

DEPARTMENT OF THE ENVIRONMENT  
AIR AND RADIATION MANAGEMENT ADMINISTRATION

**RESPONSE TO COMMENTS**

for the

PUBLIC HEARING held on January 7, 2015  
in BALTIMORE, MD  
related to new Chapter COMAR 26.11.38

Purpose of Hearing: The purpose of the public hearing was to allow for public comment on the Department's proposal regarding new chapter COMAR 26.11.38 Control of NO<sub>x</sub> Emissions from Coal-Fired Electric Generating Units.

The proposed action establishes new nitrogen oxides (NO<sub>x</sub>) emission standards and additional monitoring and reporting requirements for coal-fired electric generating units in Maryland.

Date and Location: The public hearing was held on January 7, 2015 at 11 a.m. at the Department of the Environment, 1800 Washington Boulevard, 1st Floor Aerie and Aqua Conference Rooms, Baltimore, Maryland 21230.

Attendance: 35 Attendees

Statement: The Department's statement was read by Eddie Durant, Regulatory and Compliance Engineer of the Regulations Development Division of the Air and Radiation Management Administration, Department of the Environment.

Comments and Responses: Comments were received from American Coalition for Clean Coal Electricity, Eugene M. Trisko; Raven Power, Michael Powell; Maryland Coal Association, Adrienne Ottaviani; Sierra Club, Earthjustice, Chesapeake Climate Action Network, Environment Maryland, Environmental Integrity Project, Interfaith Power & Light (MD, DC, NoVA), Maryland Environmental Health Network, Maryland League of Conservation Voters, Joshus Berman; Chesapeake Physicians for Social Responsibility, Gwen L. DuBois; Chris Yoder, Myrene O'Connor, Marion Edey, Cindy Murphy, Doris Toles, Dan Greifenberger, Joe Garonzik, David Greenwood, Naomi Binko, Will Candler, Jon Kenney, Lisa Bardack, Peter Hemlicher, Sara Via, Richard Reis, Josh Tolken, David Smeddick, Seth Bush, Andrew Garrett, Carol Anderson, Clara Summers, Nancy Meier, Leah Kelly, Sharon Bauger, Russell Donnelly; William O'Sullivan, New Jersey Department of Environmental Protection, William O'Sullivan; Delaware Department of Natural Resources & Environmental Control, Ali Mirzakhilili; NRG Energy, Inc., David Cramer; and Norfolk Southern Railway Company, C.S.Muir.

A summary of the written comments received, in some instances, have been summarized and the Maryland Department of the Environment's (the Department or MDE) responses are given below.

**COMMENT:**

A commenter states NO<sub>x</sub> emissions from coal-fired electric generating units (EGUs) impact local and downwind compliance with the National Ambient Air Quality Standard (NAAQS) for ozone and these emissions tend to be highest during periods that are most conducive to the formation of ground level ozone. Therefore the NO<sub>x</sub> emissions from coal-fired EGUs may have a significant negative impact on the health and welfare of both local and downwind populations. The commenter supports Maryland's proposed regulations, COMAR 26.11.38.

**RESPONSE:**

The Department appreciates this supportive comment and underscores the importance of the public health benefits of the proposed regulations.

**COMMENT:**

A commenter states several of the units affected by the proposed regulations have the capability to operate at substantial loads using fossil fuels other than coal and should be required to follow the requirements of proposed Regulation .03A(2) when operating on any fossil fuel. The commenter suggests including other fuels in the provisions of proposed Regulation .03A(2).

**RESPONSE:**

While some of the units subject to the regulations start up on gas, none of the affected have the capability to operate at substantial loads on any fuel other than coal. These regulations apply to coal-fired electric generating units because of their significant contribution to the State's stationary source NO<sub>x</sub> emissions. Emission limits for boilers operating on other fossil fuels will be reviewed, and possibly revised, in conjunction with the upcoming RACT review for the 2008 ozone standard.

**COMMENT:**

Several commenters noted that proposed Regulation .03B(3)(a) contains a single unit exemption. One commenter states currently there is only one coal fired facility in Maryland (Warrior Run) that does not share ownership with one or more additional facilities, and this "independent" facility, at this time, includes only a single coal-fired EGU. The commenter states this provision has the potential to in the future exempt a single facility even if the single facility contains more than one coal-fired EGU and requests that Maryland clarify that this provision exempts only "independent" facilities that contain a single coal-fired EGU. A second commenter is concerned this would leave the facility with only a seasonal cap on tons, which does not protect daily air quality. The commenter suggests emission levels in proposed Regulation .05A(2) become unit specific emission limits.

**RESPONSE:**

The commenter is correct that this provides an exception to the NO<sub>x</sub> 0.15 lb/MMBtu 30-day system-wide rolling average for a specific unit or facility that is sold and no longer part of a multi-facility system, and is not limited to a facility with a single unit. The unit(s) remains subject to the optimization requirements of proposed Regulation .03 and would have to submit a new optimization plan and continue to comply with emission rates applicable to its operating mode. In 2020, the unit would be subject to proposed Regulation .04 requirements. The unit also remains subject to annual and ozone season emission limits in COMAR 26.11.27. The Warrior Run facility is subject to Regulation .03D.

**COMMENT:**

A commenter states that fuel switching from coal to natural gas alone may not achieve NO<sub>x</sub> emission rate reductions on the same order as with installation of selective catalytic reduction technology (SCR) and requests that Maryland consider adding a representative NO<sub>x</sub> emission rate target/limit for units opting to fuel switch to comply with the provisions of proposed Regulation .04B.

**RESPONSE:**

Natural gas and oil-fired boilers are not addressed under these regulations. Emission limits for these units will be reviewed, as possibly revised, in conjunction with the upcoming RACT review for the 2008 ozone standard. Units that elect to fuel switch would be subject to these limits.

