) since 1990, primarily because of the implementation of national and regional EGU reductions of these pollutants. Title IV reductions, the NOx State Implementation Plan (SIP) Call, and Cross-State Air Pollution Rule (CSAPR) require emission reductions from EGUs of up to seventy percent (70%) from baseline conditions in selected States across the eastern U.S. Additionally, state implementation of RACT and BACT to achieve ozone attainment have contributed to NOx emissions reductions and ozone air quality improvement.

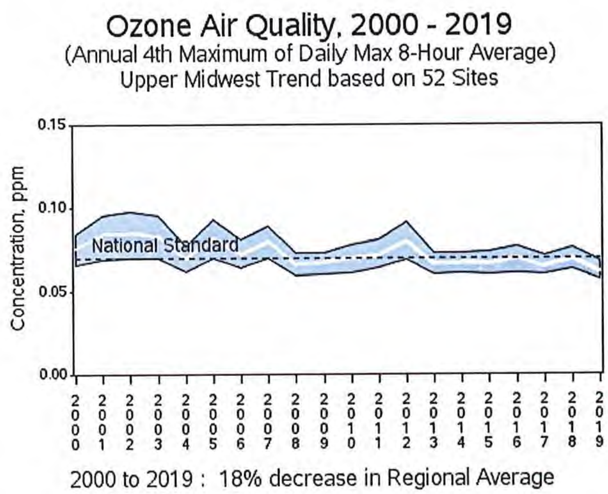
NOx emissions have also declined in industrial sectors, such as the pulp and paper industry, as many coal-fired industrial boilers have been retired or refueled with natural gas. The industrial boiler emission reductions are driven in part by the Industrial, Commercial and Institutional Boiler MACT, the 1-hour SO2 NAAQS, state implementation of RACT and BACT for ozone attainment, and installation of new boilers fired with natural gas and controlled with low-NOx burners. EPA's assertion that "EPA's relatively incomplete and uncertain databases on which it based this proposed analysis" is the reason for EPA's inability to seek further reductions from industrial boilers through use of its Clean Air Act authorities ignores the substantial reductions already achieved by these sources. EPA seeks comment on a myriad of issues relative to emissions/emissions reduction potential for: non-EGUs (C-10), potential for newly identified non-EGU data and information (C-11), request for additional assessment of emissions/emissions reduction potential from glass furnaces and cement kilns (C-12), a variety of emissions sources from several industry sectors (C-13), feasibility of further controls on IC engines and large ICI boilers (C-14), cost-effective emission reduction potential from glass and cement manufacturing sectors (C-15), cost-effective emission reduction potential for other sectors or sources (C-16), feasibility of additional emissions/emission reduction potential for large ICI boilers and IC engines (C-17), additional controls on non-EGU NOx

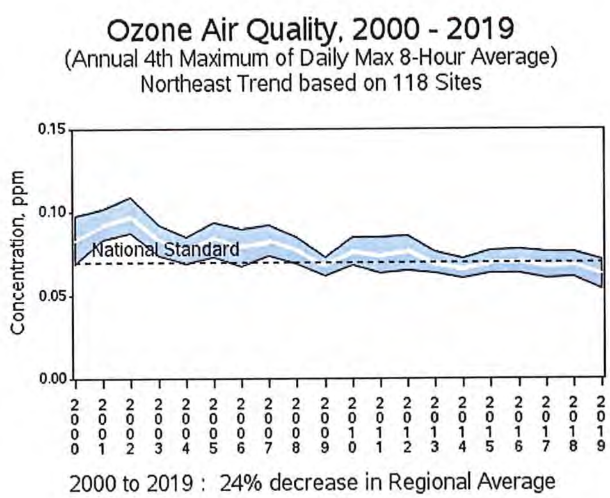
5 https://gispub.epa.gov/air/trendsreport/2020/#home

SIP Call sources (C-18), additional controls on large non-EGU boilers and turbines (C-19) and (C-20). However, much information has been collected and much analysis has already been performed in the context of the MACT and NAAQS implementation measures already completed.

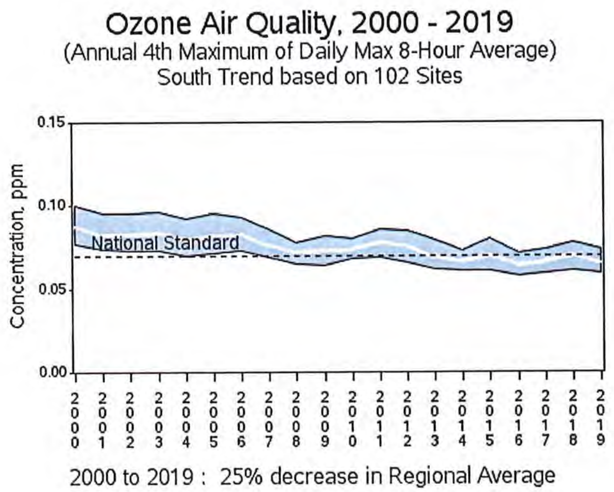
b. Air quality improvements are following emissions reductions

Air quality data have shown marked decreases in monitored concentrations based on decreasing trends in ozone Design Values (DV) over time[6]. Eastern U.S. regional average 8-hr ozone DVs for each overlapping three-year period starting with 1998-2000 and ending with 2017-2019 are presented in Figure 3. Ozone DVs were calculated as the annual 4th highest daily maximum 8-hour averaged over three consecutive years. Average 8-hr ozone design values have decreased in all nine regional areas between 2000 and 2019 as emissions have declined largely driven by federal and state implementation of stationary and mobile source regulations[7].





6 https://www.epa.gov/air-trends/ozone-trends
7 https://gispub.epa.gov/air/trendsreport/2020/#home



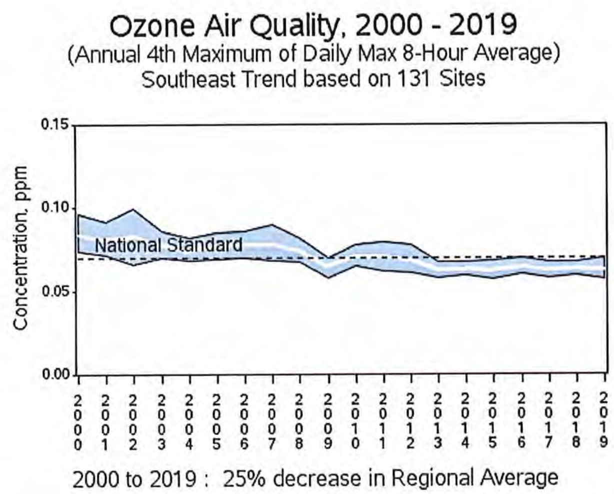


Figure 3. Regional average 8-hr ozone design value trends (ppb).

c. Modeling projections for 2023 and 2028 show ozone precursor NOx emissions will continue to decline even in the absence of the proposed CSAPR Update Revisions.

In addition to continued implementation of stationary source regulation, reductions from the on-road mobile source vehicle fleet and fuel regulations have and are anticipated to generate additional reductions. Examples of these programs include the Tier 2/Gasoline Sulfur rule and Heavy Duty Engine/Vehicle and Highway Diesel Fuel rules. Further reductions can be expected from the implementation of newly promulgated programs such as regulations on locomotives, marine vessels, and others. Air quality will continue to improve as emissions are reduced pursuant to the requirements of these types of environmental rules. EPA emission projections[8] reflect the reductions achieved through the continued implementation of promulgated "On-The-Books" and

8ftp://newftp.epa.gov/Air/emismod/2016/v1/reports/all_2011v63_2014v71_2016v1_county_summary_09-Oct-2019.zip

"On-The-Way" regulations which were promulgated at the time EPA's modeling was conducted in January 2020. As can be seen in Figure 4, reductions of ozone precursor emissions of NOx are projected to decline between now and 2028, consistent with these known controls.

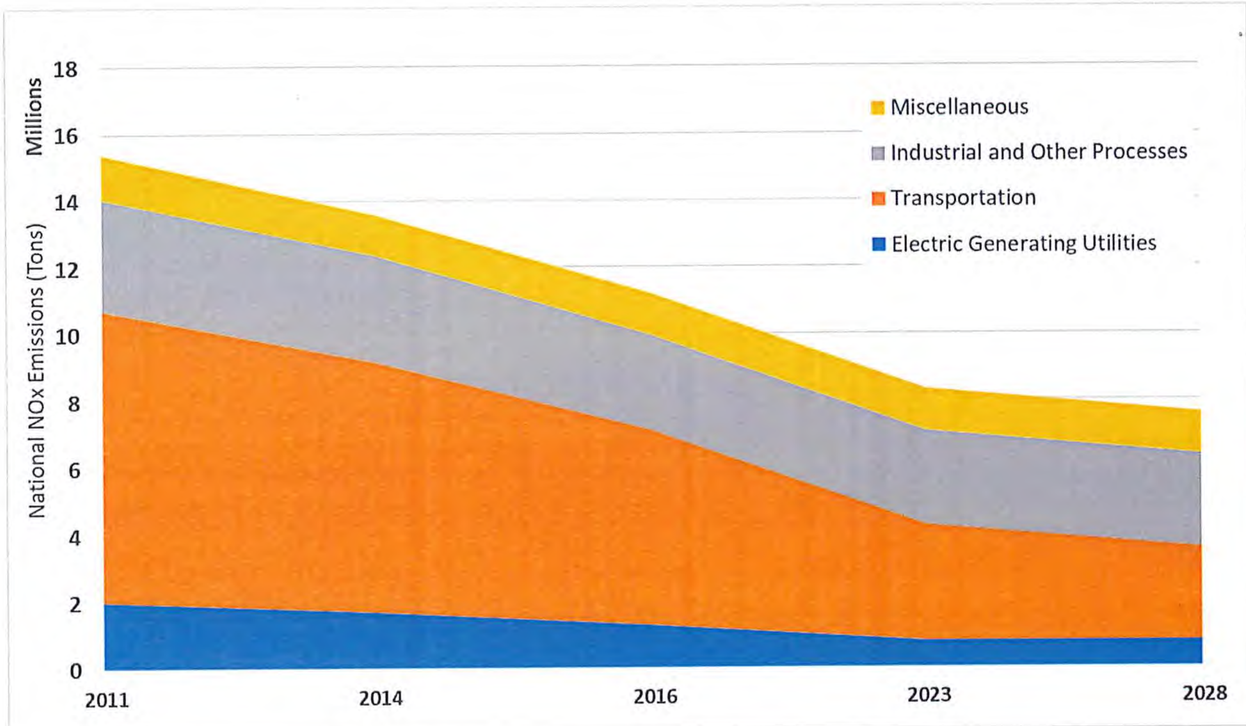


Figure 4. Annual NOx emission trends and projections by major source category.

2. **EPA has improperly determined at Step 1 that there are downwind problem monitors related to the 2008 ozone NAAQS. The three Connecticut monitors and the one Texas monitor cited by EPA do not provide an appropriate basis for EPA's proposal.**

EPA's proposal is premised on the assumption that the only remaining purported nonattainment monitors likely to exist in 2021 are the located in Fairfield County Connecticut and the only two purported maintenance monitors are in each of Connecticut and Texas as set forth in Table 2 below:

Monitor ID	State	Site	Avg DV 2014-2018	Max DV 2014-2018	Avg DV 2021	Max DV 2021	2019 DV
Nonattainment Receptors							
090013007	CT	Stratford	83.0	83	76.5	77.4	82
090019003	CT	Westport	82.7	83	78.5	78.9	82
Maintenance Receptors							
090099002	CT	Madison	79.7	82	74.0	76.1	82
482010024	TX	Houston	79.3	81	75.5	77.1	81

Table 2. Proposed CSAPR Update Revision Problem Monitors

EPA has failed, however, to technically justify its reliance on these monitors in support of the proposed CSAPR Update Revision as will be addressed in this portion of MOG's comments.

a. The computer modeling used by EPA to assess downwind monitors does not accurately assess monitors such as those EPA has identified in Connecticut that are located at the interface between land and water bodies. EPA's reliance on its "no water" modeling results does not adequately address this concern. (Comment C 2)

EPA's ozone attainment modeling guidance states that:

"[t]he most important factor to consider when establishing grid cell size is model response to emissions controls. Analysis of ambient data, sensitivity modeling, and past modeling results can be used to evaluate the expected response to emissions controls at various horizontal resolutions for both ozone and $PM_{2.5}$ and regional haze. If model response is expected to be different (and presumably more accurate) at higher resolution, then higher resolution modeling should be considered. If model response is expected to be similar at both high and low(er) resolution, then high resolution modeling may not be necessary. *The use of grid resolution finer than 12 km would generally be more appropriate for areas with a combination of complex meteorology, strong gradients in emissions sources, and/or land-water interfaces in or near the nonattainment area(s)*" (emphasis added)

EPA's modeling in support of the proposed rule simulated a national domain using a 12km grid resolution domain wide. While this makes running a national, regional simulation easier from a technical perspective, it neglects the important issue of the complex meteorology and/or land-water interfaces in or near the nonattainment or maintenance monitors of interest.

Photochemical modeling along coastlines is complex for two reasons. First, the temperature gradients along land/water interfaces can lead to localized on-shore/off-shore flows; and secondly, the photochemical model formulation spreads the emissions in a grid cell throughout the full grid volume of the cell.

Figure 5 presents a unique area in the eastern U.S. that is challenged by these complex meteorologic issues at land-water interfaces. For each monitor associated with this proposed rule and located in Connecticut along the Long Island Sound, Alpine has reviewed the EPA published model performance evaluation (MPE) metrics for ozone and compared them to additional MPE metrics from the same modeling platform.

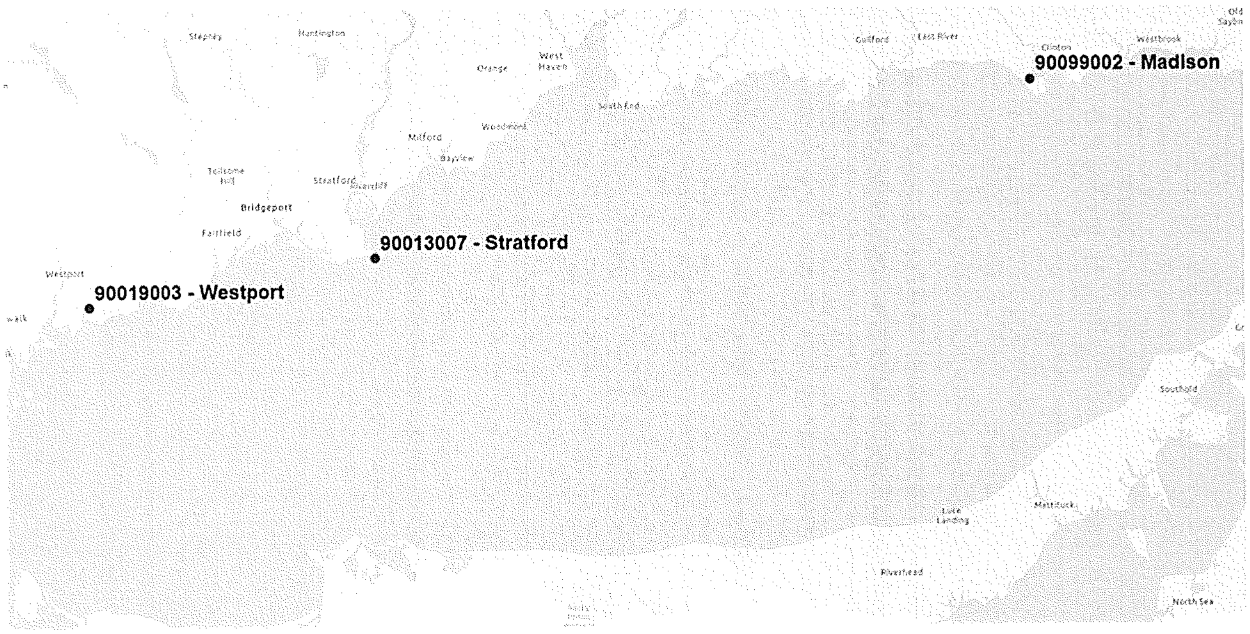


Figure 5. Connecticut monitors located on land/water interface.

Examining each of these monitors Alpine notes that a portion of the grid cell is located over or adjacent to a water body. Studies indicate that air quality forecast models typically predict large summertime ozone abundances over water relative to land and that meteorology around the Long Island Sound is distinctly unique; both shortcomings warrant individualized attention and a finer grid resolution to best explore actual conditions.

Additionally, the 3x3 neighborhood of grid cells used in determining the design values of the relative response factor (RRF) extends into the water bodies. Under current guidance, the top ten modeled days within this 3x3 matrix are used in determining this RRF for each monitor.

Had EPA conducted more refined 4 km modeling it would likely have found the three Connecticut monitors to have been in attainment. Unless and until such modeling is conducted, it is inappropriate to base a rule of this significance on monitors such as these located at the land/water interface.

EPA's modeling for the Revised CSAPR Update proposal sets forth both EPA's "3x3" modeling data, as well as its modified "No Water" approach on a 12km grid. In addition to these two

EPA data sets, EPA previously released in its interstate transport information memorandum[9] language that supports the use of equally credible modeling that uses "state-of-the-science" and "fit for purpose" models and configurations to address SIP modeling. EPA ozone attainment modeling guidance[10] further states that "the use of grid resolution finer than 12 km would generally be more appropriate for areas with a combination of complex meteorology, strong gradients in emissions sources, and/or land-water interfaces in or near the nonattainment area(s)."

Based on a recent modeling effort conducted on behalf of MOG, Alpine Geophysics generated 4km modeling results[11] (using the "3 x 3" approach) and compared these results with EPA's 12km modeling for both the "3x3" and "No Water" options. In this comparison, and specifically as applied to the Connecticut coastal monitoring sites where complex meteorology is prevalent, this report found that future year average design values were an average of 2.1 ppb lower using the finer grid 4km resolution compared to the 12km "No Water" approach. In fact, the maximum difference demonstrated was at the Westport monitor (90019003), where there was a reduction of 4.7 ppb, the highest projected DV monitor remaining from the 2021 interpolation. See Table 3 below.

				DVf (2023) Ave		
Monitor	State	Site	DVb (2011)	EPA "No Water" 12km Modeling	Alpine 4km Modeling	Delta DVf
90013007	CT	Stratford	84.3	71.0	69.2	-1.8
90019003	CT	Westport	83.7	73.0	68.3	-4.7
90099002	CT	Madison	85.7	69.9	68.9	-1.0
90010017	CT	Greenwich	80.3	68.9	66.8	-2.1
90110124	CT	Fort Griswold	80.3	67.3	66.0	-1.3

Table 3. Fine grid modeling results comparison.

Recognizing the importance of this rule and the unique coastal geography and meteorology of the remaining nonattainment and maintenance monitors in Connecticut, EPA has inappropriately relied upon these monitors to demonstrate either nonattainment or maintenance in the absence of running a 4km simulation of this domain. The agency should have run its own 4km simulation of the region or at least made the data available in time for an independent analysis of the platform at this finer grid resolution.

This would have helped determine if finer grid meteorology, emissions, and air quality would provide a more accurate projection of future year ozone concentrations at these locations. Simply using the previous 4km relative changes from Alpine's prior work, if comparable reductions in

9 https://www.epa.gov/sites/production/files/2018-03/documents/transport_memo_03_27_18_1.pdf

10 https://www.epa.gov/sites/production/files/2020-10/documents/o3-pm-rh-modeling_guidance-2018.pdf

11 "Good Neighbor" Modeling Technical Support Document for 8-Hour Ozone State Implementation Plans Using MOG's 4kei Modeling Platform, Alpine Geophysics, LLC, March 2019, Revised: June 2019 attached and identified as Exhibit A.

moving from 12km "no water" to 4km concentrations were achieved with the Revised CSAPR Update platform, monitors in Connecticut would likely demonstrate attainment.

b. The days selected by EPA for modeling and analysis are not days influenced by sources in midwestern states further undermining the technical validity of EPA's analysis.

The days that EPA has selected for relative response factor (RRF) and used in future year design value and significant contribution calculations have back trajectories that do not largely support influence from midwestern states. In fact, many trajectories indicate a localized flow and associated impact from local sources. Additionally, two of the days used in the calculation have been identified in Connecticut's exceptional events demonstration for the episode related to the Fort McMurry wildfires in May 2016.

As noted elsewhere in this document, the Connecticut demonstration related to the May 2016 event showed that Canadian wildfire caused the event and noted that ". . . the exceedances of May 25-26th cannot be attributed to EGUs operating on high electric demand days as is more typically the case later in the ozone season." EPA concurred in that demonstration on July 31, 2017.

EPA selects the top ten days from the base year (2016) modeling platform to calculate the RRF used in the projection year design value calculation and to determine significant contribution from upwind states to downwind receptors. Table 4 presents the top ten modeled days selected for each of the three Connecticut monitors.

Top Day	Stratford (90013007)	Westport (90019003)	Madison (90099002)
1	7/25/2016	7/25/2016	7/25/2016
2	5/26/2016*	7/6/2016	7/18/2016
3	7/6/2016	5/26/2016*	5/26/2016*
4	7/18/2016	7/18/2016	7/22/2016
5	7/22/2016	7/28/2106	7/6/2016
6	8/31/2016	7/21/2016	5/25/2106*
7	5/28/2016*	7/17/2016	9/14/2016
8	7/17/2016	8/24/2106	7/17/2016
9	8/24/2016	7/22/2016	6/7/2017
10	7/21/2016	8/31/2016	8/31/2016

**dates referenced by Connecticut DEEP as impacted by wildfire smoke in exceptional events demonstration*

Table 4. Top ten base year modeled days used in EPA RRF and significant calculation determinations for three Connecticut monitors.

Figures 6, 7, and 8 below present the 48-hour back trajectories from the Stratford, Westport, and Madison monitors, respectively. These figures arranged in order from highest base year modeled day (top left) to tenth highest (lower right) show the flow of the air packets influencing the modeled ozone concentrations on the dates listed in Table 4.

Except for May 26 (a wildfire smoke exceptional event influenced day) and July 16, none of the trajectories at any of the three monitors reaches farther west in the U.S. than western Pennsylvania. In many cases, a localized recirculation is noted in the region or initiating over the Atlantic Ocean. An additional transport pattern is noted to arrive via upstate New York and southeastern Canada and others reach south along the mid-Atlantic coast. According to these patterns, significant flow initiating over units in the Midwestern states is not present indicating negligible influence from sources within those states.

Considering these observations, it is our opinion that control strategies developed for upwind states outside of the presented back trajectory transport patterns will not have the impact presumed in the NPR and that localized strategies focusing on source categories concentrated in adjacent states to the Connecticut monitor will be required to demonstrate modeled attainment with the 2008 ozone NAAQS. By requiring optimization of SCRs on upwind EGUs, shown here to have nominal influence on future year modeled ozone concentrations at these three monitors, EPA is over-controlling these states with the NPR. We also claim that a trajectory analysis for the top 10 modeled days used in EPA's significant contribution calculations show that few of the trajectories at the three Connecticut monitors passed over Midwestern states, questioning whether units located within the region truly were significant contributors to the monitors on the days selected for nonattainment and maintenance determination and to used inform the calculation for significant contribution.

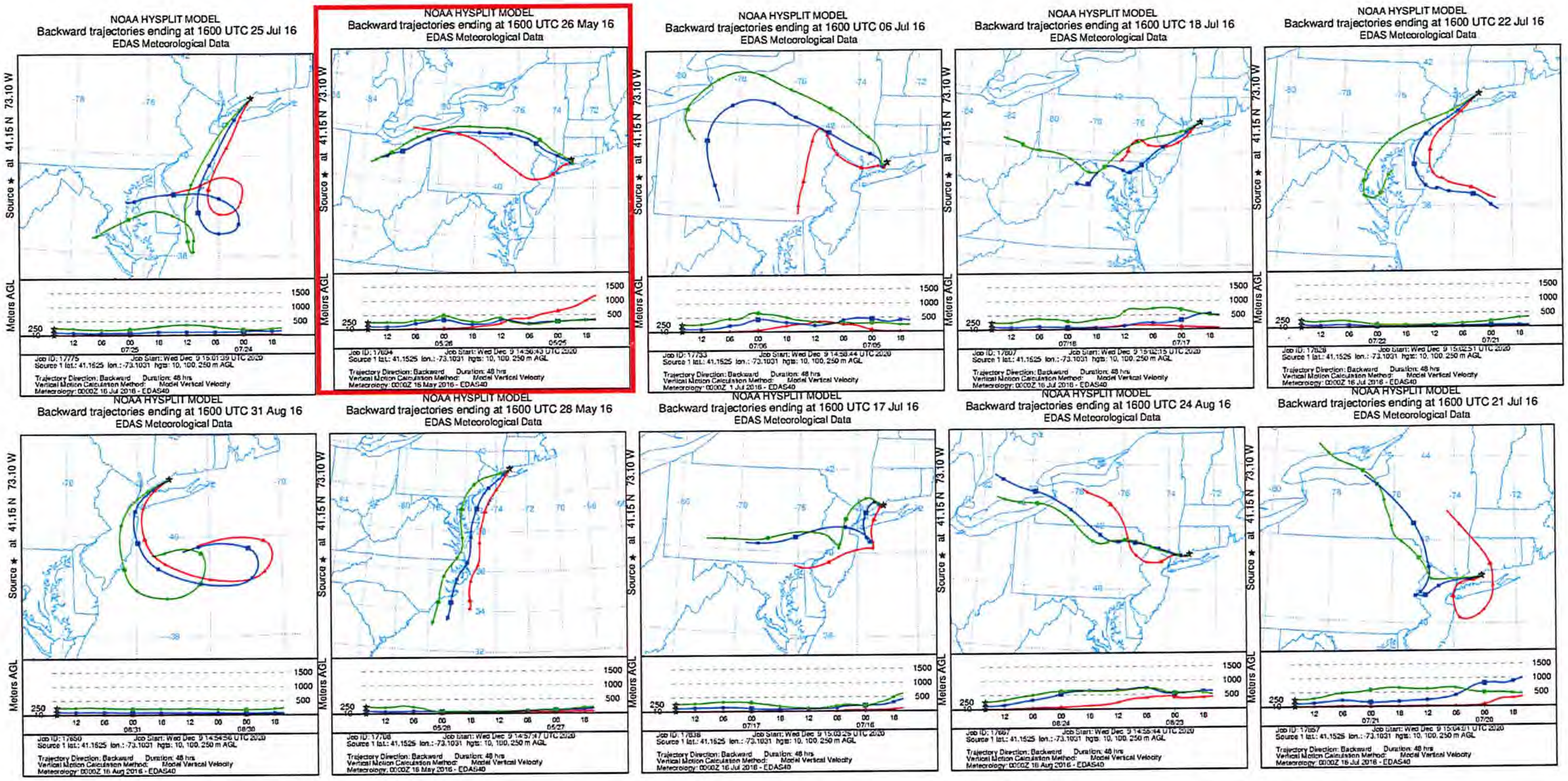


Figure 6. 48-hour back trajectories from Stratford (090013007) monitor on top 10 days used in RRF and significant contribution calculations in order of highest base year modeled value (top left to bottom right). Red outlined trajectories indicate exceptional events days.

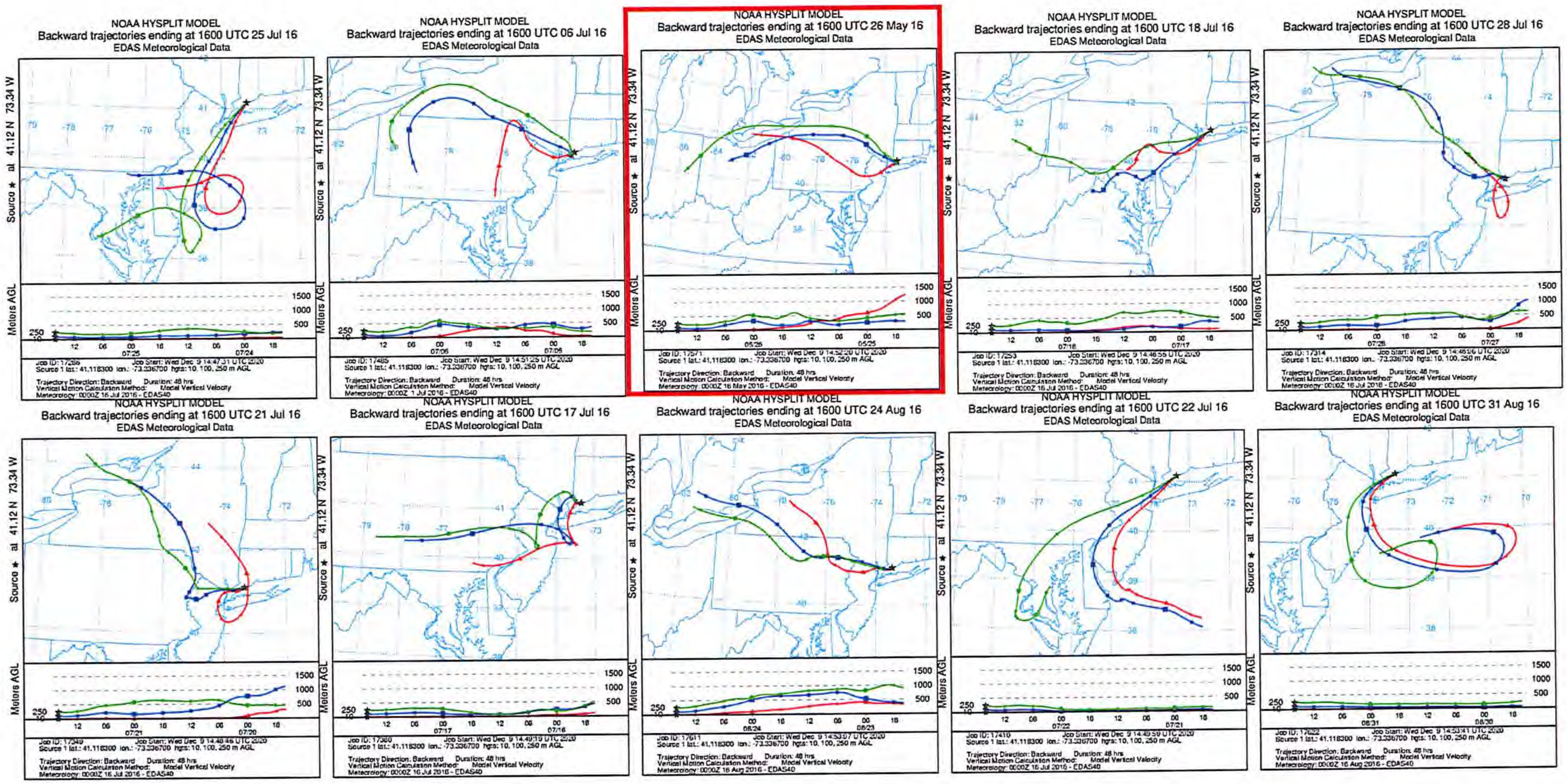


Figure 7. 48-hour back trajectories from Westport (090019003) monitor on top 10 days used in RRF and significant contribution calculations in order of highest base year modeled value (top left to bottom right). Red outlined trajectories indicate exceptional events days.

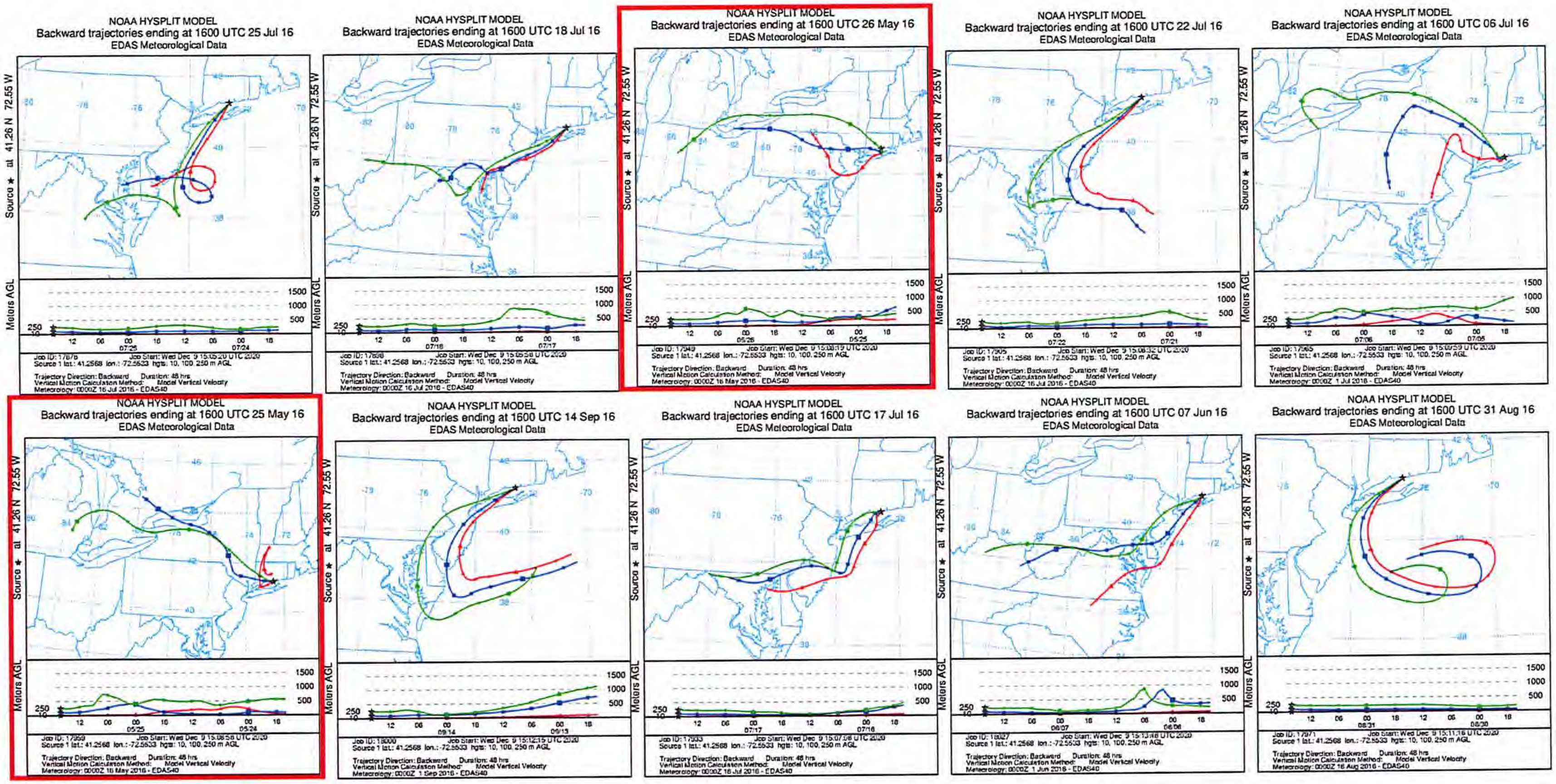


Figure 8. 48-hour back trajectories from Madison (090099002) monitor on top 10 days used in RRF and significant contribution calculations in order of highest base year modeled value (top left to bottom right). Red outlined trajectories indicate exceptional events days.

c. EPA failed to conduct air quality modeling of the attainment year of 2021. EPA instead assumed without adequate justification that its proposed rule could be based on quality modeling performed for completely independent purposes for the years 2016 and 2023 and to assume, without adequate justification, that air quality improvement between those years would be linear.

