EXHIBIT C

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March 17, 2015

Gina McCarthy
Administrator
U.S. Environmental Protection Agency
Mail Code 1101A
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

RE: Docket No. OAR-2008-0699 – Ozone NAAQS

Dear Administrator McCarthy,

Please find attached comments filed on behalf of the Midwest Ozone Group (MOG) in response to the November 26, 2014, U.S. Environmental Protection Agency (EPA) proposal to revise the 2008 primary National Ambient Air Quality Standard for ozone from its current level of 75 parts per billion (ppb). (79 Fed. Reg. 79234, December 17, 2014). MOG is an affiliation of companies, trade organizations, and associations which have drawn upon their collective resources to advance the objective of seeking solutions to the development of a legally and technically sound national ambient air quality program. MOG has been actively engaged in a variety of issues and initiatives of EPA related to the development and implementation of air quality policy including not only the development of National Ambient Air Quality Standards ("NAAQS") but also such programs as transport rules, petitions under 176A and 126 and the development of state-based alternatives to EPA transport rules. MOG members operate more than 85,000 MW of coal-fired generation in more than ten states.

MOG has reviewed the proposal, finds that it is unsupported by the agency and concludes that EPA has not justified scientifically the proposal to lower the ozone NAAQS level. We are also concerned that EPA has not adequately described what the full impact of this proposal will be on the nation. From a thoughtful review of the administrative record for this proposal, MOG observes more unanswered questions than affirmative technical and legal conclusions. This proposal speaks more to advocacy for amended air policy than to a Clean Air Act review of an existing NAAQS for ozone.

Health and Welfare Studies. Assessment of the science of health and welfare upon which EPA bases its proposal depicts a body of research that essentially represents conclusions of many years ago, calling into question the determination by the agency that the current standard is deficient. EPA's advocacy for the need to revise the standard is thinly founded upon a seemingly new revelation that the ozone standards of today are not protecting our health and welfare. The record does not speak to such a new revelation and in fact speaks to the need to invest in new research to assist in understanding whether the health and welfare air quality standards are insufficient.

Emission Inventories. EPA's technical discussion of emission inventories is not comprehensive, inviting the question as to how a proposal of this significance could not be based on current information. The emission inventory assumptions are dated using information that has been replaced by more current data. For example, mobile sources (a significant portion of the ozone related inventory) are described using outdated methods for characterizing their contribution to the emission inventory. Relative to future emissions, we find odd that EPA's estimate of 2025 baseline emissions cannot be independently corroborated. EPA did not provide county, source category detail, or summaries of this scenario, from which all proposed alternate attainment control strategies were applied. Also, EPA fails to include future year transport of international emissions and uses 2011 boundary condition files to estimate the international component of emissions transport.

Active regulatory programs – "On the Books". EPA engages in a selective process of how it manages emissions reductions required by a new ozone standard and those required by other programs. For example, it chooses to include reductions predicted from the proposed Clean Power Plan as a means of reducing the regulatory impact of a change in the ozone NAAQS. A noted omission relative to reductions is that EPA did not include many regional/local/state attainment programs to reduce ozone in its base case or baseline projections.

Growth. EPA fails to account for projected increases in operation of multiple electric generating unit (EGU) units as predicted by its own EGU forecasting tool. EPA made "no growth" assumptions on large, geographically important categories despite projected economic growth. No explanation is offered about the agency's the decision not to include certain growth. The lack of explanation raises questions about the purpose for managing growth factors in this manner. Growth is an important element of managing the inability to meet the new standard. Inclusion of growth would have changed the media messaging on the impact of this proposal.

Air Quality Modeling and Ozone Chemistry. EPA's air quality modeling and its assumptions appear fail to properly characterize the true impact this proposal will have on their livelihood, lifestyles, and general well-being of much of the nation. EPA has advocated, based on its air quality modeling, that any new standard will easily be achieved. Its supporting analyses, however, is seriously flawed significantly undermining EPA's conclusion. Among those flaws are:

- EPA assumes first ton reduced gives the same ozone change as last ton reduced, failing to account for the non-linearity of emission reductions and associated ozone concentration changes.

- EPA's across-the-board sensitivity results and associated ozone reduction factors do not account for the fact that elevated source reductions do not have same ozone concentration potential as non-elevated sources.

- EPA developed ozone reduction factors from its across-the-board sensitivity runs failing to account for the differences that low level and elevated source emission reductions have on downwind ozone concentrations.

- EPA failed to model the final, most stringent control scenario for each NAAQS level to confirm assumptions of change in ozone.

- EPA's "known" control scenarios for proposed alternate NAAQS attainment contain many instances of control technologies that do not appear valid for the source category to which it is applied.

- EPA makes the assumption that the application of "unknown" controls within a sub-region will have an identical ozone concentration impact on all monitors within that sub-region.

- EPA fails to take into account transport of ozone across regional boundaries within the United States.

- EPA uses 2007 modeling to develop the case for background ozone concentrations and international transport assumptions.

- EPA fails to include future year transport of international emissions and uses 2011 boundary condition files to estimate the international component of emissions transport.

States Role for Air Quality Management. MOG supports the role of the States as the proper forum for dealing with ozone air quality particularly in relation to transport of ozone and its precursors. We applaud state driven alternatives such as the SCOOT (State Collaborative On Ozone Transport) process.

MOG works hard to advance strong air quality science and urges EPA to do the same. Accordingly, EPA has no technical justification other than to reaffirm the 75 ppb primary ozone standard.

Very truly yours,

David M. Flannery
Counsel
Midwest Ozone Group

cc: Environmental Protection Agency
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COMMENTS OF THE MIDWEST OZONE GROUP ON EPA'S PROPOSED REVISIONS TO THE OZONE NATIONAL AMBIENT AIR QUALITY STANDARD (79 FEDERAL REGISTER 75233, DECEMBER 17, 2014)

March 17, 2015

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EXECUTIVE SUMMARY

The Midwest Ozone Group (MOG) is an affiliation of companies, trade organizations, and associations which have drawn upon their collective resources to advance the objective of seeking solutions to the development of a legally and technically sound national ambient air quality program. MOG has been actively engaged in a variety of issues and initiatives of EPA related to the development and implementation of air quality policy including not only the development of NAAQS standards but also such programs as transport rules, petitions under 176A and 126 and the development of state-based alternatives to EPA transport rules. MOG members operate more than 85,000 MW of coal-fired generation in more than ten states.

On November 26, 2014, the U.S. Environmental Protection Agency (EPA) proposed to revise the 2008 primary National Ambient Air Quality Standard for ozone from its current level of 75 parts per billion (ppb) to a range of 65 ppb to 70 ppb, while taking comment on an alternative standard of 60 ppb, and adding new proposed secondary ozone standards to protect vegetation and other welfare-related values (79 Fed. Reg. 79234, December 17, 2014).

MOG has reviewed the proposal, finds that it is unsupported by health effects science, and urges that EPA not lower the ozone NAAQS level as proposed. Principal among the reasons for not changing the NAAQS is the fact that the science of ozone impacts on health and welfare have not changed since the last review conducted by EPA and do not support a change in the NAAQS from current levels. Moreover, the lowering the NAAQS would cause much more of the country to be classified as non-attainment than EPA has estimated.

MOG also finds that EPA's Regulatory Impact Analysis of its proposal is fatally flawed because:

(1) EPA based its emission inventory on outdated information

(2) EPA improperly relied on its proposed Clean Power Plan rule in assessing the regulatory impact of a change in the ozone NAAQS,

(3) EPA failed to use the most recent methods available to determine mobile source emissions,

(4) EPA failed to account for projected increases in multiple electric generating unit (EGU) units as predicted by its own EGU forecasting tool,

(5) EPA made "no growth" assumptions on large, geographically important categories despite projected economic growth planned,

(6) EPA did not include many regional/local/state attainment programs to reduce ozone in its base case or baseline projections,

(7) EPA assumed first ton reduced gives the same ozone change as last ton reduced, failing to account for the non-linearity of emission reductions and associated ozone concentration changes,

(8) EPA's across-the-board sensitivity results and associated ozone reduction factors do not account for the fact that elevated source reductions do not have same ozone concentration potential as non-elevated sources,

(9) EPA developed ozone reduction factors from its across-the-board sensitivity runs failing to account for the differences that low level and elevated source emission reductions have on downwind ozone concentrations,

(10) EPA failed to model the final, most stringent control scenario for each NAAQS level to confirm assumptions of change in ozone,

(11) EPA's estimate of 2025 baseline emissions cannot be independently corroborated with certainty since EPA did not provide county, source category detail, or summaries of this scenario, from which all proposed alternate attainment control strategies were applied,

(12) EPA's "known" and "unknown" controls contain numerous errors,

(13) EPA failed to take into account transport of ozone across regional boundaries within the United States,

(14) EPA used 2007 modeling to develop the case for background ozone concentrations and international transport assumptions,

(15) EPA failed to include future year transport of international emissions and uses 2011 boundary condition files to estimate the international component of emissions transport, and

(16) Revised ozone NAAQS implementation impacts on the power industry and people.

Finally, consideration of any new ozone transport rule is premature. The States are the proper forum for dealing with transport, especially given the advent of state driven alternatives such as the SCOOT process. Moreover, there is no air quality basis for revising OTR membership, and accordingly EPA should deny the pending CAA Section 176A petition by the Northeast states. For all of these reasons and more, MOG urges that EPA reaffirm the 75 ppb primary ozone standard.

COMMENTS OF THE MIDWEST OZONE GROUP
ON EPA'S PROPOSED REVISIONS TO THE
OZONE NATIONAL AMBIENT AIR QUALITY STANDARD
(79 FEDERAL REGISTER 75233, DECEMBER 17, 2014)

March 17, 2015

A. Introduction.

The Midwest Ozone Group (MOG) is an affiliation of companies, trade organizations, and associations which have drawn upon their collective resources to advance the objective of seeking solutions to the development of a legally and technically sound national ambient air quality program.[1] The primary goal of MOG is 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 of EPA related to the development and implementation of air quality policy including not only the development of NAAQS standards but also such programs as transport rules, petitions under 176A and 126 of the Clean Air Act and the development of state-based alternatives to EPA transport rules. .

MOG members operate more than 85,000 MW of coal-fired generation in more than ten states. It's members are concerned not only about the direct impact of rules such as this on their facilities but also about the impact that such rules have on the consumers of their electric power.

On November 26, 2014, the U.S. Environmental Protection Agency (EPA) proposed to revise the 2008 primary National Ambient Air Quality Standard for ozone from its current level of 75 parts per billion (ppb) to a range of 65 ppb to 70 ppb, while taking comment on an alternative standard of 60 ppb, and adding new proposed secondary ozone standards to protect vegetation and other welfare-related values (79 Fed. Reg. 79234, December 17, 2014). The EPA proposal states that the current primary ozone standard of 75 ppb is not protective of public health with an adequate margin of safety, and that it should be revised to a lower concentration to provide increased public health protection. EPA notes that, while "the CASAC recommended a range of levels from 0.060 ppm to 0.070 ppm, and that levels as low as 0.060 ppm could potentially be supported, the Administrator solicits comment on alternative standard levels below 0.065 ppm, and as low as 0.060 ppm. However, the Administrator notes that setting a standard below 0.065 ppm, down to 0.060 ppm, would inappropriately place very little weight on the uncertainties in the health effects evidence and exposure/risk information." (79 Fed. Reg.75246).

As will be stated is greater detail in these comments MOG believes EPA's proposal to revise

1 These comments were prepared with the technical assistance of Alpine Geophysics, LLC. Comments or questions about this document should be directed to David M. Flannery, Legal Counsel, Midwest Ozone Group, Steptoe & Johnson PLLC, 707 Virginia Street East, Charleston West Virginia 25301; 304-353-8171; dave.flannery@steptoe-johnson.com.

the standard to a lower concentration is premature and unjustified.

B. The Science Does Not Support a Change in the NAAQS.

MOG questions whether the science supports the conclusion that the existing health based standard warrants revision and is not protective. EPA presents a series of unconvincing observations about the status of relevant ozone health effects research. EPA provides that it is proposing the revision to the ozone NAAQS "to increase public health protection, including for "at-risk" populations such as children, older adults, and people with asthma or other lung diseases, against any array of O_3-related adverse health effects." 79 Fed. Reg. 75236. In conducting its review of the current standard, EPA provides that it has "carefully evaluated the currently available scientific literature on the health and welfare effects of ozone, focusing particularly on the new literature available since the conclusion of the previous review in 2008." Id. It is uncertain that any such new literature concerning health and welfare effects leads to a well-documented scientific conclusion that revision of the health standard is warranted. We have reviewed the 2007 U.S. EPA OAQPS "Policy Assessments of Ozone Research Needs and Priorities" as compared to the 2014 U.S. EPA OAQPS "Policy Assessments of Ozone Research Needs and Priorities" and according to the language within these documents it is apparent that very little has changed.

Of particular interest is the comment offered by EPA's staff in its 2014 "Policy Assessment for the Review of the Ozone National Ambient Air Quality Standards" ("PA") in which they state that the uncertainties associated with inconclusive scientific and technical information is managed by the primary standard's "adequate margin of safety." PA at ES-3. They explain that the Clean Air Act does not require "that a primary NAAQS be set at zero-risk levels, but rather at levels that reduce risk sufficiently to protect public health with an adequate margin of safety." Id. Using the uncertainty that is a function of the adequate margin of safety, the EPA staff dismisses as irrelevant the fact that the health effects from ozone are not discernible from other photochemical oxidants. Id. at ES-4. A further read of the PA informs that the Staff concludes additional research is needed to evaluate ozone responses and exposures. Id at pp 4-70 through 4-72.

The uncertainties in the studies are most obviously reflected in the range identified for the health effects standard of 70 – 60 ppb. "The Administrator's consideration of specific standard levels will reflect her judgments as to the appropriate weight to be given to various aspects of the scientific evidence and exposure/risk information, including the appropriate weight to be given to important uncertainties." Id. at ES-6.

It is inappropriate for EPA to engage in the statutorily driven review of the ozone standard as a function of time for review rather than of substance of the protection against health and welfare impacts that are scientifically based. MOG urges the agency to withdraw this proposal for the health based ozone standard in favor of pursuing appropriate and refined research. Rather than invoke a new standard imposing substantial costs on the regulated community, it is more appropriate for EPA to dedicate taxpayer dollars to the development of a health based standard that has a known endpoint. Our economy cannot support investments that are not well developed and for which we have little information of the health benefit to be gained.

C. EPA should reaffirm the 75 ppb primary ozone standard in the current ozone standard rulemaking.

For reasons articulated in these comments, MOG urges that EPA reaffirm the 75 ppb primary ozone standard in the current ozone standard rulemaking. In addition, MOG joins Governor Tomblin and many states in expressing concern about the ramifications of the proposal. In his letter dated February 19, 2015, to Administrator McCarthy, Governor Tomblin (D-WV) said:

> ".. this new standard is impractical and unattainable. Forty-five percent of the necessary controls to achieve the standard are classified in the proposed rule as 'unknown.' With this in mind, the introduction of a new ozone standard has the potential to cause a tremendous negative impact on our state's economy and would make the economic prospects for working families even more challenging.... I am simply unable to endorse a proposal that will cause hardship for already-struggling West Virginia families. I urge you to maintain the current ozone standard of 75 ppb."

Science has shown that ground level zone, or urban smog, is caused by the photochemical reaction of emissions of nitrogen oxides (NOx) and volatile organic compounds (VOCs) in the presence of sunlight. Emissions contributing to ozone come from a wide variety of natural and manmade sources, including on-road and off-road motor vehicles, fossil-fueled power plants, refineries, chemical, and other manufacturing and industrial facilities, oil and natural gas production, and small area sources such as gas stations, lawnmowers, chain saws, motor boats, restaurants, dry cleaners, and auto repair shops, as well as consumer and industrial products such as paints and solvents.

1. Ozone concentrations are declining

EPA reports that national average ozone concentrations declined by 21% from 2000 to 2013 due to state and federal emission control programs, and will continue to decrease due to the implementation of other ongoing state and federal air quality programs. Significantly, EPA delayed implementation of the 2008 ozone standards for more than two years, postponing the designation of nonattainment areas and related state efforts to develop State Implementation Plans (SIPs), while it pursued a voluntary reconsideration of the standards that the President of the United States terminated in 2011. As a consequence of this delayed implementation, many states have not yet fully complied with the requirements of the 2008 ozone standards, including the submission of attainment demonstration SIPs, where required.

2. Regional and state emissions trends mimic national trends

Alpine Geophysics and ENVIRON have now prepared a regional and state analysis of air quality trends data reported recently by EPA on a national basis. Using the same data and methods as published by EPA, refined to include state-of-science year and source-specific data and models, Alpine prepared a series of presentations and fact sheets documenting the trends[2] in ozone and

2 http://www.midwestozonegroup.com/AirTrendsJuly2013Public.html

particulate matter precursor emissions and developed methods and output to present State-wide maximum and average design value (DV) data for 8-hr ozone and annual and 24-hr PM2.5 concentrations. The Alpine reports confirm on state levels what EPA's data indicate on a national level; that emissions have significantly decreased and air quality is significantly improved as a result of regulations already in place and are on track to continue to improve as existing regulations are fully implemented in the future.