**COMMENT:**

Several commenters request Maryland consider incorporating a representative short term (24-hour average maximum) NO<sub>x</sub> emission rate limit in Regulation .04B(1). The commenter asserts that a 30-day rolling average NO<sub>x</sub> emission rate requirement, even at 0.09 lb/MMBTU, does not provide sufficient emission stringency during the generally short periods associated with high electric demand days when the National Ambient Air Quality Standard (NAAQS) for ozone is typically exceeded. One commenter suggests an alternative 24-hour NO<sub>x</sub> emission limit of 0.125 lb/MMBTU for coal-fired EGUs. A second commenter recommends a 24-hour NO<sub>x</sub> emission rate of 0.14 lb/MMBTU. One commenter notes that daily limits such as these would eliminate the need to utilize data from a previous ozone season to calculate a 30-day rolling average, which is an unusual approach.

**RESPONSE:**

The Department considered numerous options for averaging rates giving consideration to the operational variability of coal-fired units and the need for these units to operate providing electricity in Maryland. The Department concluded that Regulation .03A(1) and (2) offered the most protective control scenario without exemptions that are usually necessary for more

stringent, short-term emission limits. The Department intends to evaluate the performance of this regulation and its innovative concepts and can take further action if deemed necessary.

**COMMENT:**

A commenter states that the table of unit specific 24-hour average NO<sub>x</sub> emissions in Regulation .05A(2) may be representative of daily average values exhibited during recent ozone season operations, as discussed in the technical support document, but may not be an accurate representation of the specific unit's capability to achieve lower NO<sub>x</sub> emission rates when the unit is maintained and operated in accordance with good pollution control practices. The commenter states the unit specific table values should be established based on the information required to be submitted to Maryland in accordance with the requirements of Regulation .03A, which may result in NO<sub>x</sub> emission rates that are lower than those demonstrated during recent ozone seasons.

**RESPONSE:**

The Department agrees with the commenter. As more data on these units in their various operating modes becomes available, the Department expects the plans required by Regulation .03A may be adjusted to reflect optimal emission rates that are achievable.

**COMMENT:**

A commenter supports the requirement for affected EGUs to submit a plan to minimize daily NO<sub>x</sub> emissions including periods of start-up, shut down and low capacity (load) operation.

**RESPONSE:**

The Department appreciates support for this innovative concept and asserts that optimizing existing controls can produce significant reductions at low cost.

**COMMENT:**

A commenter supports the provisions of proposed Regulation .03A(2) that requires units to minimize NO<sub>x</sub> emissions by operating their controls optimally each day of ozone season. The commenter recommends that these requirements be extended to units that operate on natural gas and oil, including provisions to install SCR and SNCR. A commenter recommends Maryland adopt lower NO<sub>x</sub> emission limits for gas turbines over time to address peak day emissions.

**RESPONSE:**

This regulation addresses emissions from coal-fired electric generating units, which are significant contributors to the State's stationary source NO<sub>x</sub> emissions inventory. Emission limits for gas-fired turbines and natural gas and oil-fired boilers will be reviewed, and possibly revised, in conjunction with the upcoming RACT review for the 2008 ozone standard.

**COMMENT:**

A commenter supports the elimination of system-wide averaging for the units identified in Regulation .04 after 2020 and recommends that system-wide averaging be eliminated for all coal-fired units to ensure that none of the units emit high NOx emissions on high ozone days.

**RESPONSE:**

NOx emissions are minimized on peak days for all coal-fired units both prior to and after 2020 through application of the requirements in Regulation .03(A)(2), which requires each unit to operate and optimize the use of installed NOx pollution control technologies at all times the unit is in operation. Additionally, Regulation .03A(1) requires the unit owner or operator to submit a plan specifying the unit's operating parameters under all modes of operation and explaining how those parameters will be monitored and recorded to track and maintain the optimum NOx emission controls. The 24-hour block average NOx emission rates contained in Regulation .05A(2) provide an indication to the Department that the specific unit is implementing good air pollution control practices as required in Regulation .03A(2). Additionally, all units are subject to the Healthy Air Act mass emission caps under COMAR 26.11.27. The system averaging remains in place as another compliance tool.

**COMMENT:**

A commenter notes that the requirements of Regulation .04 have been delayed two years. The commenter states this delay is reasonable and encourages the replacement of old control units with new control units. The commenter does not favor the option of fuel switching to natural gas if the units are not required to maintain a NOx emission rate of 0.09 lb/MMBTU, and further recommends that Maryland require all gas-fired boilers to meet this rate as a 24-hour average.

**RESPONSE:**

The Department appreciates support for the proposed 2020 deadlines. Natural gas and oil-fired boilers are not addressed under these regulations, but emission limits for these units will be reviewed in conjunction with the upcoming RACT review for the 2008 ozone standard. Units that opt to fuel switch would be subject to these limits.

**COMMENT:**

A commenter supports the concept of reporting why emissions are higher than the indicator rates as required in proposed Regulation .05A(2), and recommends that reporting should be every operating day. The commenter expresses reservation that the limits in the table are not enforceable limits especially for the units already equipped with SCR because after 2020 the only applicable enforceable limit is the 0.15 lb/MMBTU NOx emissions rate.

**RESPONSE:**

While not enforceable limits, the 24-hour block average NO<sub>x</sub> emission rates contained in the table in proposed Regulation .05A(2) provide an indication to the Department about whether the specific unit is implementing the good air pollution control practices as required in Regulation .03A(2). If the limits are exceeded, a compliance review for the enforcement of Regulation .03A(2) is undertaken comparing the report provided regarding the unit's operating mode to the emission rates specified in the unit's plan required by Regulation .03A(1). See Appendix J – Compliance Plan of the Department's Technical Support Document for more details. Appropriate remedial actions are then undertaken.

**COMMENT:**

A commenter supports the proposed regulations, but notes that the support would be withdrawn if substantive changes were made to the proposal. The commenter recommends the following non-substantive changes for clarity: (1) change the word "capacity" to "load" in Regulations .03A(1), .05(A)(3)(h)(iii) and .05(A)(4); (2) change "where" to "when" in Regulation .05(A)(2); (3) add "as a result of these factors" before "including, but not limited to" in Regulation .05(A)(4); and (4) add "or otherwise sufficient" before "system operating days" in Regulation .05(b)(2).

**RESPONSE:**

The Department believes that the three of the proposed changes do not differ substantially from the original text and that these non-substantive changes will provide clarity to the proposed regulation. The Department does not feel the requested change, (4) add "or otherwise sufficient" before "system operating days" in Regulation .05(b)(2) is non-substantive.