Photochemistry is a highly non-linear problem because chemical reaction rates among most compounds depend upon their ambient concentrations. In Eulerian air quality models like the Comprehensive Air Quality Model with Extensions (CAMx) model used in the NPR, ambient concentrations depend on how well the modeling grid resolves emissions, transport, and chemical history. In the CSAPR Remand NPR, EPA has chosen to estimate 2021 ambient ozone concentrations using a linear interpolation of the 2016 base year and 2023 projection year modeling platforms. This method was done without any documented justification and apparently in disregard of emission changes expected between 2016 and 2021 and between 2021 and 2023.

EPA's estimate of 2021 air quality wrongly presumes that air quality from year to year is not based on the unique distribution of precursor emissions by region or source sector. In fact, by using a linear interpolation method to calculate 2021 ambient conditions, EPA has assumed that all ozone precursor emissions from source sectors within each region of the model change at an equal rate between 2016 and 2023 and that the model's response to those changes is also linear. It is recognized that many source sectors, sometimes with explicitly regional accuracy, change emission levels in a step function, depending on the implementation of a rule, or may have reached the end of implementation in a year between the two interpolated end points.

Likewise, response of the model's ozone estimates to either NOx or VOC emission changes varies in both time and space and may not be equally responsive to changes in either precursor. For example, as shown in Tables 5 and 6, in the modeling platform[12] supporting the proposed rule, total NOx decreases by 27% and total VOC emissions decrease changes by 3% between 2016 and 2023 in the twelve upwind states identified as significant contributors. Across each state, this decrease varies from 0% to 7% for VOC and from 12% to 38% for NOx between 2016 and 2023.

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12 https://www.epa.gov/csapr/revised-cross-state-air-pollution-rule-update

		Total Annual Emissions (tons)			
State	**Pollutant**	**2016**	**2021***	**2023**	**% Change**
Illinois	NOx	390,630	330,918	307,032	-21%
Indiana	NOx	327,662	251,500	221,035	-33%
Kentucky	NOx	231,168	167,819	142,479	-38%
Louisiana	NOx	345,292	290,802	269,006	-22%
Maryland	NOx	108,887	82,293	71,655	-34%
Michigan	NOx	299,868	249,275	229,038	-24%
New Jersey	NOx	147,708	112,958	99,058	-33%
New York	NOx	268,858	224,374	206,580	-23%
Ohio	NOx	353,495	283,688	255,765	-28%
Pennsylvania	NOx	402,172	322,582	290,746	-28%
Virginia	NOx	234,112	175,610	152,209	-35%
West Virginia	NOx	150,608	137,546	132,321	-12%
12 State Total	**NOx**	**3,260,461**	**2,629,364**	**2,376,925**	**-27%**

*2021 emissions calculated as straight-line interpolation of 2016 to 2023.

Table 5. Total annual NOx Emissions from CSAPR Remand NPR Identified States and Rate of Change between 2016 and 2023 modeling platform inventories.

		Total Annual Emissions (tons)			
State	**Pollutant**	**2016**	**2021***	**2023**	**% Change**
Illinois	VOC	802,118	777,374	767,476	-4%
Indiana	VOC	528,513	510,109	502,747	-5%
Kentucky	VOC	1,000,711	985,058	978,797	-2%
Louisiana	VOC	1,762,203	1,758,066	1,756,412	0%
Maryland	VOC	257,200	245,408	240,692	-6%
Michigan	VOC	921,111	889,463	876,804	-5%
New Jersey	VOC	273,632	260,862	255,754	-7%
New York	VOC	802,737	777,423	767,297	-4%
Ohio	VOC	706,963	680,503	669,920	-5%
Pennsylvania	VOC	959,733	947,798	943,024	-2%
Virginia	VOC	1,150,657	1,130,408	1,122,308	-2%
West Virginia	VOC	650,254	665,071	670,998	3%
12 State Total	**VOC**	**9,815,833**	**9,627,544**	**9,552,228**	**-3%**

*2021 emissions calculated as straight-line interpolation of 2016 to 2023.

Table 6. Total annual VOC Emissions from CSAPR Remand NPR Identified States and Rate of Change between 2016 and 2023 modeling platform inventories.

For comparison purposes, we show that historical anthropogenic-only NOx and VOC emission changes do not follow a linear pattern. Tables 7 and 8 below provides anthropogenic ozone season NOx and VOC emissions from another seven-year period, 2012 to 2019 taken from EPA's state-level air pollution emission trends data[13]. As seen in these tables and the associated Figures 9 and 10, year-to-year variability does not follow a straight line, nor are the emission changes consistent between states.

In Figure 9, we see that Illinois' and Kentucky's NOx emissions have distinctly different historical changes from year to year compared to New Jersey and West Virginia. A straight line has been drawn between the two end points for Illinois' NOx emissions between 2012 and 2019 to better illustrate how individual years may be over or under the linear trend.

	Anthropogenic Source Annual NOx Emissions (thousand tons)							
State	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Illinois	490	473	455	408	349	320	311	295
Indiana	428	412	397	357	307	281	276	246
Kentucky	313	299	287	258	216	200	190	177
Louisiana	478	424	371	351	325	314	301	293
Maryland	157	148	139	128	105	96	95	87
Michigan	424	404	383	342	284	280	243	224
New Jersey	164	160	157	146	151	137	117	110
New York	369	350	331	302	263	241	232	221
Ohio	532	481	430	384	340	329	277	252
Pennsylvania	539	516	493	437	363	322	306	293
Virginia	301	289	277	256	221	212	191	175
West Virginia	177	182	187	170	146	128	122	116
12 State Total	**4,374**	**4,138**	**3,906**	**3,538**	**3,072**	**2,862**	**2,660**	**2,489**

Table 7. Annual anthropogenic NOx emissions from CSAPR remand NPR identified states between 2012 and 2019.

13 https://www.epa.gov/sites/production/files/2018-07/state_tier1_caps.xlsx

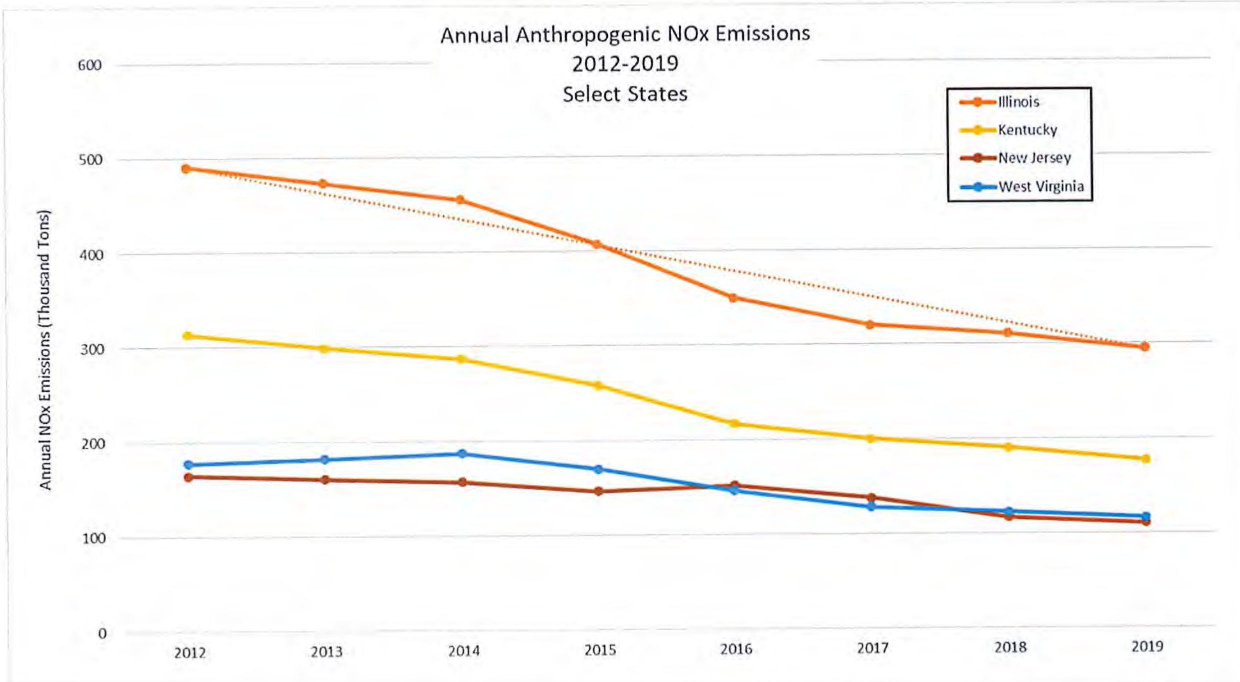


Figure 9. Annual anthropogenic NOx emissions from select states between 2012 and 2019. Straight line interpolation drawn between Illinois' end points to demonstrate non-linear trend in emissions from year to year.

	Anthropogenic Source Annual VOC Emissions (thousand tons)							
State	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Illinois	382	390	397	389	376	383	375	370
Indiana	284	283	282	270	252	248	243	239
Kentucky	269	263	298	302	302	270	267	264
Louisiana	631	569	521	504	482	398	393	390
Maryland	125	125	125	118	103	98	95	93
Michigan	433	415	396	365	316	310	300	294
New Jersey	176	170	175	168	165	149	140	137
New York	417	415	414	370	311	276	272	268
Ohio	414	391	373	364	359	354	340	335
Pennsylvania	412	448	486	458	419	397	389	384
Virginia	292	289	279	271	255	248	235	230
West Virginia	156	172	200	194	183	167	164	163
12 State Total	**3,991**	**3,931**	**3,947**	**3,772**	**3,524**	**3,298**	**3,212**	**3,166**

Table 8. Annual anthropogenic VOC emissions from CSAPR remand NPR identified states between 2012 and 2019.

In Figure 10 we see that Illinois' and Kentucky's VOC emissions also have distinctly different historical changes from year to year compared to New Jersey and West Virginia.

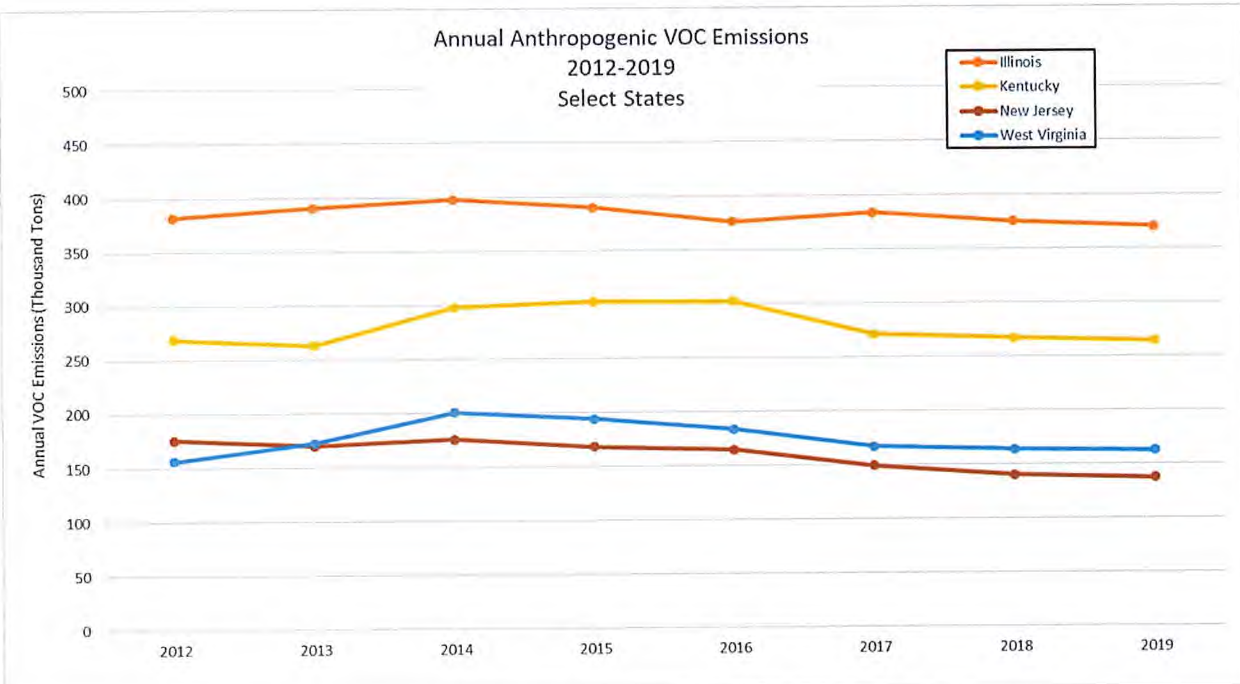


Figure 10. Annual anthropogenic VOC emissions from select states between 2012 and 2019.

In developing linearly interpolated ozone concentrations for each monitor, EPA has assumed that every state changes at the same rate regardless of location or mix of source categories within each state. Instead of developing linearly interpolated air quality design values, EPA should have developed a 2021 specific emissions inventory or at a minimum developed an interpolated 2021 emission inventory and then rerun the photochemical model to account for the reactivity of ozone formation from the distribution of ozone precursor emissions. By failing to take this step, EPA has introduced significant uncertainty into the air quality projections of the proposed rule and potentially subjected multiple upwind states to unnecessary additional control requirements.

d. EPA's own 2021 IPM base case simulation demonstrates the error in EPA's attempt to base its proposed rule on a linear interpolation of its 2016 and 2023 modeling data.

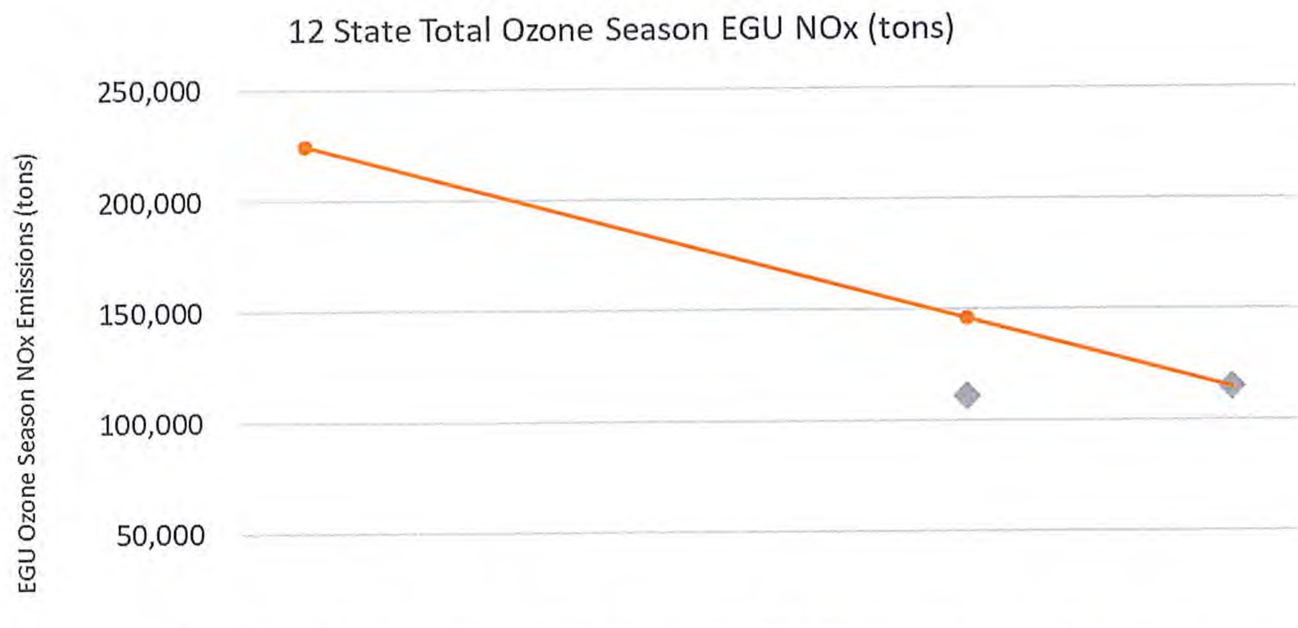
To generate air quality concentrations for 2023, EPA ran IPM and produced a 2023 emissions inventory from the results. These emissions are documented in "Air Quality Modeling Base Case - State Emissions Projections - All Emissions" spreadsheet[14] published with the proposed rule. In this file, EPA has documented both 2021 and 2023 NOx emission values calculated for each state using the January 2020 reference version of the IPM model.

Additionally, EPA has identified its use of linear interpolation in this proposed rule to

14 https://www.epa.gov/airmarkets/analysis-revised-cross-state-air-pollution-rule-update

estimate the air quality in 2021 and to justify significant contribution calculations and potential controls on upwind states that are shown to be significant contributors. This interpolation for 2021 was derived from 2016 and 2023 conditions.

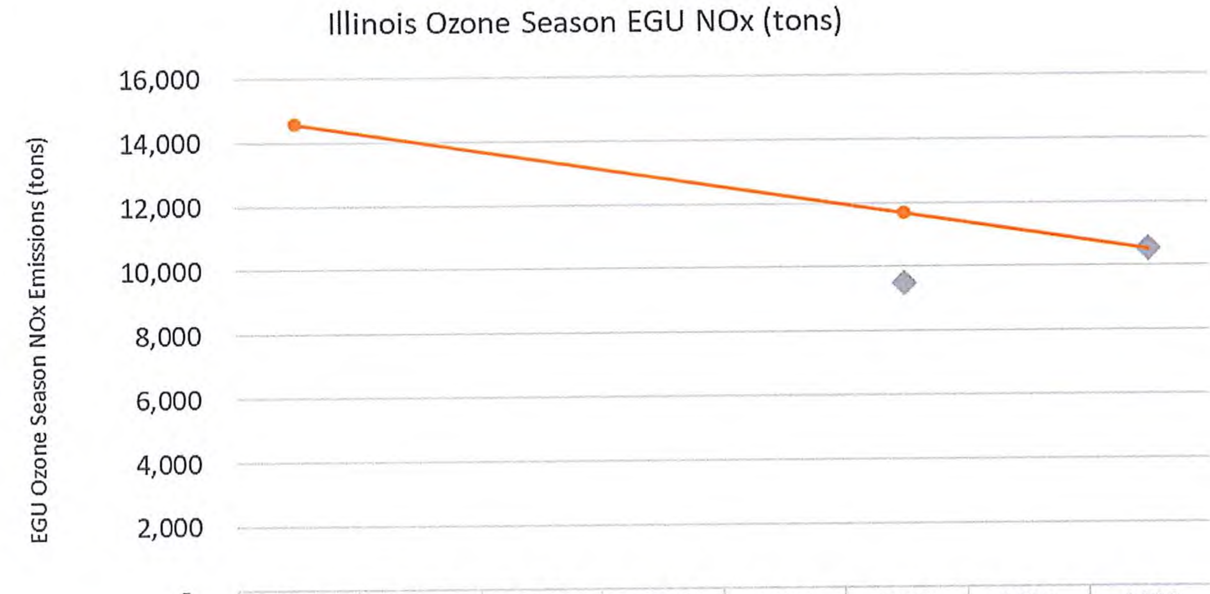
At MOG's request, Alpine Geophysics has reviewed the EGU modeling platforms from 2016 and 2023 used as the basis for this proposed rule to estimate the approximate emissions that EPA's interpolation would have resulted. As presented in Figure 11, when data for all twelve of the proposed CSAPR Update Revision upwind states (Illinois, Indiana, Kentucky, Louisiana, Maryland, Michigan, New Jersey, New York, Ohio, Pennsylvania, Virginia, and West Virginia) are considered, EPA's linear interpolation method (146,237 tons NOx; represented by the orange line and dots) overestimates IPM's 2021 projection (110,696 tons NOx; represented by the grey diamond in Figure 11) by 35,542 tons NOx in the ozone season.



	2016	2017	2018	2019	2020	2021	2022	2023
NPR Estimates	224,766					146,237		114,826
IPM Estimates						110,696		114,826

Figure 11. Comparison of CSAPR NPR upwind significantly contributing states' IPM modeled EGU NOx emissions for the ozone season compared to EPA's linear interpolation method.

To further illustrate the significance of this error, we note that certain of the 12 states targeted by EPA's proposed rule have been brought into EPA's proposal on the basis of significant contribution estimates that are only marginally greater than even EPA's 1% significant contribution levels. In the case of Illinois (with the lowest significant contribution level of any of the 12 states), EPA's straight-line interpolation in the modeling platform between the 2016 EGU ozone season NOx (14,570 tons) and 2023 EGU ozone season NOx (10,535 tons), estimated Illinois EGU emissions in 2021 as 11,690 tons for the ozone season (identified by the orange line and circles in Figure 12). However, in the IPM base case reference file associated with the proposed rule, EPA states this value as being 9,500 tons NOx in the ozone season (represented by the grey diamond in Figure12) - over 2,000 tons less than what linear interpolation generates. EPA's review of this data for other states will find that a similar error exists.



	2016	2017	2018	2019	2020	2021	2022	2023
NPR Estimates	14,571					11,688		10,535
IPM Estimates						9,500		10,535

Figure 12. Comparison of Illinois' IPM modeled EGU NOx emissions for the ozone season compared to EPA's linear interpolation method.

Set out below in Table 9 is a comparison of EPA's IPM modeled EGU NOx emissions for the ozone season compared to EPA's linear interpolation method which dramatically demonstrates how significantly EPA's method for characterizing 2021 overstates EGU emissions. This factor alone necessitates that EPA abandon the short-cut methodology that it applied to development of this proposed rule in favor of conducting appropriate air quality modeling for the attainment year of 2021.

State	2016	2021 (Interpolated)	2021 IPM	2023 IPM
Illinois	14.57	11.69	9.47	10.54
Indiana	35.42	22.85	17.28	17.83
Kentucky	25.26	13.17	6.09	8.34
Louisiana	23.47	13.71	8.04	9.80
Maryland	5.36	3.55	2.38	2.83
Michigan	16.7	14.7	14.1	14.0
New Jersey	2.77	2.60	2.14	2.54
New York	7.41	7.33	7.27	7.29
Ohio	24.86	20.17	17.45	18.30
Pennsylvania	35.04	19.72	13.13	13.59
Virginia	12.35	6.61	3.91	4.31
West Virginia	21.60	19.12	19.87	18.13
Total	**224.8**	**146.2**	**110.7**	**114.8**

Ozone Season EGU NOx Tons (Thousands)

Table 9. Comparison of IPM and Linear data.

If EPA had modeled the 2021 emissions estimated by the IPM run used to generate the 2023 results instead of linearly interpolating the air quality (and by association all emission precursors from all regions and source categories), its projections of air quality for nonattainment and maintenance monitors would have almost certainly been lower (and likely have demonstrated modeled attainment) and upwind states may have been found not to be significant contributors to these locations. By using this linear interpolation method, EPA has not only overestimated the NOx EGU emissions in 2021 compared to its own IPM simulation but may also have established a process in which these upwind states are likely to be subject to prohibited over-control.

e. EPA's failure to use the IPM January 2020 Reference Base Case emissions for 2021 has resulted in the overestimate of significant contribution of upwind states to the nonattainment and maintenance monitors and over control of EGU sources.

MOG tasked Alpine Geophysics, LLC to develop an independent source apportionment modeling analysis of the 2023 modeling platform and associated 2021 results and to compare the results of that study against published results from EPA's proposed CSAPR Remand rule. However, due to the exceptionally short 45-day comment period associated with the NPR and Alpine's delay in receiving the technical platform and associated modeling inputs and scripts from the agency, a full, comprehensive modeling analysis could not be performed.

Instead, there have been previously identified methods and approaches that estimate the relative contribution of upwind source regions and categories to downwind modeled ozone concentrations and significant contribution values. These methods were applied and monitor level results of the study for the nonattainment and maintenance monitors in the NPR is provided below.

This method utilizes the EPA modeling platform from the proposed rule and develops relationships between State anthropogenic APCA source apportionment modeling conducted by EPA[15] and the seasonal NOx emissions used to develop the ozone concentrations. Using monthly, county and source category specific emissions published by EPA[16], we have developed relational "impact factors" using these data.

Because EPA's APCA modeling did not involve the delineation of individual source categories within each state, we first needed to establish a consistent summary of NOx emissions for direct comparison and factor calculation and allocate an appropriate percentage of emissions and associated ozone concentration estimates to the controlled EGU sector. In review of the EPA 2023fh1 modeling platform, we aggregated anthropogenic source sectors from the platform into two categories for this purpose; total EGU emissions and remaining anthropogenic emissions by state.

To these emissions, we made monitor-level associations to state-anthropogenic ozone concentration contributions as determined by EPA's APCA modeling. In using these data, we presumed, as did EPA in its linear interpolation to 2021, that all sources contribute to the ozone concentration in an equal rate (ppb/ton) compared to 2023. The resulting ozone concentrations were then split into two values; one associated with EGU contribution and the second attributed to the remaining anthropogenic emissions. This ratio was developed by allocating the significant contribution value from each state proportionally by the seasonal emissions value. With these values a ratio of resulting interpolated 2021 emissions to the allocation of 2021 significant contribution concentration was developed for each monitor.

This resulting value is referred to as the impact factor as it represents a relative contribution of modeled emissions (tons) to resultant ozone concentrations (in ppb).

Impact Factor (ppb/ton) = OSAT Contribution (ppb) / Emissions (tons)

A primary purpose for this calculation was to determine, at each monitor, from where and what source category, on a ppb per ton basis, we see the greatest relative contribution. In other words, which source category, and from what state, has the greatest per ton NOx contribution to the monitor's modeled ozone concentrations. Because source specific APCA results by state were not prepared by EPA, this impact factor is equal in ppb/ton for both EGU and remaining anthropogenic sources at the monitor level based on a proportional distribution of emissions.

Once this value was developed for each state-EGU emissions value relative to individual monitors, it was applied the seasonal EGU emissions delta between the interpolated 2021 values and the IPM January 2020 Reference Case simulation emissions for 2021[17]. The resulting metric is the associated change in significant contribution relative to EPA's published 2021 significant

15 EPA-HQ-OAR-2020-0272-0064_attachment_5.xlsx

16 ftp://newftp.epa.gov/Air/emismod/2016/v1/postv1_updates/

17 https://www.epa.gov/sites/production/files/2020-10/air_quality_modeling_base_case.zip

contribution metrics.

Resulting monitor-level, relative impact factors for the twelve states identified in the proposed rule are presented in Table 10 with calculated relative change in significant contribution by state and monitor. As is shown, for the states of Illinois and Kentucky, where significant contribution is estimated to be just above the 1% threshold, this calculation may be enough to lower their contribution below the significance threshold. Additionally, when all states beyond only the twelve EPA-identified significant contributors are included in the calculation and change in ozone concentration, we estimate that the Stratford monitor moves from nonattainment to maintenance designation in 2021.

The results of this analysis identify the following three key points. (1) Had EPA chosen to develop a 2021 emissions inventory and associated modeling platform and used those data to simulate 2021 conditions, future year design values and individual state significant contribution metrics would be different. (2) Using an actual 2021 emissions inventory and modeling platform may have resulted in fewer monitors modeling nonattainment or being designated as maintenance monitors for the 2008 ozone NAAQS. (3) Individual states may have been determined to be under the 1% of NAAQS significant contribution threshold, thereby preventing over control of sources in the remedy.

Table 10. 2021 interpolated May-September EGU NOx emissions (tons) from NPR 2016-2023 modeling platform, IPM 2021 Ozone Season January 2020 Reference Case emissions (tons), impact factor, and estimated change in significant contribution by state and monitor.

	2021 Ozone Season NOx Tons			APCA-Based 2021 Significant Contribution Metrics (ppb): 90019003 - Westport				90013007 - Stratford				90099002 - Madison			
State	EGU	Other Anthro	2021 IPM - Jan 2020 Ref Base Case	All Anthro	EGU Only	Impact Factor (ppb/ton)	Delta Contribution	All Anthro	EGU Only	Impact Factor (ppb/ton)	Delta Contribution	All Anthro	EGU Only	Impact Factor (ppb/ton)	Delta Contribution
Illinois	14,668	103,435	9,471	0.81	0.101	6.86E-06	-0.036	0.69	0.086	5.84E-06	-0.030	0.80	0.099	6.77E-06	-0.035
Indiana	22,388	73,015	17,277	1.26	0.296	1.32E-05	-0.068	0.99	0.232	1.04E-05	-0.053	1.08	0.253	1.13E-05	-0.058
Kentucky	13,089	49,264	6,087	0.87	0.183	1.40E-05	-0.098	0.78	0.164	1.25E-05	-0.088	0.79	0.166	1.27E-05	-0.089
Louisiana	13,403	101,201	8,039	0.27	0.032	2.36E-06	-0.013	0.27	0.032	2.36E-06	-0.013	0.15	0.018	1.31E-06	-0.007
Michigan	14,875	81,760	14,088	1.71	0.263	1.77E-05	-0.014	1.16	0.179	1.20E-05	-0.009	1.62	0.249	1.68E-05	-0.013
New Jersey	2,570	41,362	2,144	8.62	0.504	1.96E-04	-0.084	7.70	0.450	1.75E-04	-0.075	5.71	0.334	1.30E-04	-0.055
New York	7,348	78,632	7,266	14.44	1.234	1.68E-04	-0.014	14.42	1.232	1.68E-04	-0.014	12.54	1.072	1.46E-04	-0.012
Ohio	18,735	90,733	17,450	2.55	0.436	2.33E-05	-0.030	2.34	0.400	2.14E-05	-0.027	2.35	0.402	2.15E-05	-0.028
Pennsylvania	20,111	106,559	13,132	6.86	1.089	5.42E-05	-0.378	6.72	1.067	5.31E-05	-0.370	5.64	0.895	4.45E-05	-0.311
Virginia	6,882	61,508	3,909	1.30	0.001	1.46E-07	0.000	1.29	0.002	2.92E-07	-0.001	1.69	0.001	1.46E-07	0.000
West Virginia	18,756	37,556	19,871	1.49	0.496	2.65E-05	0.029	1.45	0.483	2.57E-05	0.029	1.55	0.516	2.75E-05	0.031

f. EPA's analysis is also flawed because it failed to consider EGU units retirements resulting in an over-prediction of EGU emissions from upwind states.

It is apparent from our review of EPA's 2023 modeling platform EGU emission files and EPA's IPM simulation that EPA has failed to account for the retirement of certain units that are scheduled to be retired by 2023 had been included in the units retired in the run.

To illustrate this error and to underscore the need for EPA to conduct a comprehensive review of its assumptions of EGU retirements before finalization of its proposed CSAPR Update Revision, MOG has requested Alpine Geophysics to prepare the following list of those expected planned retirements in Illinois and Kentucky over the next few years. These states have been selected as the illustration for this analysis as the two members of the 12 states being targeted by EPA that has the lowest contribution to the monitors of interest to EPA. The results of this analysis are set forth in Table 11 below:

State	Plant/Unit	Retirement Date / Year	Nameplate Capacity (MW)
Illinois	Coffeen 1	11/1/2019	389
Illinois	Coffeen 2		617
Illinois	Havana	11/1/2019	488
Illinois	Hennepin 1	11/1/2019	75
Illinois	Hennepin 2		231
Illinois	Duck Creek	12/15/2019	441
Illinois	Baldwin 3	11/5/2020	635
Illinois	CWLP Dallman 31	12/31/2020	78
Illinois	CWLP Dallman 32		78
Illinois	Edwards 2	12/31/2022*	281
Illinois	Edwards 3		364
Illinois	CWLP Dallman 33	9/15/2023	192
Illinois	Baldwin 1	12/31/2025*	625
Illinois	Baldwin 2		635
Illinois	Joppa 1	12/31/2025*	183
Illinois	Joppa 2		183
Illinois	Joppa 3		183
Illinois	Joppa 4		183
Illinois	Joppa 5		183
Illinois	Joppa 6		183
Illinois	Kincaid 1	12/31/2027*	660
Illinois	Kincaid 2		660
Illinois	Newton 1	12/31/2027*	617

State	Plant/Unit	Retirement Date / Year	Nameplate Capacity (MW)
Kentucky	HMP&L Station 2 – Unit 1	2/1/2019	166.7
Kentucky	HMP&L Station 2 – Unit 2	2/1/2019	173.7
Kentucky	EW Brown 1	2/28/2019	114
Kentucky	EW Brown 2	2/28/2019	180
Kentucky	Elmer Smith 1	5/29/2020 Shuttered 2019	163.2
Kentucky	TVA Paradise 3	2/1/2020	1150
Kentucky	Elmer Smith 2	5/29/2020	282.1
Kentucky	Robert Reid 1	9/30/2020	71.7
Kentucky	Kenneth C Coleman 1	9/30/2020	159.1
Kentucky	Kenneth C Coleman 2	9/30/2020	159.1
Kentucky	Kenneth C Coleman 3	9/30/2020	165.6
Kentucky	Mill Creek Generating Facility 1**	12/312024	355.5

**No later than, may retire sooner should economic or other conditions dictate.*
*** Presented in current rate case to PSC and pending approval by PSC.*

Table 11. Illinois and Kentucky unit retirements.