EPA data indicate that, in 2011, the principal sources of manmade NOx and VOC emissions contributing to ozone were mobile sources (52%), industrial facilities and area sources (40%), and coal-based electric generating units (7%)[3]. Further, EPA data indicate that the vast majority of states have achieved significant reductions of emissions contributing to ozone and have seen improved air quality over the past decade, with projected further air quality improvements over the next several years due to the implementation of existing Clean Air Act programs, including the 2011 Mercury and Air Toxics Standards (MATS) rule and the Tier III low-sulfur gasoline and automotive fuel economy rules.

Figure 1 below presents one example of the graphical displays available for each region or State, by pollutant, from the Alpine Geophysics reports prepared for MOG. This Figure shows the resultant NOx, and VOC emission trends, by major category, for the State of Illinois for the 1999 through 2011 timeframe. Consistent with findings on regional scales, emissions from EGU and mobile source categories show the greatest decline over time as the result of ongoing implementation of various federal, state, and local regulations. Comparable data for other states can be found at: http://midwestozonegroup.com/AirTrendsJuly2013Public.html.

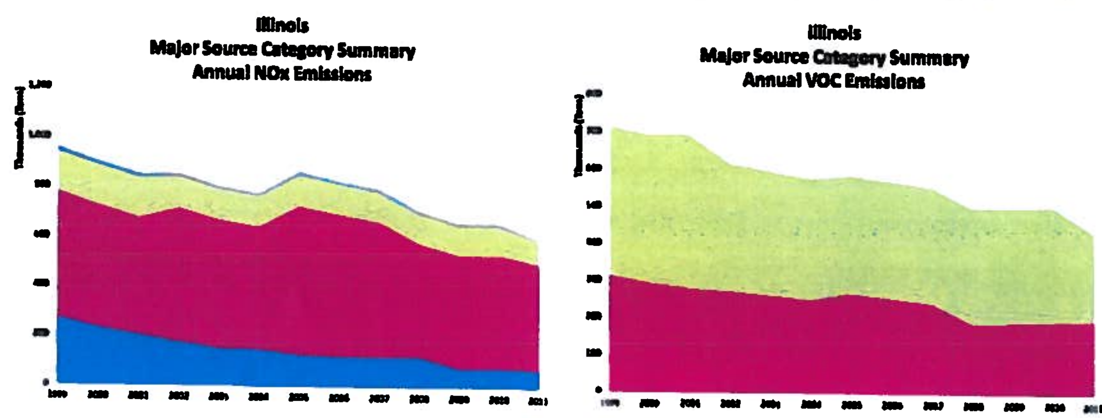

Figure 1. Annual NOx, and VOC emission trends by major source category for Illinois.

■ Electric Utility Coal Fuel Combustion ■ Mobile Sources
■ Industrial Fuel Combustion & Processes ■ All Others

3 http://www.epa.gov/airtrends/2011/index.html

NOx emission reductions during the period of 1999 to 2011 range from a low thirty-one percent (31%) in the central States to a high of forty-seven percent (47%) in the southeastern domain. These percentages are largely attributable to the tonnage associated with coal-fired EGU source category control.

Table 1 below presents an example of NOx emission reductions for the southeastern domain. As can been seen, in 2011, coal fuel combustion EGU sources achieved NOx reductions of 1,297,074 tons from 1999 levels in the southeast.

Table 1. NOx emission reduction (Tons since 1999) in southeastern States.

	Cumulative Emissions Reduction (Tons)				
Source Category	2000	2002	2005	2008	2011
Electric Utility Coal Fuel Combustion	164,103	311,456	669,590	909,773	1,297,074
Mobile Sources	-126,328	-76,417	-396,572	147,338	674,723
Industrial Fuel Combustion & Processes	7,233	228,589	300,400	315,763	574,054
All Others	22,340	69,035	112,622	156,051	173,996
Total	67,348	532,662	686,039	1,528,925	2,719,847

	Emissions Change (Percent since 1999)				
Source Category	2000	2002	2005	2008	2011
Electric Utility Coal Fuel Combustion	-10%	-18%	-39%	-53%	-75%
Mobile Sources	4%	3%	14%	-5%	-24%
Industrial Fuel Combustion & Processes	-1%	-23%	-30%	-31%	-57%
All Others	-9%	-28%	-46%	-64%	-71%
Total	-1%	-9%	-12%	-26%	-47%

Sector specific emission trends reported by Alpine and ENVIRON for electric utility coal combustion, industrial fuel combustion and industrial processes, mobile sources and "all others" show air pollutant emissions have decreased over the time period of 1999 through 2011.

3. Air quality improvements are following emissions reductions

Concomitantly, the Alpine Geophysics/ENVIRON study reports that air quality data has shown marked decreases in monitored concentrations based on decreasing trends in Design Values (DV) over time. The 8-hr ozone and 24-hr and annual particulate matter DVs for each overlapping three-year period started with 1999-2001 and ended with 2009-2011 and were calculated based on EPA data handling conventions. Results are that average 8-hr ozone design values have decreased in all five regional planning areas between 1999 and. See Figure 2 below.

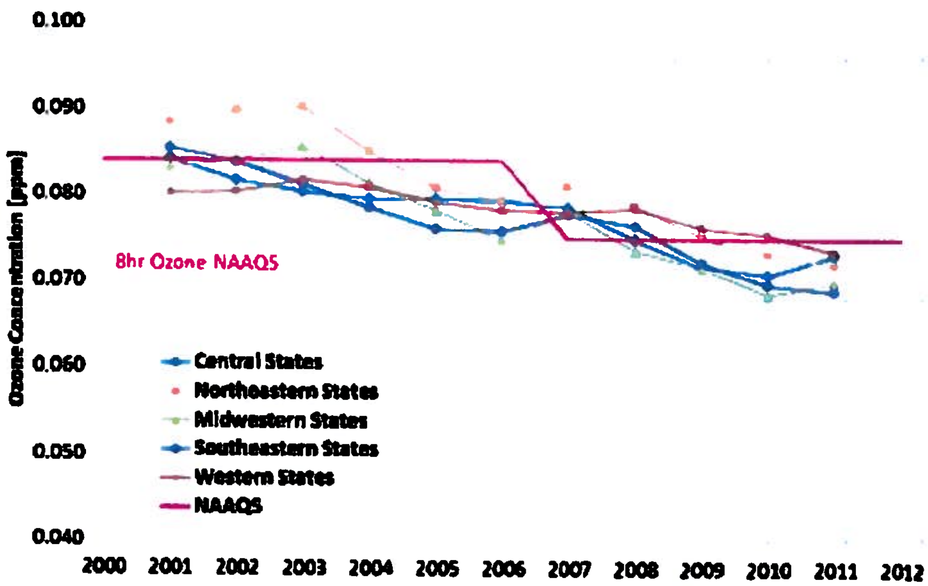

Figure 2. Regional average 8-hr ozone design value trends

Ozone DVs were calculated as the annual 4th highest daily maximum 8-hour average averaged over three consecutive years with the current standard equaling 0.075 parts per million (ppm).

While these trends demonstrate marked improvement in air quality on a regional basis for the period from 1999 through 2011, it is clear that there still remain areas in the U.S. that require additional control to achieve the existing and proposed ozone NAAQS.

These residual non-attainment areas will require the continued implementation of existing regulation and introduction of new air pollutant emission controls, both regionally and locally, to attain existing and proposed NAAQS.

These findings are consistent with EPA's most recent trends publication citing a national decrease in national, aggregate emissions of fifty-nine percent (59%) since 1990. Emissions of NOx are among the largest emission declines during the study timeframe, largely as a result of the implementation of national and regional electric generating unit (EGU) regulation of these pollutants. Title IV reductions, the NOx State Implementation Plan (SIP) Call, and Clean Air Interstate Rule (CAIR) require emission reductions from EGUs on the order of up to seventy percent

(70%) from baseline conditions in selected States across the eastern U.S.

Additional reductions from onroad mobile source vehicle fleet and fuel regulations have and are anticipated to generate additional reductions from these pollutants as covered by these rules, including the Tier 2/Gasoline Sulfur rule and Heavy Duty Engine/Vehicle and Highway Diesel Fuel rules. Secondary reductions of PM and other combustion by-products are additionally achieved via these promulgated regulations.

Further reductions can be expected from the additional Implementation of promulgated programs such as regulation on locomotives, marine vessels, and others. Air quality will continue to improve as emissions are reduced in line with the requirements of these environmental rules.

4. Additional processes underway will improve air quality even more as well as deal with transport issues.

The fruits of multiple emission reduction programs yet to be completed will bear on ozone NAAQS attainment and ozone transport for years to come. Examples include CSAPR, the SCOOT process, and the optimization process articulated by EPA OAQPS Director Steve Page in his January 22, 2015, memorandum to EPA Regional Air Directors titled "Information on the Interstate Transport 'Good Neighbor' Provision for the 2008 Ozone National Ambient Air Quality Standards (NAAQS) under Clean Air Act (CAA) Section 110(a)(2)(D)(i)(I)."

CSAPR, promulgated in 2008 and following unsuccessful legal challenge still in effect, has yet to be fully implemented. Reductions of emissions resulting from complete implementation will provide significant additional improvements in ozone levels across the eastern US. CSAPR Phase 1 implementation is now scheduled for 2015, with Phase 2 beginning in 2017. EPA CAMx modeling of CSAPR impacts, when CSAPR is fully implemented, has shown that the majority of the eastern US, with the exception of only two monitors in Connecticut, one in Maryland, and one in New York, will attain the 2008 ozone standard by 2018.

The SCOOT process is ongoing and will likely result in an agreement or memorandum of understanding among multiple states that, when implemented, will resolve many of the "good neighbor" SIP issues between participating states. It will also result in significant improvements in ambient ozone air quality due to transport.

Finally, OAQPS Director Page notes in his January 22, 2015, memorandum that EPA is still in the process of quantifying benefits from these and other programs that will further improve air quality. All of these programs are still in play and, for that reason, MOG urges that EPA let the current standard work before moving to a different standard.

D. Lowering the NAAQS would cause much more of the country to be non-attainment than EPA has estimated.

EPA's proposal is likely to result in the designation of nonattainment for much of the country. Anticipating the comment that this proposal will result in 358 counties in the nation to be designated as violating an ozone standard of 70 ppb and that an additional 200 counties (total of 558) would violate a standard of 65 ppb, EPA offers historical examples of its implementation record. For example, in 1979, 101 areas were designated as nonattainment for the 1-hour O3 standard and by 2013 (34 years later) three remain in nonattainment. 79 Fed. Reg. 75370. EPA also points out that the 1997 revision to the ozone standard resulted in 113 nonattainment designations and that by 2015 (18 years later) 12 areas remain in nonattainment. 46 areas have been designated as nonattainment for the 2008 ozone standard, which realistically results in decades of controls and "significant changes" to achieve those levels. The message gleaned from these examples of nonattainment is that meeting a revised ambient air quality standard takes decades of significant changes. As noted by EPA, the majority of man-made NOx and VOC emissions that contribute to O_3 formation in the U.S. come from the following sectors: on-road and non road mobile source, industrial processes (including solvents), consumer and commercial products, and the electric power industry. Id. "Man-made" is synonymous with "in support of our human capital."

The data indicate improved and improving ozone related air quality. EPA cites to percentages of the National Emissions Inventory (NEI) drawing a picture that is subject to the loose concept of 100%. In its effort to advocate for imposing more controls, EPA directs the reader to a discussion of the nation's source inventory offering explanation of efforts to date to manage "man-made" emissions, implying that more must be done to reduce activities that we engage in to support our human capital. Unanswered is when does 100% become irrelevant. MOG urges EPA to review the need to develop a new ozone standard relative to air quality trends.

In an effort to analyze the current and projected levels of 8-hr ozone concentrations in the eastern U.S. states, Alpine Geophysics, LLC has obtained, reviewed, and analyzed monitor-level concentration data and modeling output from various sources and studies.[4] These data have been summarized in the following document for ease of review.

1. 2014 Maximum Daily 8-hr Ozone Design Values

Ambient (outdoor) concentrations of pollutants are measured at more than 4,000 monitoring stations owned and operated mainly by state environmental agencies. The agencies send hourly or daily measurements of pollutant concentrations to EPA's database called the Air Quality System (AQS). AirData retrieves data from AQS and makes them available in various formats on the AirData website[5]. Using data published on this site as of February 6, 2015, we generated the maximum daily 8-hour (MDA8) design values from the monitor-level hourly observations. As noted by EPA, these data are to be considered draft until May 2015 when a final data release is scheduled.

From this list, we pulled the fourth-highest MDA8 for use in calculating each monitor's 3-year, 8-hour ozone design value average. This 3-year average design value is the statistic that describes the air quality status of a given location relative to the level of the National Ambient Air Quality Standards (NAAQS). In this case, it represents each monitor's 8-hour ozone concentration relative to the 8-hr ozone NAAQS[6]. As established by EPA, the design value to be calculated is the annual

4 http://www.midwestozonegroup.com/files/ReviewofRecent2014and2018OzoneData_Mar_2015_.pdf
5 http://www.epa.gov/airquality/airdata/ad_data.html
6 http://www.epa.gov/air/criteria.html

fourth-highest daily maximum 8-hr concentration, averaged over 3 years. For 2014, this would be an average of fourth-highest design values for 2012, 2013, and 2014.

According to these data, of the 1,235 non-zero, valid data, reporting monitors in the continental U.S. during calendar year 2014, 10% of them are estimated to be in nonattainment with the current 2008 8-hr ozone NAAQS of 75 ppb. From this same data, an estimated 32% are currently in nonattainment with a proposed 70 ppb NAAQS, 63% are currently in nonattainment with a proposed 65 ppb NAAQS, and 84% are in nonattainment with a proposed 60 ppb NAAQS. State and continental U.S. level summaries of these calculations are provided in the following Table 2.

Table 2. State and continental U.S. level summaries of monitors in nonattainment of various 8-hr ozone NAAQS.

	# of Monitors > ppb NAAQS						% of Monitors > ppb NAAQS			
State	**Total**	**# > 75**	**# > 70**	**# > 65**	**# > 60**		**% > 75**	**% > 70**	**% > 65**	**% > 60**
Alabama	23	0	0	10	20		0%	0%	43%	87%
Arizona	46	5	29	42	46		11%	63%	91%	100%
Arkansas	9	0	3	7	9		0%	33%	78%	100%
California	174	60	81	108	130		34%	47%	62%	75%
Colorado	28	4	14	20	26		14%	50%	71%	93%
Connecticut	12	10	10	12	12		83%	83%	100%	100%
Delaware	7	0	6	7	7		0%	86%	100%	100%
District Of Columbia	2	0	1	1	1		0%	50%	50%	50%
Florida	59	0	0	9	45		0%	0%	15%	76%
Georgia	21	3	5	10	18		14%	24%	48%	86%
Idaho	3	0	0	1	3		0%	0%	33%	100%
Illinois	37	5	13	31	36		14%	35%	84%	97%
Indiana	44	1	12	31	41		2%	27%	70%	93%
Iowa	15	0	0	0	0		0%	0%	0%	0%
Kansas	8	0	4	8	8		0%	50%	100%	100%
Kentucky	29	0	8	21	29		0%	28%	72%	100%
Louisiana	24	0	4	18	23		0%	17%	75%	96%
Maine	16	0	1	4	9		0%	6%	25%	56%
Maryland	20	2	12	19	20		10%	60%	95%	100%
Massachusetts	17	0	2	14	15		0%	12%	82%	88%
Michigan	30	3	22	29	30		10%	73%	97%	100%
Minnesota	17	0	0	2	10		0%	0%	12%	59%
Mississippi	10	0	1	5	8		0%	10%	50%	80%
Missouri	23	2	12	18	21		9%	52%	78%	91%

	# of Monitors > ppb NAAQS						% of Monitors > ppb NAAQS			
State	Total	# > 75	# > 70	# > 65	# > 60		% > 75	% > 70	% > 65	% > 60
Montana	8	0	0	0	0		0%	0%	0%	0%
Nebraska	5	0	0	3	4		0%	0%	60%	80%
Nevada	21	1	11	18	19		5%	52%	86%	90%
New Hampshire	12	0	0	6	10		0%	0%	50%	83%
New Jersey	17	2	12	16	17		12%	71%	94%	100%
New Mexico	24	0	3	17	23		0%	13%	71%	96%
New York	31	0	10	21	29		0%	32%	68%	94%
North Carolina	46	0	1	20	38		0%	2%	43%	83%
North Dakota	9	0	0	0	0		0%	0%	0%	0%
Ohio	51	1	24	47	51		2%	47%	92%	100%
Oklahoma	24	0	12	20	21		0%	50%	83%	88%
Oregon	10	0	0	0	3		0%	0%	0%	30%
Pennsylvania	55	0	16	45	50		0%	29%	82%	91%
Rhode Island	3	0	2	3	3		0%	67%	100%	100%
South Carolina	18	0	0	1	9		0%	0%	6%	50%
South Dakota	6	0	0	1	5		0%	0%	17%	83%
Tennessee	21	0	4	17	19		0%	19%	81%	90%
Texas	77	14	36	60	71		18%	47%	78%	92%
Utah	18	1	6	13	16		6%	33%	72%	89%
Vermont	2	0	0	0	2		0%	0%	0%	100%
Virginia	24	0	2	11	22		0%	8%	46%	92%
Washington	14	0	0	0	4		0%	0%	0%	29%
West Virginia	10	0	0	5	9		0%	0%	50%	90%
Wisconsin	28	4	12	19	25		14%	43%	68%	89%
Wyoming	27	0	0	2	19		0%	0%	7%	70%
Total	1,235	118	391	772	1,036		10%	32%	63%	84%

2. 2018 Modeled 8-hr Ozone Design Values

In February 2014, EPA released the 2011v6 modeling platform[7]. With these data, a base year (2011) and projection year (2018) set of mass emission inventories and inventory modeling files were made available to the public for review. With these data, the Lake Michigan Air Directors Consortium (LADCO) implemented the Comprehensive Air Quality Model with Extensions (CAMx) and generated future year ozone concentration data for an east-of-the-Rockies U.S. modeling domain[8]. This emissions projection, according to the EPA modeling platform TSD, contains the implementation of the Tier 3 rule for mobile sources and the implementation of the Clean Air Interstate Rule (CAIR), the Mercury and Air Toxics Standards (MATS), and the final actions EPA has taken to implement the Regional Haze Rule for electric generating units.

