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February 1, 2016

Mr. David Risley
Environmental Protection Agency
Clean Air Markets Division
Office of Atmospheric Programs (Mail Code 6204M)
1200 Pennsylvania Ave., NW
Washington, DC 20460

Re: Proposed Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS
Docket ID No. EPA-HQ-OAR-2015-0500

Dear Mr. Risley:

The Maryland Department of the Environment (MDE or the Department) would like to thank the Environmental Protection Agency (EPA) for the opportunity to provide comments on the Proposed Cross-State Air Pollution Rule Update (CSAPR II) (80 FR 75706, 12/03/2015), which is intended to partially address ozone transport for the 2008 Ozone National Ambient Air Quality Standard (NAAQS). MDE applauds EPA's nitrogen oxides (NO_x) emission budget development and the focus on achieving these budgets through the operation of existing controls on fossil fuel-fired electric generating units (EGUs) in 23 states. MDE also strongly supports the proposed schedule and believes the 2017 compliance deadline is reasonable because no new controls will be needed. CSAPR II only requires that existing controls be run in an optimal manner.

The Department supports EPA's proposed budget methodology and believes EPA developed a procedure that follows the U.S. Supreme Court ruling as set forth under *EPA v. EME Homer City Generation, L. P.*, 134 S. Ct. 1584 (2014). MDE also believes that it is appropriate for EPA to take comment on and work with states to make sure that the technical data used in the budget calculations is accurate.

Ozone exceedance days in Maryland have decreased by roughly 80% since 2002. This dramatic progress has been driven by federal, regional, and Departmental efforts to reduce emissions from many sources including cars, trucks, power plants, other stationary sources, and smaller sources like gasoline stations and consumer products. On many days, about 70% of Maryland's ozone problem originates in upwind states and is transported into Maryland. MDE runs one of the nation's most sophisticated ozone research programs and on many days we use airplanes, balloons and mountaintop monitors to measure incoming ozone levels that are already approaching the 2008 Ozone (75 ppb) NAAQS.

Additional state and federal efforts to reduce NO_x emissions in upwind states are the most critical element needed to continue reducing ground level ozone in Maryland. Maryland continues to adopt new "in-state" control programs, but our modeling and our research show that regional NO_x reduction programs are what lowers ozone the most in the Mid-Atlantic region. The Department supports the CSAPR II budgets, which serve as an immediate and cost effective partial solution to upwind states' Good Neighbor obligations for the 2008 Ozone NAAQS. Maryland supports each state's right to develop its own solution to comply with Good Neighbor requirements and is ready to work with any state that chooses that pathway. It is also important to recognize that CASPR II, along with additional regional NO_x and VOC control measures, will place Maryland in a better position to attain and maintain the 2008 Ozone NAAQS and 2015 Ozone NAAQS. Maryland's ozone nonattainment area that has been the toughest to bring into attainment is the Baltimore nonattainment area. Currently, this nonattainment area is just 1 ppb from meeting the new 2015 Ozone (70 ppb) NAAQS.

MDE feels that it is absolutely critical for EPA to stay on schedule with the final implementation of this rule and finalize it by the 2017 ozone season. Maryland would have preferred to see CSAPR II in place in 2011 when Good Neighbor SIPs were due for the 2008 Ozone NAAQS. This long delay makes it even more critical for EPA to follow the current implementation schedule. Analysis completed by the Department and the University of Maryland show that if EGUs in 10 upwind states and Maryland (states covered by CSAPR & CSAPR II) had operated and optimized existing NO_x controls since 2011, approximately 490 tons per day of NO_x could have been removed. Modeling demonstrates an approximate 2 ppb ozone reduction could have been achieved in Maryland on bad ozone days. These reductions could have meant the difference between attainment and nonattainment for Maryland under the 2015 Ozone NAAQS.

In the preamble to the rule, EPA acknowledges that this rule may only be a partial solution to the regional issue of transport, and that additional reductions may be required to fully address states' interstate transport obligations and to protect public health. MDE would prefer to have a full solution as quickly as possible, but fully supports EPA's efforts to drive near term reductions through the partial solution. The proposed NO_x emission reductions and the 2017 compliance date are essential for these states to address a very significant portion of their contribution to nonattainment. The NO_x emission reductions can be implemented expeditiously by running and optimizing existing control technology that is currently idled or being used inefficiently. As demonstrated in the proposed rule, these reductions can be obtained at relatively low cost.

MDE recommends that EPA move quickly to require additional ozone precursor reductions needed to fully address transport for the 2008 NAAQS. MDE's analyses indicate that additional reductions should include the following: complementary 30-day rolling average limits for EGUs, 24-hour limits for EGUs in neighboring states, and nine control measures identified by the Ozone Transport Commission (OTC) that address mobile and area sources. MDE modeling shows that controls similar to those required by CSAPR II and these additional measures can bring design values for most states in the Eastern U.S. into attainment for the 2008 Ozone NAAQS by 2018. Thus, MDE feels these additional reductions could satisfy Good Neighbor requirements for most states in the East. More detail on these additional reduction requirements and other detailed comments are included in the Attachment to this letter.