**COMMENT:**

A commenter supports the development of regulations that would allow coal plants to utilize the control technologies installed in response to the 2006 Healthy Air Act. The commenter notes that Baltimore has monitoring data that complies with the current 75 ppb ozone standard, a testament to the effectiveness of the Healthy Air Act and various federal controls. The commenter also notes that EPA has proposed to adopt a lower ozone standard between 65 and 70 ppb. The commenter further recommends that MDE suspend the requirements of the proposed regulations that take effect in 2020 until EPA finalizes the proposed revision to the ozone standard and revise those requirements through a new stakeholder process.

**RESPONSE:**

In proposing a 2020 compliance deadline for the requirements of Regulation .04, the Department considered EPA's proposed new ozone standard. Given growth projections for the State, additional NO<sub>x</sub> emission controls will be needed if Maryland is to maintain compliance with the current 75 ppb ozone standard and achieve compliance with a revised lower standard. Further delay in implementing requirements for advanced NO<sub>x</sub> controls on coal-fired power plants in

Maryland only delays the associated public health benefits and conflicts with the Clean Air Act mandate to achieve the standard as expeditiously as possible.

**COMMENT:**

A commenter prefers the provisions of the earlier draft regulations developed during the stakeholder process, which allow emissions averaging among units currently not equipped with SCRs and permits continued operation of those units during the second phase of the regulations. The commenter characterizes the provisions of the final regulation as requiring a “de facto shutdown.” The commenter recommends MDE amend the second phase 2020 control requirements to include flexibility provisions similar to those deleted from the August 28th draft.

**RESPONSE:**

The second phase requirements in the final regulation provide compliance flexibility both in time and manner through three available compliance options, and do not constitute a “de facto shut down” requirement. There is no need for emissions averaging among units that all operate on advanced controls or fuel switch to natural gas.

**COMMENT:**

A commenter opposes the October 1, 2014, revision of the second phase control requirements applicable to seven units on the basis that the revisions were made through a negotiation among some, but not all, parties in interest.

**RESPONSE:**

The Department disagrees with the commenter’s assertion that the revisions were made outside of the stakeholder process. Additional stakeholder sessions open to all interested parties were announced at the September meeting of the Air Quality Control Advisory Council (AQCAC). An additional opportunity for stakeholders to comment was provided at the October AQCAC meeting in advance of action by AQCAC on the regulation.

**COMMENT:**

A commenter notes the proposed regulations eliminate the flexibility provision for emissions averaging and extend the second phase control period from 2016 to 2020, which has no bearing on the attainment year of 2018. The seven units not equipped with SCRs are given the option of switching to natural gas, installing SCR equipment, or shutting down. The commenter equates the change to a shutdown order for the affected units, given the high costs of retrofitting with SCR equipment and notes that no other state defines "Reasonably Available Control Technology" to include unit shutdowns.

**RESPONSE:**

First, this regulation is intended to go beyond RACT requirements to ensure reductions of peak-day NO<sub>x</sub> emissions. Second, the purpose of extending the deadline to achieve compliance with Regulation .04 to 2020 is to allow affected sources sufficient time to evaluate and select the most cost-effective phase two compliance option, among the three offered, based on projected changes in the energy market. It is noteworthy that in 2012 Securities and Exchange Commission filings, the previous owners of the Chalk Point and Dickerson units stated their intent to install SCR technology at Chalk Point Unit 2 and Dickerson Units 1, 2 and 3.

**COMMENT:**

A commenter asserts that MDE testified before the Economic Matters Committee on January 29, 2014 regarding MDE's modeling for the 75 ppb standard. The commenter states the modeling is based upon the effects of the emission rate standards that are effective in 2015, projected to the year 2018, and not on reductions resulting from installation of advanced controls or fuel switching to natural gas.

**RESPONSE:**

The attainment date for the Baltimore Nonattainment Area is 2018. The modeling for that attainment demonstration would only consider controls for which implementation is required in that timeframe. The additional controls required in 2020 will be needed for all of Maryland to achieve compliance with any revised ozone standard that is lower than 75 ppb and to maintain compliance with the current 75 ppb standard, given the projected continued economic growth in Maryland over the required 20 year maintenance period.

**COMMENT:**

A commenter notes the seven coal units affected by the 2020 requirements in the proposed regulations accounted for 21% of Maryland's 2013 coal-fired generation of 15,753 Gigawatt-hours. These seven units burned approximately 1.4 million tons of coal in 2013, or 22% of the 6.0 million tons of coal consumed by NRG and Raven Power.

**RESPONSE:**

The seven units mentioned by the commenter are utilized much less frequently than units already controlled with SCR. These units are older, dirtier, costlier to maintain, and less efficient than other coal-fired units in the State and tend to operate on days of high electricity demand, thereby contributing a significant percentage of total local NO<sub>x</sub> emissions on those days, often as high as 50%. High electricity demand days often coincide with high ozone days and these units are major contributors to high ozone levels.

**COMMENT:**

A commenter asserts that MDE has not formally evaluated the reliability risks posed by the second phase of the proposed regulations. The commenter maintains that Maryland and other states in the PJM region are confronting major reliability issues due to the projected number of coal plants scheduled to retire as a result of the EPA MATS rule and other factors. A recent NERC Reliability Assessment notes that 108 to 134 Gigawatts of fossil capacity is projected to retire by 2020. The commenter states several of the units affected by the second phase of this regulation may be reliability-critical.

**RESPONSE:**

As discussed in more detail in the responses to other comments, at least four new natural gas plants are under construction or in various phases of permitting in Maryland. These units are all expected to come on line prior to 2020 and will have a beneficial impact on congestion and reliability in Maryland and the PJM region. Deactivation notices submitted to PJM for Chalk Point and Dickerson for 2018 prompted a PJM reliability analysis, which concluded that retirement of these units in that time frame would not adversely impact reliability.

**COMMENT:**

A commenter disagrees with MDE's assertion that the proposed regulations will have no expected impact on the Department, other State agencies, or local governments as a result of this action. The commenter states thousands of direct and indirect jobs are at risk due to potential shutdowns, as well as the loss of substantial tax revenues to State and local governments. The commenter notes concerns along these lines were raised during the April 1<sup>st</sup> 2014 Senate Finance Committee hearing.