From the list above, Alpine has identified that Unit 3 at Baldwin, a 635 MW coal-fired boiler, which retired in November 2020 is still listed in the 2023 inventory with ozone season NOx emissions of 864 tons. Emissions from this unit would also have been assumed in the 2021 interpolation. Units SCT1 and SCT2 at the Smith Generating Facility in Kentucky are also included in the 2023 IPM emissions projection (both of 149 MW) even though they are scheduled to be retired in that year.

By including EGU sources in the 2023 modeling platform and the associated 2021 linear interpolation of emissions and air quality developed to support the rule, EPA has inaccurately characterized EGU emission profiles for these years. As a result, both the estimated air quality concentrations and associated significant contribution calculations for all upwind states is incorrect.

g. EPA's analysis erroneously relies on air quality monitoring data that is known to have been influenced by exceptional events. Failure to have accounted for the impact of these exceptional events overstates the ozone design values for the problem monitors involved and the contribution of upwind states and results in over-control that is prohibited under the Clean Air Act.

Clean Air Act Section 319 (42 U.S. Code § 7619) requires that EPA promulgate regulations that remove the impact of air quality data that is affected by what is known as "exceptional events." The following statutory requirements are established in Section 319 (b) (2)(B):

> Not later than 1 year after the date on which the Administrator publishes proposed regulations under subparagraph (A)...the Administrator shall promulgate final regulations governing the review and handling o[f] air quality monitoring data influenced by an

exceptional event that are consistent with paragraph (3)....
(3)(A) ...In promulgating regulations under this section, the Administrator shall follow—
...
(v)the principle that air quality data should be carefully screened to ensure that events not likely to recur are represented accurately in all monitoring data and analyses.

EPA has published three guidance documents describing the process by which the impacts of exceptional events are to be managed. In 2018, a memorandum by then-Director of Office of Air Quality Planning and Standards Peter Tsirigotis[18] on the development of Good Neighbor SIPs provided a discussion of exceptional events and the importance of downwind states seeking available regulatory relief before turning to upwind states. Consideration of exceptional events allows certain monitoring data impacted by exceptional events to be removed from inclusion in the determination of design values related to determining compliance with the NAAQS.

In April of 2019[19], the Director of the Air Quality Assessment Division, Richard Wayland, and then-Director of the Air Quality Policy Division, Anna Marie Wood, published a memorandum titled "Additional Methods, Determinations, and Analyses to Modify Air Quality Data Beyond Exceptional Events." Their memo notes that the "2016 Exceptional Events Rule specified that it applies to the treatment of monitoring data showing exceedances or violations of any NAAQS for the purpose of [a number of] types of regulatory determinations by the Administrator," including "other actions on a case-by-case basis as determined by the Administrator," and also noted that "EPA included 'other actions on a case-by-case basis'... to provide a degree of flexibility for addressing other possible regulatory determinations," adding that "the case-by-case provision is not intended to serve as a data-exclusion mechanism for determinations by the Administrator not influenced by exceedances or violations of the NAAQS, nor for non-regulatory purposes."

The Wayland, Wood memo then provided guidance to EPA Regions and state agencies regarding three types of determinations and analyses under which the exclusion, selection, or adjustment of air quality monitoring data may be appropriate. Significantly, one of the types of determinations and analyses is certain modeling analyses using EPA's Guideline on Air Quality Models (see 40 CFR Part 51, Appendix W) ...estimating base and future year design values for ozone and PM2.5 SIP attainment demonstrations." (emphasis supplied)

On August 8, 2019, Acting Director of the Air Quality Policy Division Scott Mathias and Director of the Air Quality Assessment Division Richard Wayland published a memorandum[20] titled "Exceptional Events Guidance: Prescribed Fire on Wildland that May Influence Ozone and Particulate Matter Concentrations," in which they provided guidance to all EPA Regions regarding

18 https://www.epa.gov/sites/production/files/2018-08/documents/ga_epd_comments_on_epa_march_27_2018_ozone_transport_memo.pdf
19 https://www.epa.gov/sites/production/files/2019-04/documents/clarification_memo_on_data_modification_methods.pdf
20 https://www.epa.gov/sites/production/files/2019-08/documents/ee_prescribed_fire_final_guidance_-_august_2019.pdf

the manner in which ozone monitoring data that is measured on days impacted by both prescribed fires and wildfires, should be analyzed, recognizing that such data may be affected by fire events and therefore improperly bias ozone design values.

A number of states including Nevada, New Jersey, Massachusetts, Rhode Island, Maryland, Colorado, Pennsylvania, Louisiana, and Connecticut have already made requests to have air masses impacted by the numerous wildfires that occurred in 2016 and 2017 be declared Exceptional Events – thus allowing monitored data influenced by those events to be excluded from the calculation of the design value for the affected monitor. The exceptional events demonstrations of all of these states have been approved in whole or in part by EPA using the guidance applicable at the time the demonstrations were submitted.

The Connecticut demonstration related to the May 2016 event showed that Canadian wildfire caused the event and noted that ". . . the exceedances of May 25-26th cannot be attributed to EGUs operating on high electric demand days as is more typically the case later in the ozone season." EPA concurred in that demonstration on July 31, 2017. For the three Connecticut monitors upon which the proposed Revised CSAPR Update was based (Stratford/Fairfield, 90013007; Westport/ Fairfield, 90019003; and Madison/New Haven, 90099002), accounting for the 2016 exception event resulted in a significant change in the ozone DV for each monitor. This is illustrated in Table 12 for Stratford, Table 13 for Westport and Table 14 for Madison below in which the red bars reflect monitor values that occurred during the exceptional events that occurred in May and July of 2016:

AQS_SITE_ID 90013007

Date	Daily MDA8 (ppm)
7/22/2016	0.096
5/25/2016	0.089
7/15/2016	0.084
7/18/2016	0.083
8/11/2016	0.082
7/21/2016	0.081
8/12/2016	0.079
7/17/2016	0.079
8/24/2016	0.076
5/26/2016	0.076

Fairfield, Connecticut

Value	Ozone MDA8 (ppb)
2016 4th (fire)	83
2016 4th (no fire)	79
2014-16 DV (fire)	81
2014-16 DV (no fire)	79

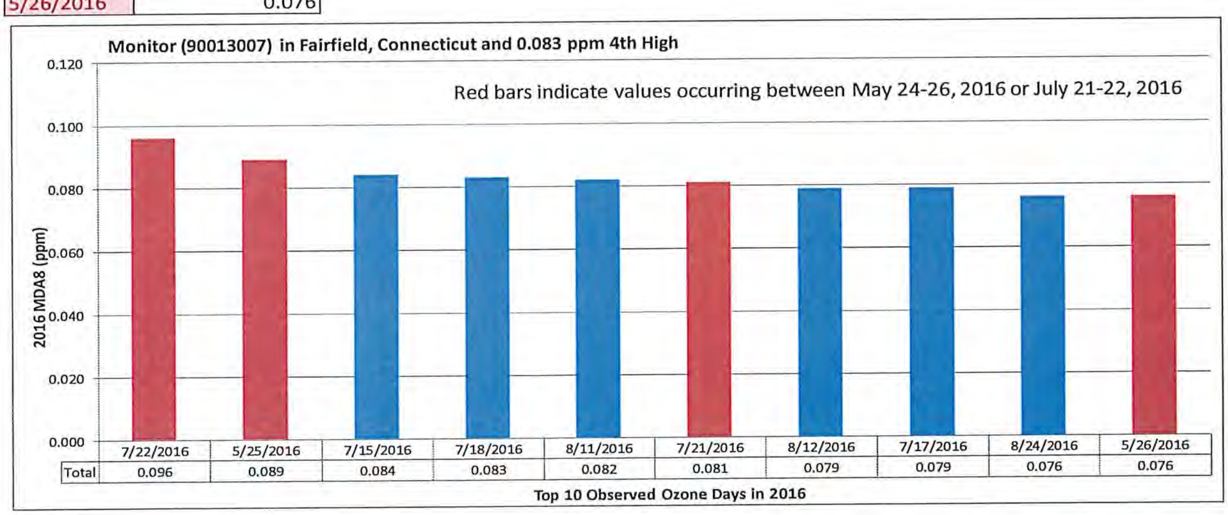


Table 12. 2016 Exceptional Event for Stratford.

AQS_SITE_ID 90019003

Fairfield, Connecticut

Date	Daily MDA8 (ppm)
7/22/2016	0.097
5/26/2016	0.090
5/25/2016	0.087
7/21/2016	0.087
8/11/2016	0.087
5/28/2016	0.081
7/18/2016	0.080
8/24/2016	0.079
8/31/2016	0.076
7/17/2016	0.076

Value	Ozone MDA8 (ppb)
2016 4th (fire)	87
2016 4th (no fire)	79
2014-16 DV (fire)	85
2014-16 DV (no fire)	82

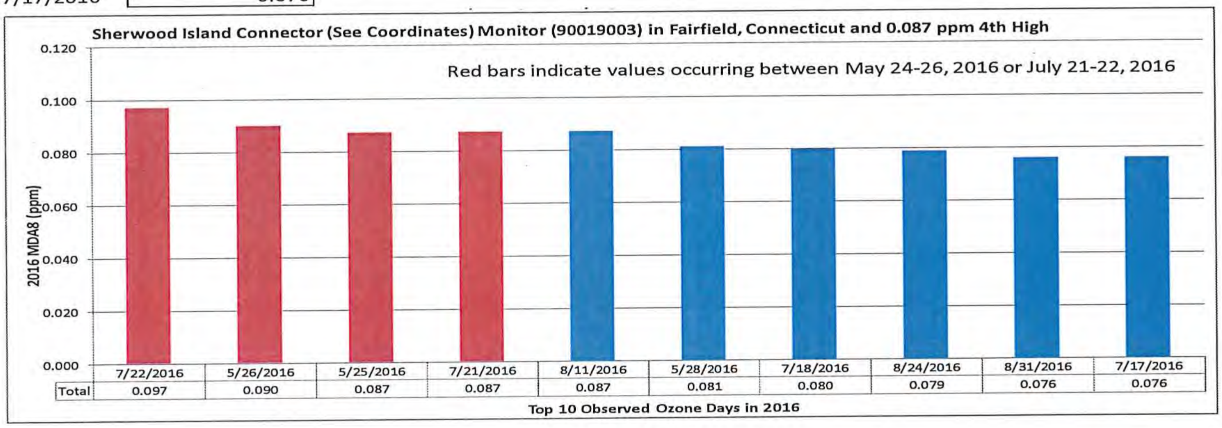


Table 13. 2016 Exceptional Event for Westport

AQS_SITE_ID 90099002

New Haven, Connecticut

Date	Daily MDA8 (ppm)
5/25/2016	0.089
5/26/2016	0.086
7/18/2016	0.082
9/14/2016	0.080
6/7/2016	0.078
7/22/2016	0.078
8/13/2016	0.077
8/12/2016	0.075
7/21/2016	0.074
6/21/2016	0.071

Value	Ozone MDA8 (ppb)
2016 4th (fire)	80
2016 4th (no fire)	77
2014-16 DV (fire)	76
2014-16 DV (no fire)	75

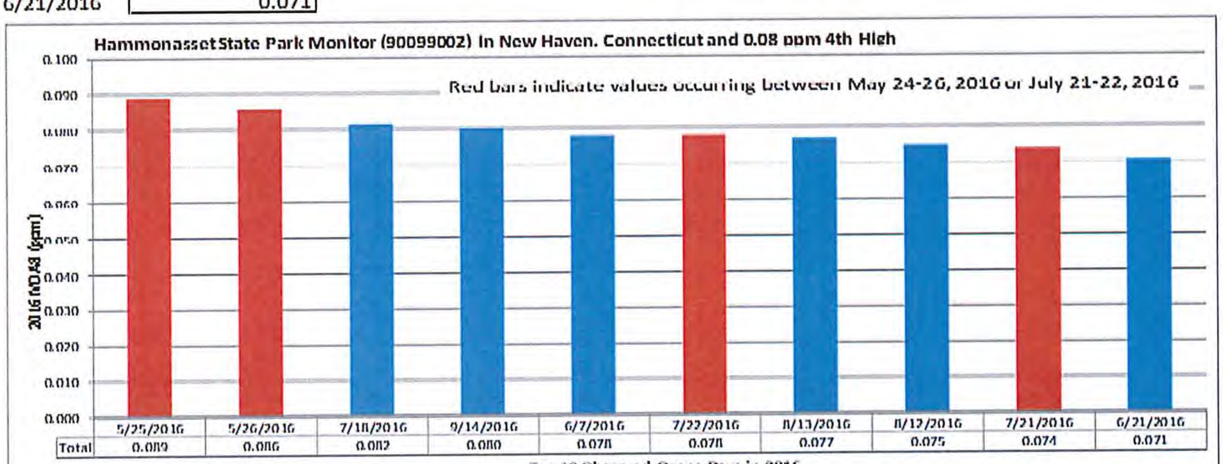


Table 14. 2016 Exceptional Event for Madison.

It is also noted that in the Connecticut exceptional events demonstration[21] for the May 2016 episode there were nine total monitors which were shown to have been impacted by the wildfire event. Of those nine, only four were shown to have immediate regulatory significance - Abington, Westport, Cornwall, and East Harford. Each of these monitors, with exceptional event exclusion, were determined to demonstrate attainment with the 1997 (Westport) or 2015 (Abington) ozone NAAQS or potentially prevent impediment of attainment with the 2008 ozone NAAQS (Cornwall and East Hartford). Two monitors not included in CT DEEP's demonstration request or in EPA's concurrence are the Stratford and Madison monitors, currently listed as nonattainment and maintenance, respectively, in this proposed rule.

In the CT DEEP demonstration, the Stratford monitor would have had a 2016 4th high ozone value reduced by 1 ppb (83 ppb to 82 ppb) and the Madison monitor would have had a 2016 4th high ozone value drop 2 ppb (from 80 ppb to 78 ppb) because of the wildfire's impact. At the time, this change in resulting 2014-2016 design value was 1 ppb at Stratford and negligible at the Madison monitor due to truncation of the 3-year average, however, now that these 2016 4th high values are also being used in the proposed rule's projection of EPA's 2016 platform to 2023 (and linearly interpolated to 2021), these adjustments now have potential regulatory significance.

CT DEEP has itself recognized the potential future impact of the additional monitors to be considered and in the 2016 wildfire demonstration report to EPA stated:

> *"Based on the severity of the difference in critical value, and the expectation that those sites with the largest differences will be controlling in any assessment of attainment status, DEEP has decided to focus this demonstration on the four sites with the greatest difference in critical value.* ***If future assessments of attainment status based on inclusion of sites with lower critical differences prove to be controlling, then DEEP will revisit this analysis."*** *(emphasis added)*

The potential change in 2016-impacted 4th high concentrations at these two monitors have the potential to generate alternate average and maximum future year design values that would impact nonattainment or maintenance status in the 2021 linear interpolation of the 2023 modeled results and could reduce the significant contribution calculation of one or more upwind states linked to those monitors. It is imperative that EPA consider these regulatory significant events, recalculate the projected design value excluding these event day concentrations, and determine the attainment status and significant contribution metrics resulting from the new values.

In addition, there have been multiple fire and other exceptional events episodes in the 2014-2018 period. Multiple fire and other exceptional events between 2018 and the present clearly fall within the ambit of the guidance memoranda published by EPA that have resulted in a significant impact on the design values of these four monitors. EPA is now obligated to undertake an examination of the exceptional events that occurred in subsequent years before concluding that any of the monitors relied upon to support this proposal are considered either nonattainment or maintenance, and, more importantly, before concluding that a multistate transport rule should be

21 https://www.epa.gov/sites/production/files/2017-09/documents/r1_ct_deep_ft._mcmurray_final_demonstration_submittal_20170523.pdf

based on only four such monitors. Failure to undertake this additional analysis creates a fatal flaw in the final rule.

h. EPA's proposal is deficient at Step 1 because it fails to consider the impact of international emissions on the monitors in Connecticut and Texas that are the basis for EPA's proposal.

While the Court in *Wisconsin* addressed international emissions as part of EPA's Step 2 analysis, it did not address international emissions at Step 1. As will be shown in this comment, it is clear that consideration of the impact of even a limited portion of international emissions at Step 1 would be more than enough to bring the subject Connecticut monitors into attainment.

The Clean Air Act makes it clear however that an implementation plan or revision as impacted by international emissions is relevant to states' attainment obligations and strategies as a matter of law. The Clean Air Act 42 U.S.C. §7509a (Section 179B) addresses International border areas. Section 179B(a) provides,

> Notwithstanding any other provision of law, an implementation plan or plan revision under this chapter shall be approved by the Administrator if – . . . (2) the submitting State establishes to the satisfaction of the Administrator that the implementation plan of such State would be adequate to attain and maintain the relevant national ambient air quality standards by the attainment date specified under the applicable provision of this chapter, or in a regulation promulgated under such provision, but for emissions emanating from outside of the United States.

EPA has spoken to international emissions in guidance[22], policy assessments[23] and rulemakings[24] relative to Good Neighbor implementation plan development and the ambient air quality standard, per Clean Air Act authorities. EPA has noted "The Clean Air Act's good neighbor provision requires states and the EPA to address interstate transport of air pollution that affects downwind states' ability to attain and maintain NAAQS. Other provisions of the CAA, namely sections 179B and 319(b), are available to deal with NAAQS exceedances not attributable to the interstate transport of pollution covered by the good neighbor provisions but caused by emission sources outside the control of a downwind state. These provisions address international transport and exceptional events, respectively." 80 Fed. Reg. 75712 (December 3, 2015) (CSAPR Update Rule).

EPA's 2018 Tsirogotis memorandum[25] on the development of Good Neighbor SIPs related to the 2015 ozone standard recognized the role of international emissions and specifically directed states to consider whether the air quality, cost or emission reduction factors should be weighted

22 Tsirigotis, Peter, Director, Office of Air Quality Planning and Standards, U.S. EPA, "Information on Interstate Transport State Implementation Plan Submissions for the 2015 Ozone National Ambient Air Quality Standards Under Clean Air Act Section 110(a)(2)(D)(i)(I). March 27, 2018.
23 85 Fed. Reg. 49830 at 49837 (August 14, 2020); Policy Assessment for the Review of the Ozone National Ambient Air Quality Standards, p. 2-36.
24 80 Fed. Reg. 75712 (December 3, 2015) (CSAPR Update Rule).
25 http://www.midwestozonegroup.com/files/transport_memo_03_27_18_1.pdf .

differently in areas where international contributions are relatively high. MOG urges EPA to continue to adhere to the Clean Air Act by requiring that states consider impacts of international emissions during the development of state implementation strategies, whether good neighbor or infrastructure implementation plans.

EPA's own data underscores the practical significance of addressing the international transport issue. Specifically, EPA performed nationwide, state-level ozone source apportionment modeling using the CAMx Ozone Source Apportionment Technology/Anthropogenic Precursor Culpability Analysis (OSAT/APCA) technique to provide data on the expected contribution of 2023 base case NOX and VOC emissions from all sources in each state. The lateral boundary and initial species concentrations (IC/BC) for the 36 km modeling domain are provided by a three-dimensional global atmospheric chemistry model, the Hemispheric version of the Community Multi-scale Air Quality Model version 3.1.1. In the source apportionment model run, the agency also tracked the ozone formed from the initial and boundary concentrations, a component of which is of international anthropogenic emission origin.

In its resulting OSAT/APCA summary tables[26], EPA also identified the relative contribution of this IC/BC component to each individual monitor. Table 15 below summarizes that relative contribution to each of the remaining nonattainment and maintenance monitors in the CSAPR Remand proposed rule.

AQS Site ID	State	Site	2016-Centered Average DV	2021 Average DV	% of 2021 DV from Can/Mex & IC/BC	U.S. State & Tribal	Canada & Mexico	Offshore Sources	Fires	IC/BCs	Biogenics
90013007	CT	Stratford	82.0	76.5	29%	48.28	2.35	0.76	0.26	19.93	4.60
90019003	CT	Westport	82.7	78.5	30%	48.82	2.58	0.68	0.35	21.07	4.78
90099002	CT	Madison	79.7	73.9	32%	43.81	3.02	1.07	0.25	20.84	4.72
482010024	TX	Houston	79.3	75.5	40%	38.60	0.25	3.60	1.14	29.65	2.07

Table 15. Impact of international emissions on nonattainment and maintenance monitors.

Comparing the contribution of Canadian and Mexican emissions with the IC/BC component, a non-zero fraction which is international anthropogenic, we see that between 29% and 40% of the average 2021 DV at each monitor is estimated from these two sectors. Additionally, at each Connecticut nonattainment monitor, the incremental contribution from the Canadian and Mexican emission category is alone (depending on rounding and significant digits) enough to demonstrate 2021 average design values at or below the 75.9 ppb nonattainment threshold necessary to meet the 2008 ozone NAAQS.[27]

26 EPA-HQ-OAR-2020-0272-0064_attachment_5.xlsx.

27 Since the source apportionment results are not calculated relative to the maximum DVs used in maintenance monitor identification, we are not able to estimate the relative impact on the New Haven monitor in the same way we can the Stratford and Westport nonattainment monitors. However, MOG urges that EPA assess the impact of international emissions on maintenance monitors relevant to this rulemaking.

It is imperative that the modeling and associated data and methods used by EPA in the development of this proposal take into consideration the impact of international transport on ozone air quality. International transport has been correctly identified in these comments as being more than enough to cause any nonattainment concerns with respect to the 2008 ozone NAAQS. As air quality improvements continue to occur as the result of steadily reducing domestic emissions of ozone precursors, the role and relative importance of international transport becomes a matter of increasing significance. Advancing the proposed Revised CSAPR Update in the face of these facts and circumstances results in over-control that is prohibited under the Clean Air Act and fails the scrutiny required under the APA for regulation based on reasonable facts avoiding arbitrary and capricious agency decisions.

i. EPA's proposal is also deficient at Step 1 because the agency failed to include consideration of significant on-the-books regulatory programs in the computer modeling used to determine the attainment status of the Connecticut monitors on which the proposal is based.

EPA has failed to account for on-the-books emission reductions programs that are of sufficient magnitude to have a material effect on the outcome of the analysis underlying the proposal. Only through a full assessment of these reductions can EPA assess whether there is a factual basis for this transport rule, since there must be nonattainment to support such a transport rule. In addition, we are mindful of the Court mandate that any effort to regulate upwind states once the downwind state has achieved attainment would be prohibited as "over-control".

There are significant regulatory program developments in the New York – New Jersey – Connecticut nonattainment area that must be assessed in EPA's Step 1 analysis to properly determine whether there will be nonattainment or maintenance areas in 2021 with respect to the 2008 ozone NAAQS. These programs include:

OTC - Section 184(c)(1) of the federal Clean Air Act establishes the following process for addressing transport concerns within the Northeast Ozone Transport Region:

> "Upon petition of any State within a transport region established for ozone … the Commission may … develop recommendations for additional control measures … if … such measures are necessary to bring any area in such region into attainment ….

This process, fairly applied, obligates OTR states to address transport from their own sources, (i.e., local sources), as the primary means for addressing any concerns those states may have about the transport of air pollutants and nonattainment. Only after implementing controls on their own sources may the OTR states satisfy their primary obligation under the CAA. Ozone Transport Commission (OTC) member states must address their own sources that are impacting air quality first after which they are required to analyze the impact of upwind states and the need to impose additional controls on those sources to attain the NAAQS. The OTC member states are significant contributors to nonattainment as measured by the Connecticut monitors. The OTC has developed model rules to establish emission reduction programs designed to address ozone nonattainment. These programs are adopted by the OTC states, including Connecticut, New York and New Jersey. An assessment of the model rules and other programs these states have on the books or on the way is essential to understanding the nonattainment conditions for ozone. The OTC annually publishes a table that reflects the status of state adoption of the model rules which can be found at: https://otcair.org/upload/Documents/Model%20Rules/OTC_SAS_MobileSources_Rules_Adoption_Tracking_07172019.xlsx.

New York – In addition to its regulation of certain oil- and natural-gas-fired combustion turbines, referred to as "peaking units," to lower their allowable NOx emissions during the ozone season (6 NYCRR Part 227-3),, New York has adopted the following programs:

- OTC Controls: The OTC table described above reflects that NY has adopted the following OTC recommended rules, as of July 2019:
  - VOC controls
    - for commercial products (Phase I 1/1/05; Phase II 1/2/2010),
    - architectural and industrial maintenance coatings (Phase I 1/1/05;
    - Phase II 1/11/2020), asphalt paving (effective),
    - portable fuel containers (effective),
    - mobile equipment repair and refinishing,
    - autobody and/or motor vehicle and mobile equipment refinishing and recoating non-assembly line coatings operations (Phase I effective);
    - solvent degreasings (Phase 1 effective; 3/19 proposed);
    - industrial, commercial and institutional adhesives and sealants (effective);
    - distributed generation (5/1/2020).
  - NOx controls
    - NY has adopted industrial, commercial and institutional boiler SCT, SRE (effective);
    - stationary generators (Part 222 under development),
    - HEDD EGU combustion turbines (Proposed 3/19);
    - EGU oil and gas boilers (7/8/2010);
    - EGUs: coal (5/2019);
    - cement and glass plants (6/19/10), and
    - municipal waste combustors. (3/14/2020).

- NOx Budget Trading Program, 6 NYCRR Part 204;
- Acid Deposition Reduction Program, 6 NYCRR Parts 237 and 238,
- Clean Air Interstate Rule (CAIR) and
- Cross-State Air Pollution Rule (CSAPR)
- Oil and Natural Gas Fired Combustion Turbines. 6 NYCRR Part 227-3 requires simple cycle combustion turbines referred to as "peaking units," to lower their allowable NOx emissions during the ozone season. By May 1, 2023, first phase of NOx emission limits become effective at 100 ppmvd for all SCCTs. May 1, 2025 is the second phase of NOx emission limits set at 25 ppmvd for gaseous fuels and 42 ppmvd for liquids. The primary goal of this regulation is to lower NOx emissions from simple cycle combustion

turbines during the ozone season. The lower emissions from these sources will help to address Clean Air Act (CAA) requirements, ozone nonattainment and protect the health of New York State residents. New York must fulfill its CAA "good neighbor" obligations which require states to include adequate measures in its state implementation plans (SIPs) prohibiting emissions of air pollutants "in amounts which will...contribute significantly to nonattainment in, or interfere with maintenance by, any other state with respect to" a NAAQS. In addition, New York must meet the 2008 and 2015 ozone NAAQS, for which the New York-Northern New Jersey-Long Island, NY-NJ-CT area is in nonattainment. On high ozone days newer SCCTs produced 64 percent of the electricity generated from SCCTs while emitting only 4 percent of NOx emissions from these sources. If the older sources were replaced with newer sources, the total NOx emissions from those older sources on the 99 high ozone days assessed would drop from the reported 1,849 tons to between 40 and 60 tons depending on efficiency. This would result in an approximate 1,800-ton reduction of NOx emissions over those high ozone days. A reduction of 18 tons of NOx emissions on an ozone season day would represent a reduction of over 10 percent of NYMA NOx emissions from the electricity generation sector and an overall reduction of 3.5 percent from all sources.

- Municipal Waste Combustion - A new Subpart 219-10 addressing municipal waste combustion units became effective on March 14, 2020 and is slated to be approved by EPA as a revision to the State Implementation Plan for New York State. The Department adopted a new Subpart 219-10 that will limit emissions of Oxides of Nitrogen (NOx) from municipal and private solid waste combustion units (MWCs) on a 24-hour average and annual average basis. These new limits are intended to reduce the amount of NOx emitted from MWCs in the state by requiring their owners and operators to apply Reasonably Available Control Technology (RACT) based on the combustion technology employed at the facility. Facilities will be required to demonstrate compliance with these new limits based on data recorded by Continuous Emissions Monitoring systems (CEMs) and by conducting an initial performance test following the promulgation of the rule. Sources will be required to demonstrate compliance within one year of the effective date of the regulation.

- Simple cycle and regenerative combustion turbines. 6 NYCRR Subpart 225-2 This regulation will lower available NOx emission from simple cycle and regenerative combustion turbines during the ozone season. "The lower emissions from these sources will help to address ozone nonattainment requirements pursuant to the Clean Air Act and protect the health of New York State residents." In the NY Register the following statement is provided, "New York must fulfill its CAA "good neighbor" obligations which require states to include adequate measures in its state implementation plans (SIPs) prohibiting emissions of air pollutants "in amounts which will...contribute significantly to nonattainment in, or interfere with maintenance by, any other state with respect to" a NAAQS. In addition, New York must meet the 2008 and 2015 ozone NAAQS, for which the New York-Northern New Jersey-Long Island, NY-NJ-CT area is in nonattainment." This rule is effective April 2, 2020.

- Aftermarket Catalytic Converter Standards (AMCC) 6 NYCRR Parts 200 and 218. NY has amended Subpart 218-7 to incorporate revisions to the standards for new California certified AMCCs. The proposed amendments prohibit the sale and installation of federal certified AMCC in New York State absent a waiver from the Department. The proposed amendments also include provisions pertaining to AMCC installation requirements; AMCC installer recordkeeping requirements; recordkeeping requirements for AMCC manufacturers, distributors, wholesalers, and retailers; and clarification of AMCC manufacturer reporting requirements. New York has made considerable progress in improving its air quality; however, several areas of the State still do not meet federal health based national ambient air quality standards (NAAQS) for ozone and have been categorized as non-attainment areas. The Department has the obligation to regulate and mitigate criteria pollutant and greenhouse gas (GHG) emissions from mobile sources to safeguard the health of State residents and protect the State's environment. This rule became effective on March 14, 2020. The adopted regulatory amendments, except the federal certified AMCC prohibition, will take effect 30 days after adoption. The prohibition of federal certified AMCCs for all 1993 and subsequent model year on-road gasoline fueled light and medium-duty motor vehicles will take effect January 1, 2023.

- Distributed Generation Sources Located in New York City, Long Island, Westchester and Rockland Counties. 6 NYCRR Part 222. Emergency generators are allowed to operate for up to 500 hours per year. The New York City building code requires buildings greater than 75 feet high be equipped with emergency generators. There are approximately 10,960 buildings in New York City greater than 75 feet in height. Assuming a typical emergency generator is 1000 kW, the capacity of emergency generation sources in New York City is estimated at 10,960 MW. Effective May 1, 2020, combustion turbines, compression ignition engines and lean-burn natural gas-fired engines must be of model year 2000 or newer or must have a NOx emission rate less than or equal to 2.96 pounds per megawatt-hour as certified in writing by a professional engineer. Also, effective May 1, 2020, rich-burn natural gas-fired engines must be equipped with three-way catalyst emission controls. These provisions are expected to result in a NOx emission reduction of more than 3.5 tons for a typical 6-hour demand response event. NOx emission reductions during DR events will come from sources currently enrolled in the NYISO programs. Potential NOx emissions from price responsive generation sources will be reduced to 11.87 tons per hour effective May 1, 2020. An owner or operator of a DG source that will operate as an economic dispatch source must notify the Department in writing by March 15, 2021 or 30 days prior to operating the source as an economic dispatch source, whichever is later. The first set of control requirements take effect on May 1, 2021. The second set of control requirements (NOx emission limits) take effect on May 1, 2025.

- Architectural and Industrial Coatings. 6 NYCRR Part 205, AIM coatings, commonly referred to as paints, release volatile organic compounds (VOCs) into the atmosphere. VOC content is regulated in Part 205 for 52 coating categories. The current VOC limits were set in 2004 and the industry and technology has changed and improved since then to make lower VOC options available. Because New York State has a nonattainment area for ozone, the Clean Air Act (CAA) requires the state to develop strategies to reduce

VOC emissions. The revisions to this rule are part of that effort. The major revisions to this proposal are intended to reduce the VOC limit on 12 coating categories, create VOC limits for 12 additional coating categories, eliminate 15 coating categories and eliminate the quart exemption. This proposal applies to any person who supplies, sells, offers for sale or manufactures architectural coatings for use in New York State. Part 205 was submitted to United States Environmental Protection Agency (US EPA) as a revision to the State Implementation Plan for New York State Applying these categorical reductions to New York, DEC estimates the rule revisions will achieve VOC mass reductions of approximately 16 tons per day (TPD). Effective date was January 11, 2020. The proposed compliance date for the sale of products is January 1, 2021. The sell-through provision allows for product manufactured before January 1, 2021 to be sold through May 1, 2023.

- Consumer Products, 6 NYCRR Part 235, consumer products regulation is proposed to reduce ozone precursor emissions, specifically volatile organic compounds (VOCs), to help attain the ozone NAAQS. The Department estimates that 164,200 tons of VOCs were released in the state during 2014 from consumer products and architectural and industrial maintenance coatings. It is essential that the Department adopt stringent consumer product emissions limitations to protect human health and the environment. The current version of the consumer products regulations in New York State is based on a 1996 version of regulations effective in California as required by Section 183 of the Clean Air Act. 42 USC 7511b. Revisions to Part 235 are expected to reduce VOC emissions from products used throughout the state. As a result of these product formulation revisions, the amount of VOC released to the air is expected to be reduced by 5.3 tons per day (approximately 1900 tons per year). Since emissions from consumer products are highest in population centers, the reduction in the New York City metropolitan area, where the ozone standard is exceeded, is expected to be 3.4 tons per day.

- RACT. Stringent Reasonably Available Control Technology on all major NOx and VOC stationary sources in New York, including power plants and major non-power plant sources. 6 NYCRR Parts 212-3, 220 and 227-2 as adopted on 4/30/2015 State Implementation Plan revision for the 2008 and 2015 8-hour Ozone NAAQS, draft SIP submittal of October 2020.