In closing, MDE would again like to express our strong support for the proposed CSAPR II. MDE believes that the CSAPR II budgets would go a long way towards attaining and maintaining the 2008 Ozone NAAQS and the 2015 Ozone NAAQS throughout the Eastern U.S. Although not a part of this comment process, MDE also urges EPA to begin the process it has used for CSAPR II to ensure that the elements for the Good Neighbor SIPs for the 2015 Ozone NAAQS are analyzed, developed and ready for implementation by the end 2018 when the infrastructure SIPs will be due.

Thank you for the opportunity to provide these comments. If you have any questions, please contact me at george.aburn@maryland.gov or 410-537-3255.

Sincerely,

George (Tad) S. Aburn, Jr., Director
Air and Radiation Management Administration

cc: Dave Arnold, EPA Region III
Cristina Fernandez, EPA Region III

Attachments

ATTACHMENT

Maryland Department of the Environment (MDE)
Proposed Rulemaking Comments on:
Proposed Cross-State Air Pollution Rule Update (CSAPR II) (80 FR 75706, 12/03/2015) EPA-HQ-OAR-2015-0500
February 1, 2016

I. ENSURING THAT EXISTING CONTROLS ON POWER PLANTS ARE RUN … AS THEY WERE DESIGNED TO BE RUN … WHEN THEY ARE NEEDED TO PREVENT OZONE AIR POLLUTION

MDE supports the EPA's proposal to set budgets based on optimizing existing electric generating unit (EGU) controls, beginning with the 2017 ozone season. In the preamble of CSAPR II, the EPA notes that nitrogen oxide (NO_x) reductions can be achieved expeditiously and cost effectively via this method, since the control equipment is already in place and only requires activation and efficient operation.

The optimization of existing EGU NO_x controls in the East is one of the two remaining control programs that have the potential to generate large regional NO_x reductions across the East. The other program is the Tier 3 Vehicle Emission and Fuel Standards (Tier 3) (80 FR 9077, 02/19/2015). MDE predicts that widespread regional NO_x reductions will significantly lower ozone across the East[1]. EPA research and analysis reaches the same conclusion, and estimates that NO_x emissions across the East could be reduced by approximately 500 tons per day. MDE analyses show that the optimized EGU strategy has the potential to prevent over 490 tons of NO_x from entering the atmosphere on bad ozone days. Implementation of these two control efforts are critical to seeing ozone levels in the East continue to drop.

Over the past two years, MDE has evaluated the operation of existing NO_x controls at individual coal-fired EGUs in the eastern United States. The parameters of MDE's evaluation was to not add costly controls, switch fuels, or any other action which could be both time intensive and costly, but to simply operate the existing controls at historically demonstrated emission rates. The graph below (Figure 1) used data reported by the utilities to EPA's Clean Air Market Division (CAMD). Figure 1 shows that average ozone season NO_x emission rates were highest, by more than a factor of 4, in the 2011 through 2013 time period. The example in Figure 1 uses data from units in Pennsylvania. MDE has conducted similar analysis was completed on other states' data. See Appendix A for details on specific units in 10 states and Maryland.