**RESPONSE:**

The proposed regulation is the result of a year-long stakeholder process that has included public meetings and numerous opportunities for input and participation from affected sources, public health groups, environmental organizations, and the general public. The Department has reviewed data regarding some of the direct and indirect jobs that may be affected under the proposed regulation. As discussed in more detail below, a number of new electric generating facilities are under construction or in various phases of the permitting process (Competitive Power Ventures (CPV), Mattawoman Energy Project, and Old Dominion Electric Coop Wildcat Point, Keys Energy Center), and will provide new employment opportunities and tax revenue to the counties. In addition, coal exports from western Maryland are increasing.

**COMMENT:**

A commenter states that coal is an important economic resource in Garrett and Allegany Counties and objects to the proposed regulations because the State, although developing these regulations to meet federal requirements, fails to account for the economic impact of these

requirements on the coal industry and these counties. The commenter further notes this deprives communities that rely upon the coal industry of jobs and economic opportunity.

**RESPONSE:**

The majority of coal used as fuel in Maryland plants is produced outside Maryland. Maryland coal, which is high quality coal, is typically shipped abroad for use in producing steel. Exports of this coal have been increasing in recent years. These regulations should not have a significant economic impact on Garrett and Allegany Counties.

**COMMENT:**

A commenter states that acute exposures to high levels of nitrogen dioxide in and of itself can lead to a decline in pulmonary function and increased sensitivity to bronchial constrictors, especially in children and asthmatics, aside from its contribution to ozone. The commenter adds that children active in multiple outdoor sports who live in high ozone environments have three times the likelihood of developing asthma as children who do not spend active time outdoors. The commenter states that long term exposure to ozone pollution is associated with an increase in respiratory mortality. The commenter asserts that the Baltimore-Washington corridor has the 8th worst ozone pollution in the U.S.

A commenter states nitrogen dioxide is a precursor to fine particle pollution associated with an increase in mortality. The commenter states that SCR technology reduces secondary fine particle pollution. The commenter asserts that Maryland has poor nitrogen oxide emission controls and recommends that Maryland require SCR technology for all Maryland coal-fired power plants and that the plants be required to use this technology at all times. The commenter maintains that system-wide controls allow some areas to experience unacceptable levels of nitrogen oxide air pollution.

A commenter provides an extensive review of the studies undertaken to assess the public health risk of exposure to ozone and nitrogen oxides, and provides support for the federal health-based air quality standards. The commenter describes the Baltimore region's air quality status with respect to the ozone NAAQS, emphasizing the importance to public health of attaining the federal ozone standard as expeditiously as possible.

**RESPONSE:**

The Department and the U.S. Environmental Protection Agency have reviewed extensive research associating ozone exposure with adverse health effects in numerous toxicological, clinical and epidemiological studies. Reducing ozone concentrations is associated with significant human health benefits, including the avoidance of mortality and respiratory illnesses. Nitrogen oxides (NO<sub>x</sub>) is an ozone precursor, and reducing NO<sub>x</sub> emissions would also reduce adverse health effects associated with nitrogen dioxide (NO<sub>2</sub>) exposure. These health benefits include fewer asthma attacks, hospital and emergency room visits, lost work and school days, and lower premature mortality.

To further protect public health and address federal air quality standards the Department proposes COMAR 26.11.38 - *Control of NO<sub>x</sub> Emissions from Coal-Fired Electric Generating Units* - as a key element in Maryland's current and future State Implementation Plans (SIPs) to achieve Statewide compliance with the federal ozone standard. Although the Department previously promulgated several regulations applicable to coal-fired power plants, NO<sub>x</sub> emissions from the source category subject to these regulations continue to comprise a large percentage of ozone season NO<sub>x</sub> emissions.

**COMMENT:**

A commenter states the proposed RACT regulations appropriately recognize that SCR-level emission rates are RACT for Maryland's most poorly controlled coal units. The commenter reiterates EPA's definition of RACT and notes EPA has clarified that "[e]conomic feasibility presumes that it is reasonable for similar sources to bear similar costs of emission reductions. The commenter stresses economic feasibility rests very little on the ability of a particular source to 'afford' to reduce emissions to the level of similar sources but rather is largely determined by evidence that other sources in a source category have in fact applied the control technology in question and cost-effectiveness should be in keeping with the severity of the nonattainment problem. The commenter adds that in recent comments regarding Pennsylvania's proposed RACT regulation for coal plants, EPA has clarified that the states should look to actual emission rates achieved in practice by sources.

**RESPONSE:**

The Department researched the RACT regulations of other states during the development of the proposed regulations. The Department then proposed emission limits appropriate for Maryland's particular circumstances aimed at providing significant reductions in Maryland attainment plans. COMAR 26.11.38 - *Control of NO<sub>x</sub> Emissions from Coal-Fired Electric Generating Units* - satisfies RACT requirements, but goes beyond RACT to also address peak day NO<sub>x</sub> emissions.

**COMMENT:**

A commenter supports the proposed emission rate limitation of 0.09 lb/MMBtu as a 30-day average as technologically feasible as evidenced by the accompanying expert report of Dr. Ranajit Sahu documenting the prevalence of coal units that meet a limit of 0.09 lb/MMBtu as a 30-day average during the ozone season. The commenter states that SCR is the most widespread control technology for NO<sub>x</sub> and has been installed, or is slated for installation, on over 47% of active coal units in the country above 150 MW, making it RACT for the non-SCR coal-fired electric generating units in Maryland. The commenter further notes only 46% of Maryland coal units have SCRs in a state where areas cannot demonstrate attainment of the 2008 ozone NAAQS based on existing controls, and where coal units equipped with SCR are capable of achieving emission rates at least 90% lower than those achieved by the State's most poorly controlled units. The commenter asserts it is both necessary and appropriate to require that the non-SCR units achieve SCR-level emission rates.