  NOx RACT Regulations (4/30/2015)
  □ Subpart 212-3, "Reasonably Available Control Technology for Major Facilities"
  □ Subpart 212-4, "Control of Nitrogen Oxides for Hot Mix Asphalt Production Plants"12
  □ Part 214, "Byproduct Coke Oven Batteries"
  □ Part 216, "Iron and/or Steel Processes"
  □ Subpart 220-1, "Portland Cement Plants"
  □ Subpart 220-2, "Glass Plants"
  □ Subpart 227-2, "Reasonably Available Control Technology (RACT) for Major Facilities of Oxides of Nitrogen (NOx)"

VOC RACT Regulations (4/30/2015)
□ Subpart 212-3, "Reasonably Available Control Technology for Major Facilities"
□ Part 226, "Solvent Cleaning Processes and Industrial Cleaning Solvents"
□ Part 228, "Surface Coating Processes, Commercial and Industrial Adhesives, Sealants and Primers"
□ Part 229, "Petroleum and Volatile Organic Liquid Storage and Transfer"
□ Part 230, "Gasoline Dispensing Sites and Transport Vehicles"13
□ Part 233, "Pharmaceutical and Cosmetic Manufacturing Processes"
□ Part 234, "Graphic Arts"

- California vehicle emission standards. 6 NYCRR Part 218. NY has adopted California's motor vehicle emission standards, which place more stringent controls on the amount of NOx emitted from motor vehicles than federal emission standards. New York has adopted the Low Emission Vehicle III standards, which set emissions standards on all 2017 through 2025 model year vehicles up to 14,000 pounds gross vehicle weight rating, and most recently adopted revisions to strengthen our aftermarket catalytic converter standards. This was most recently amended in September 2016.

- Statewide Vehicle Inspection and Maintenance 6 NYCRR Part 217-6. requirements for motor vehicles that include testing of older, high emitting vehicles to significantly reduce on-road mobile emissions.

- VOC Controls. Adoption of regional measures to reduce VOC emissions from a variety of large source categories that have been recommended by the Ozone Transport Commission including consumer products, architectural and industrial maintenance coatings, portable fuel containers, adhesives and sealants, asphalt paving, and solvent metal cleaning processes. 6 NYCRR Parts 235, 205, 239, 228, 241 and 226.

- LAER. Lowest Achievable Emission Rate standards on all new major sources of NOx or VOCs, and on all existing sources that would undergo major modifications with emissions above certain significant project thresholds. 6 NYCRR Part 231.

- Boilers and Indirect Fired Process Heaters. The NYDEP announced a new general permit (GP-009B) in April 2020 addressing boilers greater than or equal to 10 MMBTU/hr and less than 50 MMBTU/hr for boilers and indirect fired process heaters combusting gaseous fuel. Natural gas and No. 2 fuel oil (under specific conditions) are the only fuels that may be used under this permit. The new permit has a maximum limit of NG fuel consumption of 840 MMSCF/year, the previous permit did not have. The 500 hours yearly limit on No. 2 Fuel Oil consumption was reduced to 48 hours. The purpose is to control emissions of NOx, CO, VOC, TSP, PM2.5, SO2 and HAP emissions.

New Jersey New Jersey has adopted emissions standards for NOx and VOCs that are more stringent than federal regulations.

- <u>OTC Controls</u>: The OTC table discussed above reflects that NJ has adopted the OTC recommended rules, as of July 2019 as follows:
    - VOC controls
        - commercial products (Phase I 1/1/05; Phase II 1/1/09),
        - architectural and industrial maintenance coatings (Phase I 1/1/05),
        - asphalt paving (3/20/09),
        - portable fuel containers (Phase I 1/1/05; Phase II 1/28/09),
        - mobile equipment repair and refinishing,
        - autobody and/or motor vehicle and mobile equipment refinishing and recoating non-assembly line coatings operations (Phase I; 2002));
        - solvent degreasings (Phase 1 2002);
        - industrial, commercial and institutional adhesives and sealants (1/1/09)
        - large above ground VOC storage tanks (3/20/2009).
    - NOx controls
        - industrial, commercial and institutional boiler SCT, SRE (2005);
        - ICI boilers (3/20/2009);
        - distributed generation standards (effective);
        - stationary generators (9/08/2005),
        - asphalt productions (3/20/2009);
        - glass production (3/20/2009);
        - HEDD EGU combustion turbines (Compliance 2009 and 2015);
        - EGU oil and gas boilers (compliance 2013/2014);
        - EGU coal (effective);
        - municipal waste combustors (3/20/2009)
        - refineries (consent decrees)
        - mobile sources, (statewide VOC and NOx (gasoline) requirements.

- <u>Power Plants:</u> New Jersey has enforceable performance standards, including short-term standards, for NOx emissions from power plants that are among the most stringent and effective air pollution control regulations in the country. New Jersey has taken the lead by adopting measures to address emissions from power plants that operate on days of high electricity demand when ozone concentrations tend to be elevated. These sources are critically important contributors to episodes of elevated ozone in the New York Metropolitan Area. N.J. Admin. Code §§ 7:27-19.29 and 19.30.

- <u>Distributed Generation/Demand Response</u>: New Jersey's rules for stationary reciprocating internal combustion engines do not allow the use of engines without emissions controls for the purpose of distributed electric generation or demand response in non-emergency situations. However, in many states these engines are uncontrolled and used to assist the electric grid during high electric demand periods. Like the power plants discussed in the previous bullet point, many of these engines are operating on hot summer days which usually coincide with high ozone days. N.J. Admin. Code § 7:27-19.8

- Municipal Waste Combustors: New Jersey has implemented measures to control NOx emissions from Municipal Waste Combustors. N.J. Admin. Code § 7:27-19.12

- Mobile Source Controls: New Jersey has addressed emissions from mobile sources to the extent that state action is not pre-empted by the Clean Air Act. New Jersey has adopted a Low Emission Vehicle Program addressing motor vehicle emissions based on the standards used by the State of California to ensure that the lowest emitting vehicles available in the nation are sold in New Jersey including zero emission vehicle standards. New Jersey also has some of the most stringent rules in the country for vehicle idling and heavy-duty vehicle inspection and maintenance using on-board diagnostics technology. N.J. Admin. Code § 7:27-28.1 to -28.

- Pipeline Compressor Stations: In 2017, New Jersey enacted new limits on NOx emissions from natural gas pipeline compressor stations that use combustion turbines or reciprocating engines to - maintain system flow and overcome pressure losses and to facilitate the movement of the natural gas. There are no federal NOx standards for existing (as opposed to newly-constructed) compressor turbines or compressor engines, but New Jersey identified this class of sources for controls to further its efforts to attain the ozone NAAQS. N.J. Admin. Code §§ 7:27-19.5 and -19.8.

- Strict VOC Emissions Standards: New Jersey has also adopted stringent control measures to reduce emissions of VOCs. New Jersey requires State of the Art air pollution control for significant equipment of new VOC sources at minor facilities. The State has implemented one of the most stringent petroleum storage tank rules to address VOC emissions from bulk petroleum storage facilities. More recently, New Jersey has adopted guidelines to address VOC emissions from a variety of commercial sectors: Industrial Cleaning Solvents, Paper, Film, and Foil Coatings, Fiberglass Boat Manufacturing Materials, and Miscellaneous Metal and Plastic Parts Coatings. N.J. Admin. Code § 7:27-16.1 et seq.

Connecticut

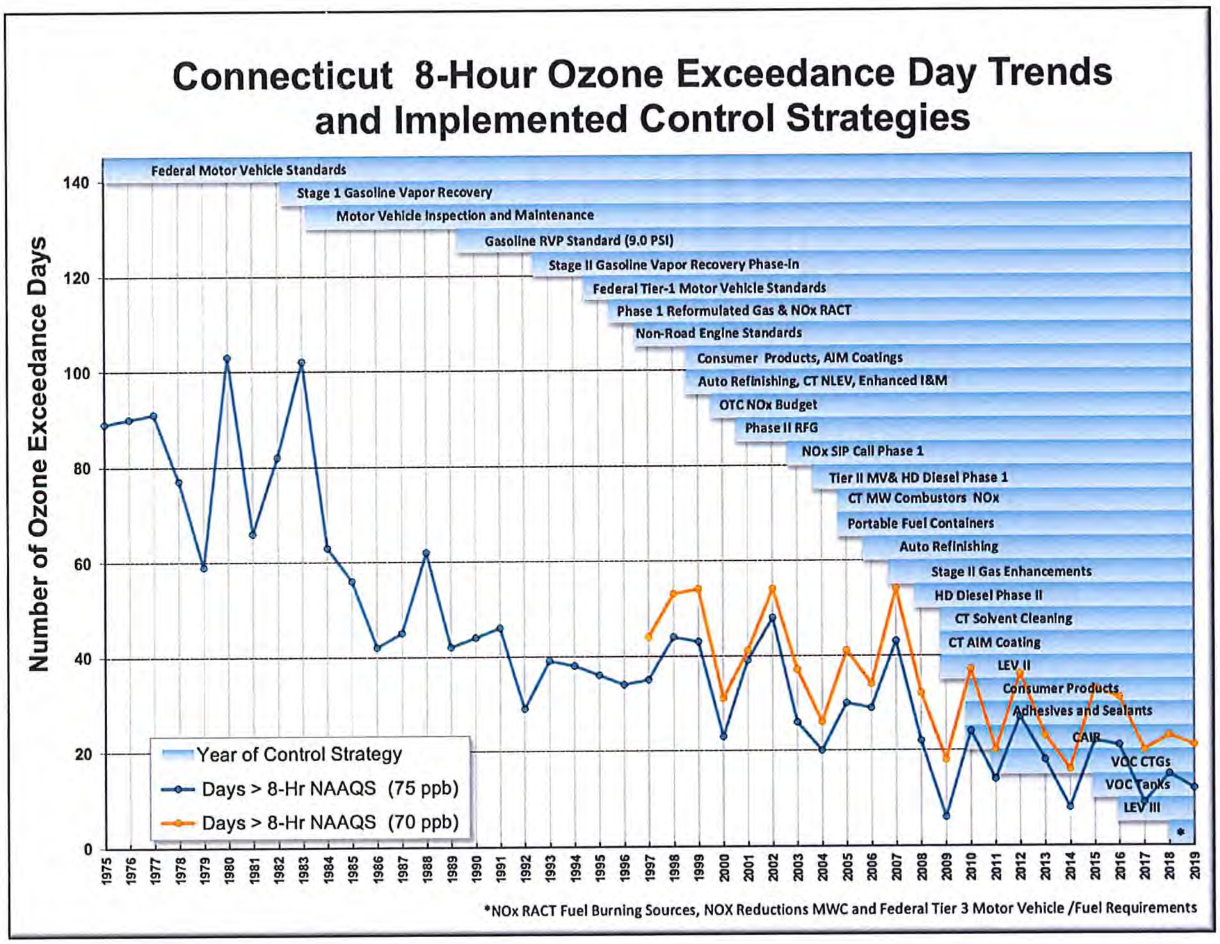
- OTC Controls: The OTC table discussed above reflects that Connecticut has adopted the OTC recommended rules, as of July 2019 as follows:
  - VOC controls
    - commercial products (7/26/2007),
    - architectural and industrial maintenance coatings (7/26/2007; 2/1/2010; 4/6/2016),
    - asphalt paving (7/26/2007),
    - portable fuel containers, mobile equipment repair and refinishing, autobody (4/4/2006) and/or motor vehicle and mobile equipment refinishing and recoating non-assembly line coatings operations (Phase I);
    - solvent degreasings (Phase 1);
    - industrial, commercial and institutional adhesives and sealants (10/03/2008;

- Amended Compliance 1/1/2009)
- large above ground VOC storage tanks (3/07/2014).

o NOx controls

- industrial, commercial and institutional boiler SCT, SRE;
- distributed generation standards; stationary generators, HEDD EGU combustion turbines (Effective 12/22/2016);
- EGU oil and gas boilers (4/6/2016);
- municipal waste combustors. (10/26/2000) (12/22/2016 amended 10/8/2019 to address "emergency engines")
- mobile sources, (statewide VOC and NOx (gasoline) requirements) (7/8/2015; 4/15/2014)
- emission standards for motor vehicles (8/10/2009). LEV Programs (1999 and 2009).

The graphic below provides an overview of Connecticut Ozone Control Strategies.



- Multi-State Medium & Heavy Duty Zero Emission Vehicle Initiative along with 14 other states to include all of its neighboring states. This organization has a 2021 timeline for the development of an action plan working with NESCAUM. As noted in the briefing provided to the CT State Implementation Revision Advisory Committee ("SIPRAC") in September 2020, 2017 Mid-Atlantic/Northeast NOx emissions from mobile sources represented a significant portion of the NOx emission inventory.

- Connecticut is also in the process to revising its General Permit to Limit Potential to Emit under which facilities registered with the option to limit premises actual emissions below 50% or 80% of Title V thresholds.

Maryland

- MD Healthy Air Act: Maryland is requiring power plants to minimize NOx emissions every day of the ozone season by optimizing and operating existing pollution control equipment and by lowering emission rates to achieve increasingly stringent standards by 2020. During the 2020 ozone season, coal-fired power plants will need to be controlled by state-of-the-art Selective Catalytic Reduction (SCR) control technology, convert to cleaner natural gas or meet stringent system-wide NOx emission limits equivalent to those achieved by SCR controls on all units. Annotated Code of Maryland Environment Title 2 Ambient Air Quality Control Subtitle 10 Health Air Act Sections 2-1001 - 2-1005.

- Local Ozone Monitoring: The Maryland Department of the Environment has observed on record in its public briefing materials the impact of large city centers on adjacent counties relative to ozone nonattainment. These facts concerning local monitored impacts highlights Maryland's observation for the need for effective nonattainment strategies on a local basis.

- Diesel Emissions Reduction Act: Acknowledgement of the significant value of local emission reductions in the Port of Maryland can be found in EPA's commitment of over $2.4 million pursuant to Diesel Emissions Reduction Act (DERA) grant to Maryland Environmental Services, which will use the funds to upgrade diesel equipment that is used to move cargo at the Port. The emphasis of this program is upon marine vessel repower, cargo handling equipment repower and replacement, drayage truck replacement.

Illinois

- Multi-Pollutant Standard (MPS): The Illinois MPS was recently revised to significantly reduce both the allowable annual and ozone-season NOx emissions from all but two of Illinois coal-fired EGUs. The MPS revision was final and effective on August 23, 2019 and was retroactively applicable in 2019 and applies each year thereafter with the possibly of emission requirements becoming even more stringent if additional units are sold, temporarily shut down, or permanently retired. Furthermore, Illinois EPA is required to develop and implement NOx RACT SIP requirements in Illinois from sources other than EGUs. [35 Ill. Adm. Code 225]

Accordingly, EPA has a duty to confirm that its modeling and analysis has accounted for these on-the-books emission reductions programs. Failure to do so raises the likelihood that the problem monitors on which this proposal is based would actually be in attainment of the 2008 ozone NAAQS. In that case there would be no legal authority for the proposal since by definition, advancing a transport rule where all downwind receptors are in attainment is prohibited "over-control".

j. EPA's approach for identifying maintenance areas in Connecticut and Texas at Step 1 is fatally flawed.

EPA's proposal inappropriately applies the nonattainment area significance test to maintenance areas and provides the same weight to the development of controls programs to address maintenance areas as it does nonattainment areas. We object to this proposal both because maintenance areas should not be subject to the same "significance" test as applies to nonattainment areas and because maintenance areas do not require the same emission reduction response as nonattainment areas. Clarifying the difference between nonattainment and maintenance, the U.S. Supreme Court opinion in *EPA v. EME Homer II, 572 U.S. 489, 134 S. Ct. 1584, 188 L. Ed. 2d 775 (2014) provides as follows:*

> The statutory gap identified also exists in the Good Neighbor Provision's second instruction. That instruction requires EPA to eliminate amounts of upwind pollution that "interfere with maintenance" of a NAAQS by a downwind State. §7410(a)(2)(D)(i). This mandate contains no qualifier analogous to "significantly," and yet it entails a delegation of administrative authority of the same character as the one discussed above. Just as EPA is constrained, under the first part of the Good Neighbor Provision, to eliminate only those amounts that "contribute . . . to *nonattainment*," EPA is limited, by the second part of the provision, to reduce only by "amounts" that "interfere with *maintenance,"* i.e., by just enough to permit an already-attaining State to maintain satisfactory air quality. (Emphasis added). With multiple upwind States contributing to the maintenance problem, however, EPA confronts the same challenge that the "contribute significantly" mandate creates: How should EPA allocate reductions among multiple upwind States, many of which contribute in amounts sufficient to impede downwind maintenance." Nothing in *either* clause of the Good Neighbor Provision provides the criteria by which EPA is meant to apportion responsibility.

The lower court case in the D.C. Circuit, *EME Homer v. EPA*, 696 F.3d 7 (D.C. Cir. 2012) held:

> The statute also requires upwind States to prohibit emissions that will "interfere with maintenance" of the NAAQS in a downwind State. "Amounts" of air pollution cannot be said to "interfere with maintenance" unless they leave the upwind State and reach a downwind State's maintenance area. To require a State to reduce "amounts" of emission pursuant to the "interfere with maintenance" prong, EPA must show some basis in evidence for believing that those "amounts" from an upwind State, together with amounts from other upwind contributors, will reach a specific maintenance area in a downwind State and push that maintenance area back over the NAAQS in the near future. Put simply, the "interfere with maintenance" prong of the statute is not an open-ended invitation for EPA to impose

reductions on upwind States. Rather, it is a carefully calibrated and commonsense supplement to the "contribute significantly" requirement.

The *Wisconsin* court concludes that EPA's CASPR Update rule "gives effect to the upwind States' independent duty not to impede downwind States' maintenance of air quality standards." *Wisconsin* at 326. The Court recounts the *EME Homer II* decision by quoting, ". . .after *EME Homer II*, the maintenance prong only authorizes EPA to "limit emissions 'by just enough to permit an already attaining State to maintain satisfactory air quality.'" *EME Homer III*, 795 F.3d 118,137 (quoting *EME Homer II*, 572 U.S. at 515, n.18, 134 S.Ct. 1584)." Although the decision notes that Industry Petitioners failed to provide an actual instance of overcontrol, it sets the stage for further analysis of maintenance as contemplated by the Clean Air Act. *Id.* at 327.

In its proposed Revised CSAPR Update rule EPA would "limit ozone season (May 1 through September 30) NOx emissions from EGUs in 12 states that are linked to 2 nonattainment and 2 maintenance monitors."

The proposed rule separately identifies "maintenance receptors as those receptors that would have difficulty maintaining the relevant NAAQS in a scenario that takes into account historical variability in air quality at that receptor. The variability in air quality was determined by evaluating the 'maximum' future design value at each receptor based on a projection of the maximum measured design value over the relevant period. EPA interprets the projected maximum future design value to be a potential future air quality outcome consistent with the meteorology that yielded maximum measured concentrations in the ambient data set analyzed for that receptor (i.e., ozone conducive meteorology). EPA also recognizes that previously experienced meteorological conditions (e.g., dominant wind direction, temperatures, air mass patterns) promoting ozone formation that led to maximum concentrations in the measured data may reoccur in the future." The result is that "[m]aintenance-only receptors include both (1) those sites with projected average design values above the NAAQS that are currently measuring clean data and (2) those sites with projected average design values below the level of the NAAQS, but with projected maximum design values of 76 ppb or greater."

As proposed by EPA, use of a modeled maximum design value, when the average is below the NAAQS to define contribution, results in a conclusion that any modeled contribution is deemed to be significant interference with maintenance. This concept is unreasonable and results in monitors being identified as maintenance that are projected to be in attainment in future years using EPA's published alternative flexibilities in projecting future air quality.

While EPA states that it is "not reopening the definition of nonattainment and maintenance receptors promulgated in the CSAPR Update" (85 Fed Reg 68979), that comment ignores the fact that EPA, subsequent to issuance of the CSAPR Update, released guidance on a more flexible approach to making a determination about maintenance monitors. EPA's departure from its own guidance raises the *Chevron* question about whether an agency can articulate "a rational connection between the facts found and the choice made."

Under EPA's memo[28], a modeled demonstration would need to show that using an alternative base year period would lead to a projected future year design value at or below NAAQS. If that demonstration is successful, EPA would expect states to include with their SIP demonstration submission technical analyses showing that:

1. meteorological conditions in the area of the monitoring site were conducive to ozone formation during the period of clean data or during the alternative base period design value used for projections;
2. ozone concentrations have been trending downward at the site since 2011 (and ozone precursor emissions of nitrogen oxide (NOx) and volatile organic compounds (VOC) have also decreased); and
3. emissions are expected to continue to decline in the upwind states out to the attainment date of the receptor.

MOG has applied this analysis to the two maintenance monitors in Connecticut and Texas identified in the proposed CSAPR Update Revision and has determined that using EPA's modeling and available observed ozone concentrations, these two monitors can meet the conditions outlined in EPA's memo. States therefore have adequate justification to request EPA to determine that it is no longer necessary to consider any of the subject monitors as maintenance monitors for purposes related to the 2008 ozone NAAQS.

As a first step in demonstrating whether a monitor should be properly characterized as a maintenance receptor, 2023 ozone design values (and their associated 2021 linear interpolation) using alternate base year concentrations (from the three, three-year time periods between 2014 – 2018) for the nonattainment and maintenance monitors are presented in the following Table 16. These data demonstrate that three of the four monitors have at least one alternate base year period design value that results in an interpolated 2021 maximum design value projection equal to or lower than the 75.9 ppb threshold satisfying this condition.

			2021 Interpolated Ozone Design Value (ppb)				
Monitor	**Site**	**DVb (2016)**	**DVf (Avg)**	**DVf (Max)**	**DVf Max (2014/16)**	**DVf Max (2015/17)**	**DVf Max (2016/18)**
90013007	Stratford	82.0	76.5	77.4	75.6	77.4	76.5
90019003	Westport	82.7	78.6	78.9	78.9	78.9	77.9
90099002	Madison	79.7	74.0	76.1	70.6	76.1	75.2
482010024	Houston	79.3	75.5	77.1	75.2	77.1	74.3

Table 16. Alternate Base Year Projections of 2021 Ozone Design Values (ppb).

The next criteria established in EPA's guidance memo for approving an alternative demonstration of a monitor's maintenance status is that the "meteorological conditions in the area of

28 https://www.epa.gov/sites/production/files/2018-10/documents/maintenance_receptors_flexibility_memo.pdf

the monitoring site were conducive to ozone formation during the period of clean data or during the alternative base period design value used for projections."

Meteorological conditions including temperature, humidity, winds, solar radiation, and vertical mixing affect the formation and transport of ambient ozone concentrations. Ozone is more readily formed on warm, sunny days when the air is stagnant and/or when the winds are favorable for transport from upwind source areas. Conversely, ozone production is more limited on days that are cloudy, cool, rainy, and windy (http://www.epa.gov/airtrends/weather.html). Statistical modeling analyses have shown that temperature and certain other meteorological variables are highly correlated with the magnitude of ozone concentrations. The overall extent to which meteorological conditions vary from year-to-year (i.e., interannual variability) depends on the nature of large-scale meteorological drivers such as the strength and position of the jet stream. Inter-annual cycles in the jet stream contribute to interannual variability in the degree to which summertime meteorological conditions are favorable for ozone formation within a particular region. Meteorological conditions that frequently correspond with observed 8-hour daily maximum concentrations greater than the National Ambient Air Quality Standards (NAAQS) are referred to as being conducive to ozone formation.

In general, below average temperatures are an indication that meteorological conditions are unconducive for ozone formation, whereas above average temperatures and mean temperature departures from average are an indication that meteorology is conducive to ozone formation. Within a particular summer season, the degree that meteorology is conducive for ozone formation can vary from region to region and fluctuate with time within a particular region. As presented in Figure 13 below, the temperature and precipitation-related information suggests that ozone season meteorology was generally conducive for ozone formation in both Connecticut and Houston in all years between 2014 and 2018, the years in which each of the 3-year design values used in maintenance monitor determination were calculated.

As an additional supporting case for flexibility in identifying maintenance monitors, EPA guidance provides that a state would need to show that "ozone concentrations have been trending downward at the site since 2011". Table 17 below presents 3-yer ozone design value data calculated for each receptor from yearly 4th high values and a calculated slope between 2011 and the most recently EPA-approved design value for 2019. For all monitors listed, negative slope, indicating the necessary downward trends, are demonstrated which satisfies the required condition of trending downward concentrations.

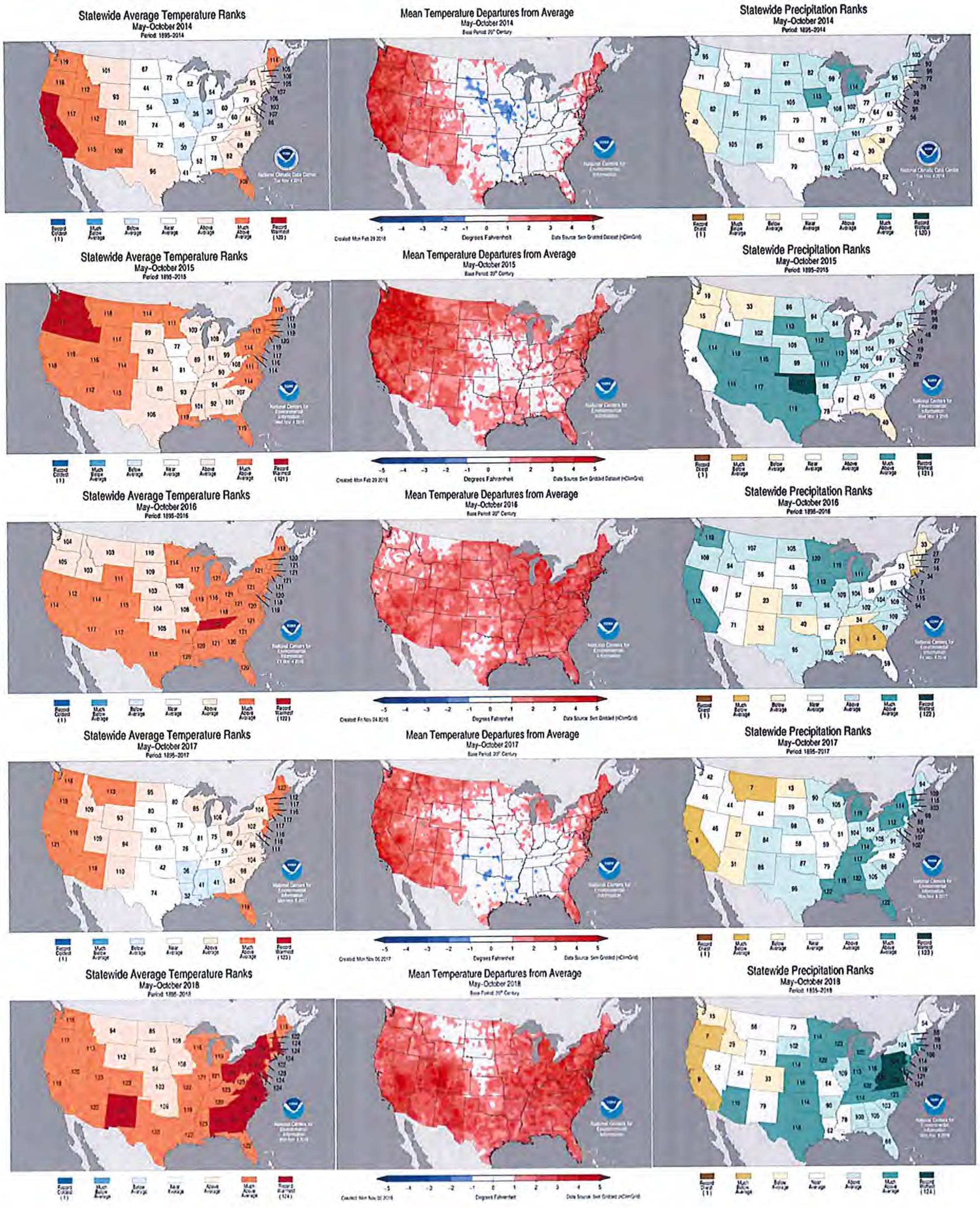


Figure 13. Statewide Ozone Season Temperature Ranks, Temperature Departure from Average, and Precipitation Ranks, 2014-2018, for Years Used in Maintenance Design Value Calculations.

Table 17. 3-Year Ozone Design Values (ppb) and Slope Calculation (2011-2019)

				3-Year Ozone Design Value (ppm)									
State	**County**	**Site ID**	**Local Site Name**	**2009-2011**	**2010-2012**	**2011-2013**	**2012-2014**	**2013-2015**	**2014-2016**	**2015-2017**	**2016-2018**	**2017-2019**	**Slope (2011 to 2019)**
Connecticut	Fairfield	090013007	Stratford	0.079	0.085	0.089	0.084	0.083	0.081	0.083	0.082	0.082	-2.00E-04
Connecticut	Fairfield	090019003	Westport	0.079	0.085	0.087	0.085	0.084	0.083	0.083	0.082	0.082	-1.17E-04
Connecticut	New Haven	090099002	Madison	0.081	0.087	0.089	0.081	0.078	0.076	0.082	0.081	0.082	-5.50E-04
Texas	Harris	482010024	Houston	0.083	0.081	0.077	0.072	0.079	0.079	0.081	0.078	0.081	-3.33E-05

As reported in earlier sections of this document, NOx and VOC emissions across the CSAPR region have been dramatically reduced in recent years. These emission reductions will continue as the result of "on-the-books" regulatory programs already required by states on their own sources, "on-the-way" regulatory programs that have already been identified by state regulatory agencies as efforts that they must undertake as well as from the effectiveness of a variety of EPA programs including the CSAPR Update Rule.

EPA's October 19, 2018 guidance memo offers states the option of using an alternative method of identifying maintenance monitors to be addressed in their Good Neighbor SIPs. The analysis presented here illustrates that when current data is applied to the various criteria identified by EPA, states are provided with the basis for requesting EPA to determine that it is no longer necessary to consider any of the subject monitors as maintenance monitors for purposes related to the 2008 ozone NAAQS.

Accordingly, MOG urges EPA to apply its own guidance for determining maintenance monitors and therefore to conclude there are no remaining maintenance monitors to be addressed in response to the CSAPR Update remand.

3. While EPA correctly concludes at Step 2 that the 9 upwind states contributing 1% or less to downwind problem areas should not be made subject to additional controls, its refusal to consider higher significance levels for other states is arbitrary and capricious.

There can be no argument with EPA's conclusion that upwind state that contribute 1% or less to a downwind nonattainment or maintenance area are not significant contributors for purposes of the Good Neighbor provisions of the Clean Air Act. However, EPA's refusal to consider higher significance levels consistent with its own guidance is an arbitrary and capricious action that alone is a fatal flaw in its proposed Revised CSAPR Update.

a. EPA decision not to consider significance levels of 1 ppb and 2 ppb is arbitrary and capricious and inconsistent with EPA's own guidance.

The *Wisconsin* court reminds EPA that "the agency retains some flexibility in administering the Good Neighbor Provision. We acknowledge that the "realities of interstate air pollution . . . are not so simple," and EPA faces its share of "thorny ... problem[s]" in regulating it." *EME Homer II*, 572 U.S. at 514-16, 134 S.Ct. 1584. EPA, though, possesses a measure of latitude in defining which upwind contribution "amounts" count as "significant" and thus must be abated. See *Id.* at 518, 1324 S.Ct. 1584, 520 n.21. And the Supreme Court has indicated that EPA can take into account, among other things, "the magnitude of upwind States' contributions and the cost associated with eliminating them." *Id.* at 518, 134 S.Ct. 1584. Additionally, in certain circumstances, EPA can grant one-year extensions of the nonattainment deadline to downwind States. *Wisconsin* at 320.

The CAA includes no specifics regarding establishment of a significance level applicable to interstate transport. CAA Section 110(a)(2)(d) simply requires that:

> "(2) Each implementation plan submitted by a State under this chapter shall be adopted by the State after reasonable notice and public hearing. Each such plan shall—
>
> . . .
>
> (D) contain adequate provisions—
>
> (i) prohibiting, consistent with the provisions of this subchapter, any source or other type of emissions activity within the State from emitting any air pollutant in amounts which will—
>
> (I) contribute significantly to nonattainment in, or interfere with maintenance by, any other State with respect to any such national primary or secondary ambient air quality standard, or
>
> (II) interfere with measures required to be included in the applicable implementation plan for any other State under part C of this subchapter to prevent significant deterioration of air quality or to protect visibility,
>
> (ii) insuring compliance with the applicable requirements of sections 7426 and 7415 of this title (relating to interstate and international pollution abatement) ..."

There is no further guidance under the CAA to define "amounts [of emissions] which will contribute significantly to nonattainment in, or interfere with maintenance by, any other state with respect to any such primary or secondary ambient air quality standard ...."

As is pointed out elsewhere in these comments, there are serious concerns about the performance of EPA's model. These concerns are acknowledged by EPA particularly with respect to all of the nonattainment monitors which coincidentally are located on a land-water interface. EPA raises the issue about the use of "3 x 3" and "no water" approaches for this rulemaking for comment in C-2, implicating the debated issues about the accuracy of the model. Given these and other uncertainties about the reasonableness of the predictions of EPA's modeling, we strongly urge that the significance level established in CSAPR and in this proposal be reconsidered and be increased to take account of these modeling limitations. In addition, setting a higher significance level is a useful approach for assurance that there is no unlawful over-control of emissions from upwind states.

EPA's use of a one-percent-of-NAAQS threshold ignores the limits of the capability of the Agency's air quality modeling techniques – and of ambient monitoring – to meaningfully detect and measure ambient-air contributions at the extremely low levels represented by one percent of current or possible future NAAQS. The numerical values that result from application of EPA's one-percent contribution – in this case, 0.75 ppb, to link upwind states to downwind receptors projected by EPA to be in nonattainment of, or to have problems maintaining attainment of, the 2008 ozone NAAQS – are so low that they are likely below the detection capability of existing modeling and measurement tools. For that reason, EPA lacks a reasonable basis to conclude that a one-percent-of-NAAQS threshold can be deemed to reflect a "measurable contribution" to downwind nonattainment and maintenance problems, as required by the D.C. Circuit. *Michigan*, 213 F.3d at 684 (". . . *EPA must first establish that there is a measurable [air quality] contribution.* Interstate contributions cannot be assumed out of thin air.") (emphasis in original).

EPA has continued to fail to provide any such justification or analysis for its insistence on the use of a 1% significance threshold. EPA's use of the one-percent-of-NAAQS threshold is becoming even more arbitrary and unjustified as the Agency applies that low threshold to revised NAAQS that are established at levels even lower than those EPA addressed in the CSAPR Update.