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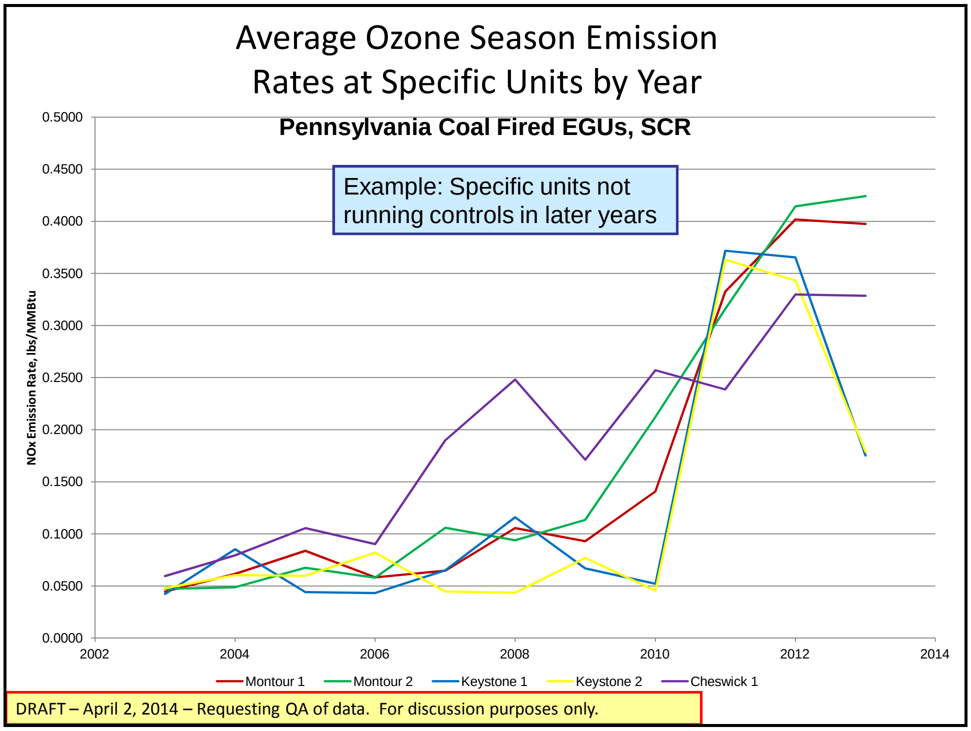
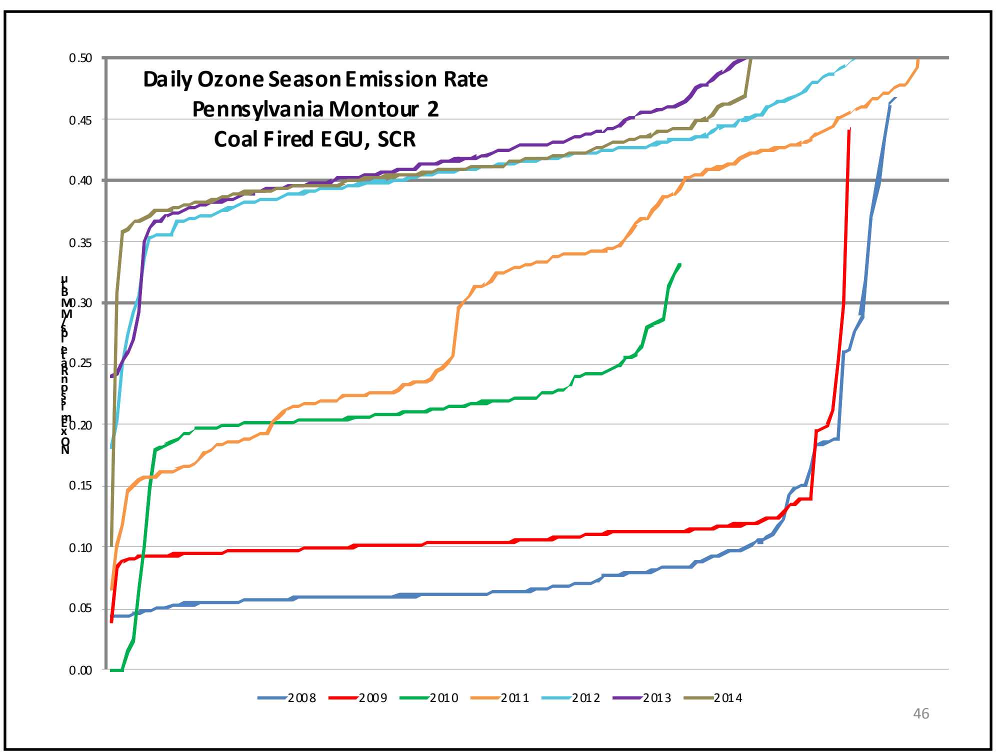
[1] Ground-Level Ozone: a Path Forward for the Eastern United States, Air & Waste Management Association, EM The Magazine for Environmental Managers, May 2015, p. 18 - 24

FIGURE 1



In Figure 2, daily, rather than average ozone season, NO_x emission rates are plotted. For each ozone season, the daily NO_x emission rate for 153 days (May through September) was sorted from lowest to highest.

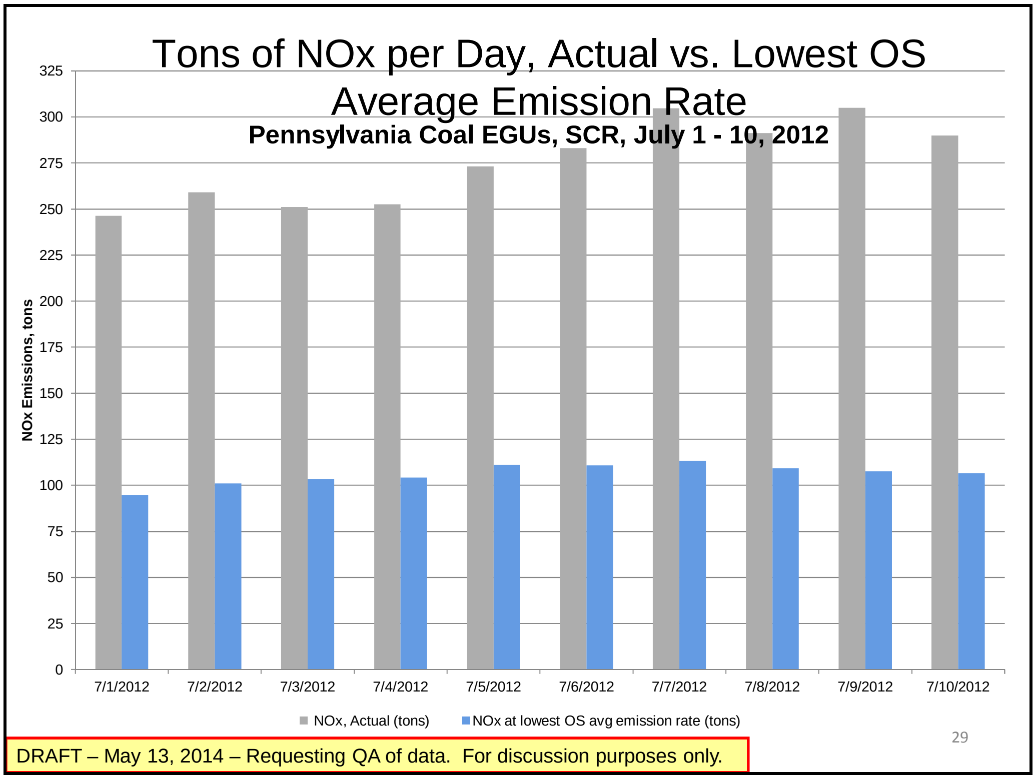
FIGURE 2



Anomalous low and high daily NO_x emission rates are recorded for each year, as would be expected. The graphs in Figure 2 highlight that the lowest average daily NO_x emission rate is recorded in 2008 and 2009 (between 0.05 and 0.10 pounds per million British thermal units, lbs/MMBtu), while the highest average daily NO_x emission rate is recorded in 2012, 2013 and 2014 (between 0.35 and 0.45 lbs/MMBtu). This demonstrates that either the NO_x controls were not being operated, or were not being operated effectively.