Alpine obtained these data from LADCO and processed the concentration files into formats for use with EPA's Modeled Attainment Test Software, version 2.6.1[9], which includes EPA's latest modeling guidance for demonstrating attainment of air quality goals for ozone[10].

From the attainment test results, we tabulated the monitor within each eastern state that has the highest projected 2018 8-hr ozone design value from this modeling. Table 3 provides the results of this process.

As can be seen in the following Table 3 below, and is represented in Figure 3 (by State name) and Figure 4 (by descending design value), of the forty-two states (some partial states on the western modeling border) represented in the modeling domain, seven (17%) are projected to be in nonattainment with the current 2008 8-hr ozone NAAQS (75 ppb). Twenty-one states (50%) are projected to be in nonattainment of a proposed 70 ppb NAAQS, thirty-four states (81%) are projected to be in nonattainment of a proposed 65 ppb NAAQS, and thirty-nine (93%) states are projected to be in nonattainment of a proposed 60 ppb NAAQS. Only three states, Vermont, North Dakota, and Montana, are projected to be in attainment of a proposed 60 ppb ozone NAAQS in 2018 with this scenario.

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7 http://www.epa.gov/ttn/chief/emch/2011v6/outreach/2011v6_2018base_EmisMod_TSD_26feb2014.pdf
8 http://www.midwestozonegroup.com/files/MidwestOzoneGroupLADCOpresentation_Oct242014_.pdf
9 http://www.epa.gov/scram001/modelingapps_mats.htm
10 http://www.epa.gov/ttn/scram/guidance/guide/Draft_O3-PM-RH_Modeling_Guidance-2014.pdf

Table 3. State Maximum Monitor - Base Year and Projected 8-hr Ozone Design Values.

			8-hr Ozone Design Value (ppb)	
State	**County**	**Monitor**	**2011**	**2018**
Alabama	Jefferson	010736002	76.7	69.6
Arkansas	Crittenden	050350005	77.3	71.1
Colorado	Douglas	080350004	80.7	79.3
Connecticut	New Haven	090099002	85.7	78.7
Delaware	New Castle	100031010	78.0	69.4
District Of Columbia	District of Columbia	110010043	80.7	70.7
Florida	Hillsborough	120573002	71.5	69.1
Georgia	Fulton	131210055	81.0	71.0
Illinois	Madison	171191009	78.3	71.2
Indiana	Greene	180550001	77.0	72.7
Iowa	Palo Alto	191471002	66.7	62.7
Kansas	Sumner	201910002	76.0	72.4
Kentucky	Jefferson	211110067	82.0	75.2
Louisiana	Bossier	220150008	77.3	74.2
Maine	York	230312002	73.7	67.6
Maryland	Harford	240251001	90.0	80.2
Massachusetts	Dukes	250070001	77.0	69.6
Michigan	Wayne	261630019	78.7	75.5
Minnesota	Anoka	270031002	66.3	61.3
Mississippi	Bolivar	280110001	71.7	68.5
Missouri	Saint Charles	291831002	82.3	75.4
Montana	Rosebud	300870001	55.5	54.9
Nebraska	Knox	311079991	68.0	65.5
New Hampshire	Coos	330074001	69.3	66.0
New Jersey	Gloucester	340150002	84.3	75.6
New Mexico	Bernalillo	350011012	72.0	70.9
New York	Suffolk	361030002	83.3	77.7
North Carolina	Mecklenburg	371190041	80.0	69.5
North Dakota	Burke	380130004	59.0	58.4
Ohio	Hamilton	390610006	82.0	75.0
Oklahoma	Oklahoma	401091037	78.3	74.1
Pennsylvania	Philadelphia	421010024	83.3	76.2
Rhode Island	Washington	440090007	76.3	68.8
South Carolina	Spartanburg	450830009	73.7	65.9
South Dakota	Minnehaha	460990008	66.0	62.5
Tennessee	Blount	470090101	76.7	71.8
Texas	Brazoria	480391004	88.0	85.8

			8-hr Ozone Design Value (ppb)	
State	County	Monitor	2011	2018
Vermont	Bennington	500030004	63.7	59.2
Virginia	Arlington	510130020	81.7	72.5
West Virginia	Hancock	540291004	73.0	68.7
Wisconsin	Sheboygan	551170006	84.3	77.4
Wyoming	Laramie	560210100	68.0	67.1

Figure 3. State Maximum Monitor - Projected 8-hr Ozone Design Values (Alphabetically Sorted).

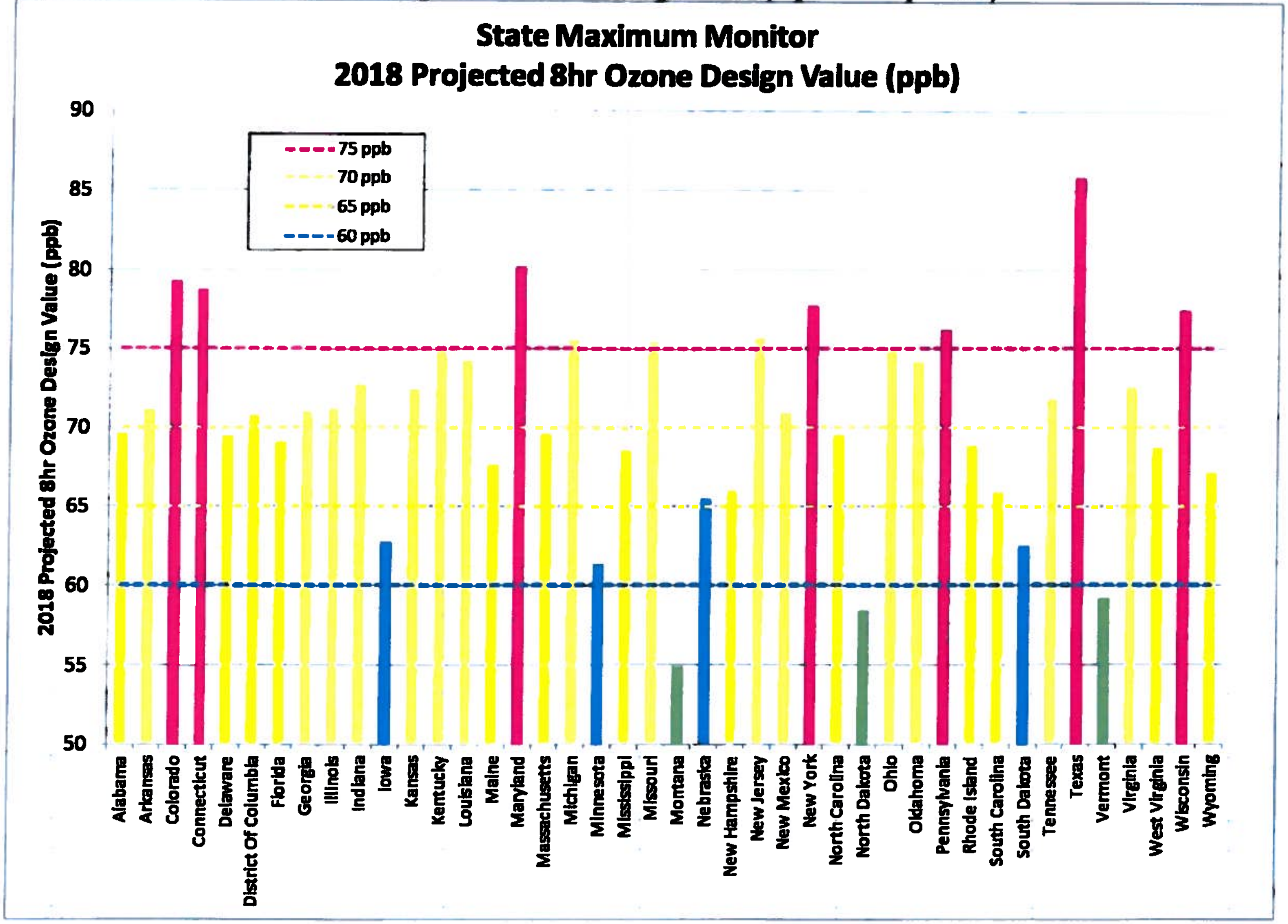
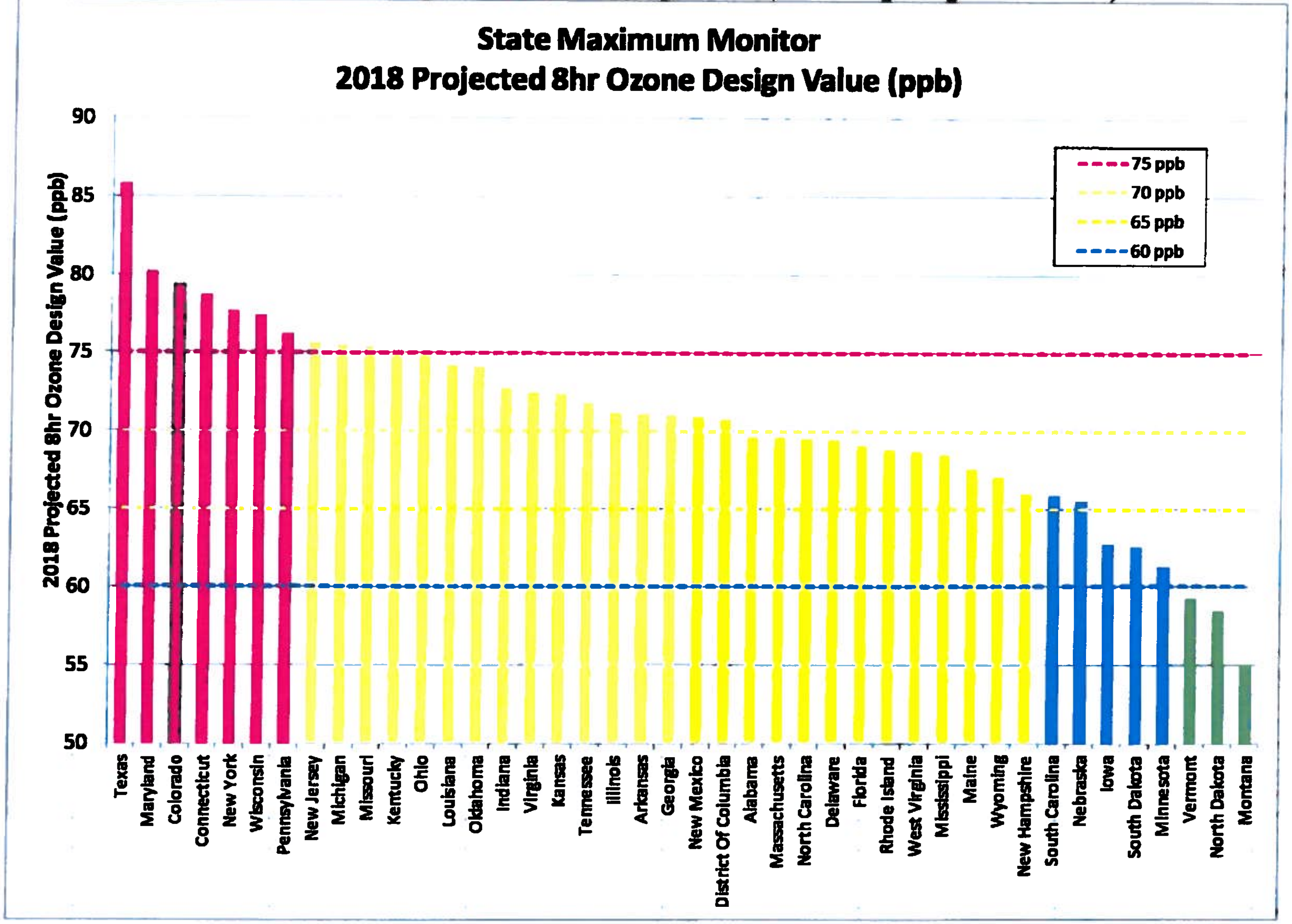


Figure 4. State Maximum Monitor - Projected 8-hr Ozone Design Values (Descending Design Value Sorted).



E. EPA's Regulatory Impact Analysis is Fatally Flawed.

The *Regulatory Impact Analysis of the Proposed Revisions to the National Ambient Air Quality Standards for Ground-Level Ozone (RIA), November 2014*, is a critical part of this rulemaking as the agency and policy-makers seek to understand the significance of the proposal being advanced by EPA. In this case the RIA is flawed with significant errors in science and policy that must be addressed as part of any effort to finalize this rulemaking. These errors include:

1. EPA Based Its Emission Inventory on Outdated Information.

EPA's use of the 2011v6.1 modeling platform and projections does not take into account comments received and modifications made to improve the data. The 2011v6.1 modeling platform cases used in the development of the air quality modeling, control, and alternate attainment strategy simulations for the proposed ozone NAAQS were released for public comment via Federal Register notices 78 FR 70935 and 79 FR 2437, respectively. However, EPA did not use the improvements and revisions submitted during the comment period for either the base year or projection years in the development of the proposed ozone NAAQS simulations. By ignoring these comments and the revision requests included in the comment period, EPA has failed to account for the latest state-of-knowledge information on emission inventories as developed by those agencies and stakeholders impacted by the proposal. Use of the earlier, unimproved data may have significantly altered the magnitude and relative contribution of sources and geographies to downwind monitor concentration estimates.

We urge that EPA use the most current version of the 2011 modeling platform that contains upgrades and updates and solicited and submitted through the public comment period.

2. EPA Improperly Relied Upon its Proposed Clean Power Plan Rule in Assessing the Regulatory Impact of a Change in the Ozone NAAQS.

The Clean Power Plan is offered in the RIA as part of the 2025 baseline to estimate costs and benefits, incorrectly using emissions reductions from this program as definitive and not speculative. RIA, ES-2. And yet, EPA comments that "there is significant uncertainty about the illustration of the impact of rules, especially the Clean Power Plan because it is a proposal…" Id at 4-24. In the RIA, EPA provides that the baseline emissions projected from 2011 to 2025 were adjusted for the Clean Power Plan. Id at ES-5. The RIA definition for baseline includes emissions reductions from the proposed Clean Power Plan. RIA at 4-1. When discussing the Baseline Control Strategy EPA provides that "we accounted for changes in ozone predicted to occur due to one potential approach for implementing the Clean Power Plan." Id at 4-5. The improper inclusion of the Clean Power Plan as an existing program that will minimize the impacts of a new ozone standard is highly objectionable.

Historically, EPA has generated baseline scenarios from rules and regulations that are already on-the-books or have been promulgated in the Federal Register. By stepping out of this typical application of modeling control strategies, EPA has compromised the relative efficacy of the proposed alternate NAAQS control strategies by pre-determining the level of control each State would impose to meet a yet-to-be finalized regulation.

By including estimates of EPA's 111(d) Clean Power Plan proposed rule, the Agency has prematurely lowered (or increased) the required level of emission reduction and associated ozone concentration levels in many areas of the U.S. by accounting for EGU control and plant shutdowns (or increases in operation) associated with this yet to be promulgated rule.

We urge that EPA generate and utilize a baseline inventory and modeling platform that only contains rule and regulations that have been finalized and are on-the-books to avoid misleading the public on the true levels of additional controls which will be required to meet the new level of the ozone NAAQS. We urge that EPA correct the RIA in part by removing the Clean Power Plan from the analysis.