Accordingly, MOG objects to EPA's proposal to use its percentage-based air quality contribution threshold approach in the current rulemaking – or in any future interstate transport rulemaking – because of the absence of a robust technical justification that the resulting thresholds reflect meaningful, and truly measurable, air quality contributions, consistent with the D.C. Circuit's directive in *Michigan*.

b. As EPA itself explained in its August 2018 memo, it is appropriate to consider significance levels of 1 ppb and 2 ppb.

In its August 31, 2018 memo,[29] EPA compared two additional ozone concentration contribution thresholds; 1 ppb and 2 ppb. The purpose of the analysis described in the memo was to determine alternate, appropriate screening thresholds for consideration in addressing Good Neighbor provisions of the Clean Air Act. Ultimately in that memo, EPA noted that a threshold of 1 ppb may be appropriate for addressing the good neighbor provision.

As shown in Tables 18, 19, 20 and 21, we review the remaining nonattainment and maintenance monitors as defined in the NPR. In this, we have also included EPA's 2021 OSAT/APCA contributions documented in the docket[30].

			APCA Relative Contribution (ppb)													
AQS Site ID	Site	2021 Ave DV (ppb)	CT	IL	IN	KY	LA	MD	MI	NJ	NY	OH	PA	TX	VA	WV
90019003	Westport	78.5	2.73	0.81	1.26	0.87	0.27	1.20	1.71	8.62	14.44	2.55	6.86	0.59	1.30	1.49
90013007	Stratford	76.5	4.16	0.69	0.99	0.78	0.27	1.21	1.16	7.70	14.42	2.34	6.72	0.58	1.29	1.45
482010024	Houston	75.5	0.00	0.02	0.02	0.02	4.68	0.00	0.00	0.00	0.00	0.00	0.00	32.68	0.00	0.00
90099002	Madison	73.9	3.96	0.80	1.08	0.79	0.15	1.56	1.62	5.71	12.54	2.35	5.64	0.36	1.69	1.55

Table 18. EPA 12km OSAT/APCA contributions to nonattainment and maintenance monitors. Yellow + orange + red cells indicate states contributing with 1% threshold. Orange + red cells indicate states contributing with > 1ppb threshold. Red cells indicate states contributing with > 2 ppb threshold. Green indicates contribution from state in which the receptor is located.

29 https://www.epa.gov/sites/production/files/2018-09/documents/contrib_thresholds_transport_sip_subm_2015_ozone_memo_08_31_18.pdf
30 EPA-HQ-OAR-2020-0272-0064_attachment_5.xlsx

AQS Site ID	State	Site	2021 Average DV	Total Upwind State Contribution	Sum of Upwind Contribution Captured with 1% Contribution	Sum of Upwind Contribution Captured with 1 ppb Contribution	Sum of Upwind Contribution Captured with 2 ppb Contribution
90019003	Connecticut	Westport	78.5	48.8	41.1	39.4	32.5
90013007	Connecticut	Stratford	76.5	48.3	38.1	36.3	31.2
482010024	Texas	Houston	75.5	38.6	4.7	4.7	4.7
90099002	Connecticut	Madison	73.9	43.8	35.3	33.7	26.2

Table 19. Total upwind contribution and the sum of upwind contribution at each receptor captured using each alternative threshold (units are ppb).

AQS Site ID	State	Site	% of DV from All Upwind	Percent of Upwind Contribution Captured with 1% Contribution	Percent of Upwind Contribution Captured with 1 ppb Contribution	Percent of Upwind Contribution Captured with 2 ppb Contribution
90019003	Connecticut	Westport	62.2%	52.4%	50.2%	41.4%
90013007	Connecticut	Stratford	63.1%	49.8%	47.4%	40.8%
482010024	Texas	Houston	51.1%	6.2%	6.2%	6.2%
90099002	Connecticut	Madison	59.3%	47.8%	45.7%	35.5%

Table 20. Percent of the upwind contribution captured by each alternative threshold at each receptor.

AQS Site ID	State	Site	Contribution Captured with 1 ppb Threshold vs a 1 % Threshold	Contribution Captured with 2 ppb Threshold vs a 1 % Threshold
90019003	Connecticut	Westport	95.9%	79.0%
90013007	Connecticut	Stratford	95.3%	81.9%
482010024	Texas	Houston	100.0%	100.0%
90099002	Connecticut	Madison	95.5%	74.3%

Table 21. Percent of the contribution captured with a 1% threshold that is captured using 1 ppb and 2 ppb thresholds.

As can be seen in this example, should the significant contribution threshold be raised from 1% of NAAQS (0.75 ppb) to a greater than 1.0 ppb limit, Illinois and Kentucky would have their contribution linkages broken to all monitors. Additionally, even with this increase in significant contribution threshold, each monitor in Connecticut would still have over 95 percent of the original

1% contribution values associated from the remaining states. Should the threshold be raised to 2 ppb, the linkage from five additional states (Indiana, Maryland, Michigan, Virginia, and West Virginia) would be broken to each Connecticut receptor. This also would leave 79.0 percent, 81.9 percent, and 74.3 percent of the original 1% contribution threshold values at the Westport, Stratford, and Madison monitors, respectively.

c. Had EPA conducted source apportionment analysis of source categories rather than of total emissions from upwind states, it would have found that EGUs have little or no impact on downwind air quality problem areas.

Alpine Geophysics previously assessed[31] the impact on downwind air quality of specific source sectors within the upwind states. Since that time, that modeling effort was updated using EPA's 2023en modeling platform and has presented results in comments to other EPA rulemakings.[32]

Consistent with EPA's methodology documented in the air quality TSD[33], Alpine performed nationwide, state, source category-level ozone source apportionment modeling, but using the CAMx OSAT technique instead of APCA, to quantify the contribution of future year base case NOx and VOC emissions from major source categories in each region to projected 2023 ozone concentrations at ozone monitoring sites.

In the source apportionment model run, Alpine tracked the ozone formed from each of the following contribution categories (i.e., "tags"):

- Regions –NOx and VOC emissions from each state or state group tracked individually using the additional source category "tags" listed below;
    - Biogenic/Fires;
    - On-Road Mobile;
    - Non-Road Mobile/Stationary Area;
    - EGU Point; and
    - Non-EGU Point;
- Boundary and Initial Concentrations – concentrations transported into the modeling domain (e.g., principally international transport but also including stratospheric intrusion, and domain initialization conditions);
- Canada, Mexico, and over water domains – anthropogenic emissions from sources in the portions of Canada and Mexico included in the modeling domain and from sources in the Pacific and Atlantic Oceans or from the Gulf of Mexico or Great Lakes.

The source apportionment modeling provided contributions to ozone from NOx and VOC emissions in each region and source category in a relative sense to all other regional and category combinations as noted above. This differs from EPA's modeling in that this analysis provided finer

31 http://www.midwestozonegroup.com/files/IndependentSector-SpecificSourceApportionmentModelingofthe2017CrossStateAirPollutionRuleModelingPlatform.pdf

32 EPA-HQ-OAR-2018-0225.

33 EPA-HQ-OAR-2020-0272-0064.

category-specific contribution resolution for components in states compared to the "all-state" total anthropogenic contribution method applied in this NPR. For example, we determined the relative contribution of Illinois' EGU source sector emissions on ozone concentrations at downwind monitors instead of just Illinois' total anthropogenic contribution to that same monitor. In this regard, we demonstrate what the relative magnitude of category-based emissions is compared to individual monitor concentrations in contrast to just regional or state total contributions.

The following figures provide OSAT output for the three Connecticut monitors using a 75 ppb reporting threshold. The following figures do not use the actual 2023 modeling platform from this NPR as the comment period was not sufficient to run a source apportionment study of this type. Instead, we are presenting 2023 modeling for the CSAPR Update rule modeling platform for as illustration of our point. In the following figures, the tables provide both the tabular results (scaled to CSAPR Update rule average 2023 design values), as well as tag-specific contributions based on the relative contribution analysis. Each cell represents the ozone concentration contribution of NOx and VOC emissions for each of the regions (rows) and source categories (columns) in the table. In this example, in the top row, in the third column from the left, Illinois' onroad motor vehicle source emissions contribute 0.13 ppb (0.19%) to this monitor's total 2023 future year design value. For purposes of this presentation, we have retained the state level contributions for the eleven states contributing to the three Connecticut monitors and has chosen to group all other states and regions (including Louisiana) into the "All Other" source region.

Monitor	90013007	Stratford, CT					
		2023 OSAT Results (Modeled ppb) -- 70 ppb Threshold					
States	Bio/Fire	Motor Vehicle	Area/NR/MAR	EGU Point	NonEGU Point	Can/Mex/Water	IC/BC
IL	0.25	0.13	0.31	0.20	0.17	0.00	0.00
IN	0.20	0.19	0.26	0.25	0.15	0.00	0.00
KY	0.19	0.14	0.22	0.11	0.08	0.00	0.00
MD	0.85	0.53	0.96	0.41	0.25	0.00	0.00
MI	0.12	0.11	0.18	0.10	0.09	0.04	0.00
NJ	1.55	2.70	4.37	0.67	0.41	0.00	0.00
NY	1.74	2.42	4.60	2.20	0.32	0.01	0.00
OH	0.31	0.30	0.43	0.30	0.18	0.00	0.00
PA	1.73	1.10	2.19	1.09	0.60	0.00	0.00
VA/DC	0.82	0.55	0.79	0.29	0.19	0.00	0.00
WV	0.12	0.05	0.21	0.12	0.08	0.00	0.00
All Other	3.56	1.38	2.95	0.98	0.94	0.69	15.15
Total	**11.44**	**10.78**	**21.15**	**7.26**	**3.25**	**1.33**	**15.98**

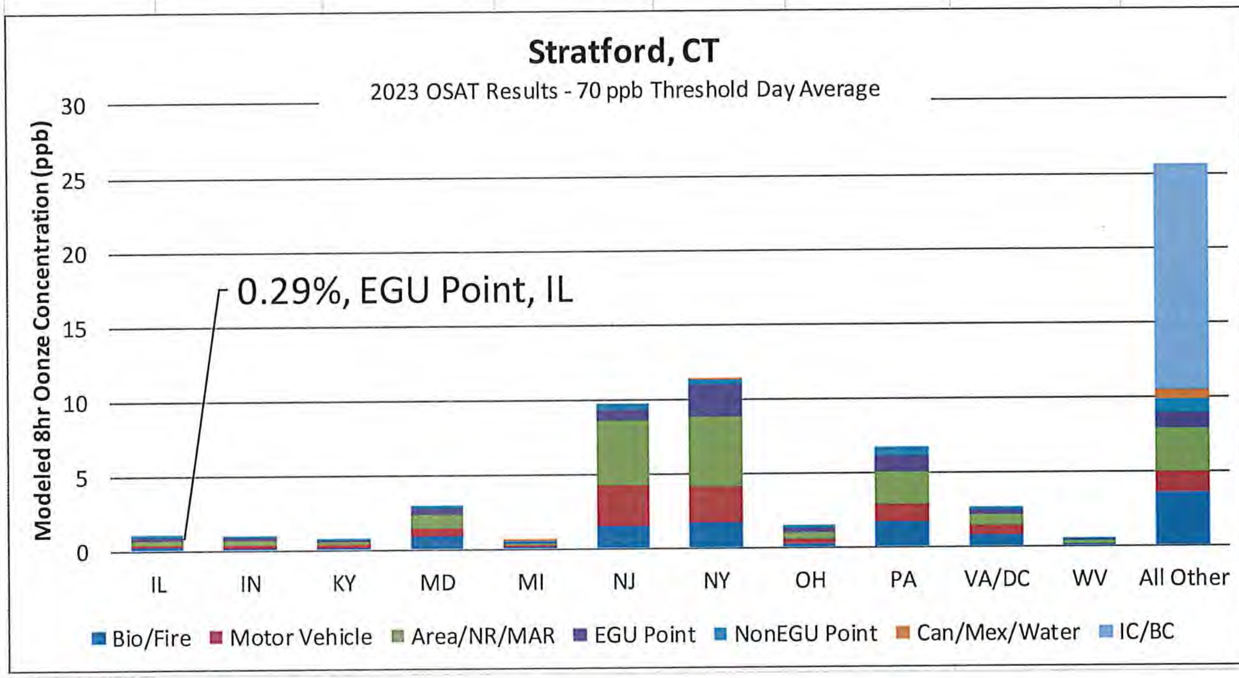


Figure 14. Relative ozone contribution in ppb by state and source sector using EPA's 2023en modeling platform at the Stratford, CT (90013007) monitor.

The figures presented here tabularly and graphically illustrate how small the relative contribution of EGU emissions from many of the upwind states are compared with other source regions and sectors to each of these monitors. As shown in Figure 14, at the Stratford, CT monitor, Illinois EGUs contribution a total of 0.20 ppb (0.29%) of the 2023 modeled ozone concentration. Similarly, at the Westport, CT monitor (Figure 15), Kentucky's EGUs contribute a total of 0.11 ppb (0.15%) of the total future year modeled ozone and at the Madison, CT monitor (Figure 16), we see that West Virginia's EGUs contribute 0.11 ppb (0.16%) of the total 2023 modeled concentration. In fact, these results also indicate that emissions from the combined anthropogenic Canadian-Mexican-International Over Water source have a greater relative contribution to each of the three Connecticut monitors than do EGU sources from these states. While we do not intend to indicate that these individual region-category values match what would have been calculated with the actual NPR modeling platform, we do recognize that the relative contribution of state EGUs to each of these monitors would be relatively close to the values presented here.

Monitor	90019003	Westport, CT					
		2023 OSAT Results (Modeled ppb) -- 70 ppb Threshold					
States	Bio/Fire	Motor Vehicle	Area/NR/MAR	EGU Point	NonEGU Point	Can/Mex/Water	IC/BC
IL	0.27	0.15	0.35	0.22	0.18	0.00	0.00
IN	0.21	0.19	0.25	0.25	0.16	0.00	0.00
KY	0.18	0.14	0.23	0.11	0.08	0.00	0.00
MD	0.87	0.53	0.94	0.40	0.24	0.00	0.00
MI	0.14	0.15	0.22	0.11	0.10	0.04	0.00
NJ	1.79	3.04	4.84	0.72	0.41	0.00	0.00
NY	1.92	2.13	4.32	2.19	0.30	0.01	0.00
OH	0.36	0.38	0.55	0.35	0.22	0.00	0.00
PA	1.77	1.18	2.36	1.07	0.62	0.00	0.00
VA/DC	0.84	0.55	0.78	0.28	0.18	0.00	0.00
WV	0.14	0.05	0.25	0.15	0.09	0.00	0.00
All Other	3.65	1.38	2.95	0.98	0.94	0.69	15.15
Total	**12.15**	**11.10**	**21.39**	**6.70**	**3.31**	**1.34**	**16.71**

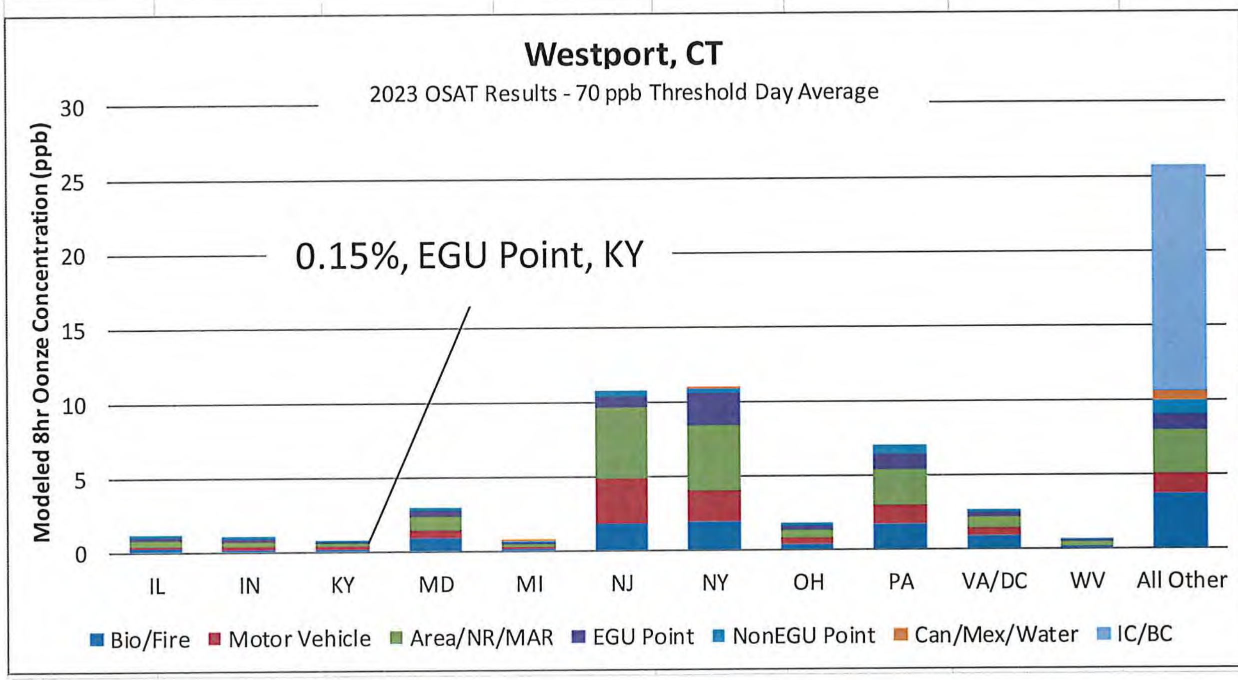


Figure 15. Relative ozone contribution in ppb by state and source sector using EPA's 2023en modeling platform at the Westport, CT (90019003) monitor.

Monitor	90099002	Madison, CT					
	2023 OSAT Results (Modeled ppb) -- 70 ppb Threshold						
States	Bio/Fire	Motor Vehicle	Area/NR/MAR	EGU Point	NonEGU Point	Can/Mex/Water	IC/BC
IL	0.32	0.17	0.41	0.26	0.21	0.00	0.00
IN	0.23	0.21	0.29	0.29	0.18	0.00	0.00
KY	0.18	0.15	0.23	0.11	0.09	0.00	0.00
MD	0.44	0.35	0.70	0.24	0.15	0.00	0.00
MI	0.10	0.12	0.18	0.11	0.07	0.04	0.00
NJ	1.14	2.10	3.37	0.54	0.42	0.00	0.00
NY	1.84	2.66	5.50	2.02	0.38	0.01	0.00
OH	0.41	0.48	0.69	0.38	0.29	0.00	0.00
PA	1.60	1.06	2.24	0.83	0.60	0.00	0.00
VA/DC	0.35	0.29	0.46	0.13	0.11	0.00	0.00
WV	0.09	0.06	0.27	0.11	0.07	0.00	0.00
All Other	3.26	1.38	2.95	0.98	0.94	0.69	15.15
Total	**9.97**	**10.96**	**23.63**	**6.55**	**3.37**	**1.17**	**15.54**

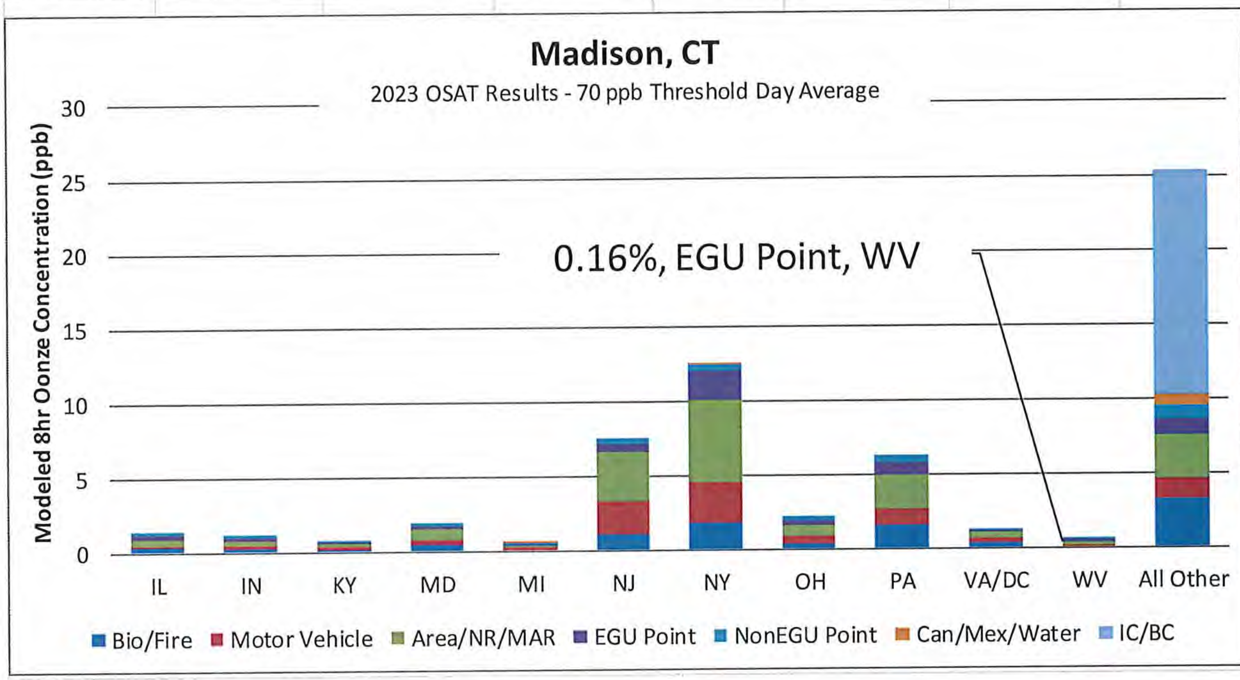


Figure 16 Relative ozone contribution in ppb by state and source sector using EPA's 2023en modeling platform at the Madison, CT (90099002) monitor.

Review of these data indicate that controls applied to just the EGU sector in the Midwestern upwind states would need to be substantial in magnitude to even minimally impact the interpolated 2021 design values calculated by EPA in this proposed rule. Because such drastic controls could not be installed nor operated in the region by the 2021 ozone season, EPA's proposed rule has effectively overstated the impact of the calculated remedy and inappropriately assigned the Group 3 remedy states.

4. EPA has inappropriately proposed to rescind its approval of the Kentucky Good Neighbor SIP with respect to the 2008 ozone NAAQS.

EPA proposes to determine in this the revision to the CSAPR Update rule that its previous approval of Kentucky's SIP as fully resolving the state's 2008 ozone NAAQS good neighbor obligations was in error. Section 110(k)(6) of the CAA (42 U.S.C. 7410(k)(6)) gives the Administrator authority, without any further submission from a state, to revise certain prior actions, including actions to approve SIPs, upon determining that those actions were in error. MOG objects to the agency's action relative to the Kentucky SIP as lacking any clarity of agency deliberation and determination or administrative record (lacking adverse public comment or subsequent appeal) that its prior formal rulemaking was erroneous. EPA offers the following statement that appears to predict the need to withdraw this proposal as ill informed,

> The Agency recognizes that it is possible, based on updated information for the final rule – as applied within a regionally consistent analytical framework – that Kentucky (or other states for which EPA proposes revised FIPs in this action) may be found to have no further interstate transport obligation for the 2008 ozone NAAQS. If such a circumstance were to occur, EPA anticipates that it would not finalize this proposed error correction or may modify the error correction such that our July 2018 approval of Kentucky's SIP may be affirmed. 85 Fed. Reg. at 68978.

MOG directs EPA's attention to the list of issues concerning fact and law that has been reviewed extensively in these comments raising concern for the agency's hastily crafted proposal to include unfounded assumption that the Connecticut monitors actually demonstrate nonattainment with the standard and inclusion of Kentucky units in EPA's assumptions that have retired[34]. EPA's failures relative to the proposal for the CSAPR Update are shared with its proposal concerning the Kentucky SIP. EPA ties its KY action very closely with the CSAPR Update proposal,

> Kentucky's remanded partial FIP has been reassessed in this action, consistent with EPA's methodology to address the other 20 states with remanded CSAPR Update FIPs, and consistent with the D.C. Circuit's direction in *Wisconsin* and *New York* . . .The analysis on which EPA proposes this conclusion for Kentucky is the same, regionally consistent analytical framework on which the Agency proposes action for all of the other CSAPR Update states with remanded FIPs. The Agency recognizes that it is possible, based on updated information for the final rule – as applied within a regionally consistent analytical framework – that Kentucky (or other states for which EPA proposes revised FIPs in this action) may be found to have no further interstate transport obligation for the 2008 ozone NAAQS. If such a circumstance were to occur, EPA anticipates that it would not finalize this proposed error correction or may modify the error correction
> EPA's new proposal. *Id.*

Factually, it is remarkable that Kentucky's impact as calculated by EPA (using flawed and inflated assumptions about the state emissions) on the Connecticut monitors targeted by EPA is

34 Kentucky unit retirements not recognized by EPA's analysis: 2019: EW Brown Unit 1 (114 MW) and Unit 2 (180 MW)(2019); Elmer Smith Unit 1 (163.2 MW)(2019); Elmer Smith Unit 2 (282.1 MW)(2020), TVA Paradise Unit 3 (1,150 MW)(2020). Additionally, the following units are announced for retirement: Smith Generating Facility SCT1 (149 MW) and SCT2 (149 MW) (2023); Mill Creek Generating Facility Unit 1* (355.5 MW) (2024). *Presented in current rate case to PSC and pending approval by PSC.

very small (Stratford 0.78; Westport 0.87; and Madison 0.79) in comparison to EPA's proposed significance level of 0.75. Kentucky's contribution is likely to drop below 0.75 when consideration is given to the several indications MOG has identified about over estimation errors relative to the 2021 emissions as noted in these comments and in Table 9 above.

Finally, EPA's action relative to Kentucky raises the question about prohibited over control of an upwind source in direct violation of the *EME Homer II* prohibition against such action.

5. EPA's legal and technical bases for its Step 3 proposal for requiring additional controls on sources in upwind states is fatally flawed.

As will be noted in this section of MOG's comments on the proposed Revised CSAPR Update, EPA has correctly determined that there is no basis for imposing any new controls on non-EGU sources or for imposing long-term controls on EGU's. However, for a variety of legal and technical reasons stated elsewhere in the comments and in this section of MOG's comments, EPA's has no legal or technical justification for the imposition of any new controls (short-term, otherwise) on EGU's.

a. EPA has no legal basis for imposing additional short-term controls on EGUs since the courts have already determined that the current CSAPR Update already properly addressed controls on those sources. (Comment C-21)

The Court in *Wisconsin v. EPA* precisely stated, "We conclude that, in one respect, the Rule is inconsistent with the Act: it allows upwind States to continue their significant contributions to downwind air quality problems beyond the statutory deadlines by which downwind States must demonstrate their attainment of air quality standards." 938 F.3d 303, 309 (D.C. Cir. 2019). The *Wisconsin* remand narrowly focused on the significant concern and need for the CSAPR Update Rule to maintain the statutory deadlines. The Court ruled that ". . .we conclude that, by issuing a Rule that does not call for upwind States to eliminate their substantial contributions to downwind nonattainment in concert with the attainment deadlines, EPA has strayed outside the bounds of its statutory authority under the Good Neighbor Provision," Id. at 318. The Court was specifically troubled by EPA's partial analysis of source contribution to downwind nonattainment and therefore a decision not to fully meet the deadlines of the Clean Air Act for attainment.

EPA developed a partial good neighbor program focusing upon EGUs equipped with catalytic controls and state-of-the art combustion that the *Wisconsin* court deemed to be reasonably based. This portion of the good neighbor strategy was upheld by the Court. The task given to EPA by the court in the *Wisconsin* remand was to align the deadlines for action by upwind and downwind states. EPA erroneously interpreted the remand as a directive to find additional controls and reductions from the EGU sector as evidenced by this proposed rule.

The *Wisconsin* court found "no basis to set aside the challenged determinations" on modeling and implementation choices. Id. at 320. The court upheld EPA's assumption that operating "Selective Catalytic Reduction" (SCR) controls would reduce an EGU's emissions to 0.10 lbs/mmBtu. Id. at 320. The court also found rational EPA's choices on modeling and intrastate generation shifting among EGUs. Id. at 321. The court found EPA's banked allowance program reasonable. Id. at 321. The EGU related CSAPR Update rule was upheld in *Wisconsin*.

The Court noted, however, that EPA decided against considering reductions from non-EGUs because, "[a]s compared to EGUs, there is greater uncertainty in EPA's current assessment of non-EGU point-source NOx mitigation potential." 81 Fed. Reg. at 74,542; see *Id.* at 74,521. In response, the Court offered,

> Questions involving the environment are particularly prone to uncertainty," but "the statutes and commonsense demand regulatory action to prevent harm, even if the regulator is less than certain." *Ethyl Corp. v. EPA*, 541 F.2d 1, 24-25 (D.C. Cir. 1976) (en banc). As a result, "EPA [cannot] avoid its statutory obligation by noting [scientific] uncertainty ... and concluding that it would therefore be better not to regulate at this time." *Massachusetts v. EPA*, 549 U.S. 497, 534, 127 S. Ct. 1438, 167 L.E.2d. 248 (2007). It is only when "the scientific uncertainty is so profound that it precludes EPA from making a reasoned judgment" that it can excuse compliance with a statutory mandate.

Id. at 318-19.

In short, EPA has improperly invoked the *Wisconsin* decision as the legal directive driving the revised strategy relative to EGUs set forth in this proposed rule.

The remainder of this section of our comments will identify the significant additional errors made by EPA in its Step 3 analysis.

b. EPA's proposal to set reduced NOx budgets on the basis of its assessment of the performance and costs of EGU SCR and combustion controls is fatally flawed.

To assist in the assessment of EPA's Step 3 analysis of emission control, MOG has engaged the services of nationally renowned experts J. Edward Cichanowicz, Michael C. Hein and J.P. Marchetti who have assessed EPA's analysis of control equipment and have offered their assessment and opinions about EPA's approach in a report entitled "Technical Comments on the Environmental Protection Agency (EPA) Revised Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS" dated December 13, 2020 ("Cichanowicz Report") which is attached to these comments and identified as Exhibit B. As will be discussed in this section of MOG's comments, the Cichanowicz Report finds that EPA was in error in determining that the cost of short term EGU controls was less than $1,600 per ton of NOx removed and that such controls could be implemented in the time period provided in the proposed CSAPR Update Revision.

c. EPA has incorrectly calculated the cost of short-term SCR controls that form the basis for its proposed reduction of the CSAPR Update ozone season emission budgets.

As discussed in detail in the Cichanowicz Report, EPA's evaluation of the cost for additional NOx control as proposed by the Revised CSAPR Update employs a database constructed for the initial CSAPR evaluation, which includes 22 states - almost twice the scope of the 12-state region evaluated for this proposed Revised CSAPR Update. EPA also uses control technology operating costs from supporting information in the February 2020 CSAPR IPM modeling. Fundamental process features such as SCR reactor design, the catalyst volume in inventory, coal composition, and the "host" boiler design – of course could not be considered in this report. Consequently, this analysis is confined to a "macro" level and provides results that are approximate.

There are at five shortcomings in EPA's analysis. First, the scope of the present action addresses 12 states, which compared to the initial 22 CSAPR states exhibit different characteristics that affect SCR design and operation. Second, EPA under-estimates boiler exit NOx emissions of many units which affects operating cost as higher NOx removal is necessary. Third, EPA estimates the total cost per ton of NOx reduction from the boiler exit as opposed to the marginal cost to provide additional NOx reduction from recent controlled emission rates. Fourth, and relevant to determining marginal cost, EPA determines the variable operating and maintenance cost for catalyst management using IPM cost relationships, which do not adequately reflect the cost to achieve extremely high NOx removal rates. Fifth, EPA did not employ an IPM-advised adjustment for subbituminous coals, and by doing so under-predicted catalyst volume and the relevant replacement cost by 17%.

As noted, EPA's analysis is flawed in that the data population used – reflecting the 22-state population – does not represent the generating units in the 12-state region that is the subject of this action. The 22-state database does not reflect the higher fraction of bituminous coal and uses boiler exit NOx emission rates that are too low. The costing methodology does not use the catalyst volume relationship correctly – the adjustment for PRB coals is ignored and the non-linear increase in catalyst volume required for NOx removal beyond 80% is not recognized. Most notably, EPA does not calculate the incremental cost of lowering NOx from the third-lowest ozone season rate to a target with margin – which affects the 90% threshold significantly. The alternative analysis conducted for this evaluation calculates a marginal incurred cost at the 90% threshold of $2,816 /ton, exceeding EPA's estimate by 75%.

d. EPA attempt to assess the cost of combustion controls is incomplete and inappropriate.

Regarding the cost of combustion controls, the EGU TSD notes:[35]

> *Consequently, EPA identifies $1,600/ton as the cost level where upgrades of combustion controls would be widely available and cost-effective.*

Unlike the case for SCR, where EPA submitted a detailed analysis (albeit with the limitations cited above), there is no analogous cost evaluation for deploying the advanced combustion control technologies in Table 1 of the EGU TSD. Rather, EPA conducted a spreadsheet-based sensitivity

35 "EGU NOx Mitigation Strategies Proposed Rule TSD" ["EGU TSD"], by USEPA, October 2020, page 10 of 12.

study using inputs from the IPM model[36] for a hypothetical 500 MW unit.[37] EPA's analysis does not determine the marginal cost for the incremental NOx reduction, nor does it account for the variability of NOx control due to fuel composition and boiler design, as described in the preceding subsections.

EPA's evaluation of a hypothetical 500 MW plant – varying only fuel rank and capacity factor - does not capture the range of cost implied for the national inventory. Similar to the analysis for SCR-equipped units, EPA does not consider marginal cost of the incremental reduction in NOx emissions.

e. EPA significantly over-estimates the capability of combustion controls to achieve the extremely low NOx emissions that are the basis for its proposed revised ozone season emission budgets.

EPA significantly over-estimates the capability of combustion controls to achieve extremely low NOx emissions and does not conduct an authentic assessment of the cost for this control technology.