**RESPONSE:**

The Department agrees with the comments and notes that the addition of controls on the units specified in Regulation .04 will ensure that Maryland's entire coal fleet is equipped with state-of-the-art-controls. These rates and controls should align Maryland plants with well-controlled plants in other states. COMAR 26.11.38 - *Control of NOx Emissions from Coal-Fired Electric Generating Units* - satisfies RACT requirements, but goes beyond RACT. The measures required by this proposed action to reduce NOx emissions address peak day NOx emissions, as well as satisfy the requirement to update the NOx RACT requirements.

**COMMENT:**

Another commenter notes that Maryland's proposed emissions limits of 0.09 lb/MMBtu as a 30-day average is both technologically and economically feasible. The owners of the affected sources did not provide evidence during the stakeholder process to suggest that it would be technologically infeasible to install and operate SCR on the non-SCR units in Maryland's coal fleet. Nor did MDE or any stakeholder raise any concern that SCR would create collateral adverse impacts to water pollution, waste disposal, or impose significant additional energy requirements. In earlier filings with the SEC, NRG stated its intent to install SCR at all of its Chalk Point and Dickerson units. The commenter further states that even in deregulated states SCR can be added cost-effectively and notes the extended compliance time frame under the regulations—July 1, 2020 for installation and operation of SCR—as well as the flexibility the regulation provides to convert units to natural gas rather than upgrade to SCR, should the economics at the time the decision is made support that approach.

**RESPONSE:**

The Department agrees that Regulation .04 offers needed and cost-effective options for control of NOx.

**COMMENT:**

A commenter states that the proposed regulations are in line with the application of RACT in other states such as Wisconsin and New York and provided the regulatory limits in effect in those states.

**RESPONSE:**

The Department researched the RACT regulations of other states during the development of the proposed regulations. The Department then proposed emission limits appropriate for Maryland's particular circumstances aimed at providing significant emission reductions in Maryland attainment plans. COMAR 26.11.38 - *Control of NOx Emissions from Coal-Fired Electric Generating Units* – satisfies RACT requirements, but goes beyond RACT to also address peak day NOx emissions.

**COMMENT:**

Eleven commenters gave testimony on personal health hardships exacerbated by ozone pollution and voiced support for the proposed regulations because they would reduce the harmful pollutants coming from coal-fired power plants and improve public health.

Six commenters gave testimony supporting the proposed regulations as a means to reduce pollutants that cause ozone. The proposed regulations require reductions that go beyond reducing criteria pollutants and provide co-benefits that reduce toxins in some cases.

**RESPONSE:**

The Department agrees that these comments underscore the importance of the public health benefits of the regulations.

**COMMENT:**

A commenter noted that reducing nitrogen oxides reduces nitrogen loading to the Chesapeake Bay and improves water quality.

**RESPONSE:**

The Department agrees with this comment.

**COMMENT:**

A commenter stated that improvements to the power plant fleet will help reduce CO<sub>2</sub> emissions and support efforts to mitigate greenhouse emissions and climate impacts.

**RESPONSE:**

The Department agrees with this comment.

**COMMENT:**

A commenter quoted a study by the Organization for Economic Cooperation and Development that found “an increase in the stringency of environmental policies does not harm productivity growth.”

**RESPONSE:**

The Department agrees with this comment.

**COMMENT:**

A commenter asserts the proposed regulation would force shutdowns instead of creating flexibility. The commenter states the proposal contains only two specific options, SCR and fuel

switching to gas without allowing opportunity to examine alternate technologies or operating scenarios. The commenter asserts these two options are not economically viable on smaller units affected by proposed Regulation .04. Therefore, the regulation forces shutdowns of these units.

**RESPONSE:**

During the stakeholder process associated with this proposal, a number of alternative strategies and operating scenarios were evaluated and considered by the Department, such as daily caps and several approaches to system-wide averaging. However, recent emissions data has shown that *daily* emissions from the affected units can be as high as 50% of the total daily NOx emissions. Owners and operators of electric generating units subject to this regulation objected to the more stringent emission limits that would be required under the alternative approaches in order to achieve the reduction in peak day NOx emissions necessary to achieve and maintain compliance with the ozone standard. This effectively eliminated alternative options from consideration in the proposal.

**COMMENT:**

The commenter asserts that at the time regulations implementing the Healthy Air Act were adopted, the Department assured generators that system-wide averaging would be permitted to comply with any future more stringent NOx emission limitations, thus avoiding the need for additional future NOx controls on units that were not equipped with advanced NOx controls.

**RESPONSE:**

The commenter is correct that the Healthy Air Act allowed generation owners to equip large efficient units with SCR and smaller units with less advanced SNCR controls, and then to achieve annual and ozone season mass emission tonnage caps through system-wide averaging. However, the commenter wrongly asserts that the Department led generators to believe that they would be permitted to comply with any future more stringent NOx emission limitations through system-wide averaging that would not require installation of additional controls. The Department has given no assurances that additional NOx controls would never be necessary, or that all future NOx emission limitations would allow compliance through system-wide averaging.

**COMMENT:**

The commenter asserts that retirement of units subject to this regulation would result in an increase in imported electricity at a higher cost to ratepayers.

**RESPONSE:**

Recent history has demonstrated that the electricity markets are very dynamic. Future costs of electricity and changes in Maryland's electricity import ratio are dependent on many factors subject to change in the course of the next five years, including natural gas and other fuel costs,

installation of new natural gas and renewable generation, electricity demand, and implementation of the Clean Power Plan and other federal regulations, to name a few. Four new natural gas combined cycle units are currently in various stages of permitting and construction in Maryland. In the event of future retirements, these and other new natural gas and renewable generation could offset all, or a significant portion of, generation losses due to retirement of existing units.

**COMMENT:**

A commenter states that meaningful air emission reductions can be achieved without shutdowns and recommends adoption of a fleet-wide system averaging approach considered during the stakeholder process and at the October 6<sup>th</sup> 2014 AQCAC meeting. The commenter asserts the approach results in an equivalent reduction of total tons of NO<sub>x</sub> reduced. According to the Commenter, this approach often results in curtailment of operations at a plant and the commenter states this drives the addition of controls or retirements to regain the ability to operate.