3. EPA Failed to Rely Upon the Most Recent Methods Available to Determine Mobile Source Emissions.

EPA used an earlier version of MOVES model, not the latest version available at the time of the proposed ozone NAAQS rulemaking. In June of 2014, EPA released the latest version of the Motor Vehicle Emission Simulator (MOVES2014), a state-of-the-science emission model that estimates emissions for mobile sources at the national, county, and project level for criteria pollutants, greenhouse gases, and air toxics. This version of the model represents the Agency's most up-to-date assessment of on-road mobile source emissions, allows users to benefit from new promulgated regulations, incorporates new and up-to-date emissions data, and has improved functionality compared to previous versions of the model. By failing to use MOVES2014, EPA has incorrectly accounted for onroad motor vehicles, one of the largest, NOx emitting, ozone contributing, categories in 2011 and 2025 using dated assumptions and a dated version of the model.

Furthermore, relative to new motor vehicles, the baseline emissions reductions projected by EPA are based on the Tier 3 rule, Corporate Average Fuel Efficiency (CAFE) standards, vehicle usage patterns and vehicle fleet turnover. The CAFÉ program is not final in its implementation and is improperly included. There is nothing in the record that suggests EPA has dedicated time to research its assumptions on vehicle fleet turnover, an activity not directly regulated by the agency.

Finally, EPA's statement that "Onroad mobile source controls are not applied because they are largely addressed in existing rules such as the recent Tier 3 rule." demonstrates an irrational void in this ozone proposal. Id. at 4-12. Failure by the agency to analyze the impacts of controls on mobile sources to meet the alternative standards is a gross error upon consideration of the contribution to ozone by such sources. Upon what objective criteria is it appropriate to not review mobile source controls relative to a national strategy to achieve an ozone standard? MOG urges the agency to provide a more appropriate inclusive assessment of mobile source controls along with controls from stationary sources.

We urge that EPA use the current state-of-science onroad mobile source emissions model to simulate emissions from this large ozone precursor contributing category.

4. EPA failed to account for projected increases in multiple electric generating unit (EGU) units as predicted by its own EGU forecasting tool.

The Integrated Planning Model (IPM) is a proprietary model used by EPA to analyze the projected impact of environmental policies on the electric power sector in the 48 contiguous states and the District of Columbia. It is touted as a multi-regional, dynamic, deterministic linear programming model of the U.S. electric power sector. It provides forecasts of least-cost capacity expansion, electricity dispatch, and emission control strategies for meeting energy demand and environmental, transmission, dispatch, and reliability constraints. As part of its solution set for scenario and sensitivity modeling that EPA relied on for demonstrating ozone reductions and alternate standard attainment scenarios, IPM forecasted, for both fossil and non-fossil fueled generating units, the generation dispatch necessary to achieve a projected attainment of the Clean Power Plan (CPP) rule. EPA refers to the State, Option 1 results as the basis of the 2025 baseline modeling from which it applied ozone reduction factors based on sensitivity modeling analyses. However, review of this State, Option 1 output file from the IPM indicates that multiple non-fossil fired Municipal Waste Combination (MWC) units are anticipated to increase their utilization and resulting NOx emission contribution in the CPP scenario.

Examination of the resultant emission inventories used in the 2025 baseline modeling indicates that emissions from these higher NOx-emitting MWC unit forecasts were not included in the final modeling and therefore the emission increases from these sources is also not accounted for in the sensitivity and alternate NAAQS attainment strategies. Instead, 2011 level emissions (with the "no growth" estimates applied) were used for these sources. By ignoring the economic growth and generation demand contribution of these sources on ozone concentrations at downwind monitors, EPA has improperly estimated the relative contribution and the resultant controlled impact of these sources.

Table 4 presents examples of some sources from the northeastern region of EPA's emission reduction domain. As can be seen in this comparison, emissions from these three facilities alone are underestimated by EPA by over 1,050 tons of NOx per year. This omission of this additional precursor contribution to ozone concentrations, both localized and downwind of these sources, must then be artificially reduced by other sources to make up the attainment deficit projected by EPA.

					2025 - Annual NOx (tpy)	
State	**County**	**ORIS ID**	**Unit ID**	**Plant Name**	**IPM (CPP)**	**"No Growth"**
Connecticut	Fairfield	50883	BLR1	Wheelabrator Bridgeport	577.8	413.2
Connecticut	Fairfield	50883	BLR2	Wheelabrator Bridgeport	577.8	406.1
Connecticut	Fairfield	50883	BLR3	Wheelabrator Bridgeport	577.8	401.0
New York	Suffolk	50656	UNIT1	Huntington Resource Recovery Facility	237.5	361.3
Pennsylvania	Montgomery	54625	1	Montenay Montgomery LP	690.0	365.2
Pennsylvania	Montgomery	54625	2	Montenay Montgomery LP	712.1	369.4
Total					**3,373.0**	**2,316.2**

Table 4. Example Northeastern State Municipal Waste Combustion Source Emission Estimates.

If EPA continues to use IPM for its generation demand forecasting, we urge that the Agency use all unit-level projections from the simulation, not selective usage of outputs from the model runs, to best account for utilization changes from all sources contributing to the generation demand needs of application of the Clean Power Plan or other applied strategies. The omission of these example units from the forecasted baseline inventories and modeling likely impacts the ozone concentrations at downwind monitors.

5. EPA made "no growth" assumptions on large, geographically important categories with projected economic growth planned.

EPA notes in the regulatory impact analysis (EPA-HQ-OAR-2013-0169-0020) cited technical support document for the proposed rule (EPA, 2014), that:

> *"In estimating future-year emissions, EPA assumed that emissions growth does not track with economic growth for many stationary non-IPM sources. This "no-growth" assumption is based on an examination of historical emissions and economic data. While EPA is working toward improving the projection approach in future emissions platforms, the Agency is still using the no-growth assumption for the 2011 platform unless states provided specific growth factors for 2018 or other years beyond 2018. More details on the rationale for this approach can be found in Appendix D of the Regulatory Impact Assessment for the PM NAAQS rule (EPA, 2006b)."*

Review of Appendix D and of the RIA (EPA-452/R-12-003) from the PM NAAQS rule reveals two issues that EPA fails to address in the development of projections of the proposed ozone NAAQS; (1) the "no-growth" assumption implemented by EPA was intended to be interim until improved and consistent data projection methods could be developed, and (2) the assumptions to use the "no-growth" method was predicated on findings related to SO2 emissions from three PM-precursor source emission categories and related PM concentration changes at downwind monitors, sources and concentrations largely different from those that contribute to ozone.

EPA states in the PM NAAQS RIA Appendix D that:

> *"The methodology used in this RIA to forecast nonEGU stationary source categories recognizes the disconnection between prior projection estimates and the historical record. The methodology is called an 'interim' emissions projection approach to acknowledge that we will work to develop improved and consistent emissions forecasting model(s) for future analyses."*

Since EPA made this determination back in 2006, two updated EPA modeling platforms have been released (2008 and 2011), with multiple versions each, identifying that nonEGU stationary source category growth has not remained flat for sources that contribute to ozone formation. In fact, based on the inventory data for ozone precursor emissions submitted by State and local agencies during the regular National Emission Inventory 3-year reporting cycles, these values have increased or decreased, depending on the geography and socio-economic conditions prevalent at the time. To assume that "no-growth" will occur for many of these large nonEGU sources and that the only change in emissions will be the result of controlling strategies and technologies fails to account for industry growth in many fields of the U.S. economy as recent history would support.

Additionally, this "no-growth" methodology has been used since 2006 without improvement and has now been applied to sources and source categories for various rulemakings unrelated to the original justification use to establish the method. Originally, in 2006, EPA used a very limited set of SO^2 emission sources and related PM concentration changes during consultation with the Advisory Council (Council) on Clean Air Compliance Analysis and Air Quality Modeling Subcommittee of the Science Advisory Board. This limited analysis applied the Council's recommended approach for three non-EGU stationary source sectors, including Pulp and Paper Manufacturing, Petroleum Refining, and Chemicals and Allied Products for SO_2 emissions and resultant PM concentrations only. By using this same justification in the proposed ozone NAAQS rulemaking, EPA has failed to adequately act on improving either the methods or the consistency for these and other sources and source categories. Many sectors that are identified as part of the sensitivity or alternate NAAQS level control runs used to justify the proposed rule modeling or to justify the use of this method on ozone precursor emitting source categories that do not even emit significant amounts of PM precursor emissions.

We urge that EPA develop methods and consistent approaches to developing future year emission projections for all major ozone precursor emitting sources and source categories, especially those that have potential to be impacted by control strategies necessary to attain alternate attainment levels. Failure to do so is potentially understating the true levels of controls, and societal costs, necessary to attain the levels of the new ozone NAAQS.

6. EPA did not include many regional/local/State attainment programs to reduce ozone in their base case or baseline projections.

Regional planning organizations (RPOs) like the Ozone Transport Commission (OTC) continuously work with their member states to develop, adopt, revisit, and implement various emission reduction initiatives designed at reducing ozone precursor emissions in their geographic domain. Unfortunately, many of these adopted initiatives are not included in EPA's emission projections used to develop alternate NAAQS control scenarios under the proposed rule modeling analyses.

Examples of some of these initiatives are the updated and adopted OTC Consumer Products Rule and the OTC Architectural and Industrial Maintenance Model Rule[11], which have new implementation dates between January 2014 and 2016 and are not currently included as part of EPA's projection package.

Through omitting controls, like those noted above, EPA has failed to account for planned reductions in precursor emissions associated with the formation of ozone in the northeastern States and elsewhere.

We urge that that EPA consider all regional/local/State published control initiatives, regional rules, and attainment programs while accounting for base case and baseline projection and associated air quality modeling and sensitivities.

7. EPA assumed first ton reduced gives same ozone change as last ton reduced, failing to account for the non-linearity of emission reductions and associated ozone concentration changes.

It is well understood that ozone formation is not a linear function of NOx emissions. Photochemical modeling with high-order sensitivity analysis has been applied to simulate the nonlinear responses of ozone to NOx and VOC emissions from different source regions and categories in various U.S. geographic areas and their interactions[12,13,14,15]. For secondary air pollutants, like ozone, precursor emissions may impact concentrations in non-linear and interdependent manners. Example modeling studies have been conducted for high ozone episodes in the southern (Houston) and southeastern United States, applying a second-order direct sensitivity method in a regional air quality model. This science is ignored by EPA in the ozone NAAQS proposal.

Proper inclusion of second-order sensitivities enables accurate characterization of response to large perturbations in emissions. Non-linearity of ozone formation is found to increase with the tonnage and emission density of each source region. Interactions among the impacts of emission

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11. http://www.otcair.org/document.asp?fview=modelrules
12. Xiao, X., D. S. Cohan, D. W. Byun, and F. Ngan (2010), Highly nonlinear ozone formation in the Houston region and implications for emission controls, J. Geophys. Res., 115, D23309, doi:10.1029/2010JD014435.
13. Di T, Cohan DS, Napelenok S, Bergin M, Hu Y, Chang M, Russell AG., J Air Waste Manag Assoc. 2010 Jul;60(7):797-804.
14. Cohan DS, Hakami A, Hu Y, Russell AG., Environ Sci Technol. 2005 Sep 1;39(17):6739-48.
15. G. Yarwood, C. Emery, J. Jung, U. Nopmongcol, and T. Sakulyanontvittaya (2013), A method to represent ozone response to large changes in precursor emissions using high-order sensitivity analysis in photochemical models, Geosci. Model Dev., 6, 1601–1608, 2013, www.geosci-model-dev.net/6/1601/2013/ doi:10.5194/gmd-6-1601-2013.

sources are shown to lead to discrepancies between source contribution attributed to an ensemble of emitters and the sum of the contributions attributed to each component. Ozone concentrations typically exhibit a non-linear response to precursor source emissions, such that ozone response to emission control of one precursor (e.g., NOx) changes along with the emission reduction and also depends on emissions of other precursors (e.g., VOCs) due to complex interactions between them. It is often shown that for ozone response to NOx, underestimates in emission rates lead to under prediction of total source contribution and over prediction of per-ton sensitivity.

EPA's assumption that every ton of ozone precursor reduced (within each sensitivity) has the same ozone concentration impact as every other ton reduced inadequately addresses the complicated chemistry involved with atmospheric ozone formation.

We urge that EPA run the alternate NAAQS control strategies and resultant emission inventories through photochemical models to determine the ozone concentration change associated with the documented emission reductions. At a minimum, EPA should run the maximum proposed alternate NAAQS strategy to confirm monitor-level ozone concentration findings associated with the incremental sensitivity approach used in the proposed rule RIA.

8. EPA's across-the-board sensitivity results and associated ozone reduction factors do not account for the fact that elevated source reductions do not have same ozone concentration potential as non-elevated sources.

Recent source apportionment studies conducted on EPA's 2011v6 (version 1) modeling platform indicates that the relative contribution to ozone formation of various emission source categories (e.g., EGU, nonEGU point, area, nonroad, onroad) are not comparable on a ton-by-ton emitted basis[16]. In fact, based on the results of these analyses, resultant emissions from nonroad and onroad source categories appear to have a higher impact on ozone concentrations than do elevated, point source emissions for most monitors in the eastern U.S. under a 2018 base case strategy. This latter point is important as the ozone reduction factors generated by EPA from the across the board emission reduction sensitivities account for reductions from all categories, yet the control strategies designed to achieve associated emission reductions of comparable magnitudes omits controls from each category involved with the across-the-board reduction sensitivities. By failing to reduce emissions from each category involved with the across-the-board sensitivities, EPA has altered the expected impact of each of its alternate NAAQS control scenarios.

The calculation and application of the ozone reduction factors by EPA are further disjoint in the fact that comparable emission reductions across all source categories are not assumed in the alternate NAAQS control strategy (onroad mobile sources are excluded) and therefore may not be as effective as the ozone reduction factors presume.

Additionally, the science produced by EPA, through its own simulations using source apportionment[17,18], indicate that there is a regionality involved in the relative contribution of NOx

16.http://www.ladco.org/about/general/2014%20Midwest%20Air%20Quality%20Workshop/Presentations_files/E_Met_Photo_Modeling/Cohan_LDworkshop_4_23_14.pdf
17. http://www.epa.gov/scram001/reports/EPA-454_R-10-005.pdf

emissions and emission reductions to ozone concentration changes at individual monitors. By incorrectly assuming that every ton reduced within EPA's large- geographic regions has the same impact as every other ton reduced within that region, EPA has failed to account for its own documented understanding of what types of sources or regions are contributing to ozone estimated by photochemical grid models. EPA's assumption simplifies the unique and complex meteorology and chemical mechanisms used to relate emission changes and downwind ozone concentrations.

9. EPA developed ozone reduction factors from its across-the-board sensitivity runs failing to account for the differences that low level and elevated source emission reductions have on downwind ozone concentrations.

It is documented by EPA in recent modeling for the Tier 3 and Clean Power Plan rulemaking analyses, that emission reduction from onroad and EGU sources, respectively, have significantly different ozone concentration impacts on downwind monitors in geography, direction, and magnitude.

EPA notes in the Tier 3 air quality modeling TSD (EPA-454/R-14-002), the majority of design value decreases in 2018 are between 0.5 and 1.0 ppb (Figure 5). There are also 33 counties with projected 8-hour ozone design value decreases of more than 1 ppb; these counties are generally in highly populated urban areas in states that have not adopted California LEV III standards. These concentration changes are associated with a national reduction in mobile source (onroad and nonroad) NOx and VOC of 238,281 and 78,739 tons per year, respectively, as documented in the Tier 3 emission inventory TSD (EPA-454/R-13-002, Tables 6-2 and 6-4).

The same TSD presents the ozone design value changes for 2030 (Figure 6). In 2030 the ozone design value decreases are larger than in 2018; most decreases are projected to be between 0.5 and 1.0 ppb, but over 250 more counties have design values with projected decreases greater than 1.5 ppb. These concentration changes are associated with a national reduction in mobile source (onroad and nonroad) NOx and VOC of 474,646 and 212,007 tons per year, respectively, as documented in the Tier 3 emission inventory TSD (EPA-454/R-13-002, Tables 6-3 and 6-5).