Specifically, EPA notes in its EGU TSD:[38]

> *EPA estimated the average 2016 ozone season NOx emission rates for all such units by firing type. For dry bottom wall-fired coal boilers with "Low NOx Burner" and "Overfire", there were 148 units averaging 0.1549 lb/mmBtu. For tangentially-fired coal boilers with "Low NOx Burner" and "Closed-coupled/Separated OFA", there were 105 units averaging 0.1390 lb/mmBtu.*

The number of boilers actually achieving these NOx emission rates is a fraction of the numbers implied by this passage. Significantly, EPA does not acknowledge the fuel-specific and boiler-specific constraints to be considered in generalizing NOx emission rates from a small subset of boilers to the national inventory. EPA did not conduct a detailed cost evaluation of combustion controls, using actual cost projected for the inventory of boilers affected by this rulemaking; rather total costs (not incremental costs) for an "illustrative unit" [39] are cited to support the threshold of $1,600/ton.

EPA's projection of low NOx emission rates is flawed as it appears to not apply to the majority of the units in the 12-state region that burn bituminous coals. Only newer units which feature relatively low Burner Zone Liberation Rates could likely replicate the claimed low NOx conditions; many existing legacy boilers are unlikely to achieve these rates. EPA's projection of

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36 See Table 5-4 of Chapter 5 of the IPM 5.13 documentation. Available at https://www.epa.gov/sites/production/files/2015-07/documents/chapter_5_emission_control_technologies_0.pdf

37 EGU TSD, see footnote #19.

38 EGU TSD, page 11 of 22.

39 *Id*, page 10 and footnote #19.

NOx control capability of advanced combustion controls is flawed as it does not consider coal rank, boiler design features, and operating characteristics. Such an analysis is beyond the scope of these comments.

f. EPA has erroneously concluded that existing SCR process equipment can be upgraded by the start of the 2021 ozone season.

There are four maintenance and operation activities for existing SCR process equipment required to achieve high NOx removal. Three of these four activities require extended planning or procurement that, with rare exceptions, will not be able to be implemented within the 6-week period from the March 15 issuance date of the final rule to the May 1 beginning of the 2021 ozone season. These four maintenance and operating actions are (a) tuning of ammonia injection grid hardware, (b) replacement and repair of cleaning hardware such as acoustic horns and sootblowers, (c) cleaning of installed catalyst to remove accumulated fly ash, and (d) replacement or addition of catalyst. As discussed in detail in the Cichanowicz Report, there is no reason to believe that these actions can be completed by the May 1, 2021 deadline that EPA has proposed for the general category SCR-equipped EGUs that EPA has identified.

The tuning of ammonia injection grid hardware, is, of course, critical to the delivery of high NOx removal (i.e. exceeding 80%). Conventional practice requires the degree of uniformity of ammonia and NOx entering the SCR process reactor be described by a RMS[40] deviation of 5% or less at the inlet of the first catalyst layer to maintain high NOx removal and an ammonia "slip" level of 2 ppm or less;[41] where better uniformity (perhaps 3% RMS deviation) is required as catalysts ages. Frequent tuning of the injection apparatus can be required depending on the specific hardware. The use of injection grids –featuring perhaps hundreds of individual injectors – requires tuning at intervals ranging from one to several years; the use of static mixers reduces but does not eliminate the need for this action.

In addition, the effective operation of cleaning devices – acoustic horns and sootblowers – is necessary to maintain clean catalyst and effective NOx control. These devices are inspected and refurbished as needed; one common acoustic horn failure is the blocking or failing of the diaphragm that generates the acoustic power. Sootblowing mechanical components should be inspected and refurbished as needed. Inspection and repair of acoustic horns requires unit shutdown for internal reactor access. Each layer of catalyst is typically equipped with an array of either acoustic horns or sootblowers. Given the requirement for shutdown, inspection, and acquiring replacement parts, within a 6-week period it is unlikely that more than 10-15% of units with these cleaning devices can be inspected and refurbished.

An important additional routine action required for most SCR reactors is removal of accumulated ash from the catalyst surface. Manual cleaning and removal of ash deposits from catalyst surface is a labor-intensive process, conducted during outages. The steps required for a large reactor – process equipment "cool down" to enable access of personnel; layer-by-layer cleaning and

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40 Root-mean-square, a common statistical metric of variability.

41 Rogers, K., *Development and Performance Data for Ammonia Injection and Gas Mixing Processes on SCR Applications,* Proceedings of the Power Plant "Mega" Symposium, Baltimore, MD, August, 2008.

ash removal; examining of seals as necessary and repair to bypass of gas to be treated - can require 4-6 days. As with testing, however, specialized services are needed for this work making it infeasible for this task to be completed for the units identified by EPA prior to the 2021 ozone season.

Finally, and perhaps most significantly, replacing spent or partially deactivated catalyst with new catalyst requires approximately one year for specification of the catalyst design, competitively bidding options and selecting a successful candidate, and installing catalyst. There are 4-5 major catalyst suppliers that provide SCR catalyst for U.S. applications; historically the "lead time" for new catalyst is 9 months to one year. It is unlikely any unit will be able to acquire and install new catalyst unless such material is already "on-order" for Spring 2021 delivery or the necessary catalyst has been acquired and is being stored.

In summary, there are few options that an EGU owner can utilize within a 6-week window to remedy deficiencies and support increasing NOx removal to the 80-90% level that is being proposed by EPA here.

g. EPA has erroneously concluded that advanced combustion controls can be installed by the start of the 2022 ozone season. (Comment C-1)

While EPA has proposed that advanced combustion controls should not be required before the 2022 ozone season, EPA solicits comments on the schedule for the retrofit of state-of-art combustion controls. Specifically:

> *EPA is taking comment on whether delaying the incorporation of emission reduction potential from the installation of state-of-the-art NOx combustion controls into state emission budgets until 2022 is necessary (Comment C-1).*

As set forth in the Cichanowicz Report, the time required for design, procurement, and installation of combustion controls for four typical example units is at least 13 and up to 19 months. This time frame reflects the entire scope of work - the specification, solicitation and selection of a successful supplier, final design, and the procurement, installation, and startup of process equipment. The most abbreviated schedules – for Units 4 and 5 at Watson - reflects installation within 13 months. The other examples indicate that from 17 to 19 months is normally required – challenging even the ability to meet the 2022 mandated timeline. In summary, combustion controls could not be deployed in time for either the 2021 or 2022 ozone season.

h. SNCR is not an appropriate technology to be considered in the development of the Revised CSAPR Update.

These technical comments address SCR - not SNCR – as the latter is not anticipated to be a significant contributor in actions pursuant to a Revised CSAPR Update. SNCR can be a useful control option, but the technology faces numerous challenges, particularly for large utility boiler operating under highly variable load conditions. NOx removal with SNCR in utility boilers is reported as capable of 20-40%,[42] but large utility boilers in cycling duty can be restricted to 15-25% NOx reduction.[43] The sensitivity of the optimal "temperature window" for injection and uniform mixing of urea reagent requires a degree of injection and process control that is difficult to maintain over large distances, with variable process conditions. As gas flow conditions change – prompted by a change in combustion conditions, varying load, accumulation of deposits on heat removal surfaces - the temperature window can shift. Urea reagent can penetrate and remain as ammonia or be oxidized to NOx. The generation of high residual ammonia leads to ammonia bisulfate fouling of the air heater. EPA should also be aware the reporting via EIA Form 860 of SNCR capability does not necessarily constitute an accurate description – many installations are simplified systems with one injection level intended for NOx trimming. These single-level injection systems are prone to be ineffective as the furnace temperature window shifts. Consequently, SNCR is not anticipated to significantly contribute to the goals of the proposed Revised CSAPR Update for the bulk of utility boilers.

6. EPA correctly concludes that there is no basis for imposing additional long-term controls on EGUs or large industrial boilers.

In this section of its comments, MOG will offer its support for EPA's proposal not to impose new long term emission limitations on EGU's or large industrial boilers on both cost and schedule grounds.

a. The cost to install new SCR controls would exceed $1600.

The cost for retrofit will readily exceed the reference value of $1,600/ton for both subbituminous and bituminous coals. A detailed treatment of NOx control cost for such retrofits was reported using actual owner-reported capital costs and by the Utility Air Regulatory Group (UARG).44 Figure 9 presents a revision of the UARG analysis describing annual operation of SCR for present-day market conditions – capital recovery periods of 10 years and 65% capacity factor. These results show the minimum observed capital requirement - $250/kW for a 500 MW unit – would incur a cost of NOx removal for PRB and bituminous coal of $9,742 and $5,000, respectively. For an SCR process capital requirement of $450/kW the NOx reduction cost for PRB and bituminous coal escalates to $16,794 and $8,520 /ton, respectively. Further, EPA's analysis for SCR retrofit in which costs are accounted for only over the ozone season shows most estimates exceed $10,000 per ton.[45]

42 S. Johnson, Care and Feeding of SNCR Systems, NOx Combustion Roundtable, February 2009, Cleveland, OH.

43 See, for example, data for Ft. Martin in Worksheet "new SNCR" in EPA-HQ-OAR-2020-0272-0006.

44 Capital Cost and Cost-Effectiveness of Electric Utility Coal-Fired Power Plant Emissions Control Technologies: 2017 Update, Utility Air Regulatory Group, December 2017. The work showed retrofit of SCR for a cost of $250/kW for a 500 MW unit incur a cost of NOx removal for PRB and bituminous coal of $6,400 and $3,200, respectively. For an SCR process cost of $450/kW these cost for PRB and bituminous coal escalate to $11,000 and $5,800 /ton, respectively.

45 See EPA-HQ-OAR-2020-0272-006, Worksheet Ex_SCR_3rd_Best, Column CK.

b. The time required to install new SCR controls on generating units generally exceeds 39 months making it unavailable for consideration as part of the Revised CSAPR Update. (Comment C-8)

EPA solicits opinion regarding the schedule for the retrofit of SCR process equipment to generating units. EPA in particular addresses the prospect of whether broad regional deployment of SCR process equipment is feasible within a 39-month window.

> *EPA is requesting comment on this proposal's determination that new post-combustion controls (SCR or SNCR) are not possible to implement on a regional basis by the start of the 2024 ozone season (Comment C-8).*

EPA itself notes that the total time associated with SCR project development is estimated to be up to 39 months for an individual power plant installing controls on more than one boiler. However, more time is needed when considering installation timing for new SCR controls regionally. EPA has previously determined that a minimum of 48 months (four years) is a reasonable time period to allow to complete all necessary steps of SCR projects at EGUs on a regional scale.[46]

As noted in the Cichanowicz Report, the experience of the electric utility industry with SCR process design and procurement supports the view that new SCR controls cannot be installed in less than 39 months. Only in those cases involving multiple units of identical design at a single facility can it be expected that a shorter schedule could be accomplished. In summary, although it is possible that select units could retrofit SCR less than 39 months, each such example appears unique in that process design was already established for a near-identical application, and/or economies of scale in installing SCR on multiple units could be exploited.

All other SCR installations required approximately 39 months or more. In summary, although it is possible select units could retrofit SCR in less than 39 months, such examples appear unique. Either process design was established for a near-identical application, and/or the economies of scale for installing SCR on multiple units could be exploited. Some installations required more than 50 months due to site-specific conditions.

c. OTC cost estimates support EPA's Step 3 conclusion that there is no justification for imposing additional controls on any non-EGU sources.

In 2009, the OTC analyzed the cost of installation of NOx controls on Industrial, Commercial, and Institutional (ICI) boilers. The analysis utilized data collected by a collective comprised of state air agency staff and consultants to evaluate the cost of installing various methods of controls on ICI boilers. Numerous background documents prepared or sponsored by EPA, DOE, OTAG, NACAA, NESCAUM, LADCO, as well as Federal & state regulations were reviewed. The Control Cost Methodology used to estimate costs was derived mainly from two consultant reports, the "Midwest RPO BART Engineering Analysis" prepared by MACTEC (March 30, 2005) and an EPA document titled "ACT Document – NOx Emissions from ICI Boilers."(EPA 453/R-94-022, March 1994).

46 85 Fed. Reg. 68998 (October 30, 2020).

The OTC study reviewed numerous types of NOx controls, including Low NOx Burners, Low NOx Burners plus Flue Gas Recirculation, Low NOx Burners plus Selective Non-Catalytic Reduction, Selective Non-Catalytic Reduction, and Selective Catalytic Reduction. The group concluded that key variables that impact cost analyses include boiler type, boiler firing type, type of fuel combusted (coal, residual oil, distillate oil, natural gas), type of emission control, uncontrolled emission rate, controlled emission rate, capital cost of control equipment (purchased equipment cost), financial costs (e.g., interest rates), unit capacity factor (hours/year), flue gas flow rates and temperatures, and commodity prices (e.g., lime, water).

The result of the OTC analysis was a finding that cost of per ton of NOx removed through use of all of the control technologies reviewed was significantly above the proposed rule cost of $1600 as is shown in Tables 22 and 23 below:

Table 22

Cost Estimates for NOx Control Technology Options
($/ton of NOx Removed)

Control Technology	Fuel Type	Cost Method	Boiler Size	
			100 MMBTU/hr	250 MMBTU/hr
Low NOx Burners - Gas	Gas	Literature[1]	$750 - $7,500	
		MACTEC 2008[2]	$5,460 - $21,800	$2,190 - $8,720
		Modified CU E[3] Cost	**$5,715**	**$4,151**
Low NOx Burners - Dist. Oil	Distillate Oil	Literature[1]	$750 - $7,500	
		MACTEC 2008[2]	$5, 460 - $21, 800	$2, 190 - $8,720
Low NOx Burners - Res. Oil	Residual Oil	Literature[1]	$750 - $7,500	
		MACTEC 2008[2]	$2,730 - $10,900	$1,090 - $4,360
		Modified CUECost[3]	$4,559	$3,305
Low NOx Burners - Coal	Coal	Literature[1]	$750 - $7,500	
		MACTEC 2008[2]	$1,560 - $6,230	$624 - $2,490
		Modified CUECost[3]	$3,155	$2,290

1. Literature values are in 2006$.
2. MACTEC 2008 values are in 2008$ for a 66% capacity factor at 8,760 hours/year.
3. Modified CUECost values are in 2006$ for a 66% capacity factor at 8,760 hours/year.

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Table 23

Cost Estimates for NOx Control Technology Options
($/ton NOx Removed)

Control Technology	Fuel Type	Cost Method	Boiler Size	
			100 MMBTU/hr	250 MMBTU/hr
SNCR - Coal (Wall-fired)	Coal	Literature[1]	$1,300 - $3,700	
		MACTEC 2008[2]	**$4 ,260 - $5 ,620**	**$2 ,480 - $3 ,030**
		Modified CUECost[3]	$4,817	$2,422
SCR - Coal (Wall-Fired)	Coal	Literature[1]	$2,000 - $14,400	
		MACTEC 2008[2]	**$3 ,430 - $11 ,600**	**$1 ,590 - $4 ,860**
		Modified CUECost[3]	$6,668	$4,763

Based on these figures, even shown in 2006 and 2008 dollars exclusive of inflation adjustments, there are no available controls that are cost effective for ICI boilers.

More recently, the Cichanowicz Report reviewed a number of the EPA technical support documents underpinning the proposed Revised CSAPR Update and found that the EPA analysis of cost and availability of even low NOx burners as non-EGU controls is based on assumptions regarding non-EGU boiler designs that are not accurate for the universe of existing units. Using two specific examples of boiler design at large non-EGU facilities, the authors of this report conclude that "[l]arge Non-EGU generators address the same challenges as EGUs – essentially all affected units have retrofit some form of combustion control technology." They note that constraints such as the physically compact arrangement of some boilers likely preclude installation of next-generation low NOx burners and that, in other cases, an upgrade of existing controls is probably not feasible due to the operation cycle and uncertain lifetime for capital recovery.

The OTC analysis and that of Cichanowicz support the simple conclusion that there are a large number of non-EGU combustion sources that are of diverse sizes and types and there is no one-size fits all solution for reducing NOx emissions from non-EGUs. Published literature (both EPA's current docketed analysis and previous analyses performed by the Ozone Transport Commission [OTC] and the Northeast States for Coordinated Air Use Management [NESCAUM]) and EPA's control technology database indicate that NOx control costs for non-EGUs are highly variable and site-specific, and are typically much higher than the cost effectiveness threshold EPA has identified for EGUs. Comments to this proposal filed by the American Forest & Paper Association ("AF&PA") provide significant detail about the lack of available NOx controls that are cost effective for the forest products industry and its sources. Those comments are incorporated by reference.

It is not surprising that EPA is struggling to address NOx emissions from industrial sources using a broad brush on a regional basis. The CSAPR program is not the appropriate mechanism to regulate this diverse group of sources, especially when EPA has not shown that NOx emissions reductions from non-EGUs would have a significant impact on downwind ozone concentrations in problem areas. Although EPA acknowledges that the information available on non-EGU NOx emissions and controls is not as robust as the information it has gathered on EGUs, additional information would not change the conclusion that non-EGU controls are not necessary under the CSAPR update rulemaking.

7. To the extent that additional controls are needed at Step 3 of EPA's analysis, those controls should be directed at the actual cause of any residual nonattainment concerns that may exist.

As will be pointed out in this section of our comments, as EPA modeling shows and as EPA itself has acknowledged, local sources from within the NY, NJ, CT nonattainment area are the sole cause of any residual air quality issues that may exist with respect to the 2008 ozone NAAQS and without direct and immediate control of those sources attainment of the 2008 ozone NAAQS cannot be achieved.

a. Local sources must be addressed first before EPA can advance a regional transport rule such as the proposed Revised CSAPR Update rule.

The U.S. Court of Appeals for the District of Columbia has provided very clear direction concerning the relationship between the Clean Air Act sections governing timing of obligations concerning attainment of the ambient air quality standards (42 U.S.C §§7407, 7410(a)(1)) and obligations with regard the good neighbor provisions (42 U.S.C. §7410(a)(2)(D(i)) in *Wisconsin v. EPA*, 938 F.3d 303 (D.C. Cir. 2019). As explained in detail below, the *Wisconsin* court highlights the fact that local source controls are inherently part of the 4-step process used by EPA in the development of the good neighbor CSAPR Update rule. 81 Fed. Reg. 74,504 (October 26, 2016). The good neighbor analysis (which runs in tandem with attainment analyses) is comprised of four steps that include: (1) identify downwind states with ambient air quality attainment problems; (2) identify upwind states whose pollution is linked to the problem; (3) quantify the amount of emission reductions required to eliminate significant contribution; and (4) quantify emissions budgets. The transport issues here are complicated by the selection of nonattainment monitors located within the multi-state NY-NJ-CT nonattainment area. Each of these states are linked to parallel attainment obligations, one for the portion of the nonattainment area in their state and the other for their contributions to interstate transport in the nonattainment area.

The *Wisconsin* court notes that ". . .the statutorily designed relationship between the Good Neighbor Provision's obligations for upwind States and the statutory attainment deadlines for downwind areas that generally calls for parallel timeframes." *Id.* at 316. The court emphasizes the downwind state's "crucial statutory obligation to secure attainment." There is no suggestion that a downwind state may "flout" the attainment deadline while awaiting action from Good Neighbor obligations by upwind states. *Id.* The Court provides that "By imposing a first-order obligation to attain the NAAQS "as expeditiously as practicable," Congress "made clear that the [downwind]

States could not procrastinate until the deadline approached." *Id.* at 317. In support of the parallel nature of the good neighbor obligations and attainment obligations, the Court references *North Carolina v. EPA*, 531 F.3d 896 (D.C. Cir. 2008) as follows: "In sum, under our decision in *North Carolina*, the Good Neighbor Provision calls for elimination of upwind States' significant contributions on par with the relevant downwind attainment deadlines." *Id.* at 315. The *Wisconsin* court reminds us that the *North Carolina* decision "explained that EPA needed to "harmonize" the "Phase Two deadline for upwind contributors to *eliminate* their significant contribution with the attainment deadlines for downwind areas." 531 F.3d at 912." (emphasis original to text). 938 F.3d at 314.

EPA is required under the CAA to first consider the effects of local emissions in a nonattainment area and nearby areas in state(s) closest to the nonattainment area in question before seeking controls in upwind states. CAA §107(a) states that "[e]ach State shall have the primary responsibility for assuring air quality within the entire geographic area comprising such State." In addition, CAA §110(a)(1) requires that a state SIP "provides for implementation, maintenance, and enforcement" of the NAAQS "in each air quality control region . . . within such State." Moreover, EPA recognized the requirement to look locally in its previous transport rules (1997 NOx SIP Call, CAIR, etc.). EPA must study the impact of local controls in its upcoming rulemaking and require that such local sources be appropriately controlled before turning to upwind states for additional reductions.

In *Maryland v. EPA*, the D.C. Circuit addressed the question of whether a nearby nonattaining monitor outside of the state could be referenced as evidence of a local nonattainment problem within the state. The fact that Delaware was referencing a Philadelphia nonattainment monitor located within the local airshed was deemed by the court as an effort "to ask that upwind sources contributing to air quality problems in the multistate nonattainment area shoulder a comparable regulatory burden." *Maryland v. EPA*, 958 F.3d 1185, 1200 (D.C. Cir. 2020). The court assessed the combined nonattainment and good neighbor responsibilities of nonattainment areas (multiple states) and concluded "In sum, states in a multistate nonattainment area share not only a nonattainment designation but also the concomitant responsibility to limit their own emissions." *Id.* at 1201. The court repeats this point in *NY v. EPA* by confirming that an impacted state like New York appropriately looked to monitors within the New York Metropolitan Area to demonstrate nonattainment. *New York v. EPA*, 964 F.3d 1214, 1226 (D.C. Cir. 2020).

These cases demonstrate that EPA must determine whether downwind states would experience non-attainment of the NAAQS even if no transport occurred at all. If local sources in a non-attainment area, or for that matter, local sources within the OTR, are causing the NAAQS to be exceeded four or more times in the critical year, independent of regional transport, then it is imperative that the downwind states control those sources before EPA can turn to upwind states for further controls.

The CAA addresses the affirmative obligations of the states to meet the deadlines for submittal and implementation of state implementation plans designed to specifically address their degree of nonattainment designation. Review of Section 172(c)(1) of the CAA provides that State Implementation Plans (SIPs) for nonattainment areas shall include "reasonably available control measures", including "reasonably available control technology" (RACT), for existing sources of emissions. Section 182(a)(2)(A) requires that for Marginal Ozone nonattainment areas, states shall revise their SIPs to include RACT. Section 182(b)(2)(A) of the CAA requires that for Moderate Ozone nonattainment areas, states must revise their SIPs to include RACT for each category of VOC sources covered by a CTG document issued between November 15, 1990, and the date of attainment. CAA section 182(c) through (e) applies this requirement to States with ozone nonattainment areas classified as Serious, Severe and Extreme.

The basic SIP components for nonattainment areas include: a reasonable further progress (RFP) plan, reasonably available control technology (RACT), reasonably available control measures (RACM), contingency measures, nonattainment new source review program, motor vehicle emissions budget and as applicable a variety of area-wide mobile source and stationary source control programs. *S. Coast Air Quality Mgmt. Dist. v EPA*, 882 F.3d 1138 (D.C. Cir. 2018).

Unless and until this local transport is addressed in the Northeast, the OTC, and Connecticut in particular, will not be able to achieve attainment of the NAAQS. It is the primary duty of the downwind states to address this concern as a condition precedent to the development of a transport rule related to these receptors.

EPA's authority to adopt a transport rule of this kind is limited by several factors including being prohibited from imposing any emission reductions on upwind states that would be more than would be necessary to eliminate nonattainment in downwind areas. As will be pointed out in these comments, it is clear that controls on local sources in and around Connecticut are the key to attainment of the 2008 ozone NAAQS – raising a significant unaddressed question in EPA's proposal about whether the proposed transport rule emission reductions are justifiable. This is all the more significant since the only remaining problem monitors in the East are located in Connecticut.

Before finalizing the rule, EPA is obligated to address these local controls. If, upon review, EPA determines that recognition of these local controls would bring about attainment, EPA has no authority to proceed further with the rule as proposed since doing so would result in prohibited over-control.

b. It is well-established that residual nonattainment in Connecticut and the remainder of the Northeast is being caused by local sources.

A recent EPA analysis recognized that the cause of remaining air quality concerns in the Northeast is local sources. EPA's analysis This study was reflected in a presentation by Norm Possiel of USEPA OAQPS dated May 14, 2018, which is attached and identified as Exhibit D.

Principal among the conclusions reached in the EPA study are the following points:

(1) From an Eastern U.S. perspective, the current ozone levels appear to be more of a "local" problem (i.e., home state and adjacent neighboring states) compared to the larger regional ozone problem for (sic) that was evident back in 2010-2012;

(2) The magnitude of net ozone available for transport into the NE Corridor and the

Lake Michigan area from more distant upwind states appears to have declined by 5 to 10 ppb based on 2010-2012 vs 2015-2017 average ranked ozone values;

(3) Ozone levels have also declined substantially at the traditionally high ozone sites in the southern and central portions of the NE Corridor and at the traditionally high ozone sites along Lake Michigan.

The study also pointedly demonstrated that despite significant reduction in NOx and ozone transport from the Midwest between 2010-2012 and 2015-2017, there is little resultant change in the design values at the Connecticut monitors. As EPA's presentation acknowledges, the lack of change in monitor data implies that the linkage assumed by transport rules between NOx from the Midwest and ozone nonattainment at the relevant monitors is broken in spite of EPA model results showing otherwise. EPA's analysis would therefore indicate that the NOx reductions required in the proposed Revised CSAPR Update will not have the impact on the monitors that is needed to bring them into attainment and may not have any impact at all.

In addressing possible causes for continued high ozone at Connecticut coastal sites in the Northeast despite a reduction of ozone transport of 5-10 ppb, the EPA study identified specific source sectors within the Northeast Corridor believed to have a significant impact on nonattainment including the following:

- The NYC area has higher mobile source emissions than other parts of the OTR, (onroad and non-road sources).
- A unique mix of local (Tri-State area) contributions from other sources such as EGU, non-EGU point, nonpoint, and commercial marine.
- "Behind the meter" generation (diesel generators that are not controlled and not in the emissions inventory that operate on hot summer days).
- Peaking units (HEDD) within the OTR that may operate on mostly high ozone days.

It should be noted that nowhere in this list does EPA implicate Midwestern states or any state outside the New York Nonattainment Area as a cause of the continued high ozone at the relevant monitors. Additionally, OTC research of air quality impacts of emissions from local sources emphasizes the need to focus upon nearby sources as part of implementation of the current ozone standards. The September 21, 2018, report of the OTC Stationary and Area Source Committee (attached and identified as Exhibit E) identified many emission units of concern in the Northeast that are in need of controls to reduce their impact on ozone air quality concentrations. Data taken from this report has been incorporated into the following Figure 17 demonstrating that states within the OTC and specifically New York, New Jersey, Connecticut and Maryland have a significant reliance on the use of simple cycle combustion turbines with very high emissions rates.

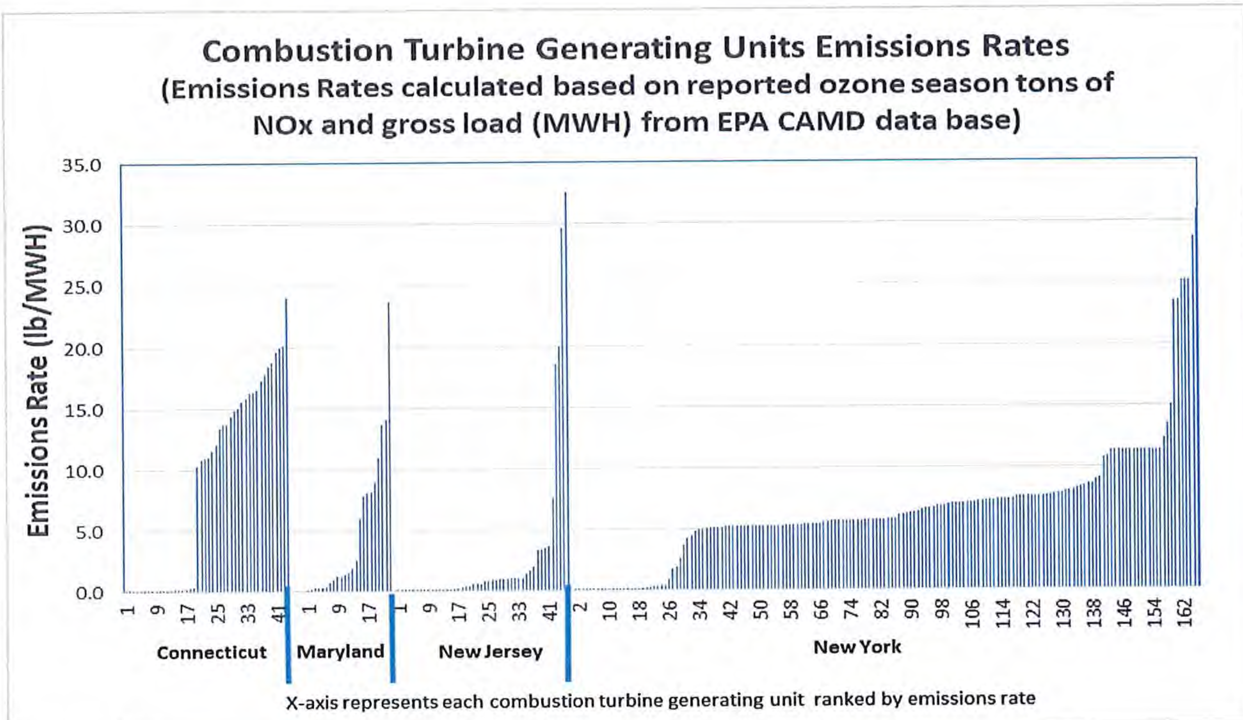

Figure 17.

Significantly, the September 18, 2018, OTC report reached the following conclusions:

- simple cycle turbines operate on high ozone days;
- control of NOx or replacement of old units is cost effective based on ozone day benefit;
- there are 200 simple cycle units in OTR with very high NOx emissions – approximately 10 times most boiler NOx rates and greater than 100 times most combined cycle NOx rates;
- simple cycle units significantly increase and can dominate EGU NOx emissions on high ozone days.

The D.C. Circuit Court itself specifically noted New York's contributions to the Connecticut monitors as being large. As the Court recognized in *Wisconsin*, of the 53.82 parts per billion of ozone in Fairfield County, Connecticut, that EPA modeling attributed to U.S. sources, "only 3.89 [parts per billion] of that 53.82" came from Connecticut; "[t]he rest … c[a]me from upwind contributions, with a significant share from one State alone (New York, which is projected to contribute 17.22 ppb)." *Wisconsin*, 938 F.3d at 316–17.

EPA also recognized the significance of New York's contribution to the Connecticut monitors in its designation of the New York Metropolitan Area as nonattainment. EPA guidance provides that designated nonattainment areas will include not only the area where the violation occurs but also nearby areas that contribute to that violation. EPA, Area Designations for the 2015 Ozone National Ambient Air Quality Standards, at Att. 3, EPA-HQ-OAR-2018-0170-0107; 42 U.S.C. § 7407(d)(1)(A)(i). As EPA has explained, *New York's own contribution* to Connecticut's air quality problems *caused* New York to be included in that nonattainment area. *See* EPA, Responses to Comments at 32, EPA-HQ-OAR-2018-0170-0128. ("Portions of New York were included in the [New York Metropolitan Area] nonattainment area because the EPA determined that those portions were themselves contributing to the air quality problems in Connecticut.").

Recently, to investigate the evolving nature of ozone formation and transport in the New York City (NYC) region and downwind, NESCAUM launched the Long Island Sound Tropospheric Ozone Study (LISTOS)[47]. This study is helping to confirm that a unique feature of Connecticut's chronic ozone problem is pollution transported in a northeast direction out of NYC over Long Island Sound. Using satellite, aircraft, balloon (ozonesondes), marine, and ground-based data collection and analysis methods to probe the New York City pollution plume and its evolution over and around Long Island Sound, the project is demonstrating NYC metropolitan area's large concentration of emission sources, including cars and trucks, ships, industrial boilers, stationary diesel engines, consumer products, power plants, and vegetation are significantly impacting air quality along the Long Island Sound and into Connecticut, Rhode Island, Massachusetts, and beyond.

Figure 18 below is a map recently produced[48] of the ozone and $PM_{2.5}$ AQI levels that were monitored on July 20, 2020. Note the general southwest to northeast orientation of the orange (unhealthy for sensitive groups) and red (unhealthy for all groups) levels exceeding the standards, originating from the NYC area and stretching to Massachusetts.

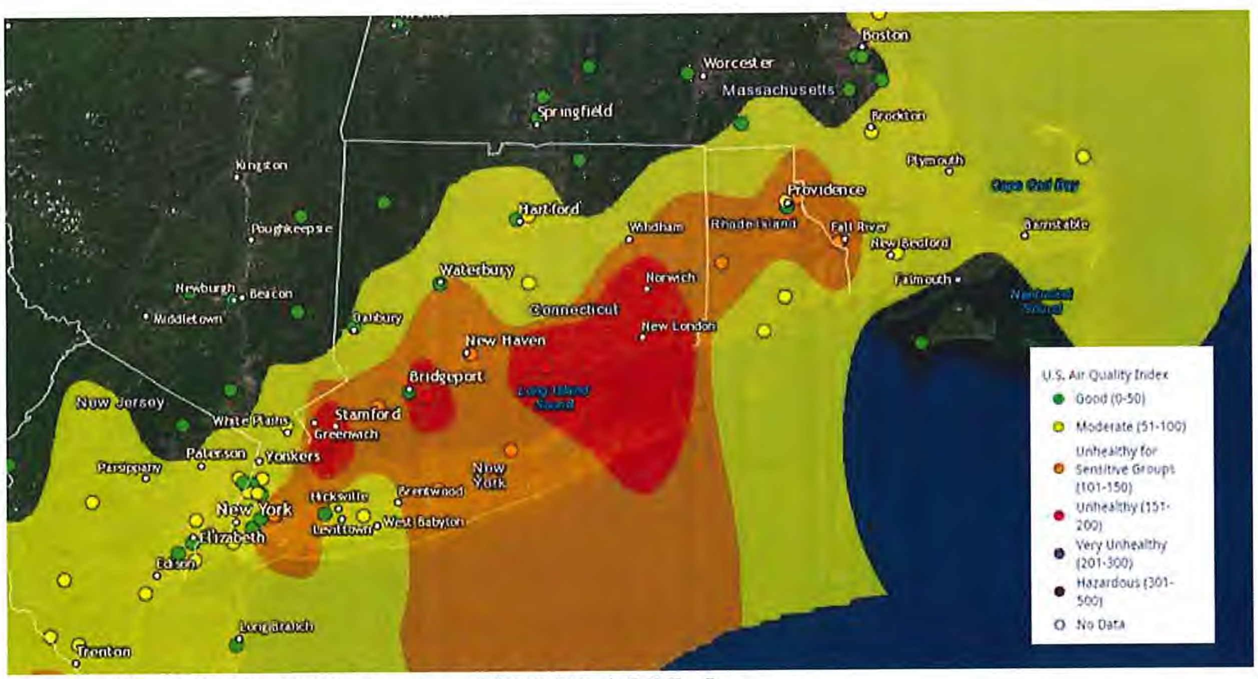

Figure 18. July 20, 2020 ozone and PM 2.5 AQI Index

47 http://www.nescaum.org/documents/listos

48 https://gispub.epa.gov/airnow/index.html

c. **Mobile sources are by far the most significant contributors to the Connecticut nonattainment and maintenance monitors involved with this rulemaking.**

In its recent advanced notice of proposed rulemaking for the Cleaner Trucks Initiative (85 Fed. Reg. 3306), EPA states that:

> "Although NOx emissions in the U.S. have dropped by more than 40 percent over the past decade, we project that heavy-duty vehicles continue to be one of the largest contributors to the mobile source NOx inventory"
>
> and
>
> "Reducing NOx emissions from highway heavy-duty trucks and buses is thus an important component of improving air quality nationwide and reducing public health and welfare effects associated with these pollutants, especially for vulnerable populations and lifestages, and in highly-impacted regions."