**RESPONSE:**

While it is true that over the entire averaging time of 30 days, a fleet-wide system averaging approach does result in an equivalent overall NO<sub>x</sub> tonnage reduction as a unit-by-unit compliance approach, the fleet-wide system averaging approach does not ensure the *daily peak day* reductions needed to address high electricity demand days, which often coincide with high ozone days. During the stakeholder process, the Department emphasized the need for reductions in emissions on high electricity demand days to eliminate exceedances and ensure maintenance of the ozone standard.

The Department agrees with the commenter that meaningful emission reductions can be achieved in 2020 without shutdowns. The proposed regulation affords two other options for compliance, allowing affected sources the time and flexibility to choose the best option for each affected unit to achieve the required NO<sub>x</sub> emission reductions. In the event that new technologies capable of achieving equivalent reductions come on the market in the future, the Department will consider revisions to the regulations.

The system-wide averaging approach presented to AQCAC on October 6, 2014 and discussed in the comments would continue to allow older, dirtier, costlier to maintain, and less efficient coal-fired units in the State to operate on high electricity demand and high ozone days, when they contribute a significant percentage of total local NO<sub>x</sub> emissions, often as high as 50%.

**COMMENT:**

A commenter states the proposed regulation is 20-30% more stringent than other state regulations and offers a table of the regulatory limits adopted by a number of nearby states. The commenter asserts that the Baltimore region has complied with the 75 ppb ozone standard and that seeking further NO<sub>x</sub> reductions is arbitrary and capricious. The commenter further states that the proposed regulations are more stringent than federal requirements and the Department failed to provide the demonstration required by Executive Order 01.01.1996.03.

## RESPONSE:

Several of the states identified in the table, *Comparison of State Regulations NO<sub>x</sub> Compliance* also commented on the Department's proposal. In their comments, they urge Maryland to adopt the shorter 24-hour averaging time and note that this regulation is not as stringent as, or equivalent to, their state regulatory limits.

After the summer of 2014, the design value for the Baltimore region is 75 ppb, the level of the current ozone standard. Ozone levels have proven to be cyclical in nature. Ozone formation is affected by the weather, which is why three years of monitoring data are necessary to determine whether a region has actually achieved attainment. Summer ozone levels generally fluctuate in cycles of 5 to 7 years from years with fewer, low concentration days to years with more frequent, higher concentration days. The summers of both 2013 and 2014 were much cooler than usual, and thus, less conducive to ozone formation, dropping the highest design values by about 15 ppb. The mild 2013 and 2014 summers contrast appreciably from the summer of 2012, during which Maryland experienced double the number of ozone exceedances. The Department expects to return to average summer conditions as the current cycle continues to progress from lower to higher levels. A request to EPA for redesignation of an area to attainment requires submission of an attainment demonstration based on enforceable control measures, not mild weather conditions, showing the area will remain in attainment for 20 years.

The Department disagrees that the regulation is more stringent than federal law and that Executive Order 01.01.1996.03 applies to this regulatory action. As previously noted, portions of Maryland have been designated as moderate non-attainment for the 75 ppb ozone national ambient air quality standard (NAAQS). Pursuant to § 110 of the federal Clean Air Act (CAA), States are responsible for developing a State Implementation Plan (SIP) which provides for the implementation, maintenance, and enforcement of the NAAQS. Federal law does not mandate specific controls applicable to all states. Rather, EPA reviews each state's SIP submission to determine whether it meets the minimum requirements of the CAA. Through this scheme, a State may enact and administer a unique set of pollution control practices designed to meet its particular needs. As part of a complete SIP, § 172 of the CAA requires Maryland to provide for the implementation of all reasonably available control measures as expeditiously as practicable. In addition, § 182 requires Maryland to revise its reasonably available control technology (RACT) standards for nonattainment areas. The Department has developed the regulation in question to satisfy these obligations under the CAA.

Executive Order 01.01.1996.03 requires any unit of State government that proposes to adopt a regulation which provides a standard that is more restrictive or stringent than an applicable standard established under a federal law or regulation that governs the same program or conduct to provide additional information regarding the impact of the regulation. The Department has not developed a regulation which is more stringent than a federal standard governing that same area. To the contrary, the CAA's SIP development and RACT obligations do not establish a particular emission standard or control. Rather, it is the CAA's explicit scheme that requires Maryland to develop its own suite of specific control standards to achieve and maintain the NAAQS. The Department's regulation is consistent with its mandate to develop controls which

the Department believes are necessary to achieve and maintain the 75 ppb NAAQS for ozone as expeditiously as practicable. For these reasons, Executive Order 01.01.1996.03 is inapplicable to this regulatory rulemaking.

**COMMENT:**

The commenter asserts that if the owners of the Maryland plants subject to this regulation select the retirement option, and no new generation is built, reliability problems could ensue. The commenter states that it is unlikely new natural gas generation will be completed for at least 10 years. The commenter asserts the proposed federal Clean Power Plan will take effect post 2020, the same timeframe as the second phase of the Department's proposed regulations, causing retirement of coal plants and reliance on single-fuel type generation, which may affect the availability of replacement resources. The commenter cites the variability of natural gas supply and cites the Polar Vortex as an instance in which the natural gas supply was limited. The commenter quotes many reliability assessments and in particular, NERC's November 2014 analysis of the Clean Power Plan (CPP) "*Potential Reliability Impacts of EPA's Proposed Clean Power Plan.*" The commenter highlights three recommendations: (1) "the *Regions, ISO/RTOs, and states should perform further analysis to examine the potential resource adequacy concerns*"; (2) *EPA and states, along with industry, should consider the time required to integrate potential transmission enhancements and additions necessary to address impacts of the proposed rule; and* (3) EPA, FERC, the DOE, and state utility regulators should employ the "array of tools at their disposal and their regulatory authority" to develop reliability assurance mechanisms such as a reliability back-stop.

**RESPONSE:**

As noted above, FERC and PJM are responsible for managing and ensuring the reliability of our electricity system. If PJM determines that the retirement of one or more affected units would compromise reliability, PJM has authority to issue a "*Reliability Must Run*" contract, which allows the power plant to recover operating expenses from the rate base. NRG has submitted 2018 deactivation notices to PJM for its Chalk Point and Dickerson Plants, which triggered a PJM reliability analysis that concluded retirement of these units in 2018 would not present reliability concerns that could not be addressed through currently planned upgrades and enhancements to the transmission system.