18. http://www.epa.gov/crossstaterule/whereyoulive.html

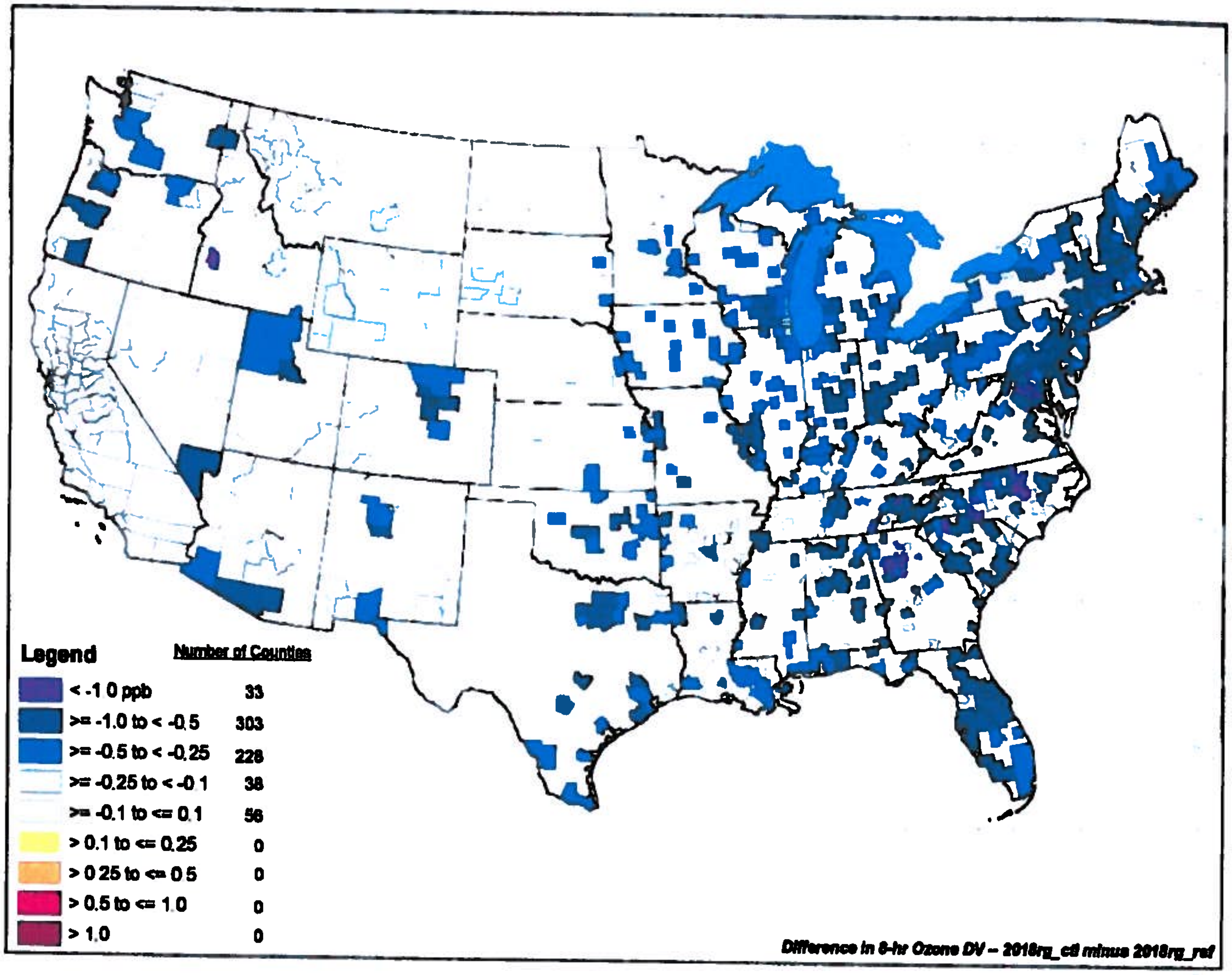

Figure 5. Projected Change in 2018 8-hour Ozone Design Values (ppb) Between the Reference Case and Control Case of Tier 3 Rule.

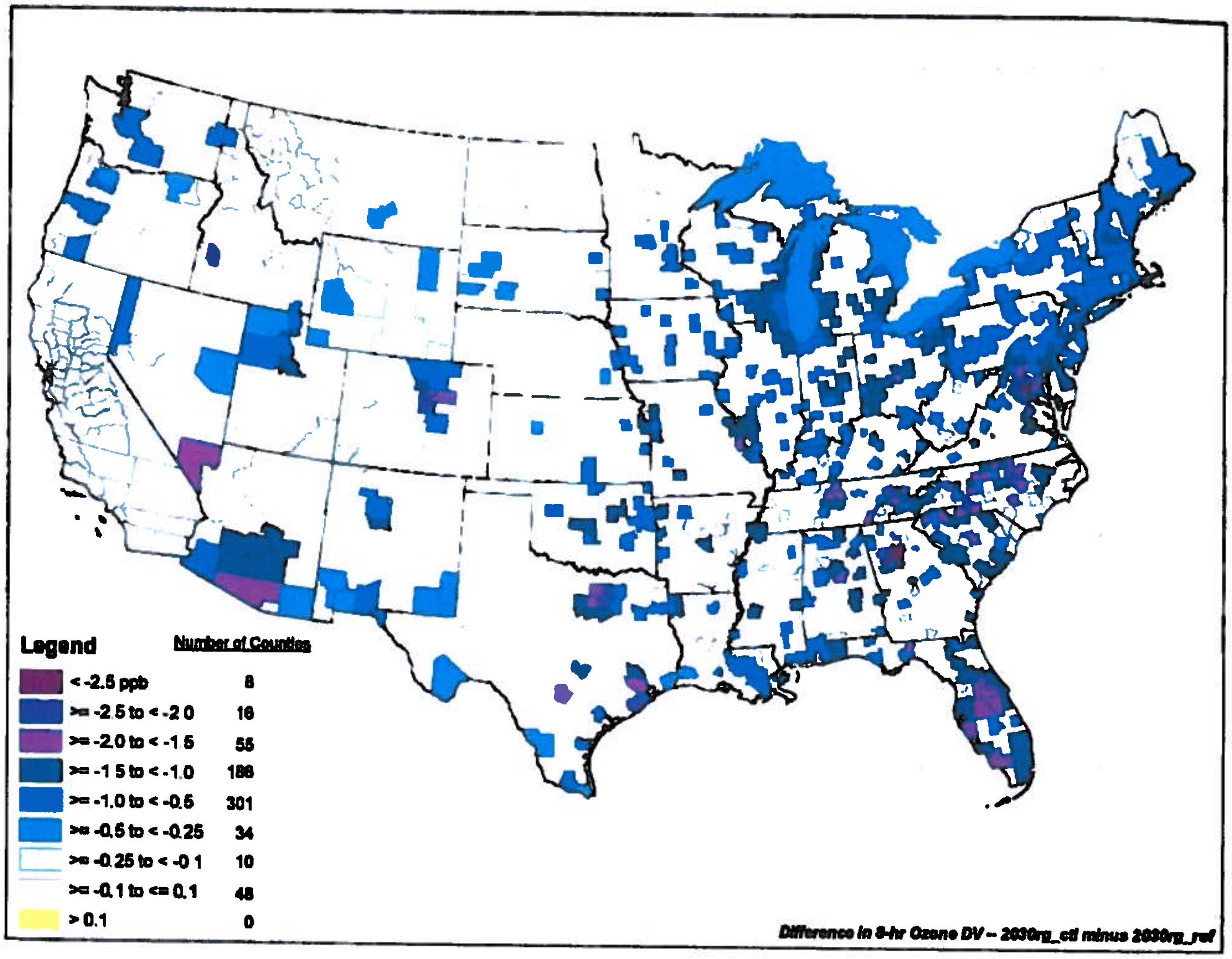

Figure 6. Projected Change in 2030 8-hour Ozone Design Values (ppb) Between the Reference Case and Control Case of Tier 3 Rule.

Comparatively, EPA's modeling of the Clean Power Plan (Scenario #1 of the proposed ozone NAAQS) demonstrates a wider distribution of concentration changes, including disbenefits (ozone increases) of 5 ppb or more in areas of Kentucky (Figure 7). In 2025, the ozone design values decreases are projected to be between -5.2 and -7.1 ppb. Median design value change across the eastern U.S. is 0.6 ppb, with 81% of the monitors demonstrating ozone concentration improvements of 1 ppb or less and 9% of the monitors with ozone design value reductions of 1.5 ppb or more. Under this scenario, NOx emissions were reduced (from elevated point sources only) by approximately 315,000 tons which includes 49 GW of coal fired retirement. However, unlike controls applied in the Tier 3 rule, the reductions associated with EGU emission reductions under the Clean Power Plan scenario have a disperse impact on ozone concentrations at downwind monitors. This is different to the relatively equal geographic pattern and directionally consistent reduction of ozone concentration changes seen in the Tier 3 modeling.

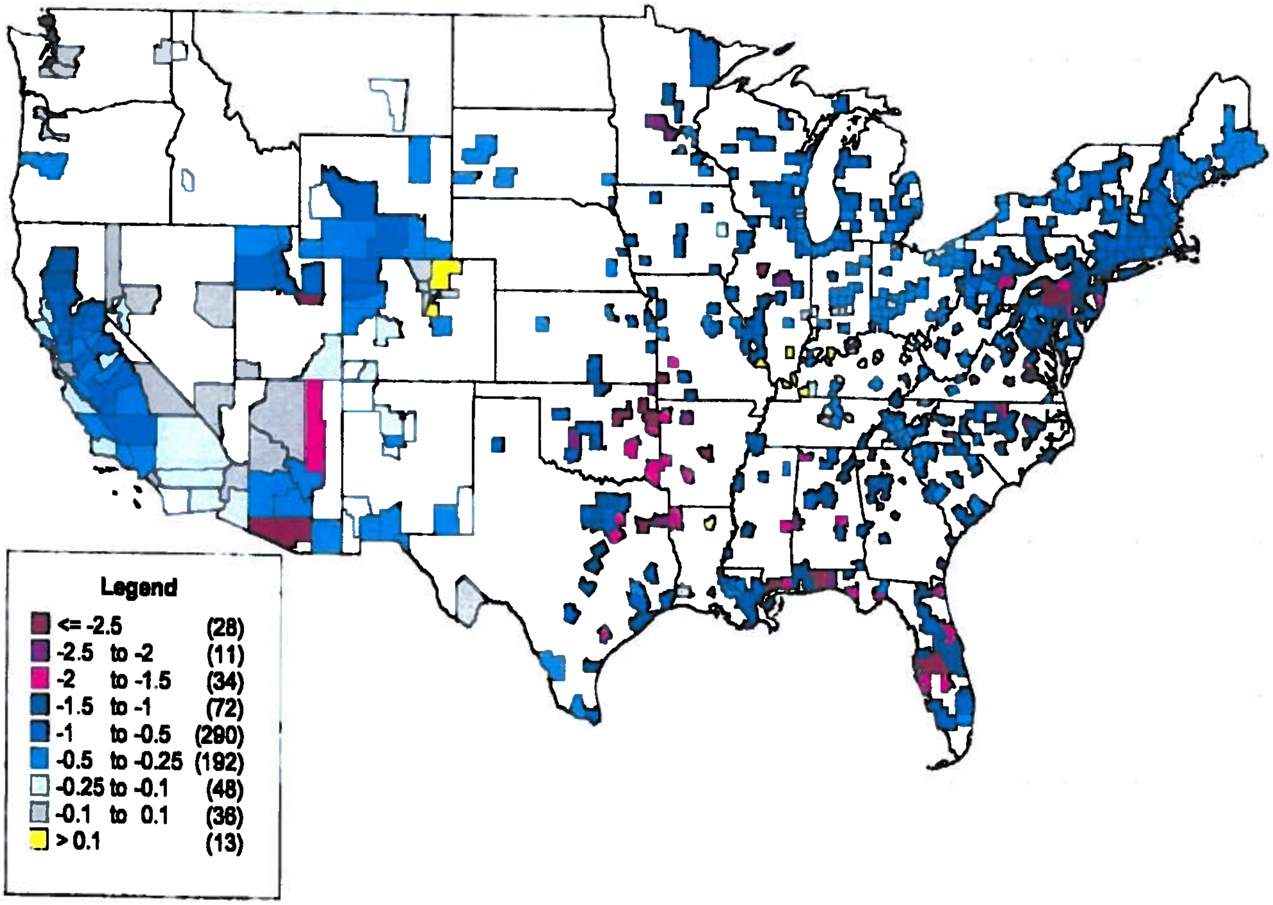

Figure 7. Projected Change in 2025 8-hour Ozone Design Values (ppb) Between the Base Case and Proposed 111(d) Clean Power Plan; Option 1, State Control.

From this evaluation, it appears that the Tier 3 rule reductions in NOx from low level mobile source emission reductions have a geographically greater, equally distributed, directionally consistent, and more widespread ozone concentration reduction potential than do the elevated point source reductions from the Clean Power Plan proposed rule.

This is noted as important because the across-the-board sensitivity runs conducted by EPA to develop region-specific ozone reduction factors use emission reductions from all source categories (low level area and mobile and elevated point sources) with each region to demonstrate ozone concentration reductions. EPA assumes that the ozone reduction factors associated with these sensitivity reductions are equal in all circumstances. This is further applied when the resulting alternate control strategies were designed to show attainment with the alternate proposed levels of the NAAQS, reductions assumed from elevated, point source oriented controls were given equal weight and distribution as low level, nonpoint and mobile source controls.

It is urged that EPA run the alternate NAAQS control strategies and resultant emission inventories through photochemical models to determine the ozone concentration change associated with the documented emission reductions. At a minimum, EPA should run the maximum proposed alternate NAAQS strategy to confirm monitor-level ozone concentration findings associated with the incremental sensitivity approach used in the proposed rule RIA.

10. EPA failed to model the final, most stringent control scenario for each NAAQS level to confirm assumptions of change in ozone.

Because of the previously mentioned non-linearity of ozone concentrations and emission reductions and EPA's development of alternate proposed NAAQS control strategies, it cannot be presumed with confidence that the proposed rule calculated ozone changes, generated from sensitivity-based ozone reduction factors, would generate design values in the ranges reported by EPA. Because of the discrepancies in EPA's assumptions with other modeling studies showing relationships between ozone precursor emission reductions and ozone concentration changes, a final, most stringent control strategy simulation should have been conducted by EPA to corroborate their findings using the additive, sensitivity-based method.

It is urged that EPA model, at a minimum, the most stringent proposed ozone NAAQS controls strategy case to determine whether ozone concentration values reported from the additive sensitivity-based analysis are valid in all areas.

11. EPA's estimate of 2025 baseline emissions cannot be independently corroborated with certainty as EPA did not provide county, source category detail or summaries of this scenario from which all proposed alternate attainment control strategies were applied.

In order to review the EPA defined control strategies documented to attain each proposed alternate level of the NAAQS, we had to generate a county, source type-level inventory that replicated EPA's 2025 baseline inventory. This baseline inventory was the starting point from which EPA applied all "known" and "unknown" controls to show attainment of each proposed alternate NAAQS level. Emission control measures are defined by EPA as "known" when they are based on information available at the time of their analysis and include primarily documented end-of-pipe control technologies.

In addition, to attain some of the alternative primary standard levels analyzed, some areas were identified to need additional emissions reductions beyond the "known" controls. EPA refers to these additional reductions as coming from "unknown" controls. EPA further defines "unknown" controls as potential controls that come from sectors for which EPA has not sufficiently explored emissions abatement opportunities or sectors that might require non-traditional abatement through measures like energy efficiency or process changes (Section 4.1, RIA). While "known" controls are applied by EPA at unit and county/source category levels, "unknown" control emission reductions are assumed by EPA to come from entire regions as a collective and do not have or are not applied with sub-regional, geographic specificity.

Starting with the EPA 2025 base case emissions inventories, we applied EGU emission changes (in some areas, emission increases) associated with EPA's proposed Clean Power Plan rule, Option 1, State application of the IPM simulation cited by EPA in the RIA (EPA-HQ-OAR-2013-0602-0221). These emissions were used in place of EPA's documented base case EGU emissions.

In addition to these EGU changes, we applied EPA methodology and incremental control measures (EPA-HQ-OAR-2013-0169-0035) to add "a portion of the explicit modeled controls" within Texas, identified by EPA as necessary to achieve the 75 ppb standard at all monitors. The resulting 2025 baseline inventory could not be validated against EPA assumptions for this starting case as EPA has indicated that they "did not assemble a 2025 baseline emissions inventory for posting in the docket[19] ".

We urge that EPA publish a county-level emission inventory consistent with the 2025 baseline inventory from which all alternate control strategies are applied so that its control technology assumptions and strategy application can be independently verified and validated.

12. EPA's "known" and "unknown" controls contains numerous errors.

From the recreated baseline inventory, we applied county-source level annual NOx reductions ("control files") as provided in EPA's control strategy simulations for the proposed alternate NAAQS levels of 70 ppb (EPA-HQ-OAR-2013-0169-0028), 65 ppb (EPA-HQ-OAR-2013-0169-0025), and 60 ppb (EPA-HQ-OAR-2013-0169-0024) to generate geographic representations of the location and magnitude of percent NOx emission reduction associated with each alternate level of the NAAQS.

Figure 8 presents the regions in which EPA has identified specific "known" and "unknown" controls to meet the proposed alternate levels of the NAAQS. Table 5 presents the EPA identified "known" source type, sub-regional emission reductions, by tons and percent, from the 2025 baseline inventory, determined to achieve the proposed alternate NAAQS levels. Because the "unknown" emission reductions are not defined by source type, Tables 6 and 7 present these additional data at the aggregate sub-regional level as presented by EPA in the proposed rule (EPA-HQ-OAR-2013-0169-0032).