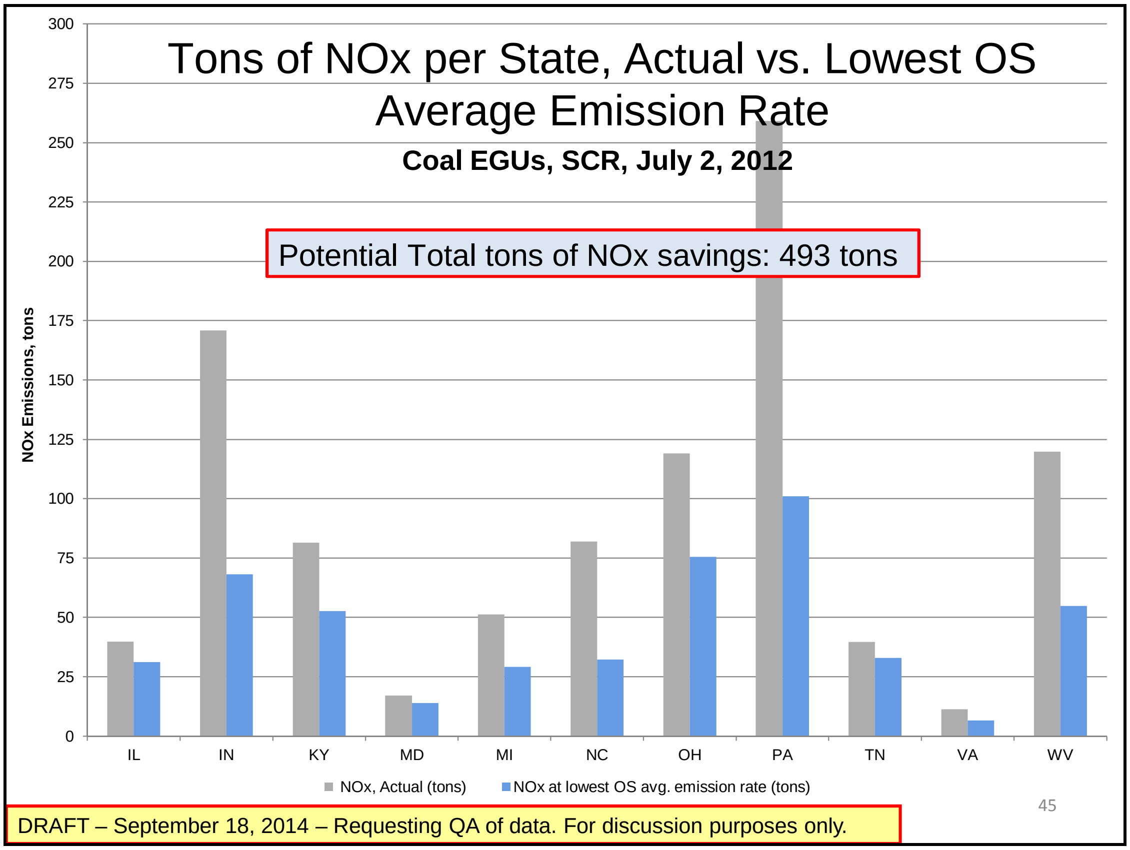
Applying the daily data in a different way, Figure 3 shows how, over a course of ten days, NO_x emissions from coal-fired EGUs with existing selective catalytic reduction (SCR) controls could have been reduced through the optimization of the existing SCR controls. On any given day, optimization of SCR controls on coal-fired EGUs in Pennsylvania could have prevented over 100 tons of NO_x from entering the atmosphere.

FIGURE 3



This same analysis was completed for 10 other states: IL, IN, KY, MD, MI, NC, OH, TN, VA and WV. In summary, if existing SCR controls were optimized on July 2, 2012, an estimated 493 tons of NO_x would have been prevented from entering the atmosphere as shown in Figure 4.

FIGURE 4



Maryland's independent analyses of emissions and rates associated with optimized controls at fossil fuel fired EGUs across the East indicate that the CSAPR II budgets are very consistent with sources running their controls in a manner consistent with best practices demonstrated in earlier years when controls were run better. Appendix A includes additional MDE analysis demonstrating the very significant emission reductions which could have been achieved with the optimal operation of the controls in the summer when ozone levels are highest.

CSAPR II needs to be implemented on schedule, and unopposed. The benefit that will be recognized from CSAPR II beginning in 2017 ozone season, in combination with Tier 3, will help eastern states meet their Good Neighbor Requirements. Additional control options which could have an impact on lowering ozone concentrations have been identified by MDE. The analysis and demonstrations are discussed below, with supporting documents contained in Appendix E as well.