Similarly, the Mobile Sources Committee of the OTC recently noted in a stakeholder webinar[49] that "Heavy Duty Diesel Trucks are one of the major NOx emitting source categories in the OTR -- A transport issue and a local contribution issue."

Mobile sources present a significant impact on air quality as illustrated by the following Figure for the remaining nonattainment and maintenance monitors in Connecticut. EPA recently conducted Anthropogenic Precursor Culpability Assessment (APCA) source apportionment modeling using a recent 2016 modeling platform[50]. These results provide ozone precursor emissions, by source sector, and their relative contribution to modeled ozone concentrations at individual receptors. The following Figure 19, prepared for the remaining nonattainment and maintenance monitors in Connecticut, demonstrate the significant relative contribution of mobile source (onroad + nonroad) emissions, largely considered to be local source contributions, to ozone concentrations at each receptor. As is seen in these charts, the amount of contribution from the combined mobile source sector can be nearly four times the amount of contribution as the next largest sector. Add the area source sector, also largely considered a local contribution sources, and close to half of each monitor's 2016 ozone concentration is identified.

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49 https://otcair.org/upload/Documents/Meeting%20Materials/OTC-MANEVU%20MSC_Stakeholder_Presentation%20Final%2020200330.pdf

50 EPA/OAQPS/AQAD – 2016ff Modeling Platform, APCA Source Apportionment Simulation." Data obtained by Alpine Geophysics, LLC in personal communication with EPA/OAQPS/AQAD staff.

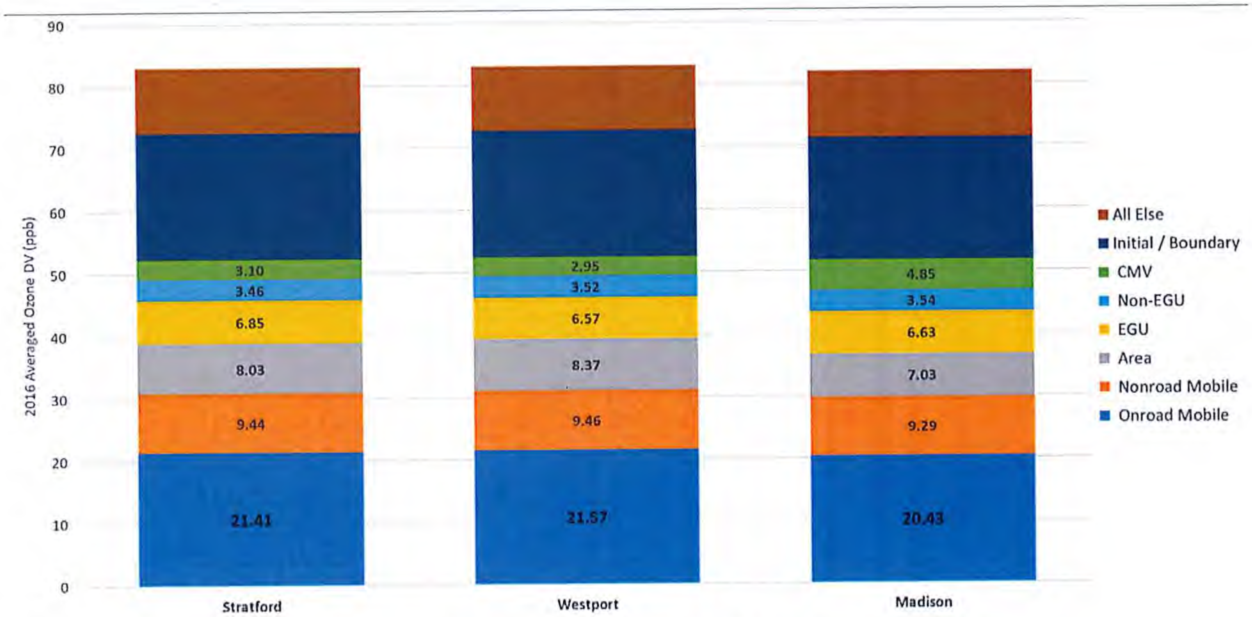

Figure 19. Source apportionment assessment of Connecticut monitors.

Of additional mobile source interest is the announced EPA Air Enforcement Division ("AED") November 2020 report on the emission effect of 550,000 diesel trucks with defeat devices equivalent to adding 9 million additional trucks to the road. EPA has made "Stopping Aftermarket Defeat Devices of Vehicles and Engines" a National Compliance Initiative for 2020-2023. It has been observed by AED that Class 2b and 3 diesel trucks emitted 30 to 300 times higher NOx and 15 to 40 times higher PM as the result of tampering. Id. at 12. The following table indicates excess NOx emissions due to confirmed and extrapolated tampering from 2009 to 2019 at 570,423 excess NOx (tons).

Table 3. Summary of "Confirmed and Extrapolated" Class 2b and 3 Diesel Vehicles Deleted from 2009 through 2019

Certified Vehicle Emissions Controls Deleted	Number of Deleted Trucks	Excess NO_x (tons) [a]	Excess PM (tons) [a]	Vehicles Added to Road Based on Excess NO_x [b]
EGR+DOC (2003-2006 MY)	72,904	16,770	0	21,016
EGR+DOC+DPF (2008-2010 MY)	129,555	65,114	1,823	184,871
EGR+DOC+DPF+NAC (2007-2012 MY)	150,954	159,001	1,313	2,623,886
EGR+DOC+DPF+SCR (2010+ MY)	204,066	329,539	2,270	6,889,968
Total Deleted Vehicles	*557,478*	*570,423*	*5,407*	*9,719,741*

See Section 4.1.1 for detailed explanations of "confirmed" versus "extrapolated" data.
a—These columns represent the excess emissions anticipated over the remaining service life of the vehicle after tampering occurs.
b—Based on the number of deleted vehicles multiplied by the ratio of NO_x emitted from a deleted vehicle over its entire life compared to NO_x emitted from a vehicle that is never deleted.

AED provides a breakdown by state of excess NOx emissions as the result of truck tampering. Based on observed data from 2009 to 2019, AED reports that New Jersey represents 5,019 (tons) excess NOx emissions, New York represents 13,927 (tons) excess NOx emissions and Connecticut represents 3,062 (tons) excess NOx emissions for a total of over 22,000 (tons) excess NOx for the nonattainment region. The following AED figure depicts nonattainment and maintenance areas for 2008 ozone NAAQS with shaded areas indicating the number of unique invoices per 100 square miles containing delete parts. *Id.* at 20. This figure illustrates the tampering and therefore NOx emissions within the NY-NY-CT nonattainment region as elevated.

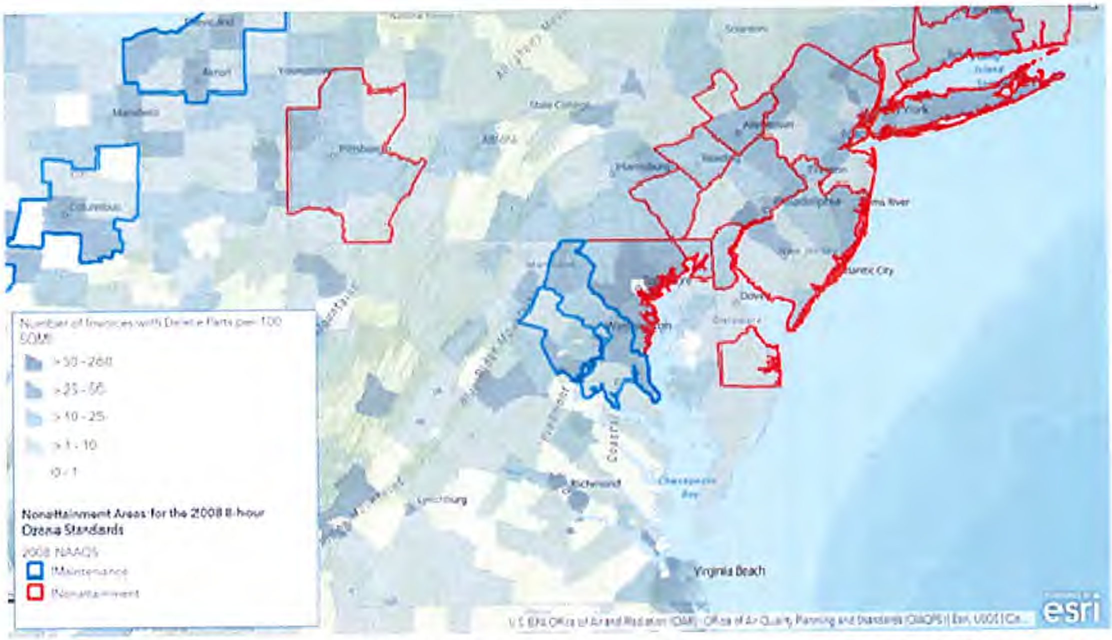

Figure 13. Number of Unique Invoices Per 100 Square Miles Containing Delete Parts – Mid-Atlantic Region

Further evidence of mobile source impacts on ozone nonattainment is EPA's work on the Cleaner Trucks Initiative ("CTI"). MOG submitted comments to EPA's CTI Advanced Notice of Proposed Rulemaking on February 20, 2020[51] and subsequently on July 6, 2020[52]. MOG's initial comments on the CTI ANPR offered support for the EPA initiative particularly with regard to air quality modeling data available at the time which demonstrated the significant contribution of mobile sources to ozone concentration in the East. That data confirmed the significant role that mobile sources play in determining air quality. In the later comments, MOG reviewed new air quality modeling (including the MOVES inventory completed by Oak Leaf Environmental, Inc. at the request of MECA and the related air quality modeling performed by Alpine Geophysics, LLC at the request of MOG) that directly assessed how the implementation of a CTI 90% NOx emission reduction scenario is likely to improve air quality in the continental U.S. The following map

51 Midwest Ozone Group Comments Regarding Cleaner Truck Initiative; Advance Notice of Proposed Rulemaking; Docket ID No. EPA-HQ-OAR-2019-0055, February 20, 2020 attached and identified as Exhibit F.

52 Midwest Ozone Group Supplemental Comments on Advanced Notice of Proposed Rulemaking Related to the Cleaner Truck Initiative; Docket ID No. EPA-HQ-OAR-2019-055, July 6, 2020 attached and identified as Exhibit G.

illustrates the benefit of NOx emissions reductions on ozone attainment with the newer 2015 ozone NAAQS. MOG Supplemental Comments at p. 5.

> As shown in Figure 3, applying the 90% NOx emission reduction CTI scenario to the 2028 base year eliminates ozone nonattainment everywhere east of the Rockies and in Denver and leaves only the states of California and Utah with 70 ppb 2015 ozone NAAQS nonattainment areas. Multiple monitors in California and in Salt Lake County, Utah also show modeled attainment with the CTI strategy.

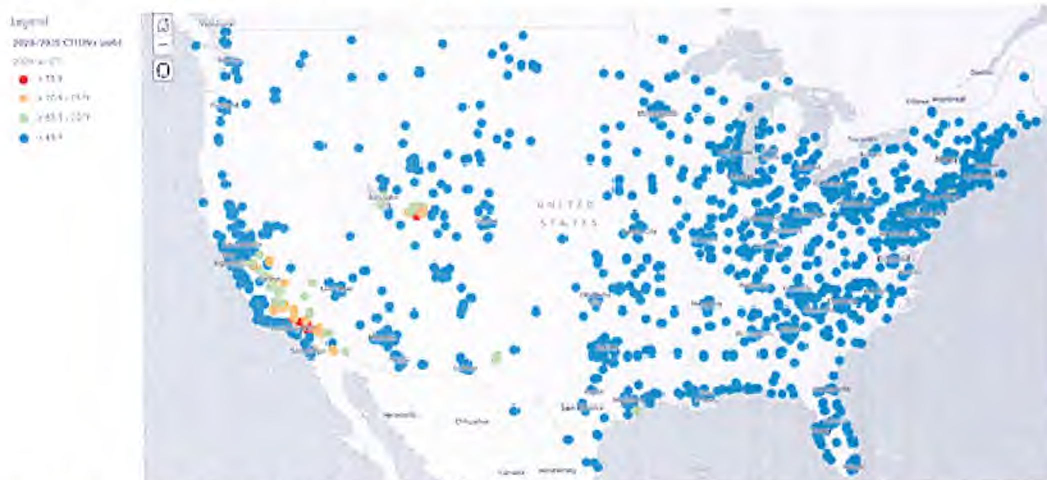

Figure 3. Calculated MDA8 Ozone Design Values (ppb) resulting from CTI strategy run.

d. Emission impact of local sources is significantly greater per ton on ozone concentrations at local monitors than emission from sources in upwind states.

In a report[53] prepared for MOG by Alpine Geophysics, Alpine examined which state's emission have the greatest impact on downwind ozone concentrations on a future year ozone concentration projection.

In this report, Alpine has determined, at each monitor, from where and what source category, on a ppb per ton basis, we see the greatest relative contribution to ozone concentrations. In other words, which source category, and from what state, has the greatest per ton NOx contribution to the monitors' modeled ozone concentrations. Results from Alpine's calculations were then normalized to the results to the maximum individual state/category contributor, so that one can easily identify the greatest ppb per ton by state/source category and have an easy way of determining which categories have greater relative impact compared to all others. In addition to recognizing the usefulness of this impact factor in determining which states and categories are the largest ppb/ton contributors to each monitor, the results may be used in assisting policy makers in the development of control strategies and their relative impact on ozone concentrations at various locations. Resulting

53 Relative Impact of State and Source Category NOx Emissions on Downwind Monitors Identified Using the 2017 Cross State Air Pollution Rule Modeling Platform, prepared by Alpine Geophysics January 2016 and attached to these comments and identified as Exhibit H.

monitor-level, relative impact factors for the twenty-one eastern state proposed rule identified nonattainment and maintenance monitors are presented in the tables set forth in that report. Source apportionment modeling updates to this analysis[54] were made with EPA's 2023en modeling platform with results for one of the Connecticut monitors shown in the Figure 20 below.

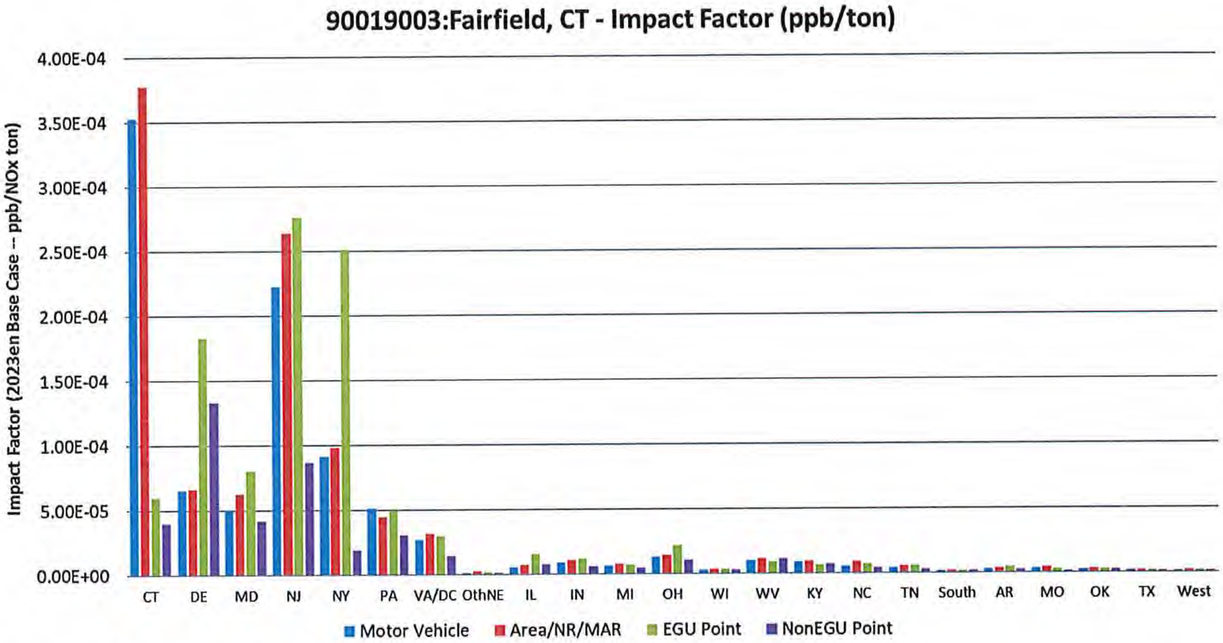

Figure 20. Impact of local sources on Westport monitor.

As can be seen from this chart, assuming linearity of NOx emissions and ozone concentration changes, the greatest relative contribution impact in ozone concentrations come from emissions and sources located in Connecticut itself and from sources throughout the Northeast. The chart also shows that the three states with the next greatest potential to improve air quality in Connecticut on a per ton of NOx reduced basis are New Jersey, New York, and Delaware. Importantly, the cost of reducing ozone (the regulated pollutant) using the methods proposed by EPA is 10 times higher in states outside of New England (assuming the same control cost on a $/ton of NOx removed basis) as EPA utilizes to determine NOx budgets in Step 3. While EPA assumes uniform control costs for the precursor NOx for every state, the cost of achieving the ozone reductions at the relevant monitors are 10 times higher in the Midwest states. This shifts the cost burden for reducing ozone by making Midwestern states reduce more emissions with less impact on ozone concentrations.

This analysis further supports the conclusion that the control of local sources and local transport are key components to addressing residual nonattainment concerns in the region with respect to the 2008 ozone NAAQS.

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54 4kei OSAT Modeling Results - Preliminary Report – prepared by Alpine Geophysics March 2019 and attached to these comments and identified as Exhibit I.

e. EPA has correctly identified several significant sources in New York as mitigation techniques that need to be addressed in this rule – effectively resolving all downwind nonattainment. (Comment C-5)

EPA has specifically invited comment on whether ozone-season NOx mitigation technologies other than those proposed should be considered for inclusion in the Revised CSAPR Update (Comment C-5; 85 Fed. Reg. 68993). Examples offered by EPA of such a technology includes the New York Department of Environmental Conservation (NYDEC) rule adopted in January 2020 which set limits on emissions from combustion turbines that operate as peaking units and grid connected municipal waste combustors. EPA states that it has not historically considered NOx mitigation technologies for these sources in rulemakings of this kind but invites comment on their appropriateness for this rulemaking including comment on its discussion of these additional strategies in the Mitigation TSD. 85 Fed. Reg. 68993. Based on the impact factors calculations discussed above, EPA would have a bigger and more cost effective impact on ozone nonattainment at the Connecticut monitors through emission reductions at these EGUs in New York, than those proposed in the Revised CSAPR Update.

Simple Cycle Combustion Turbines (SCCT)

In its Mitigation TSD,[55] EPA correctly notes that on the days conducive to high ozone in the summer, high temperatures also occur resulting in a substantial increase in electricity demand. As noted in the previous section of these comments, this increased demand in the Connecticut, New York, New Jersey and Maryland is achieved by using peaking units that have relatively high NOx emission rates. These units are often simple cycle combustion turbines that operate on high ozone days, are cost effective to be controlled or replaced, and can dominate EGU NOx emissions on high ozone days – an analysis that is confirmed by EPA's Mitigation TSD.

MOG notes with great interest the NYDEC rulemaking which imposes new controls on these simple cycle combustion turbines located in New York. Beyond the importance of addressing these controls generally, it is significant that these controls have been advanced by NYDEC specifically to address their impact on nonattainment monitors in Connecticut.

The Regulatory Impact Statement in support of the final SCCT rule makes it very clear that emissions from these sources are the cause of the nonattainment being experienced at the nonattainment monitors that EPA has used as the basis for its proposed Revised CSAPR Update rule. The following excerpts are taken directly from the final version of this Regulatory Impact Statement and specifically names the two Connecticut monitors at Stratford and Westport that are the only nonattainment monitors relied upon by EPA in support of its proposal:[56]

The current design value for the NYMA ozone nonattainment area is 0.082 ppm based upon

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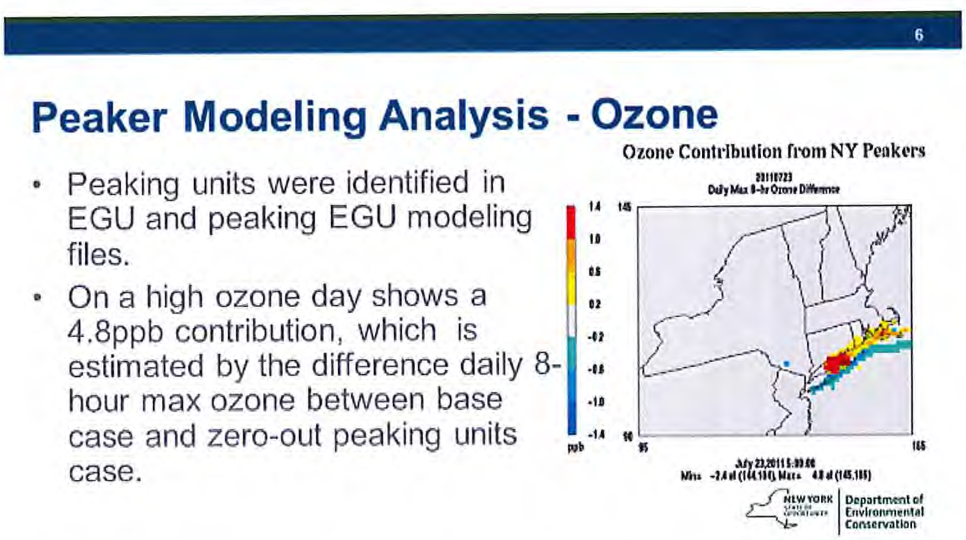
55 Technical Support Document (TSD) for the Proposed Revised CSAPR Update for the 2008 Ozone NAAQS, Docket ID No. EPA-HQ-OAR-2020-0272, EGU NOx Mitigation Strategies Proposed Rule TSD, U.S. Environmental Protection Agency, Office of Air and Radiation, October 2020. Pp. 16-20.

56 https://www.dec.ny.gov/regulations/116131.html

monitors in Westport and Stratford, Connecticut which are located in the shared multi-state nonattainment area.

> . . .
>
> New York significantly contributes to nonattainment monitors in the Connecticut portion of this nonattainment area. Currently, attainment must be reached by June 20, 2021 for the 2008 ozone NAAQS and August 3, 2024 for the 2015 ozone NAAQS. DEC is currently working on a suite of regulations, both new and revised rules, in order to further reduce New York's impact on downwind ozone levels
>
> . . .
>
> This rulemaking proposes to lower allowable emission rates for SCCTs during the ozone season with the intention to lower NOx emissions from these sources, especially on high ozone days. To better understand the impact of SCCTs on the ambient air quality, DEC used the Community Multiscale Air Quality Modeling (CMAQ) system to model one high ozone day.[6] The high ozone day modeled was July 23, 2011 and the results demonstrated that old SCCTs located in New York State contributed 0.0048 ppm to downwind monitors that currently show nonattainment. (Footnotes omitted; emphasis added.)

The following slide taken from a presentation of NYDEC[57] graphically displays the area predicted by its modeling to be impacted by emissions from these sources and confirms the NYDEC Regulatory Impact Statement that it is the Connecticut monitors that are most significantly impacted.



In its May 17, 2019 comments[58] on the New York SCCT rule, Connecticut reinforced New York's admission of responsibility for Connecticut's ozone non-attainment and maintenance concerns as follows:

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57 http://www.midwestozonegroup.com/files/New_York_Peakers.pptx

58 Tracy Babbidge, Chief, Bureau of Air Management, CTDEEP letter to Ona Papageorgiou, NYDEC dated October 7, 2019. https://portal.ct.gov/DEEP/Air/Planning/Ozone/Ozone-Planning-Efforts

> Excessive and unnecessary levels of air pollution from these units contribute to unhealthy ozone levels in Connecticut, particularly on days most conducive to high ozone levels in the region . . .
>
> Connecticut cannot attain the ozone standards without further emission reductions occurring in the New York metropolitan area. Connecticut currently exceeds the 70 parts per billion (ppb) ozone standard with design values of 82 ppb at the Stratford and Westport monitors.

It is again worthwhile noting that Stratford and Westport are the only two non-attainment monitors being relied upon by EPA to support the proposed Revised CSAPR Update.

It is also significant that beyond Connecticut's recognition that non-attainment at its Stratford and Westport monitors are being caused by emissions from these SCCT units, Connecticut's comments are critical of the New York SCCT rule as not assuring that these sources will be prevented from significantly contributing to non-attainment in downwind states. The Connecticut comments go on to state:

> The proposed rule will not begin its first phase until May 2023 and allows for compliance extensions up to four years. Delaying requirements for emission reductions from some of the <u>most inefficient</u> and <u>dirtiest</u> units in the region only helps to assure extended non-attainment of the standards. The timeframe for the implementation of the rule should be condensed to be more consistent with attainment dates for the non-attainment area. (Emphasis added).[59]

Even though NYDEC acknowledges that New York's SCCT units are causing the nonattainment at the Connecticut monitors, New York has elected to defer the implementation of required controls beyond the attainment date mandated by the Clean Air Act. As EPA has noted in its Mitigation TSD, the controls established by NYDEC call for subject units to meet a NOx emission rate of 100 ppmvd by May 1, 2023 and a more stringent limit by May 1, 2025. When challenged by those commenting on its SCCT rule to condense the timeline for implementation to be more consistent with the attainment dates for nonattainment areas, NYDEC responded by stating that it deferred the compliances dates for other reasons not related to the applicable attainment date.[60]

EPA's independent analysis of SCCT units as set forth in the Mitigation TSD confirms the conclusions reached by both New York and Connecticut, that units of this kind which are operated for only a small number of hours on high energy demand days produce emissions "that cause, help

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59 *Id.*

60 6 NYCRR Subpart 227-3, Ozone Season Oxides of Nitrogen (NOx) Emission Limits for Simple Cycle and Regenerative Combustion Turbines, Assessment of Public Comment, Comments received from February 26, 2019 through 5:00 P.M., May 20, 2019, page 46 of 50. https://www.dec.ny.gov/docs/air_pdf/siprevision2273.pdf

cause or exacerbate exceedances of the NAAQS.[61] EPA's analysis also currently concludes that:

- In the 12 states addressed in the CSAPR Update Revisions 102 SCCT units had capacity factors below 10% in 2019, but actually produced an average of 13% of their gross generation in high energy demand hours and for 18 of those units electric production in higher energy demand hours accounted for 20% of total generation of those units in 2019.[62]

- Emission rates of SCCT units can be 118 times their respective state averages.[63]

- In New York, these peaker units were found to be "highly emissions-intensive" but "provide relative minimal generation in peak hours.[64]

MOG urges EPA to address New York's failure to properly address these sources by mandating mitigation measures in the final version of this rule to impose new controls by the legally mandated attainment date of 2021.

Municipal Waste Combustion (MWC)

Beyond addressing SCCT units, MOG welcomes the opportunity to support EPA addressing the significance of emissions from Municipal Waste Combustion (MWC) as it moves forward to finalize this proposal. MOG finds it significant, that here again, EPA has determined that emissions from MWC combustors "significantly contribute to ozone levels" in the NY-NJ-CT non-attainment area.[65] This conclusion again is particularly significant in connection with the proposed Revised CSAPR Update because the only non-attainment monitors (and one maintenance monitor) cited by EPA in its proposal are indeed in the NY-NJ-CT non-attainment area.

We again direct our comments to the regulatory program of New York with respect to the MWC units, which according to EPA's analysis is less stringent than Connecticut and New Jersey – the other states in the NYMA.[66]

It is obvious that the significance of the emissions from MWC and their impact on the monitors upon which the Revised CSAPR Update is based makes these sources candidates for the imposition of new controls by the applicable 2021 attainment date.

Distributed Generation

In addition to inviting comment on SCCT and MWC units, EPA also invites comment on

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61 Mitigation TSD at p. 16 of 22
62 *Id.*
63 *Id.* at p. 17 of 22.
64 *Id.*
65 *Id.* at p. 20 of 22
66 *Id.* at p. 21 of 22

other EGUs not covered by the existing CSAPR programs.[67] In that regard, MOG urges EPA to consider utilizing the Revised CSAPR Update as the opportunity to address new mitigation measures not only for SCCT and MWC units, but also for Distributed Generation (DG) units. While New York has undertaken the regulatory process related to DG units, its approach to addressing the emissions from these sources is inadequate with respect to both the timing and degree of emission reduction control.

On September 4, 2019, New York proposed a revision to 6 NYCRR Subpart 222. Even though the Regulatory Impact Statement in support of that proposal concedes that additional controls on these sources "is a critical component" in the state's strategy to meet the federal 2008 ozone NAAQS with an attainment date of 2021 and even though New York concedes its significant contribution to non-attainment monitors in Connecticut, its proposed rule[68] defers full implementation of control requirements until May 1, 2025 – some four years later than the attainment deadline. MOG again calls on EPA to utilize the CSAPR Update Revision to accelerate the imposition of these control requirements to the extent necessary to be a mitigation measure.

Even in advance of its proposed Revised CSAPR Update, EPA took the occasion of its review of New York's RACT program to recognize the need for New York to take additional measures to properly address all three categories of sources in New York to address attainment of the 2008 ozone standard in the NYMA[69] as follows:

- With respect to SACCT units, EPA has found that New York's limits for these units are less stringent than neighboring states. Specifically, in comparison to the new limit of 100 ppmvd, effective May 1, 2023, EPA found that Connecticut had adopted a more stringent NOx limit of 50-75 ppm with a compliance date of June 2018 and 40-50 ppm with a compliance date of June 2023. Anticipating that the New York SCCT rule would be submitted to EPA for approval as a SIP revision, EPA offered the following comment which recognizes the need for more stringent controls on these sources.

  > The EPA will fully assess New York's recently adopted Subpart 227-3 for approvability once the rule is submitted to EPA for inclusion into the New York SIP. Inclusion into the SIP of more stringent NOx emission limits for simple cycle turbines located throughout the State, and particularly in the New York portion of NYMA, would provide additional NOx reductions to help attain the 2008 ozone NAAQS.

- With respect to Municipal Waste Combustors (MWC), EPA first pointed out that the New York limits were less stringent than those of Connecticut and neighboring states and then offered the following statement:

  > Inclusion in the SIP of more stringent NOx emission limits for MWCs located in the New York portion of NYMA would provide additional NOx

67 *Id.* at p. 20 of 21

68 NYDEC Parts 222 and 200 Revised Regulatory Impact Statement

69 85 Fed. Reg. 8238 (February 13, 2020)

reductions to help attain the 2008 ozone NAAQS.

- With respect to Distributed Generation, EPA noted that New York has undertaken the regulatory process to address NOx emissions from those units on HEED and that Connecticut had already done so. EPA encouraged New York to submit its regulation of these sources as a SIP revision "as soon as possible after completion of the regulatory process."

There can be no denying the fact that these New York SCCT, MWC and DG units are causing the Connecticut monitors to be nonattainment or maintenance monitors – the same monitors being relied upon by EPA in support of the proposed CSAPR Update Revision. The New York rule addressing these sources acknowledges the applicable 2021 attainment date related to the 2008 ozone NAAQS but for other reasons elects to defer the specified controls requirements. The practical and legal effect of such a decision is ongoing nonattainment/maintenance status for the Connecticut monitors. EPA has no authority in this case to base the proposed rule on the three subject Connecticut monitors, when imposing additional controls on these New York sources would bring all three subject Connecticut monitors into attainment. To avoid what would otherwise be a clear case of over-control on other categories of upwind sources, we urge that EPA recognize that imposing controls on these SCCT, MWC and DG units is an appropriate mitigation measure that effectively resolves all issues for all upwind states that would otherwise be linked to the Connecticut monitors, and that is directly responsive to the *Wisconsin* court's remand .

f. The air quality improvements related to the emission reduction programs that EPA failed to consider are significant and indicate that EPA's proposal has resulted in over-control.

The preamble to the proposed rule discusses the process by which EPA performed its analysis of overcontrol, stating (85 Fed. Reg. 69006) that

> In *EME Homer City*, the Supreme Court held that EPA cannot "require[] an upwind State to reduce emissions by more than the amount necessary to achieve attainment in every downwind State to which it is linked." 572 U.S. at 521. On remand from the Supreme Court, the D.C. Circuit held that this means that EPA might overstep its authority "when those downwind locations would achieve attainment even if less stringent emissions limits were imposed on the upwind States linked to those locations." EME Homer City II, 795 F.3d at 127

While adding that the court understands that a degree of imprecision is inevitable, EPA then confirms that it evaluated only whether reductions resulting from the proposed $1,600 per ton emission budgets for EGUs in 2021 and 2022 are expected to resolve any downwind nonattainment or maintenance problems. It concludes that the emission budgets reflecting a control cost of $1,600 per ton would change the status of one of the two nonattainment receptors (first shifting the Stratford monitor to a maintenance-only receptor in 2021 and then shifting that monitor to attainment in 2022) and that "none of the 11 states are solely linked to the Stratford receptor that is resolved at the

$1,600 per ton level of control stringency in 2022."