Figures 9, 10, and 11 present the county level, annual NOx emissions reductions identified by EPA as "known" for each of the proposed alternate NAAQS levels. These emission reductions, and the sources and source categories to which they were applied, are presented in EPA's control files for 70 ppb, 65 ppb, and 60 ppb, as referenced above.

In these control files, it is noted that EPA has applied control technologies with no associated cost to certain source categories (example, found in EPA-HQ-OAR-2013-0169-0028; selective catalytic reduction (SCR) installation on northeastern Utility Boilers - Oil-Gas/Wall-Fired for annual reduction of 337 tons NOx at no cost). It also appears that EPA has improperly applied "known" NOx reduction technologies to source types for which they are not demonstrated to be applicable (example, EPA-HQ-OAR-2013-0169-0028, SCR installation on northeastern solid waste disposal

19 Personal electronic communication between Greg Stella, Alpine Geophysics, and Darryl A. Weatherhead, Group Leader, Air Economics Group, HEID/OAQPS, U.S. EPA Office of Air and Radiation, 27 January 2015.

incinerators for annual reduction of 5,002 tons NOx at cost of $20,475,517).

It is urged that EPA reconsider its proposed "known" control strategy files for each proposed level of the NAAQS and correct control technology applications that are invalid or have no demonstrated application to the sources and source categories to which they are applied.

EPA's additional "unknown" source NOx emission reductions (by sub-region) from the resulting alternate standard scenarios are not presented at the county level and so are only included here in Tables 3 and 4. EPA makes the assumption with the application of these "unknown" controls that emission reductions achieved from anywhere within a sub-region will have an identical ozone concentration impact on all monitors within that sub-region.

It is recommended that EPA consider conducting ozone source apportionment studies on the resultant post-"known" control scenario inventories to determine appropriate geography, source types, and relative magnitude of emission reductions required to achieve attainment at downwind monitors.

It is also noted than no NOx emission reductions beyond the baseline level were applied by EPA in any of the alternate proposed standard scenarios for the following counties in Texas (noted with black highlight in the Figures 6, 7, and 8); Austin, Bastrop, Burleson, Collin, Cooke, Dallas, Denton, Erath, Falls, Fannin, Gonzales, Grimes, Hunt, Kaufman, Lee, Madison, Milam, Parker, Somervell, and Walker. EPA does not provide justification for this oversight or whether the omissions were intentional.

It is urged that EPA provide additional information on why incremental controls are not applied beyond the baseline level for the noted twenty counties in Texas.

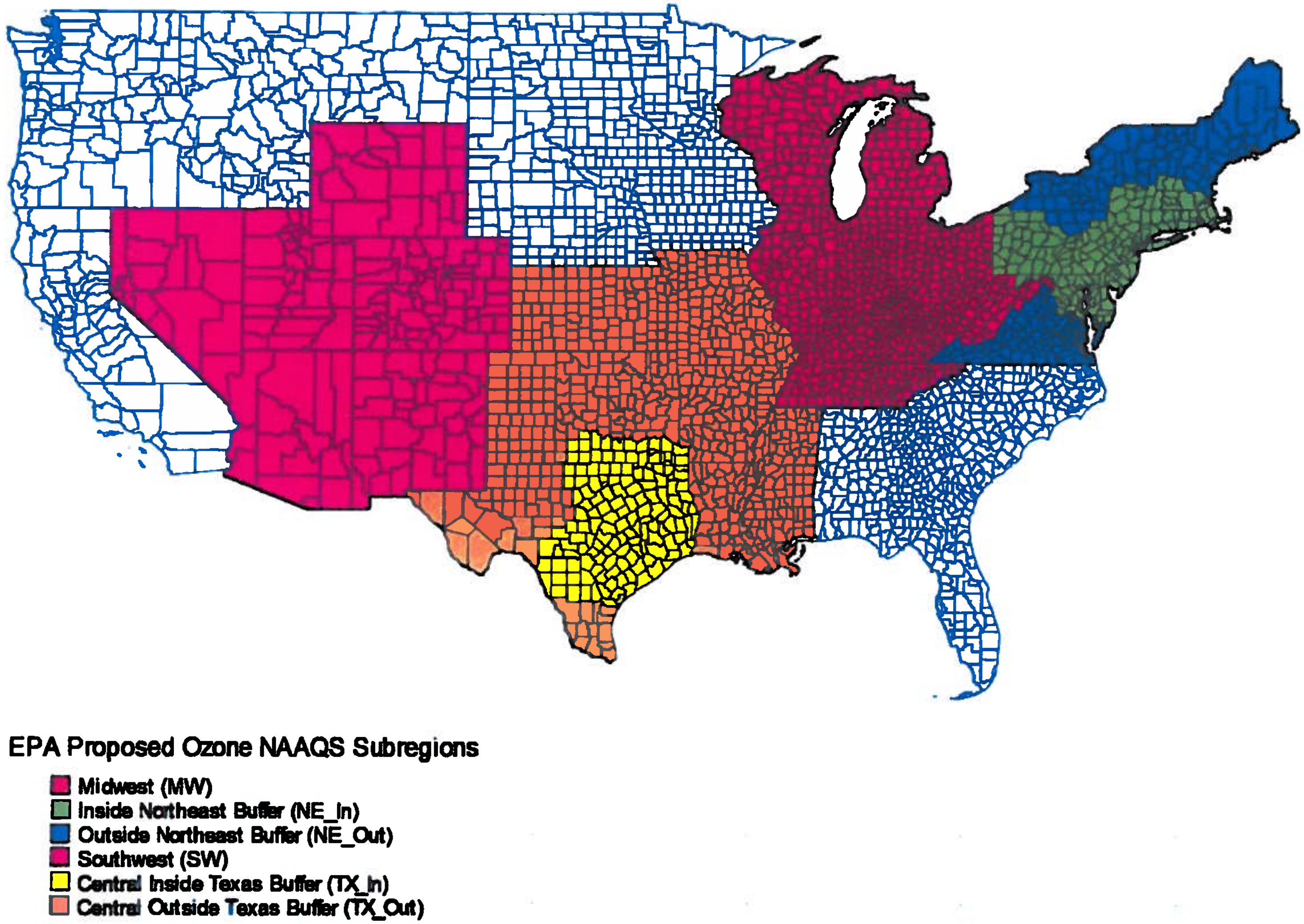

Figure 8. EPA sub-regions for "known" and "unknown" control strategy application.

Table 5. EPA "known" annual NOx emission reductions (by tons per year and percent) from 2025 baseline by sub-region and source type for proposed alternate NAAQS.

Region	Sub-Region	Source	Baseline NOx Emissions (tpy)	Known Annual NOx Emission Reductions (tpy)			Known Annual NOx Emission Reductions (%)		
				70 ppb	65 ppb	60 ppb	70 ppb	65 ppb	60 ppb
Central	Within TX Buffer	Area	129,174	39,504	39,504	39,504	31%	31%	31%
	Within TX Buffer	EGU	55,404	19,632	19,632	19,632	35%	35%	35%
	Within TX Buffer	Nonrd	78,915	573	573	573	1%	1%	1%
	Within TX Buffer	Onrd	93,947	0	0	0	0%	0%	0%
	Within TX Buffer	Point	143,684	23,543	23,543	23,543	16%	16%	16%
	Subtotal	***All Sources***	***501,124***	***83,251***	***83,251***	***83,251***	***17%***	***17%***	***17%***
	Outside TX Buffer	Area	438,287	134,388	153,235	153,235	31%	35%	35%
	Outside TX Buffer	EGU	140,875	0	49,258	49,258	0%	35%	35%
	Outside TX Buffer	Nonrd	264,104	2,017	3,807	3,807	1%	1%	1%
	Outside TX Buffer	Onrd	196,119	0	0	0	0%	0%	0%
	Outside TX Buffer	Point	426,632	121,159	184,542	184,542	28%	43%	43%
	Subtotal	***All Sources***	***1,466,017***	***257,564***	***390,841***	***390,841***	***18%***	***27%***	***27%***
Northeast	Inside NE Buffer	Area	240,910	68,036	68,036	68,036	28%	28%	28%
	Inside NE Buffer	EGU	88,023	5,685	5,685	5,685	6%	6%	6%
	Inside NE Buffer	Nonrd	166,525	1,840	1,840	1,840	1%	1%	1%
	Inside NE Buffer	Onrd	159,249	0	0	0	0%	0%	0%
	Inside NE Buffer	Point	140,295	47,157	47,157	47,157	34%	34%	34%
	Subtotal	***All Sources***	***795,002***	***122,717***	***122,717***	***122,717***	***15%***	***15%***	***15%***
	Outside NE Buffer	Area	98,263	13,741	24,431	24,431	14%	25%	25%
	Outside NE Buffer	EGU	11,499	0	892	892	0%	8%	8%
	Outside NE Buffer	Nonrd	72,505	547	743	743	1%	1%	1%
	Outside NE Buffer	Onrd	72,504	0	0	0	0%	0%	0%
	Outside NE Buffer	Point	69,674	16,659	22,369	22,369	24%	32%	32%
	Subtotal	***All Sources***	***324,445***	***30,946***	***48,434***	***48,434***	***10%***	***15%***	***15%***
Midwest	MW	Area	383,678	0	139,355	139,355	0%	36%	36%
	MW	EGU	375,215	0	92,933	92,933	0%	25%	25%
	MW	Nonrd	285,275	0	4,597	4,597	0%	2%	2%
	MW	Onrd	306,136	0	0	0	0%	0%	0%
	MW	Point	381,371	0	127,992	127,992	0%	34%	34%
	Subtotal	***All Sources***	***1,731,675***	***0***	***364,877***	***364,877***	***0%***	***21%***	***21%***
Southwest	SW	Area	143,611	0	37,466	38,808	0%	26%	27%
	SW	EGU	114,438	0	31,070	56,606	0%	27%	49%
	SW	Nonrd	115,698	0	1,278	1,278	0%	1%	1%
	SW	Onrd	108,872	0	0	0	0%	0%	0%
	SW	Point	188,184	0	38,432	47,804	0%	20%	25%
	Subtotal	***All Sources***	***670,802***	***0***	***108,246***	***144,496***	***0%***	***16%***	***22%***

Table 6. EPA NOx Emission Reductions (tons) from "known" and "unknown" controls (California not included) from 2025 Baseline by sub-region.

		70 ppb (Incremental NOx Reductions from Baseline) - TPY			65 ppb (Incremental NOx Reductions from Baseline) - TPY			60 ppb (Incremental NOx Reductions from Baseline) - TPY		
Region	Sub-Region	Known Control Reductions	Unknown Control Reductions	Total Reductions	Known Control Reductions	Unknown Control Reductions	Total Reductions	Known Control Reductions	Unknown Control Reductions	Total Reductions
Central	TX_In	83,251	68,811	152,062	83,251	180,496	263,747	83,251	308,934	392,185
Central	TX_Out	257,564	0	257,564	390,841	169,610	560,452	390,841	518,005	908,847
Northeast	NE_In	122,717	85,532	208,249	122,717	289,784	412,501	122,717	453,185	575,903
Northeast	NE_Out	30,946	0	30,946	48,434	46,744	95,178	48,434	98,256	146,690
Midwest	MW	0	0	0	364,877	65,527	430,405	364,877	508,175	873,053
Southwest	SW	0	0	0	108,246	0	108,246	144,496	348,152	492,648

Table 7. EPA NOx Emission Reductions (%) from "known" and "unknown" controls (California not included) from 2025 Baseline by sub-region.

		70 ppb (Incremental NOx Reductions to Baseline) - %			65 ppb (Incremental NOx Reductions to Baseline) - %			60 ppb (Incremental NOx Reductions to Baseline) - %		
Region	Sub-Region	Known Control Reductions	Unknown Control Reductions	Total Reductions	Known Control Reductions	Unknown Control Reductions	Total Reductions	Known Control Reductions	Unknown Control Reductions	Total Reductions
Central	TX_In	17%	14%	30%	17%	36%	53%	17%	62%	78%
Central	TX_Out	18%	0%	18%	27%	12%	38%	27%	35%	62%
Northeast	NE_In	15%	11%	26%	15%	36%	52%	15%	57%	72%
Northeast	NE_Out	10%	0%	10%	15%	14%	29%	15%	30%	45%
Midwest	MW	0%	0%	0%	21%	4%	25%	21%	29%	50%
Southwest	SW	0%	0%	0%	16%	0%	16%	22%	52%	73%

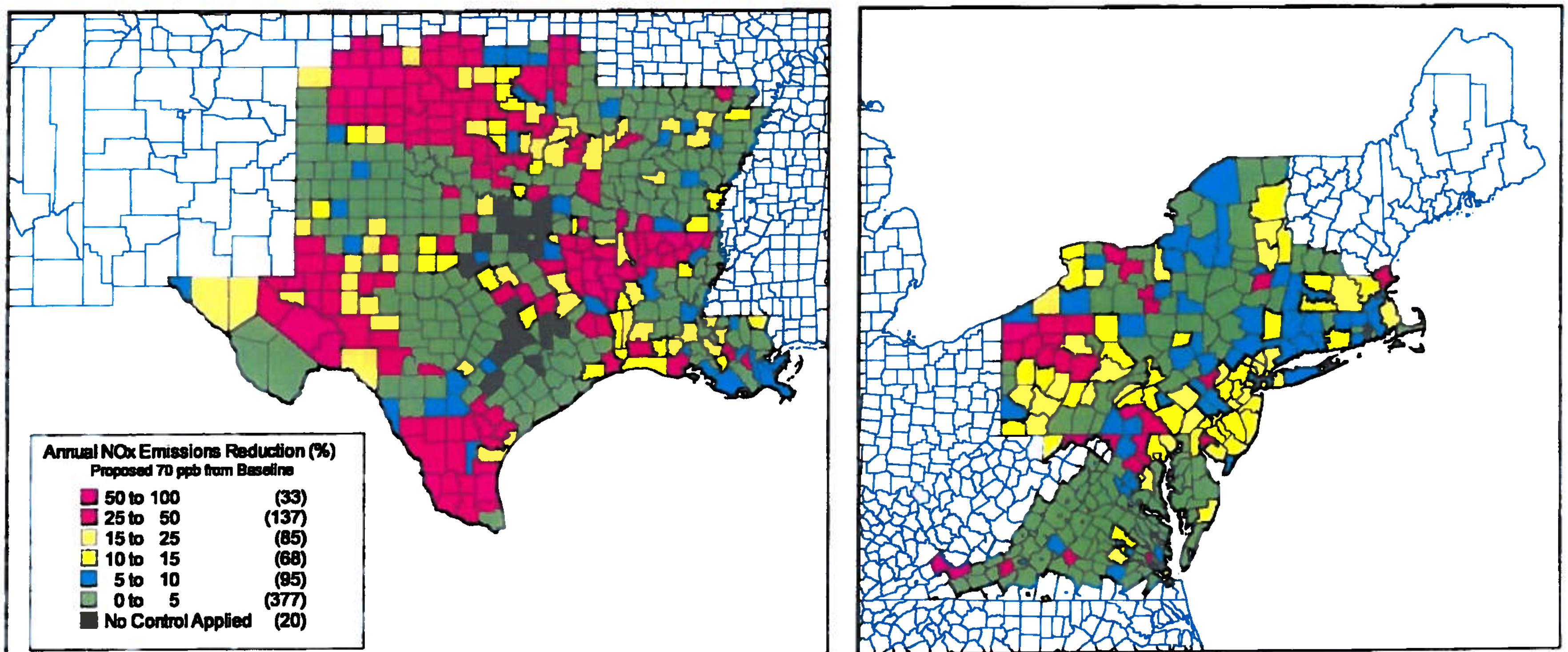

Figure 9. Location and magnitude of EPA "known" control NOx emission reduction (%) from 2025 baseline levels identified to achieve alternate NAAQS of 70 ppb.