II. THE NEED FOR A FULL SOLUTION TO ADDRESS TRANSPORT FOR THE 2008 OZONE NATIONAL AMBIENT AIR QUALITY STANDARD (NAAQS)

In the preamble to the proposed rule, EPA acknowledges that CSAPR II is only a partial solution to the regional issue of transport, and that other emission reductions and regulatory strategies, beyond reductions in NO_x emissions from EGUs, are required in order for upwind states to have a fully approvable Good Neighbor State Implementation Plan (SIP).

Below, MDE identifies control options which could be implemented to further reduce NO_x emissions from EGUs, along with additional federal or state strategies to address regional transport. MDE analyses conclude that a common sense mix of federal and state actions will further reduce ozone and, in combination with additional emission reductions being implemented inside nonattainment areas, allow all areas in the East to attain and maintain the 2008 Ozone NAAQS. At the same time, however, MDE is anxious about any delays associated with additional control options, and feels that it is absolutely critical that EPA move forward with the final implementation of CSAPR II by the 2017 ozone season.

(1) INCLUDE A GENERIC REQUIREMENT OR PERMIT CONDITION REQUIRING EGUs TO OPTIMIZE CONTROLS AS PART OF THE FULL SOLUTION FOR TRANSPORT RELATED TO THE 2008 OZONE NAAQS

One of the problems with EPA's continued use of ozone season budgets as the driver of emission reductions is that it still does not ensure that existing EGU NO_x controls are always being run effectively (or at all) on the days when they are needed the most. Excess allowances, due to cool summers and reduced generation from coal and oil-fired EGUs, has allowed such situations to develop. During the ozone season, excess allowances are purchased from the bank in place of operating existing controls. During periods of particular high demand, with the majority of units being called up to meet the increased demand for electricity, the older, less efficient, and often uncontrolled EGUs also operate, and can disproportionately emit NO_x at emission rates greater than emission rates from well controlled EGUs.

The use of allowances in place of operation of controls can be corrected by simply requiring every unit to run their controls in an optimized manner during the ozone season. This requirement is already present in Maryland's, and many other states, regulations and operating permits. The MDE analyses of the ozone season of 2015 in 29 eastern states shows that coal-fired EGUs in 20 states appear to consistently optimize existing NO_x controls. Based on discussions within State Collaborative on Ozone Transport (SCOOT) Workgroups, MDE believes that these states already include some form of a generic definition of optimized controls in operating permits. For the remaining 9 states, existing controls are apparently not run in an optimal consistent manner. MDE believes that it is likely regulations and operating permits for many of the units in these states do not include a generic requirement to optimize controls.

An example of language that should be included in federal and state EGU regulations or operating permits, requiring the summertime minimization of NO_x emissions and optimization of NO_x controls, is provided below. The language was built from federal consent orders and is consistent with the technological limitations, manufacture's specifications, good engineering and maintenance practices, and good air pollution control practices. In Maryland regulations, this language can be found in the Code of Maryland Regulations, Title 26, Subtitle 11, Chapter 38 Control of NO_x Emissions from Coal-Fired Electric Generating Units. COMAR 26.11.38.03.A(2)

> *"Beginning on May 1, 2015, for each operating day during the ozone season, the owner or operator of an affected electric generating unit shall minimize NOx emissions by operating and optimizing the use of all installed pollution control technology and combustion controls consistent with the technological limitations, manufacturers' specifications, good engineering and maintenance practices, and good air pollution control practices for minimizing emissions (as defined in 40 C.F.R. § 60.11(d)) for such equipment and the unit at all times the unit is in operation while burning any coal."*

The measurement applied to determine the optimization of existing NO_x controls, NO_x Emission Rate (lbs/MMBtu), is reported on an hourly basis to CAMD by the utilities. Historic data on performance of a unit can be used to set a short term NOx emission rate that the unit has achieved. Historic data on similar type units, with similar control measures, can also be used to evaluate an achievable unit NO_x emission rate. It is possible to easily identify when a NO_x emission rate exceeded the emission rate included in the operating permit. This calculation to determine compliance is straight-forward and could be completed at a state level with little to no additional resources required.

(2) USING 30-DAY AND 24-HOUR AVERAGE RATES TO COMPLEMENT THE CSAPR II BUDGETS AND ENSURE EMISSION REDUCTIONS OCCUR WHEN THEY ARE NEEDED

EPA has specifically requested comments on whether or not the actual EGU NOx emission rates have an impact on downwind ozone concentrations, and if they do, then what EGU emission rates reductions would be reasonable complements to the proposed CSAPR II budgets. After modeling the proposed CSAPR II budgets and determining which states still adversely affect another state due to pollutant transport, additional reductions in EGU rates would then be modeled to determine if that state was no longer adversely impacting another state.

In general terms, there are two distinct pieces to the ozone problem in the East: a large regional component due mostly to regional power plant and mobile source NOx emissions during the summer, and a local component created by nearby emissions (again, primarily power plant and mobile sources) on the days just before, or the day of, high ozone readings. Appendix B provides additional information on MDE's conceptual model for how ozone in the East is created, along with insight into how various transport patterns have been shown to impact Maryland monitors. The path forward to address ozone transport in the East is to run power plant controls and reduce mobile sources impacts.