There are considerable new generating assets in various phases of permitting or construction both in Maryland and Virginia. PJM's interconnection queue shows 2,677 MWs of natural gas "under construction," with expected online dates in the 4<sup>th</sup> quarter of 2015 (230 MW Perryman expansion), the 2<sup>nd</sup> quarter of 2016 (725 MW CPV and 735 MW Keys), the 2<sup>nd</sup> quarter of 2017 (46 MW ODEC) and the 2<sup>nd</sup> quarter of 2018 (942 MW ODEC and 45 MW Keys).

- *Mattawoman Energy Project* is a proposed natural gas-fueled, 859 megawatt combined cycle generating station featuring two H-class combustion turbines and two duct-fired heat recovery steam generators planned for construction in Brandywine, Maryland, with an estimated completion date of 2017. The turbines will use low-NOx combustion technology and will be equipped with selective catalytic reduction (SCR) systems to control NOx emissions. Fuel to the

plant will be supplied via interstate gas pipeline owned by Dominion Transmission. The company estimates that the plant will supply the power needs of approximately 859,000 homes in Maryland, and create approximately 700-800 construction jobs – with 25 direct jobs to operate the plant and 32 indirect jobs to support the plant.

- *Old Dominion Electric Coop Wildcat Point* is a proposed state-of-the-art, combined cycle natural gas-fired power plant planned for construction on the Rock Springs site in Cecil County, Maryland. The plant, which will be supplied natural gas via the Transco pipeline, will generate approximately 1,000 megawatts - enough to power 390,000 homes in the region annually and is scheduled to be on-line in 2018. According to the owner, Wildcat Point will create up to 600 construction jobs and approximately 30 permanent jobs.

- *Keys Energy Center* is a proposed natural gas-fired combined-cycle plant in Prince George's County, Maryland scheduled to be on line by mid-2017. The facility is expected to bring 735 megawatts of electrical generation to Maryland and meet the average consumption needs of approximately 500,000 Maryland homes. The project is expected to employ a construction workforce of 200 to 400 people over a two-year period, with approximately 25 full-time workers to oversee the operation of the plant. Natural gas will be provided to the plant by a pipeline owned by Dominion Transmission.

- *Competitive Power Ventures (CPV) St. Charles* is a proposed state-of-the-art 661 megawatt natural gas-fired combined cycle power plant in Charles County, Maryland. According to the owner, the plant will be supplied natural gas from the Cove Point LNG terminal or another existing pipeline and will generate enough electricity to power more than 650,000 homes. The project will create approximately 350-400 construction jobs at its peak and it will create an additional 24 permanent jobs when operational.

An additional 1,400 MW of natural gas generation is under construction in Virginia near the Maryland border that will facilitate power flow into Maryland. To the extent that any of these facilities also cleared PJM's Base Residual Auction, they face considerable penalties if they do not fulfill their generation commitments.

In addition to new natural gas generation in the region, the proposed *Dominion Cove Point LNG Terminal Project* will expand the existing facility currently used for storing and exporting domestically produced liquefied natural gas (LNG). The terminal is located along the Chesapeake Bay in Lusby, Maryland. The terminal expansion includes the construction of a liquefaction plant and additional storage facilities. The project is expected to create 3,000 construction jobs during the three-year period and will require about 75 employees. In addition, based on a U.S. Department of Commerce formula, Dominion Resources estimates another 14,000 permanent jobs created indirectly resulting from the project nationally in businesses ranging from pipe manufacturers to accounting firms.

Overall, the five proposed projects are expected to result in the creation of at least 5,000 construction and 170 permanent jobs in Maryland. While there is a large degree of uncertainty regarding possible retirement of existing coal-fired power plants and resulting job losses, the

expansion of the natural gas electric generation sector will be a catalyst for economic growth in Maryland.

The NERC report cited by the commenter in support of its reliability comments, does not contain a focused analysis of reliability issues in Maryland or the PJM region. Many of NERC's concerns were based on its mistaken assumption that states are subject to a 2020 compliance deadline under EPA's proposed Clean Power Plan, when in fact, the proposed Clean Power Plan allows for averaging compliance rates between 2020 and 2029. Moreover, the Clean Power Plan is currently in the proposal phase. EPA is considering grid reliability issues as it responds to comments and develops a final rule. The final rule may be revised in significant ways that impact the electricity markets and system reliability.

PJM is currently examining grid reliability as it relates to the Clean Power Plan, and will make those results available when complete.

**COMMENT:**

A commenter asserts the natural gas option (fuel switching from coal to natural gas) under the second phase of the proposed regulations is flawed because it specifically forces a gas conversion as the only alternative should a generator want to continue operating in Maryland without an SCR retrofit, and generation owners should have an opportunity to select other compliance alternatives, if they achieve an equivalent reduction. The commenter asserts that the proposal erroneously assumes that natural gas is available in Maryland, and can sustain the substantial rise in demand to support the operation of large generation units at economically competitive rates. The commenter further asserts that Maryland generators do not have direct access to low-cost Marcellus Shale gas, which puts an economic burden on Maryland natural gas generators relative to generators in other states. The commenter further notes that gas/electric coordination is important as it impacts the reliability of the electric system and the supply of natural gas to Maryland consumers, and that currently the gas/electric markets are not aligned.

**RESPONSE:**

Several pipelines currently under construction will deliver Marcellus Shale gas to Maryland and other eastern states, which will both directly provide supply and alleviate demand on pipelines transporting natural gas from the Gulf of Mexico.

PJM is actively discussing these issues, and FERC has formed a natural gas/electricity working group. These issues are appropriately under consideration by the regulatory agencies and entities with relevant jurisdiction, who are vested with the authority and responsibility to act when necessary to address any future reliability issues that may be associated with the supply of natural gas. For example, as a result of the natural gas supply issues arising out of the 2014 winter, PJM is proposing many changes to their market design and rules, some of which will affect natural gas plant operations.