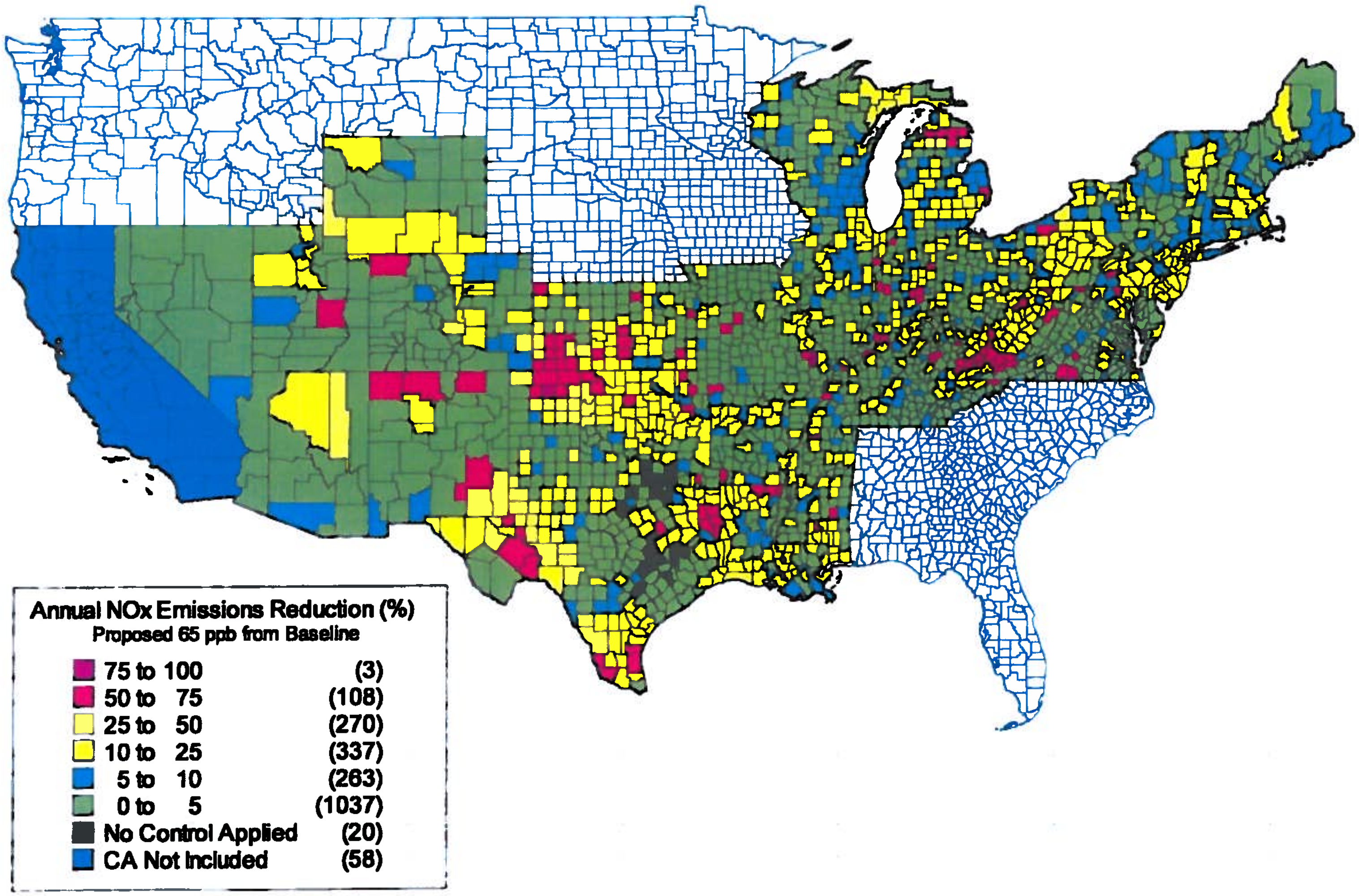

Figure 10. Location and magnitude of EPA "known" control NOx emission reduction (%) from 2025 baseline levels identified to

achieve alternate NAAQS of 65 ppb.

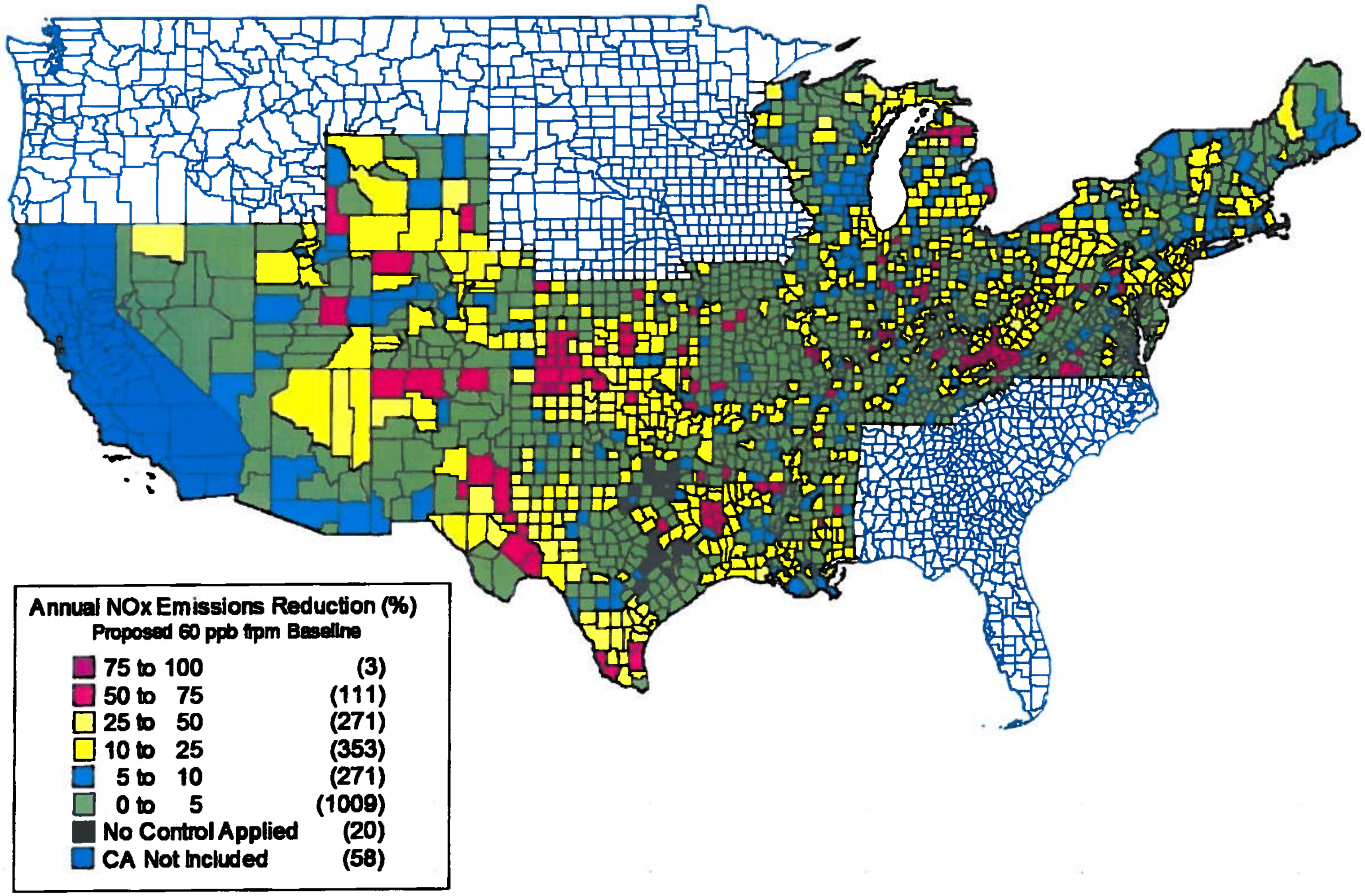

Figure 11. Location and magnitude of EPA "known" control NOx emission reduction (%) from 2025 baseline levels identified to achieve alternate NAAQS of 60 ppb.

13. **EPA failed to take into account transport of ozone across regional boundaries within the United States**

Emissions can be transported hundreds of miles downwind and are not constrained by state boundaries (79 FR 71663). By limiting the ozone concentration changes associated with regional emission control to monitors only within the region from which the reductions occur, EPA has failed in the proposed ozone NAAQS analysis to account for the benefits associated with upwind emission control on downwind monitors.

One of the basic principles of recent EPA transport-related regulation is shown to be the benefit of air quality improvement achieved at downwind monitors when upwind controls are in place (63 FR 57356, 70 FR 25162, and 79 FR 71663). By eliminating this well established transport principle, EPA has introduced a false physical boundary and limited the impacts of ozone transport physics and chemistry. These limitations influence the ozone control factors developed by EPA in establishing proposed control scenarios for the alternate proposed NAAQS levels while also introducing the potential over control of upwind sources necessary to allow downwind monitors to reach attainment.

Air is not constrained by geographic boundaries and EPA has incorrectly applied this constraint by limiting the impact of control to monitors only within a regional domain (Figure 12). Additionally, and in contrast to this limitation in the sensitivity modeling, by including the transport impact of EGU emission reductions associated with the Clean Power Plan 111(d) in the projected baseline from which all proposed control strategies are applied, EPA has unequally attributed transport-related reductions from EGU sources to downwind monitors while limiting the transport impact outside of each region for all other controlled source categories in the proposed scenarios.

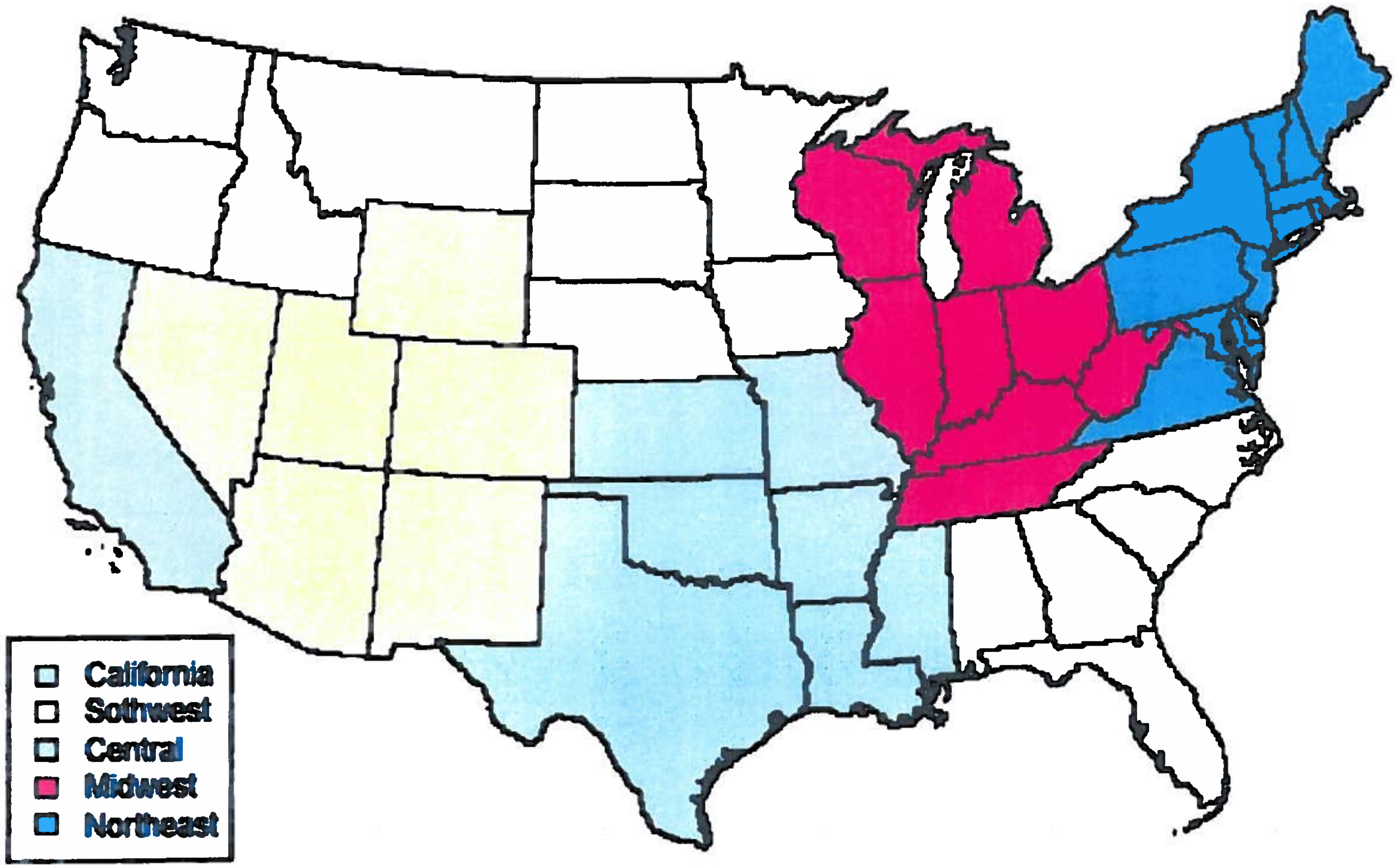

Figure 12. Five U.S. Regions Used by EPA to Create Across-the-Board Emissions Reduction and Combination Cases in Proposed Ozone NAAQS Analysis.

It is urged that EPA run an air quality simulation with the emission controls identified in each proposed control scenario to determine the downwind impact of these reductions and to ensure that over control is not impose on upwind states.

14. EPA used 2007 modeling to develop the case for background ozone concentrations and international transport assumptions.

Ozone pollution is unique in the fact that in addition to being a non-linear produced pollutant, concentration levels are influenced not only by local or regional anthropogenic sources, but by "background" sources other than these manmade emissions of ozone precursors. The definition of background ozone can vary depending upon context, but it generally refers to ozone that is formed by sources or processes that cannot be influenced by actions within the jurisdiction of concern. The magnitude of this "background" influence can vary from day-to-day and location-to-location and is very difficult to project on temporal or spatial scales with certainty.

EPA recognizes in it staff Policy Assessment for review of the NAAQS that "an appreciable fraction of the observed ozone results from sources or processes other than local and domestic regional anthropogenic emissions of ozone precursors." The Agency further documents that "it should be recognized that climate change, if not addressed through the reduction of greenhouse gases and other climate-forcing pollutants, may increase the future contribution of certain components of background ozone (e.g., wildfires, fewer days with precipitation, and additional lightning strikes), further complicating the development of effective local ozone attainment strategies."

EPA uses a 2007 modeling analysis to confirm that background ozone, while generally not approaching levels of the ozone standard, can comprise a considerable fraction of total seasonal mean ozone across the U.S (RIA, Section 2.4). It is recognized, however, that since 2007, U.S. anthropogenic emissions have decreased while international contribution of ozone precursor emissions has continued to increase.

Recent studies[20] have shown that ozone concentrations during peak ozone season have largely decreased as a result of U.S. ozone precursor regulation implementation. However, these same studies indicate that the background levels of ozone, measured at rural sites and during non-ozone season periods, have increased during this same timeframe and are consistent with international increases in ozone precursor emissions.

As a result of these diverging emission amounts, it can reasonably be expected that background ozone levels in 2011 and 2025 would show a higher fraction of background ozone across the U.S. compared to the 2007 calculations used to justify EPA initial arguments of background contribution. As this background ozone amount and relative fraction increases to levels closer to the alternate proposed ozone NAAQS levels, it will become harder for U.S.-based emissions controls to achieve attainment.

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20 Cooper OR, Parrish DD, Ziemke J, Balashov NV, Cupeiro M, et al. 2014. Global distribution and trends of tropospheric ozone: An observation-based review. Elem. Sci. Anth. 2: 000029 doi: 10.12952/journal.elementa.000029

15. **EPA failed to include future year transport of international emissions and uses 2011 boundary condition files to estimate the international component of emissions transport.**

In the photochemical modeling performed for the RIA, the EPA used constant boundary condition (pollutants entering the modeling domain from the lateral boundaries) for the base year (2011) and future year (2025). In the RIA the Agency recognizes the uncertainty in the future year conditions with the statement (RIA pp 3-5):

"Boundary conditions, which are impacted by international emissions and may also influence future ozone concentrations, are held constant in this analysis based on a similar rationale regarding the significant uncertainty in estimating future levels."

We recognize the uncertainty in specifying boundary conditions. However, the preponderance of information is projecting that the amount of ozone and ozone precursor emissions are increasing and increasing international contributions will make attainment of the ozone standard more difficult and will likely necessitate additional domestic controls.

For instance, there is now substantial evidence that anthropogenic emissions from Asia enhance ground-level ozone mixing ratios in the U.S. on many days each year. Lin et al., (2012)[21] report the application of a global high resolution model with full stratospheric and tropospheric chemistry to simulate the impacts of trans-Pacific international transport. They found surface 8-hr ozone enhancements as large as 8-15 ppb during May-June 2010 over the southwestern U.S. on days when observed MDA8 ozone exceeded 60 ppb. By zeroing out Asian anthropogenic emissions, 53% of the modeled O_3 NAAQS exceedances (75 ppb) would not have occurred in the southwestern U.S., but for Asian emissions. Ozone enhancements over the Gulf Coast states were in the 1-2 ppb range.

Asian emissions of NOx and NMVOC are forecast to increase from 2000 to 2020 by 44% and 99%, respectively[22]. Other reports show similar increases during this timeframe based on ensemble simulations comprised of multiple socio-economic scenarios[23].

Based on the most advanced global chemical transport model available for simulating international transport and deep stratosphere-troposphere exchange, the Geophysical Fluid Dynamics Laboratory modeling by Lin and coworkers has significant implications for attaining current and potentially more stringent ozone standards. Their research extends the findings of previous modeling studies that show international transport can add measurably to ozone exceedances at ground level monitors in the U.S.