Again, in very general terms, the research shows that in Maryland's case, about 70% of the ozone problem is a result of pollutant transport - the regional piece, and about 30% is a result of the local emissions. This is a generalization, but it broadly captures the regional versus local component for many ozone nonattainment areas in the East.

For the regional component, sources across much of the Mid-West and Ohio River Valley contribute to an aloft ozone reservoir that contains ozone measured in the 50 to 70 parts per billion (ppb) range. Research has shown that the aloft reservoir of ozone is seen on high ozone days all summer. This aloft reservoir covers most of the East and is most easily explained by looking at how ozone builds up over time, moves aloft at night, and mixes down to the surface every day in the early morning hours.

At night, a nocturnal inversion sets up. Daily NO_x emissions and ozone get trapped aloft as the nocturnal inversion develops. This nocturnal inversion is the result of the surface cooling faster than the air above the surface. The end result is pollutants are trapped just above the surface at night. Research has shown that this ozone and ozone precursors trapped above the nocturnal inversion can travel hundreds of miles a night due to aloft winds. Ozone monitors on mountain top locations above the inversion have measured ozone concentrations in the 60 – 80 ppb range. While surface based ozone monitors only measure in the 20 to 30 ppb range. In the morning, the earth heats up and the nocturnal inversion breaks down. The regional reservoir of aloft ozone that was trapped overnight above the nocturnal inversion mixes down during the mid-morning hours, and surface level monitors begin to record dramatic increases in ozone levels. Soon, the local ozone produced at the surface during the morning hours combines with the aloft regional ozone transported into the region that is mixed to the surface. This results in surface ozone monitors showing high concentrations of ozone.

For the local component of the ozone problem, the correlation between the NO_x mass and local factors such as weather is more critical and time sensitive. The surface NO_x emissions are released into the immediate vicinity, and, with the right local conditions, may contribute to the formation of the local component of ozone, along with augmenting the ozone levels in nearby nonattainment areas. Meanwhile, in a different location, these same surface NO_x emissions, also being released into the immediate vicinity, may not have as great an impact on the local component of ozone because of differing local conditions, and, due to the absence of nonattainment areas nearby, has a lesser impact. These short term emissions, or those occurring over less than 24 hours, need to be controlled to prevent a potential catastrophic amounts of NO_x being released to the atmosphere during brief periods each day, which, under the right conditions, could result in the formation of large amounts of ozone. Thus, a more local approach is needed to address the daily contribution to the local component of ozone.

A consistent regional approach can be used to address the regional component of the ozone problem (the regional ozone reservoir) while the local component will need a more localized approach to ensure success. To do this, MDE suggests that the CSAPR II budgets for EGUs be complemented with a 30-day average NO_x emission rate for the regional component, and, where needed, a 24-hour average NO_x emission rate to address the local component of the ozone problem.

These complementary EGU requirements, required by all states, are:

1. All sources must continue to meet federal requirements including any trading programs and annual or ozone season tonnage caps.

2. To supplement the federal program, require sources to constrain their trading programs to meet 30-day rolling average NO_x emission rates for individual units or a company's system that is consistent with demonstrated past performance. This comment recommends a system-wide approach among units within a state, but this could also apply to individual units. Separate system-wide averages will be established for units with SCRs and units with selective non-catalytic reactors (SNCRs). The system-wide averages would apply from June to August (or some other period). The rates should be established for a large region including at least the following states: CT, DE, IL, IN, KY, MA, MD, MI, NC, NJ, NY, OH, PA, TN, VA, WV.

- This concept is designed to address the "summertime" regional component of ozone problems across the East.
- Appendix C provides analyses and recommendations on 30-day rolling average emission limits for 412 individual EGUs in the East. The 30-day rolling average emission limits are established by reviewing the EGUs past performance and setting a 30-day average that aligns with what the EGU can actually achieve.

3. Establish 24-hour block average NO_x emission rates for units which are in proximity to or "close by" nonattainment areas to address daily or "peak day" ozone issues. Ideally, these limits would apply all summer. As a preliminary concept, "close by" might be defined as an adjacent state and within 200 miles of the nonattainment area of concern. States with nonattainment areas who believe this requirement is not needed should have the right to implement other appropriate controls for their area.
    - This comment is designed to address the "episodic or peak day" local component of an area's ozone problem.
    - Appendix C includes a white paper that provides a real world example of how a state can address its contribution to both the summertime regional component to transport and its daily contribution to nearby neighboring states.
    - Appendix D contains copies of regulations from MD, DE, NJ that include similar but slightly different ways to require and enforce 24-hour NO_x emission limits.

(3) OZONE TRANSPORT COMMISSION (OTC) MEASURES

For the past 10 years, the OTC has studied and analyzed regional NO_x and volatile organic compound (VOC) strategies to identify the most efficient and cost-effective strategies to reduce ozone transport into and within the ozone transport region. MDE believes that nine of these strategies will need to be implemented either locally or at a federal level so that states can have a fully approvable Good Neighbor SIP.

These nine specific strategies have been researched and shown to produce meaningful ozone reductions for the OTC region. OTC has developed model programs for each of these regional rules, but would prefer a have a single, efficient federal rule implemented. In many cases, manufacturers support the model OTC program, and often support the development of a federal rule, as compliance with a single federal rule is much more efficient compared to trying to comply with 10 to 20 similar, but slightly different, state rules.