**COMMENT:**

A commenter believes the initial need for the proposed regulation is no longer justified because Maryland's ozone monitors have three years of data below the ozone standard and asserts the improvement in air quality is the result of the Healthy Air Act, which allows system-wide averaging. The commenter asserts the proposed regulations are a sudden shift in long-standing environmental policy. The commenter states that the proposed regulation's cost basis is flawed according to EPA cost-effectiveness guidelines for RACT and that the health benefits are unsupported.

**RESPONSE:**

The commenter is not correct that Maryland's air quality monitors have recorded ozone levels below the ozone standard for three years. The Maryland portion of the Washington nonattainment area is not in compliance with the current ozone standard. Monitors in the Baltimore nonattainment area have recorded ozone levels in compliance with the standard for only one year. As explained above, the cyclical nature of ozone levels and its dependency on weather conditions make projections of compliance based on such limited data unreliable. In order for any nonattainment area to be redesignated to attainment, a demonstration must be made that the area can maintain compliance with the standard for 20 years based on enforceable control measures. Early analyses show the region barely hovering at the level of the standard. EPA has proposed a new even lower ozone standard of between 60 and 70 ppb, which is expected to be finalized by the end of 2015. These regulations are needed for all of Maryland to achieve and maintain compliance with the current standard, as well as any revised more stringent ozone standard, given the continued economic growth projected for Maryland over the required 20-year maintenance period.

**COMMENT:**

The commenter asserts the proposed regulations are a sudden shift in long-standing environmental policy to allow system-wide averaging to demonstrate compliance with emission limitations, and notes additional time was requested to evaluate the proposal.

**RESPONSE:**

There is no such Department policy to allow system-wide averaging to demonstrate compliance with all existing or new NOx emission limitations.

In addition to a robust 15-month stakeholder process, the Department provided an initial public comment period of more than 30 days to compensate for the holidays, and subsequently extended the comment period for an additional week. The Department's adoption schedule was established to ensure that NOx emission reductions would occur during the upcoming 2015 ozone season. The 2020 compliance deadline for the second phase of the regulations allows opportunity for a mid-course review and corrective action based on consideration of new data analyses and technologies that might become viable.

**COMMENT:**

A commenter notes the cost projections of \$15,000 to \$24,000 per ton of NO<sub>x</sub> removed are outside EPA's cost effectiveness guidelines for RACT.

**COMMENT:**

This regulation is intended to go beyond RACT requirements to ensure "peak day" NO<sub>x</sub> emission reductions needed for ozone attainment. The Department appreciates the cost information provided by NRG, which is incorporated into the Technical Support Document. Based on the data supplied, the cost of the SCR retrofits are annualized over a 10-year period rather than presented on a cost-per-ton basis. The Technical Support Document provides an explanation of the cost data for both phases of the regulations, and to the extent possible, each option under the second phase.

The commenter is correct that the Department did not specifically analyze health benefits that could be attributed solely to reductions from this regulation. The Department based costs and benefits attributable to the proposed regulation on health benefits associated with attainment of the 2008 ozone standard by 2018 using a current draft CMAQ modeling run and the BENMAP modeling tool provided by EPA. The cost is expressed in 2010 dollars, the output of the tool. The data is current. Many stakeholders presented additional health impact data during the regulation development process, much of which is more recent than 2010.

The Department relies on studies and evaluations of health benefits performed by experts in the health fields and EPA's assessments of health benefits for similar regulations. The Department notes that the 2012 Indian River Impact Study mentioned by the commenter was conducted by the Delaware Division of Health and Social Services, and not the Delaware Department of Natural Resources and Environmental Control.

**COMMENT:**

A commenter states that the proposed regulation does not take into account expected "co-benefits" from upcoming federal regulations, specifically the Cross State Air Pollution Rule and the MATs rule.

**RESPONSE:**

Co-benefits are difficult to calculate at this time especially for rules taking effect in the 2018-2020 timeframe. The Cross State Air Pollution Rule has been delayed for five years due to litigation, all of which has not yet been resolved. Many facilities subject to this regulation are already achieving more NO<sub>x</sub> reductions than would be required by the rule. Implementation of the MATs rule does not, in and of itself, provide NO<sub>x</sub> benefits. Any NO<sub>x</sub> benefits that may be attributable to the MATS rule will be due to retirement of electric generating units, and no retirements of Maryland electric generating units are projected due to MATS. Reductions in NO<sub>x</sub> emissions due to retirement of units in upwind states are uncertain at this time.

**COMMENT:**

The commenter states that PJM capacity restructuring currently underway favors fuel certainty that coal facilities provide. The commenter asserts that retirement of coal facilities in conjunction with PJM's new regulations could increase the costs paid by Maryland consumers. The commenter asserts that this regulation eliminates needed coal-fired generation in Maryland.

**RESPONSE:**

The Department supports a diverse, but well-controlled, electricity generating fleet. This regulation does not eliminate coal-fired generation in Maryland. In fact, many of the State's coal-fired electric generating units are already well-controlled with state-of-the art NOx controls. Increased costs due to regulations proposed by PJM are not attributable to this regulation.

**COMMENT:**

A commenter includes in an appendix to the comments, a number of documents, including letters, testimony and presentations at meetings outside of the stakeholder process and correspondence between outside parties.

**RESPONSE:**

The Department has reviewed the appended materials. In some cases, the documents were not provided to the Department and no input was sought from the Department. Letters from Delegates Jameson and Bromwell were not addressed to the Department, nor was the Department copied on them. The Department has attempted to access the report upon which Austin Slater, Jr., President and CEO of SMECO based his testimony to the Senate Finance Committee, but the full report was not provided to the Committee and is not in the public record. Without the full report, the Department cannot respond to the issues raised by SMECO.

**COMMENT:**

A commenter states that data provided by electric utility operators in Maryland indicates approximately 1.4 million tons of coal are at risk as the result of the proposed regulations that could result in power plant shut downs or alternate fuel conversions. The commenter further inquires as to whether MDE views all coal types (Appalachian, Illinois Basin, and Western) equally in its calculation of NOx output and options for emission reductions.

**RESPONSE:**

The majority of coal used as fuel in Maryland plants is produced outside Maryland. Maryland coal is high quality coal and is typically shipped abroad for use in producing steel. Exports of this coal have been increasing in recent years. This regulation is not expected to have a significant economic impact on coal producers in Maryland.