MOG also notes that the EPA analysis used a 1% of the NAAQS threshold for its linkage criteria notwithstanding the fact that EPA itself has authorized the use of a 1 *ppb* linkage threshold[70]. Use of the 1 ppb threshold alone would have eliminated the nonattainment linkage for three of the 12 states proposed to be included in the revised CSAPR Update program.

Because EPA analysis of over-control as required by the court in *E.M.E. Homer City*, used a 1% linkage threshold, and because EPA's analysis failed to consider the factors cited in these comments showing that the Connecticut problem monitors will likely attain the 2008 ozone NAAQS, EPA has failed to properly assess over-control. Specifically, the failure to incorporate the air quality benefits of a number of local emission reduction programs that are already in place, or will be in place by the 2021 ozone season, and the failure to address the adequacy of the Connecticut monitors as appropriate indicators of nonattainment or maintenance, creates a fatal flaw in EPA's over-control analysis.

8. EPA's proposed plan to determine budgets and implementation should be adjusted to correct errors.

In addition to its comments related to EPA's Step 1, 2 and 3 analysis. MOG offers the following comments with respect to Step 4 and the manner in which EPA proposes to establish and implement it proposed budget changes.

a. The initial 12 state budgets for 2021 must be recalculated because of EPA's erroneous assumptions regarding unit retirements.

EPA's initial 2023 inventory, from which it back-calculated the 2021 initial 12 state budgets, excludes units that EPA assumed would be retired. There a number of those assumed retired units that are not legally required to be retired and that may, in fact, be operating beyond any announced retirement date. As discussed above, there are a number of other units whose retirements have already occurred, but that remain in EPA's inventory for 2021. A full re-examination and validation of the inventory should be performed prior to the issuance of any final rule. Because the location and amount of emissions impacts the fundamental premise of EPA's action – that a significant contribution to downwind non-attainment occurs within a specific state – any changes as a result of that re-examination should be made available for public comment prior to the issuance of any final rule.

b. The proposal to reduce state budgets by subtracting emissions from retired units unlawfully increases the stringency of the program and threatens electric reliability.

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70 https://www.epa.gov/sites/production/files/2018-09/documents/contrib_thresholds_transport_sip_subm_2015_ozone_memo_08_31_18.pdf

EPA announced a dramatic change in the way retired units are treated for the future years (beyond 2021) in the proposed rule[71] stating that ".... EPA will be accounting for scheduled fleet turnover after the first-year budget. For instance, if State X's budget was 100 tons in 2021, but there are 10 tons of emissions from a unit scheduled to retire at the end of the year and 5 tons expected from a new unit coming online, then the state emission budget for 2022 would reflect these scheduled changes by establishing a budget of 100 tons—(10 tons -5 tons) = 95 tons for the subsequent year." Although EPA states that this does not amount to the imposition of a more stringent standard on the affected units within a state, that is exactly what occurs as a result of this change in policy.

Removing from the state budget all of the emissions associated with a retired unit in the year of its retirement without allowing any flexibility for other affected units to "make up" the generation from that unit is unreasonable and becomes a constraint on generation. For example, EPA lists R.M. Schahfer Units 14, 15, 17 and 18 in Indiana as retiring in 2023. EPA adjusts for these retirements and other factors and the result is that Indiana's ozone season state budget is reduced from 11,998 tons in 2023 to 9,447 in 2024 and thereafter. In 2024, total ozone season NOx emissions in Indiana would be reduced by 43% from 2019 levels. According to Appendix A to EPA's Ozone Transport Policy Assessment, over the period from 2021 to 2024, EPA's calculated "baseline NOx emissions rate" for Indiana units during the ozone season is reduced from 0.089 #/mmBtu in 2021 to 0.064 #/mmBtu in 2024. This level of control far exceeds the purported basis of EPA's proposal to "cap" emissions from SCR controlled units at 0.08 #/mmBtu.

EPA's analysis in Appendix F of the Ozone Transport Policy Assessment Proposed Rule TSD also raises serious doubts about the wisdom of this policy shift, as in every year beyond 2022, existing and committed resources, including new renewable resources, are insufficient to satisfy existing loads plus 0.8% growth, as shown in Table F-3, reproduced below.

Table Appendix F-3: Assumed Baseline OC Generation & Expected New Build Generation (TWh)						
	2019	2020	2021	2022	2023	2024
2019 Generation Levels with 0.8% Growth	384.1	387.2	390.3	393.4	396.5	399.7
Assumed Baseline Fossil Generation with Known Fossil Retirement & Fossil New Build*	384.1		387.1	389.2	385.4	379.2
New Build (non-Fossil) **			4.6	7.2	7.2	7.2
Total			391.7	396.4	392.6	386.4
Total (including planned NGCC new build) **				412.4	408.6	402.4

*Includes "committed" new fossil under construction.

**Likely underestimates new RE as it may not show up in EIA 860 far in advance due to shorter installation time. Note, this assumes no new RE in 2023 and beyond.

**Includes new fossil planned for 2022 or later, but with approval pending.

71 85 Fed Reg 68964 at 69007-8

Only by including planned capacity additions that have not yet received regulatory approvals can EPA assert that there is no deficiency created by this change in policy.

We offer Indiana as a state that is particularly adversely impacted. Appendix Table F-1 reports the results of EPA's analysis, and shows that while the average heat input from covered fossil units during 2016-2019 in Indiana ranged from a high of 432.3 TBtu in 2018 to a low of 356.5 TBtu in 2019, the assumed heat input from those units under the proposed rule would be constrained from a high of 356.5 TBtu in 2021 to a low of 302.3 TBtu in 2024. This corresponds with a precipitous drop in energy production from 38.4TWh in 2023 to 33.8 TWh in 2024 as a direct result of the assumed unit retirements in Indiana. No other state is as dramatically impacted by the rule. In fact, most of the twelve states have relatively steady contributions from existing units during this same period. However, the changed policy affecting unit retirements means that existing units will not be able to "make up" the generation formerly supplied by other covered units, particularly in the later years of the program. In fact, sufficient resources may not be available unless currently planned projects receive timely and complete approvals and are able to meet construction schedules without interruption. EPA performed no analysis of past timelines for permitting and regulatory approvals to support this assumption.

In addition, the assumption that new units will always emit fewer tons than a retiring unit is simply not valid. While that might have been true once, many of the coal units have become load following, and CSAPR budgets already self-adjust by basing allocations on the most recent 5 year period, resulting in a new baseload unit being allowed to emit more than a retiring unit. EPA has requested comment on whether 2020 emissions should be used to develop budgets, but 2020 has not been a representative year for unit operations, with many businesses closed and high unemployment at sustained levels throughout the year. Including this year in the analysis will only further depress state budgets and hamper economic recovery in these states.

EPA's approach of continuing to allocate allowances to retired units while shrinking the state budgets would cause some of those allowances to sit on the sidelines and not enter the market or be used by a company to forgo more cost-effective reductions so as to conserve capital and O&M expenditures. Given these concerns for many companies' reliance on the market for a substantial portion of their compliance is not reasonable because of the restrictions EPA has put on the trading program and the stringency of the proposed program. This problem can be addressed by determining state budgets and unit allocations using the same, consistent approach for both using a multiyear average heat input basis. MOG can support EPA's long-standing policy for allowing retired units to retain their share of a state's NOx budget for some period of time provided that when retired units are no longer used for determining the size of the state budget, the allocation to those retired units ceases. The inequity in the proposed rule (requiring that remaining operational units are subject to more stringent control simply due to retirement of other units) must be addressed.

MOG therefore urges EPA to reject this new policy on unit retirements and re-evaluate the success of the program based on the requirements currently in place for the entire 22-state CSAPR region. Allowing retired units to continue receiving allocations for a limited period after ceasing operations will not diminish the need to optimize SCR controls, given the levels of generation projected for 2021-2014 in EPA's own analysis. *See* Table Appendix F-1, Ozone Transport Policy

Assessment. Eliminating those emissions from the program has dramatic adverse impacts on states where multiple unit retirements occur simultaneously.

c. EPA's failure to account for the use of common stacks has resulted in significant errors in calculating the budgets for at least the states of Indiana and Kentucky.

EPA's methodology to evaluate NOx emissions from common stacks (reporting under 40 CFR 75.72) that monitor flue gas from both SCR-equipped and non-SCR-equipped units is flawed. EPA's inability to accurately partition emissions for these types of gas flow configurations results in an underestimation of state budgets for the years of 2021 and 2024. This section describes the shortcomings and proposes revised budgets for the states of Kentucky and Indiana.

EPA determined NOx emissions from SCR-equipped units by improperly parsing reported CEMS data from combined stacks in an attempt to partition emissions between SCR-equipped and non-SCR-equipped units. EPA assigned the NOx tons observed over periods when the unit *not equipped with SCR* was inoperable, assigning these tons to the *SCR-equipped unit* and further assuming these emissions are indicative of SCR NOx control for this unit. EPA has previously apportioned emissions from common stacks for some of these units.[72]

In almost all common stack incidents EPA's approach did not properly reflect the performance of the SCR-equipped unit. As a result, NOx emissions assigned to the SCR-equipped units are excessively high, thus the "balance" of NOx tons assigned to the non-SCR equipped unit are too low. As a consequence, the NOx budget for SCR-equipped units is allocated additional emission reductions for SCR optimization when the units were already operating below 0.08 lb/MBtu. For example, in Kentucky, Cooper Unit 2 has a permit limit from a 2007 consent decree to meet a 0.08 lb/MBtu NOx emission rate on a 30-day rolling average.[73] The unit did not have any NOx emission rate exceedances in the 2019 calendar year. Further, the SCR processes on Shawnee Units 1 and 4 did not initiate operation until the 2018 ozone season, so review of historical data would not report the actual emissions rate from Units 2, 3 and 5 which share the stack.

EPA set SCR emission rates for both Ghent 3 and Clifty Creek 4 and 5 at 0.075 lb/MBtu, but the agency did not apply these rates in either the Indiana or Kentucky budget setting process.[74] Since the budget process is based upon 2019 emission rates, the more correct NOx emission rates that should have been applied to Ghent 3 are 0.046 lb/MBtu and to Clifty Creek 4 and 5 are 0.07 lb/MBtu. There is one exception to the re-assignment of emissions in the Indiana budget setting process discussed earlier and that applies to Rockport. Rockport installed an SCR on Unit 1 in 2017 and installed an SCR on Unit 2 in June 2020, pursuant to a federal consent decree.75 In addition to

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72 *Documentation for EPA's Power Sector Modeling Platform v6 Using the Integrated Planning Model* (November 2018). See Table 3-18. Hereafter EPA Power Documentation.

73 www.epa.gov/sites/production/files/documents/eastkentuckypower-cd.pdf

74 EPA Power Documentation.

75 www.epa.gov/sites/production/files/2019-07/documents/env_enforcement-2819962-v1-aep_filed_version_of_motion_to_enter_fifth_modification.pdf

requiring the installation of SCR on both units, the consent decree establishes a 30-day rolling average NOx emission rate of 0.090 lbs/MBtu. Table 2 lists the units and the 2019 SCR NOx emission rates used to adjust both the Kentucky and Indiana state budgets in 2021, based upon discussion with unit operators.

Unit	2019 SCR Rates (lbs/MBtu)
Ghent 3	0.046
Cooper 2	0.047
Shawnee 1	0.036
Shawnee 4	0.031
Clifty Creek 4 and 5	0.070
Rockport 1 and 2	0.090

Table 24. *2019 Unit SCR Emission Rates (lb/MBtu).*

Utilizing the revised value of NOx emissions for SCR-equipped units results in a *higher NOx budget* in 2021. Correcting NOx emissions from the SCR –equipped unit to a lower value increases the NOx tons assigned to the non-SCR-equipped unit – the total common stack emissions must remain the same. If the non-SCR-equipped unit is equipped with state-of-the-art combustion controls, then the revised, assigned NOx tons increase will be reflected in the budget for 2022 forward. If the non-SCR unit does not have state-of-the-art controls the 2022 forward emissions will be adjusted based upon retrofitting the unit with a state-of-the-art emission factor.

This critique proposes a remedy to EPA's shortcomings for the state budgets of Kentucky and Indiana. The approach taken was to contact the owners of units emitting through common stacks and obtain unit specific ozone season NOx rates or NOx emissions rate from the SCR-equipped units. These results are used to determine if the SCR was correctly optimized (<0.08 lb/MBtu NOx) in determining the 2021 state budgets. The emissions to the non-SCR-equipped unit were revised (e.g. increased) accordingly. This revision to the common stack data analysis increased the state budgets for both states.

Table 25 presents how these adjustments increased the total budget for Kentucky and Indiana.

State		NOx Budget: As Proposed				NOx Budget: Revised Per Common Stack Corrections			
		2021	2022	2023	2024	2021	2022	2023	2024
KY		14,384	11,936	11,936	11,936	15,308	12,347	12,347	12,347
IN		12,500	11,998	11,998	9,447	12,902	12,400	12,400	9,849

Table 25. *Adjusted State NOx Budgets per Common Stack Corrections (in tons).*

The states of Kentucky and Indiana feature numerous "common stack" generating stations in which the stack gas from an SCR-equipped unit is blended with that of a unit not equipped with

SCR, confounding EPA efforts to ascribe authentic emissions to each individual unit. In almost all cases, EPA incorrectly infers a higher NOx emission rate to the SCR-equipped unit, unavoidably assigning a lower NOx rate to the unit without SCR. As a consequence, this NOx "imbalance" for a SCR unit artificially lowers the NOx budget for a state. Correcting EPA's inferred NOx emission rates for both SCR- and non-SCR-equipped units results in state NOx budget increases.

d. Contrary to EPAs representations, the NOx limits proposed for EGUs cannot be achieved by many units through the operation of existing controls.

The basic premise of EPA's Revised CSAPR Update proposal is that NOx emission reductions are achievable by the 2021 ozone season. Clearly, and appropriately, EPA recognizes that installation of new SCRs by EGUs in not physically possible by the start of the 2021 ozone season. However, MOG believes that compliance with EPA's proposal by many EGUs will require a significant change in the operation of even existing SCRs. This is exacerbated by the impact of the way the proposed rule treats unit retirements.

In a significant change in policy, EPA's treatment of planned unit retirements in setting future year budgets (2022 to 2024) inappropriately results in an inequitable distribution of allowances that will have the consequence of subjecting other operational units within a state to more stringent reductions and/or higher allowance costs simply due to the retirement of a unit. In the proposed budget tables, EPA uses planned unit retirements to decrease the state budget. However, under the proposed method of allocating the budget to individual sources, the tables show that units that have been retired in the budget determination will continue to get a share of that smaller budget. In other words, the unit level allocations are lower not because operating units are expected to employ even more stringent control measures but simply because other units are retired. Those allocations come at the expense of the remaining operational units even as those remaining units are likely to operate more to make up for generation that will no longer be provided by the retired units. This impact can be significant, forcing reductions in allocations to an individual unit of well over 100 tons. In effect, this is equivalent to holding the operating units to a more stringent requirement than anticipated and could result in prohibited "overcontrol" if those reductions exceed the cost-effective basis of $1600 per ton. EPA must address this inequity if it intends to set declining budgets in the Revised CSAPR rule.

MOG believes that the increased stringency of control level that the proposed rule will require of existing units results in the inability of most units to comply by the May 1, 2021, start of the ozone season for reasons including the following. Most SCRs were built in the period between 2002 and 2005 and were designed to meet seasonal NOx limits imposed either by regulations or agreements in effect at the time of design and construction. Compliance with the EPA proposed rule will require most of these existing SCR units to perform at levels that, in many cases, significantly exceed design criteria and will require extensive renovation in order to be in compliance by May 1, 2021.

There are at least four maintenance and operations activities required by the operators of existing SCR in order to achieve high NOx removal.[76] They include tuning of ammonia injection grid hardware, replacement and repair of cleaning hardware such as acoustic horns and sootblowers,

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76 Cichanowicz Report, Exhibit B.

cleaning of installed catalyst to remove accumulated fly ash, and replacement of or addition of catalyst. Three of these four activities require extended planning or procurement that, with rare exception, are not possible to complete in a six-week period such as the six weeks between finalization of the proposed rule and the start of the 2021 ozone season. Indeed, MOG believes that, because of supply chain limitations, catalyst replacement would not be possible by the start of the 2021 ozone season for many units even if planning for such as change is initiated now.

For example, tuning of the ammonia injection grid hardware, which may include hundreds of individual injectors, must be done at intervals ranging from 1 to several years and can take days to weeks. This work is most reliably done by specialized test crews with dedicated trailers of instrumentation that are relocated between sites – there are at most six providers of this service nationwide.

Replacement and repair of cleaning devices, typically acoustic horns and sootblowers, is necessary to maintain clean catalyst and effective NOx control. These devices can be inspected and refurbished as needed, but inspection and repair of acoustic horns requires access to the reactor internals, which can only be done when a unit is shut down, so compliance with the proposed rule could result in significant grid reliability issues if multiple affected units in a state are required to be shut down for much of the six week period between April 15 and May 1, 2021.

Finally, with respect to catalyst replacement, catalyst must be replaced with either "new" product or regenerated catalyst. Catalyst replacement frequency varies widely and is prompted by a combination of deactivation or severe blocking by deposits that cannot be manually removed by vacuuming. Replacing spent or partially deactivated catalyst with new catalyst requires approximately a year time due to the time necessary to specify the catalyst design, seeks bids from suppliers, select a supplier, and fabricate or regenerate and install the catalyst. There are only four or five major catalyst suppliers that provide SCR catalyst for U.S. application and the historic "lead time" for new catalyst is 9 months to one year. Accordingly, it is unlikely any unit will be able to acquire and install new catalyst, unless such material is already "on-order" for Spring 2021 delivery or the necessary catalyst has been acquired and is being stored. Moreover, cost of replacing an entire catalyst bed is likely much in excess of the $1600/ton NOx reduction that EPA has determined is cost effective. As a result, and contrary to the assumptions of EPA in the proposed rule, MOG submits that there are few options that an owner can utilize within the period between now and the date this rule is finalized to remedy deficiencies and support increasing NOx removal from moderate levels of 50-70% to the 80-90% required in the proposed rule.

The complete lack of any implementation period between finalization of the proposed rule and the start of the 2021 ozone season does not allow sufficient time to replace catalyst in exiting SCRs even if planning for such a change is initiated now. EPA has not only established state-wide budgets based upon this assumption but has also determined what unit specific allocations would be to implement those state budgets. EPA's proposal is premised on the assumption that the emissions rates upon which budgets have been set are achievable at the unit level or by trading. Even if this were otherwise a correct assumption, the lack of a compliance period to achieve such requirements makes compliance difficult if not impossible for many unit owners.

As a result of the near term compliance bottleneck created by the lack of time between the rule finalization and start of the 2021 ozone season, MOG recommends that EPA consider establishing a compliance period mechanism that addresses the inability to comply by employing one or more of the following recommendations:

1. Authorize the owner/operator of an affected EGU to purchase the right to delay compliance. This alternative compliance payment was used previously by the agency as part of the program to implement the ozone and particulate matter NAAQS. There, EPA allowed a source facing costs higher than had been anticipated by EPA, to pay a set annual amount per ton to fund cost-effective emission reductions. See: Presidential Documents, "Memorandum of July 16, 1997, Implementation of Revised Air Quality Standards for Ozone and Particulate Matter," 62 Fed. Reg. 38,421 (July 8, 1997).

2. Delay the implementation period by one year, to allow sufficient time to procure additional catalyst and stagger installation during reasonably scheduled unit outages.

3. Establish a first year transitional budget with emissions based on NOx emission rates of 0.10 lb/MMBtu and move to the proposed 0.08 lb/MMBtu budgets in 2022.

4. Set budgets on the basis of the same three-year average heat input data used in the proposed rule to address budget reallocation as the budget changes from year to year rather than basing the overall budget on a single year as in the proposed rule.

These recommendations recognize that the program is not simply about a numerical value; rather, it is underpinned by the averaging period. The emissions rate used to set the limit can't just be the lowest level EPA has seen, it must include the periods during which units are out of market and must operate at economic minimums to control the amount of money that they lose during these periods.

e. EPA's proposal correctly provides that NOx budgets should be set based on applicability of the entire ozone season and not high ozone days.

MOG has repeatedly opposed any suggestion that it would be appropriate to impose EGU NOx limits in a transport rule on any time scale shorter than the ozone season. While MOG has certainly objected to the several EPA actions to impose EGU NOx controls to address interstate transport, it has never done so because those limits were to be imposed on an ozone season basis. To the extent that controls on peak days are appropriate, MOG asserts that such may be more appropriate when applied to local – and not regional – sources.

EPA has consistently rejected the suggestion that it should use a daily emission limit instead of, or in addition to, the seasonal trading program. As it stated in the proposal of the CSAPR Update rule this rejection is based on the fact that "NOx ozone season trading programs are effective at reducing peak ozone concentrations."[77]

No party in the *Wisconsin* litigation challenged EPA's decision to use a seasonal cap. As

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77 See 81 Fed. Reg. at 74,523 and Response to Comments to the Proposed Action on Section [7426(b)] Petitions from Delaware and Maryland.

noted, the *Wisconsin* court found "no basis to set aside the challenged determinations" on modeling and implementation choices. Id. at 320. The court upheld EPA's assumption that turning on idled "Selective Catalytic Reduction" (SCR) controls on a seasonal basis would reduce an EGU's emissions to 0.10 lbs/mmBtu. Id. at 320. The EGU related emissions reduction strategy in the CSAPR Update rule was upheld by *Wisconsin*, and therefore the continuation of that strategy in the revised CSAPR Update is reasonable.

It has not been demonstrated that individual sources are capable of achieving a uniform NOx emission. Additionally, when establishing an average NOx emission rate, EPA calculated it by reviewing the past performance of all electric generating units nationwide that had catalytic controls. *Id.* at 77,543-44. EPA identified an average that was a reasonable representation of optimized performance for broken-in catalytic controls, based on an average of the third-lowest ozone-season NOx rates achieved by units with catalytic controls between 2009 and 2015. EPA declined to use the lowest rate ever achieved, or even the second-lowest rate because those rates may represent newly installed catalytic controls, emitting at rates not consistently achievable. EPA focused on emission rates that were routinely achievable to arrive at the average.

EPA has repeatedly considered and rejected the assertion that short-term limits are necessary to prevent NOx emission control units from being under-utilized on days with high ozone.[78] Based on reported emissions data, EPA found in its denial of the Maryland 126 petition that this was not typically occurring. Instead "[catalytic]-controlled units generally operated with lower emission rates during high generation hours, suggesting [catalytic controls] generally were in better operating condition – not worse, let alone idling-during those days/hours." EPA concluded that "the data do not support the notion that units are reducing [catalytic control] operation on high demand days." [79] Not injecting ammonia during high load periods is not something that is done. When in market or at high loads, the high heat input without ammonia injection would result in excessive allowance use during periods when ammonia injection provides a more economical means to account for emissions. NOx control at higher loads is cheaper than allowances except when allowances are extremely inexpensive.

In its rejection of the merit of short-term emission limits, EPA has assessed the lack of technical support for the assertion that EGUs are not operating their controls at all times therefore justifying the need for a unit-specific rates. EPA's analysis included a review of the ozone-season emission rates from coal-fired units equipped with SCR and found that, based on 2017 emissions with the CSAPR Update in place, 261 of 274 units had ozone-season emission rates below 0.2 lb/mmBtu indicating they were likely operating their controls throughout the ozone season. EPA also examined whether units turn off or turn down controls on high electricity demand days (HEDD) when demand for electricity is high (perhaps as a result of hot ozone-conducive weather conditions resulting in additional cooling demand). EPA concluded that, if there was any effect at all, that units typically operate their controls more-effectively on HEDD than other days. EPA also observed that for units that are cycling their SCRs (turning them down or off during low demand times), these units typically operated the SCR during the afternoon when ozone formation was most conducive. Consequently, EPA found that units are consistently operating their SCRs throughout the ozone

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78 83 Fed. Reg. at 50,466-7.
79 *Id.*

season. [80]

To the extent that controls on peak days are appropriate, MOG asserts that such may be more appropriate when applied on local – and not regional – sources.

9. The period EPA provided for public comment on its proposed rule is insufficient, especially given EPA's failure to prepare and make available information needed to assess and review the proposed rule.

MOG has been an active participant in transport rule development since the 1997 NOx SIP Call and continues to be keenly interested in the development of air pollution regulations that are based on sound science. MOG has undertaken independent modeling and verification of EPA modeling in the past and offered comments on how to improve the accuracy and completeness of those efforts in prior comments on various transport rules.

As a result of its continued interest in the transport issue MOG has followed EPA's efforts to respond to the *Wisconsin* remand. On June 9, 2020, and again on August 31, 2020, MOG's technical consultant requested available 2021 data from EPA to support MOG's technical efforts to analyze potential remaining ozone nonattainment issues. On June 19, and again on August 31, EPA responded saying there was no publicly available 2021 data.

It was not until November 13, 2020 two weeks after the final rule was published in the Federal Register and after fully one third of the comment period had elapsed, that MOG's technical consultant received disk drives with much of the modeling platform, but even then neither all of the requested input files and associated run scripts necessary to confirm EPA's modeling steps nor the complete set of input/output files for the attainment test tool (SMAT-CE) which EPA used to estimate future year design values were included on those drives. This information is critical to MOG's ability to review EPA estimates of land/water calculations, create model performance calculations, and examine alternate maintenance area options, among other critical tasks that impact the nonattainment analysis. Having performed a great many nonattainment analyses in the last 25 years, MOG understands the significant amount of time necessary to complete technical work in order to be prepared to offer comprehensive and technically sound comment on a proposed transport rule. In addition, MOG recognizes the need to use the same data inputs that EPA would have to use in its rule development so that the efforts would be comparable.

While MOG's contractors have been able to conduct a significant number of technical analyses and reviews of EPA's data supporting the proposed rule, numerous studies that would corroborate or contrast EPA's supporting analyses could not be completed in the forty-five days allocated for the comment period. Among those studies are an independent 2023 projection year CAMx simulation consistent with EPA's documented study, a region-sector based source apportionment analysis to determine relative contribution of EGU sources on downwind receptors, the development and modeling of a 2021 interpolated emission inventory to support a CAMx run, and EGU scenario simulations to create independent air quality surfaces for scaling ratio calculations, among others.

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80 *Id.*

MOG notes that it and others have requested EPA to extend the comment period by at least 45 days. As we have stated repeatedly in these comments, the extent and complexity of the technical and related issues raised by EPA's proposal are so extensive that they cannot be adequately addressed in the limited time-period EPA has provided. Even without all the requested files from EPA, MOG has identified numerous flaws in EPA's analysis and believes that additional, and likely fatal, flaws will be uncovered once the files are finally made available. Even more significant is the fact that we have identified numerous other flaws that must also be investigated and for which there is inadequate time. We recommend that EPA conduct additional modeling and analysis to address the deficiencies we have identified and that once that is done, EPA should provide for an additional comment period to allow for thoughtful public and stakeholder input that could not be provided during the current abbreviated comment period.

10. EPA's use of multiple future year platforms to estimate 2021 conditions within each step of rulemaking process compromises the integrity of the remedy strategy results.

EPA has used three different future year emissions and modeling platforms in the development of air quality, benefits analysis, and scaling factors used in the calculation of the impact and cost of the CSAPR remand remedy case. By developing each of these components using independent future year estimates of EGU and other section emissions and associated air quality, EPA's results are at best inconsistent and almost certainly incompatible within each step of the proposed rule.

As documented in the air quality technical support document of the proposed rule[81], EPA notes the use of a 2023 emissions modeling platform linearly interpolated to 2021 and largely based on the 2016v1 state collaborative inventory with associated projections. Within this platform, EPA notes the use of the IPM January 2020 Reference Case for 2023 EGU emissions as well as other platform updates from earlier version of the 2016 modeling. This platform also uses a 2016 meteorological data set to support the air quality and transport patterns and replicates this meteorology for the 2023 projection. Because of the uniqueness of the 2016 meteorology and updates in the projection factors used to generate 2023 emissions, the results of this run are inconsistent with the data used in both the benefits analysis and the air quality scaling factors used to determine the remedy strategy.

Earlier in this document, we discuss the top ten days used in the determination of future year nonattainment status and significant contribution calculations. Because these factors were both based on the 2016 modeling platform and associated meteorology from the air quality step 1 which were developed in January 2020, they are inconsistent with the 2023en projection modeling used in the benefits analysis[82] which used a modeling platform from the Affordable Clean Energy rule (ACE) that is based on a 2011 platform and meteorology developed in 2017. In the 2023 projections associated with the ACE platform, a totally unique set of days, emissions distribution and magnitude, and transport patterns would have been used to determine nonattainment status and

81 Reference to NPR Air Quality Modeling TSD.

82 Reference to NPR RIA.

significance based on the configuration of 2011.

Not only is this platform inconsistent with the air quality modeling of this proposed rule, but it also contains a significant number of elements which have been updated since the time of its release. Of equal significance are the use of a 2016 base case and meteorology in this proposed rule air quality modeling as well as the updated version of the IPM model and associated EGU emission estimates developed over the three-year period. Other improvements in the 2016-based platform are the use of the latest version of the MOVES model, inclusion of federal, state, and regional regulatory programs promulgated between 2017, economic and environment growth and control rates, lateral boundary and initial species condition concentrations from international sources, and the version of the photochemical model used in the proposed rule (CAMx), all which could have a significant impact on the chemistry, transport, air quality, and contributions calculated at individual downwind monitors.

Table 26 below presents a comparison of the two 2023 future year base cases used in these first two steps of the proposed rule remedy calculations. As is clearly seen in this table, both the total anthropogenic and EGU only emission totals for NOx between the two platforms is significantly different by state and for the twelve-state total.

	Annual 2023 NOx Emissions (Tons)				
	AQ Modeling - 2023fh			**Benefits Analysis - 2023en**	
State	**Total Anthro**	**EGU Only**		**Total Anthro**	**EGU Only**
Illinois	266,721	31,189		293,450	30,764
Indiana	198,957	44,029		243,954	63,397
Kentucky	119,973	14,411		171,194	42,236
Louisiana	249,531	17,223		373,849	46,309
Maryland	68,599	5,387		88,383	9,720
Michigan	214,031	30,141		228,242	33,708
New Jersey	97,302	5,771		101,659	5,222
New York	197,440	14,740		230,001	16,256
Ohio	237,186	40,029		252,828	37,573
Pennsylvania	279,883	33,301		293,048	49,131
Virginia	140,180	10,183		161,677	20,150
West Virginia	126,365	41,891		136,333	46,324
12 State Total	**2,098,866**	**282,525**		**2,472,957**	**395,567**

Table 26. *Twelve state anthropogenic total and EGU only NOx emissions (tons) used in the air quality modeling and benefits analysis of the proposed rule.*

In addition to being inconsistent with the air quality platform, the benefits analysis modeling is inconsistent with the air quality scaling factors used in step 3 of the remedy calculations. Documented in the Ozone Transport Policy Analysis Proposed Rule TSD[83] that details the

83 Reference to NPR Ozone Transport Policy Analysis Proposed Rule TSD.

calculation of the proposed reduction strategies on the future year air quality, EPA specifies that two separate IPM runs were used in the (a) air quality base case, (b) illustrative case analysis and final policy case determination. Here EPA documents how the actual IPM 2021 emissions were used to develop the illustrative and policy case results although a linearly interpolated 2021 was used in the air quality simulation. By again utilizing yet a third IPM output to define a particular part of the proposed rule, EPA has proposed a remedy that is contradictory among each of its individual parts.

The air quality is based on a set of assumptions and meteorology that is then linearly interpolated to 2021, the benefits analysis is based on a modeling platform that was developed for an entirely different rule, and the remedy and control assumptions are based on yet a third output of EPA's IPM model that are inconsistent with the other two steps noted here. Based on the disconnect alone of these three significant steps associated with the final remedy determination, EPA has unacceptably compromised the technical results of this proposed rule and has placed into serious question whether there is any significant contribution by upwind states to downwind nonattainment or maintenance monitors in the East.

11. Contrary to statements made by commenters at the public hearing, this proposal should not address the 2015 ozone NAAQS.

During the November 12, 2020 public hearing reference was made by certain commenters to the possibility of EPA using this proposed rule to address the 2015 ozone NAAQS in addition to the 2008 ozone NAAQS. MOG strongly opposes any such comment for a variety of reasons including the fact that the *Wisconsin* remand is limited to the 2008 ozone NAAQS and the fact that EPA has failed to offer any data addressing the 2015 ozone NAAQS. Indeed, the issue to be addressed is the Revised CSAPR Update rule which solely relates to the 2008 ozone NAAQS.

III. Conclusion.

While the Midwest Ozone Group appreciates the opportunity to comment on this proposed rulemaking, the proposal being offered by EPA to impose additional emission controls on upwind EGUs is fatally flawed both legally and technically. An appropriate alternative course of action that must be considered by EPA to address the type of residual nonattainment that is of concern to EPA in the proposed Revised CSAPR Update is for EPA to impose new emission reduction requirements on the local sources in the New York Metropolitan Area that have been identified in these comments and in EPA's Mitigation TSD as being not only the most significant contributors to the Connecticut monitors but also the EGU mitigation measures that can fully address any residual air quality concerns that may exist in Connecticut.

The proposed EGU reductions are not based on sound data, underestimate the costs of compliance, impose an unreasonably short compliance time frame, and contain other serious flaws. EPA has failed to address the deficiencies identified by the *Wisconsin* court, and instead has created additional regulatory obligations for well-controlled sources that are not necessary or effective in addressing any residual nonattainment. EPA should withdraw this proposal and adopt measures that directly address the disproportionate contribution of uncontrolled sources within and immediately adjacent to the New York Metropolitan nonattainment area.