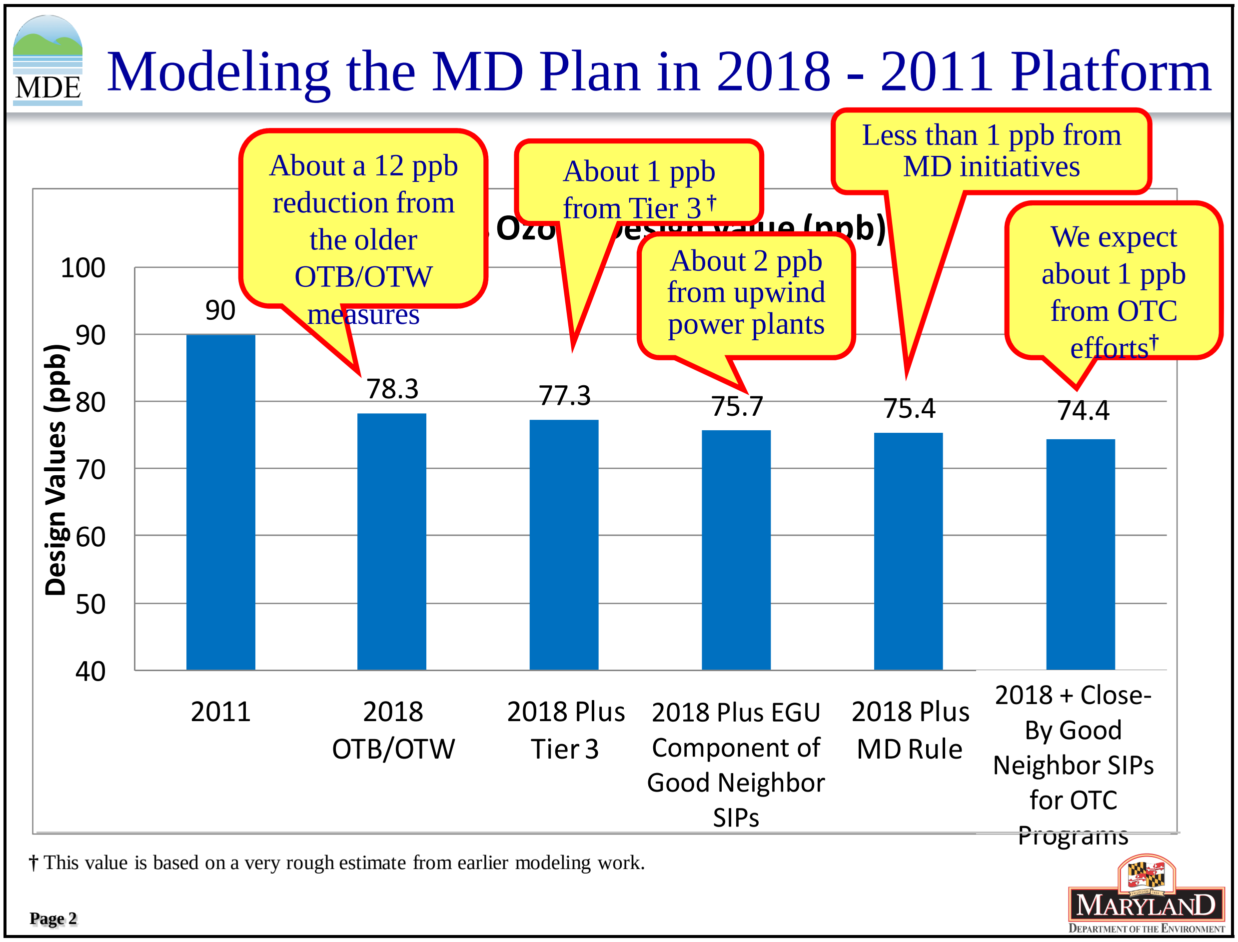
The nine regional strategies with NO_x and VOC projected emission reductions are summarized below in Table 1.

TABLE 1

OTC Model Control Measures	Regional Reductions (tons per year)	Regional Reductions (tons per day)
Aftermarket Catalysts	14,983 (NO_x) 3,390 (VOC)	41 (NO_x) 9 (VOC)
On-Road Idling	19,716 (NO_x) 4,067 (VOC)	54 (NO_x) 11 (VOC)
Nonroad Idling	16,892 (NO_x) 2,460 (VOC)	46 (NO_x) 7 (VOC)
Heavy Duty I & M	9,326 (NO_x)	25 (NO_x)
Enhanced SMARTWAY	2.5%	
Ultra Low NO_x Burners	3.669 (NO_x)	10 (NO_x)
Consumer Products	9,729 (VOC)	26 (VOC)
AIM	26,506 (VOC)	72 (VOC)
Auto Coatings	7,711 (VOC)	21 (VOC)

MDE has also modeled the benefits associated with implementation of the nine OTC model programs. As shown in Figure 5, Maryland would see about a 1 ppb ozone benefit from regional implementation of the nine OTC strategies. Appendix E provides more detail on this MDE modeling. Details on OTC Model Rules and analysis can be found at: http://www.otcair.org/document.asp?fview=modelrules

FIGURE 5



(4) FIXING THE BANKED ALLOWANCES

The EPA used EGU operating data from as early as 2006 in development of the budgets for the original Transport Rule (CSAPR). By January 2015, or when CSAPR was finally implemented to address the 1997 Ozone NAAQS, many of the conditions which existed during the time in which CSAPR was being developed had changed: natural gas was abundantly available; natural gas was more cost effective; and other federal programs, such as Mercury and Air Toxics Standards (MATS) and Clean Power Plan (CPP), lead to an increase in operating costs and fees at coal-fired EGUs. As a result, the budgets set under CSAPR exaggerated the operating capacity of coal-fired EGUs, and resulted in an abundance of ozone season NO_x allowances. This situation has in fact led to the failure of the CSAPR budget, where the cost for operation, even of existing controls, is much greater than the cost of allowances.