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21 Lin, M., et al. (2012), Transport of Asian ozone pollution into surface air over the western United States in spring, Journal of Geophysical Research, 117, D00V07, doi:10.1029/2011JD016961.
22 Ohara, T., et al. (2007), An Asian emission inventory of anthropogenic emission sources for the period 1980-2020, Atmospheric Chemistry and Physics. 7. 4419-4444.
23 van Vuuren, D., M. den Elzen, P. Lucas, B. Eickhout, B. Strengers, B. van Ruijven, S. Wonink, R. van Houdt, 2007. Stabilizing greenhouse gas concentrations at low levels: an assessment of reduction strategies and costs. Climatic Change, doi:10.1007/s/10584-006-9172-9.

Recent studies presented by members of the Task Force on Hemispheric Transport of Air Pollution[24] indicate that historically increasing amounts of Asian NOx emissions are influencing the background levels of ozone concentrations measured in the United States. Adequately accounting for these emissions and their projected increases ensures that EPA will appropriately design control strategies and reduction programs that target domestic sources of emissions most likely to impact ozone formation in the U.S. and for which domestic States and stakeholders have control.

It is recommended that this issue be explored by at a minimum performing a sensitivity test on the additional domestic controls that would be required from increasing boundary conditions and that EPA use most current base year (2011) and projection year (2025) estimates of international emissions and boundary conditions in its modeling approach.

16. Revised Ozone NAAQS Implementation Impacts on the Power Industry and People.

EPA estimates that the annual cost of compliance with a revised standard of 70 ppb would be $3.9 billion, rising to $15 billion for a standard of 65 ppb, and to $39 billion for the alternative standard of 60 ppb, making this regulation potentially the most costly ever issued by EPA. EPA elects to shield itself from much of the economics of its NAAQS program directing the public to the *American Trucking Associations v. EPA*, decision at 175 F.3d at 1043 (Noting that because the EPA is precluded from considering costs of implementation in establishing NAAQS, preparation of a Regulatory Impact Analysis (RIA) pursuant to the Unfunded Mandates Reform Act would not furnish any information which the court could consider in reviewing the NAAQS. 79 Fed. Reg. 75386. Actual impact on the population due to a changed economy and shuttered power plants cannot be dismissed, even under the Clean Air Act.

In the RIA, EPA reviews its assessment of monitors that will record nonattainment and concludes that populations in those areas will benefit from the new standard, in this case low-income populations. RIA at 9-7. EPA is referring to environmental and health benefits. EPA chooses not to assess whether there are disbenefits from changes in the nonattainment area that reflect a shrinking economy from additional regulatory controls.

Relative to the power industry, the National Electric Reliability Corporation, the Federal Energy Regulatory Commission, and several Regional Transmission Organizations are raising cautions about the near term reliability of the nation's electric grid due to the large amount of generating capacity projected to be taken out of service over the next several years due to compliance with the EPA MATS rule and other factors. The additional NOx emission reductions potentially required to achieve a revised ozone standard could lead to further retirements of fossil-fueled electric generation subject to the EPA MATS rule and other federal air quality regulations, with adverse consequences for the reliability and affordability of electric power.

The nonattainment area designations associated with potential revision of the ozone standard would limit economic and job growth by restricting new and expanded industrial and manufacturing facilities while raising electricity prices for all industries and consumers. New nonattainment

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24 Cooper, O. R., et al. (2012), Long-term ozone trends at rural ozone monitoring sites across the United States, 1990–2010, J. Geophys. Res., 117, D22307.

designations will have significant adverse impacts concentrated among low- and fixed-income citizens, including senior citizens and minorities.

EPA projects that most NOx reductions needed for attainment of a 65 or 70 ppb standard would come from a mix of non-EGU industrial point sources, area sources and EGUs. The anticipated reductions from EGUs are assumed by EPA to come from the retrofit of 7 GW to 51 GW of SCRs on the post-CPP coal fleet (~200 GW). EPA has identified 145 existing coal-fired EGUs, with a total of 51.0 GW of capacity, that (1) are in areas anticipated to need additional NOx reductions under an alternative ozone standard of 65 ppb, and (b) do not already have an SCR emission control system. (For an alternative ozone standard of 70 ppb, there are 15 EGUs so identified, with a total of 7.4 GW of capacity.) The impacts on the power generation fleet by a new ozone standard are substantial in terms of the rule itself and subject the fleet to subsequent Clean Air Act transport petitions and rulemaking. EPA's emissions reductions estimates are speculative since state SIP development and available source reductions will be varied. These estimates will also be impacted by market decisions on the ability to finance SCR retrofit as compared to decisions to shut down EGUs.

MOG urges EPA to withdraw this proposal to reassess the implementation and compliance strategies that will be required to meet this proposal in combination with existing program requirements. EPA must also assess the health impacts of such an implementation program relative to changes in nonattainment areas and the related economic stressors. Finally, EPA's rulemaking must acknowledge the impacts on power generation capabilities of the nation upon implementation of this unjustified change in the health standard.

F. Possible Transport Rule

In the event that EPA elects to consider the need for a process to address the good neighbor SIP requirements of the Clean Air Act, MOG urges that the agency turn to mechanisms other than a transport rule.

One such alternative is the State Collaborative On Ozone Transport (SCOOT) process which evolved in part from initial discussions between MOG and representatives of the State of Maryland about sharing technical data associated with analyzing ozone monitoring data. The SCOOT process resulted from those meetings and is moving toward multistate collaboration on a "good neighbor" SIP development process. EPA clearly needs to let that process go to completion rather than trumping it with a Federal rule before any work product can be produced.

An additional approach is set forth in the January 22, 2015, memorandum by OAPQS Director Stephen Page which was issued as "part of the process of working with states to offer support and information to enable the EPA and states to move forward to address the requirements of the 'Good Neighbor' provision for this NAAQS as soon as possible." In the memorandum, Director Page Notes that "EPA plans to facilitate discussions with states on (1) available emission controls; (2) potential state-by-State electric generating unit (EGU) nitrogen oxides (NOx) reductions based on those controls; and(3) potential EGU emissions budgets informed by those reductions." EPA's stated goal in this process is to provide information "to initiate discussions that will inform state development and EPA review of "Good Neighbor" SIPs and, where appropriate, to facilitate state efforts to supplement or resubmit the Good Neighbor SIPs." Significantly, Page states that "EPA also recognizes its backstop role in the SIP development process-that is, our obligation to develop and promulgate federal implementation plans, as appropriate." MOG suggests that EPA's role in the process is to let the Good Neighbor collaborative among participating states conclude prior to adding more guidance on the Good Neighbor SIP process.

Any efforts to address interstate transport whether through SCOOT, good neighbor SIPs or a transport rule, must take into account the factors set forth by the DC Circuit.

Delegated states are the primary entities responsible for air quality management planning in non-attainment areas. The Clean Air Act process requires delegated states to control their own sources and, as appropriate, eliminate downwind impacts. Under the Clean Air Act Section 110 SIP process, if non-attainment remains, the states must apply the court mandated so-called "red lines" analysis. [EME Homer City Generation, L.P. v. E.P.A., 696 F.3d 7, 11 (D.C. Cir. 2012) rev'd and remanded, 134 S. Ct. 1584, 188 L. Ed. 2d 775 (2014)] MOG believes that the Court opinion established the following "red lines" as directives for the development of SIPs to implement the "good neighbor" provisions of Section 110(a)(2)(d) of the Act:

1. Upwind State Obligation - An upwind State is obligated to reduce its own significant contribution to a downwind state's nonattainment and cannot be forced to reduce emissions to account for any other factors impacting a downwind State's nonattainment.

2. Proportionality of Downwind States - A downwind State is responsible for reducing the amount of ozone levels above the NAAQS that are not attributable to significant contributions from upwind States.

3. Proportionality of Upwind States - The ratio of an individual upwind State contribution to the total contribution should be used as scalar to determine how the total upwind contribution is allocated among upwind States.

4. The Role of Costs - EPA may reduce some of the obligations of upwind States or eliminate them if the cost of the necessary emissions reductions is unreasonable.

5. Insignificance - Once contributions from an upwind State are determined, the State is not required to address more than that contribution amount minus the significance threshold.

6. NAAQS Attainment - Once an area meets the NAAQS, no additional upwind emission reductions are required.

7. Over-Control - Reductions by an upwind State associated with one downwind area should be analyzed for other areas to ensure against unnecessary over control.

The starting point for this analysis should be the scaling of current monitoring data with future year modeling to determine which monitors will be in non-attainment with the applicable NAAQS. This should be followed by the application of source apportionment modeling to assess responsibility for undertaking additional emission reductions. MOG believes this is best accomplished through the application of the following analytical steps:

Step 1: Determine scaled CSAPR design value (DV)

Step 2: Apply source apportionment data to DV from Step 1 to determine contribution from upwind States, downwind State, and background

Step 3: Using contributions from Step 2, determine what portion of any amount over DV is attributable solely to upwind States

Step 4: Allocate upwind States' collective contribution (Step 3) to each upwind State in proportion to their contribution to downwind DV (Step 2)

Step 5: Select from among state contributions in Step 4, those upwind States that have contributions to the DV that exceed the significance level

Step 6: Make appropriate adjustments to the subset of an upwind State's contribution as necessary to avoid the imposition of unreasonable costs

We recognize that this analysis will need to be applied in situations of greater complexity than time and resources have historically allowed to be addressed. These additional complexities include both the situation in which an upwind state may contribute to one downwind non-attainment areas to a much greater extent than it does to another and the situation in which a downwind non-attainment area is itself contributing to non-attainment in another state, raising the question about the order in which emission reduction requirements are implemented

We also recognize that a full analysis of this matter will almost certainly involve consideration of such matters as:

a. the role of a downwind State as the state with the primary responsibility for attaining NAAQS within its borders;
b. the implications of the establishment of alternative thresholds for significance;
c. the cost levels that should be deemed to be unreasonable; and
d. how best to address motor vehicles as the single largest contributor in most upwind States to downwind non-attainment.

MOG believes that the appropriate and, more significantly, the legally required forum for development and implementation of "good neighbor" SIPs is in the states. Only the states are equipped to address such questions as whether additional controls are needed on one or more units, whether units should be operated differently, or whether units should be regulated at different emission rates than are provided by existing applicable regulatory requirements.

G. 176A petition

The interplay of ozone NAAQS, the ozone transport rule (CSAPR) and petitions asserting ozone transport impacting neighboring states warrants comment. This proposal comes at a time when a 176A petition is pending, but that petition is premised upon historical information and is not relevant to whether a new health-based ozone standard is justified. Since that petition the Supreme Court has remanded CSAPR to the D.C. Circuit and the stay of this rule has been lifted. Implementation is in the process and guidance on the matter is forthcoming.

On December 9, 2013, a Clean Air Act §176A petition was jointly filed by nine Northeast states – Connecticut Delaware, Maryland, Massachusetts, New Hampshire, New York, Pennsylvania, Rhode Island and Vermont (Petitioners) Section 176A, a product of the 1990 Clean Air Act Amendments, allows EPA to establish, by rule, a transport region whenever the Administrator has reason to believe that the interstate transport of pollutants from one or more states contributes significantly to a violation of a NAAQS in another state or states.

Petitioners' Section 176A petition seeks to expand the Northeast Ozone Transport Region (OTR) to include the states of Illinois, Indiana, Kentucky, Michigan, North Carolina, Ohio, Tennessee, Virginia and West Virginia. It alleges that the targeted upwind states have failed to fulfill all Clean Air Act requirements because their air pollution control programs do not require the installation of controls as stringent as required by the OTR and because air pollution from the upwind states is transported into the OTR, thus contributing to violations of the 2008 National Ambient Air Quality Standard for ozone within the OTR states.

The Petitioners hope that the petition, if granted, will subject the targeted states to more stringent requirements in the form of revised State Implementation Plans for VOC and NOx emissions, including but not limited to additional requirements for enhanced Inspection and Maintenance of mobile sources, nonattainment New Source Review, and Reasonably Available Control Technology. Those opposed to Petitioners' action question the technical basis for the petition, noting that it relies so heavily on data published no more recently than 2005.

The petition does not have any air quality merit and is political in nature. Petitioners offer no analysis of air quality measurements in the OTR and instead rely on outdated computer modeling published in 2005 to assert the nonattainment status of the region. Air quality is significantly improving in much of the OTR making it unnecessary to impose additional controls. The significant reduction in emissions projected by EPA to occur over the next several years will result in continued improvement in air quality throughout the OTR. For other monitors in the OTR, source apportionment analysis indicates that any additional controls should be local in nature.

As confirmed by the analysis of the State of Maryland, NAAQS violations in OTR occur during periods of stagnation and recirculation when no interstate transport occurs. High ozone readings in OTR in 2013 occurred at the same time as the peaking of emission rates of sources in the OTR (and not in the target states).

Emission reductions by EGUs in the Midwest and Southeast are greater than reductions that have occurred in the Northeast. Petitioners offer no evidence of significant contribution other than EPA's 2005 modeling that was based on what turned out to be an incorrect premise that emissions from EGUs in the target states would be 13% higher than they actually were in the year of the analysis (2012). Target state EGU NOx emissions in 2012 are 23% below EPA CAIR Phase I cap levels (2009-2014) and 7% below Phase II (2015).

Petitioner criteria for selecting new members of the OTR have no support in Clean Air Act. Emission reductions by EGUs in the Midwest and Southeast are greater than reductions that have occurred in the Northeast. Petitioners offer no evidence of significant contribution other than EPA's 2005 modeling that was based on what turned out to be an incorrect premise that emissions from EGUs in the target states would be 13% higher than they actually were in the year of the analysis (2012).

Finally, EPA's recently released transport rule guidance moots the need for the granting of this petition. EPA OAQPS Director Steve Page memorandum to EPA Regional Air Directors dated January 22, 2015, titled "Information on the Interstate Transport 'Good Neighbor' Provision for the 2008 Ozone National Ambient Air Quality Standards (NAAQS) under Clean Air Act (CAA) Section 110(a)(2)(D)(i)(I)."

H. Conclusion

MOG appreciates the opportunity to participate in the rulemaking process and offer the science, legal and policy basis for its urging that EPA not lower the ozone NAAQS level as proposed by the agency.

Principal among the reasons for not changing the NAAQS is the fact that the science of ozone impacts on health and welfare have not changed since the last review conducted by EPA and do not support a change in the NAAQS from current levels. Moreover, the lowering the NAAQS would cause much more of the country to be classified as non-attainment than EPA has estimated.

In addition, EPA's Regulatory Impact Analysis is fatally flawed because:

(1) EPA based its emission inventory on outdated information,

(2) EPA improperly relied on its proposed Clean Power Plan rule in assessing the regulatory impact of a change in the ozone NAAQS,

(3) EPA failed to use the most recent methods available to determine mobile source emissions,

(4) EPA failed to analyze the impacts of controls on mobile sources to meet the alternative standard, a gross error upon consideration of the contribution to ozone by such sources.

(5) EPA fails to account for projected increases in multiple electric generating unit (EGU) units as predicted by its own EGU forecasting tool,

(6) EPA made "no growth" assumptions on large, geographically important categories despite projected economic growth planned,

(7) EPA did not include many regional/local/state attainment programs to reduce ozone in its base case or baseline projections,

(8) EPA assumes first ton reduced gives the same ozone change as last ton reduced, failing to account for the non-linearity of emission reductions and associated ozone concentration changes,

(9) EPA's across-the-board sensitivity results and associated ozone reduction factors do not account for the fact that elevated source reductions do not have same ozone concentration potential as non-elevated sources,

(10) EPA developed ozone reduction factors from its across-the-board sensitivity runs failing to account for the differences that low level and elevated source emission reductions have on downwind ozone concentrations,

(11) EPA failed to model the final, most stringent control scenario for each NAAQS level to confirm assumptions of change in ozone,

(12) EPA's estimate of 2025 baseline emissions cannot be independently corroborated with certainty since EPA did not provide county, source category detail, or summaries of this scenario, from which all proposed alternate attainment control strategies were applied,

(13) EPA fails to identify why incremental "known" controls are not applied to sources within all counties of the Central state, inside Texas buffer sub-region,

(14) EPA fails to take into account transport of ozone across regional boundaries within the United States,

(15) EPA uses 2007 modeling to develop case for background ozone concentrations and international transport assumptions,

(16) EPA fails to include future year transport of international emissions and uses 2011 boundary condition files to estimate the international component of emissions transport, and

(17) EPA has failed to consider impacts of implementation of the revised ozone NAAQS on the power industry and the American people.

Finally, consideration of any new ozone transport rule is premature. The states are the proper forum for dealing with transport, especially given the advent of state driven alternatives such as the SCOOT process. Moreover, there is no air quality basis for revising OTR membership, and accordingly EPA should deny the pending CAA Section 176A petition by the Northeast states.

For all of these reasons and more, the EPA should reaffirm the 75 ppb primary ozone standard.