In CSAPR II, the NO_x budgets for the ozone season, beginning in 2017, have been reduced dramatically, with the application of historical emission rates at times when the existing controls on EGUs were being optimized. However, there still remains the banked allowances from the 2015 and 2016 ozone season, which by the conclusion of the 2016 ozone season is expected to be over 300,000 tons. In the preamble to CSAPR II, EPA has requested comments on what options are available to reduce the existing bank without creating a condition in which the limit of available allowances and the reactivation of mothballed controls, in combination with the unknown weather conditions, could result in a situation of volatility and overvalued allowances in the near future, potentially affecting both the cost to the consumer, and the stability of the Independent System Operator/Regional Transmission Organization (ISO/RTO).

The Department believes that a reduction in the number of banked allowances is necessary, but the reduction should be flexible to prevent any extreme volatility in price. Below are two approaches which MDE has considered.

The first approach, which has been implemented previously, is to apply a surrender ratio to prior vintage years' allowances, such that more than one banked allowance must be surrendered to account for one ton of NO_x emissions. The OTC NO_x Budget Program incorporated this through the "Progressive Flow Control" mechanism, where up to a certain percentage of a source's banked allowances could be surrendered at 1:1 in any given season, but any allowances above the percentage must be surrendered at 2:1. In the past, the percentage was set equal to 10% of that season's NO_x budget divided by the total number of banked allowances.

The Department would support the use of Progressive Flow Control because:

- It has been tested; it has been incorporated in a program in the past administered by EPA.
- It allows for unlimited banking, while discouraging sources from depending on large withdrawals of banked allowances instead of running controls.
- It allows some withdrawal of allowances from the bank at a 1:1 ratio.
- Inclusion of an untested banked allowance surrender ratio in CSAPR II increases the risk for rule failure (i.e. not having enough allowances in the program to cover emissions).
- It regulates the bank size on an ongoing basis by driving the number of banked allowances toward a certain percentage of the next year's budget (10%, in the OTC example).

The second approach to the allowance bank surplus is a future year budget adjustment. In this approach, EPA would count how many excess allowances are in circulation, and spread deductions equal to that amount across the next several years' aggregate budgets, beginning in 2017 ozone season. EPA may choose to spread the deductions equally across years, or according to a different glide path. Additionally, EPA would need to allocate the budget adjustments across EGUs in an equitable manner. Maryland recommends allocating the adjustments in proportion to each EGUs share of the aggregate budget.

This approach would be more straight-forward than a surrender ratio since it is directly based on the number of excess allowances in circulation, and would avoid some potential problems that surrender ratios can cause when they retroactively alter the value of allowances that were allocated and traded in good faith.

The two approaches are not mutually exclusive, as long as they are not applied on the same year, which would effectively double-count each banked allowance and introduce excess scarcity. EPA could adopt a budget adjustment in the near-term to address the current bank surplus, and then adopt PFC to regulate the bank size in the medium- to long-term, by allocating a budget adjustment across the next several seasons' budgets, and implementing Progressive Flow Control starting on the year following the final adjusted season.

APPENDICES

Appendix A

1. Collaborative Briefing Sept 2014 Final 090314 power point
2. IL EGU Operation of SCR & SNCR power point
3. IN EGU Operation of SCR & SNCR power point
4. KY EGU Operation of SCR & SNCR power point
5. MD EGU Operation of SCR & SNCR power point
6. MI EGU Operation of SCR & SNCR power point
7. NC EGU Operation of SCR & SNCR power point
8. OH EGU Operation of SCR & SNCR power point
9. PA EGU Operation of SCR & SNCR power point
10. TN EGU Operation of SCR & SNCR power point
11. VA EGU Operation of SCR & SNCR power point
12. WV EGU Operation of SCR & SNCR power point
13. 2015 Optimization Analysis Final power point

Appendix B

1. Em-Forum Ozone Article May 2015
2. Path Forward 2015 NJ Final power point

Appendix C

1. Running Power Plant Controls to Help Address Regional and Local Contributions to Ozone in the East
2. Maryland 30-Day Rolling Average NO_x Rates for Coal-Fired Units Equipped With SCR and SNCR Post-Combustion

Appendix D

1. Maryland Regulations
2. Delaware Regulations
3. New Jersey Regulations

Appendix E

1. Scenario 7 for LADCO ADs May 1 042814 power point
2. Senario 7 for MOG Final 050914 Color problem Fixed power point
3. MARAMA 022415 022115 Final power point
4. April 8 EPA Mtg Final Aburn power point
5. NJ Clean Air Council 041415 Final power point
6. MOG May 7 Final 050515 power point
7. EPA R3 Coord 061715 power point
8. Umd_epa_150929 power point