Department of the Environment

COMAR 26.11.38 Control of NOx Emissions from Coal-Fired Electric Generating Units

An Update to AQCAC

Air Quality Control Advisory Council
October 6, 2014

Topics Covered

- A recap of the last month
- Brief overview of recent changes to the regulation resulting from stakeholder input
- How key issues have been addressed in the revised draft
- Next Steps and Schedule

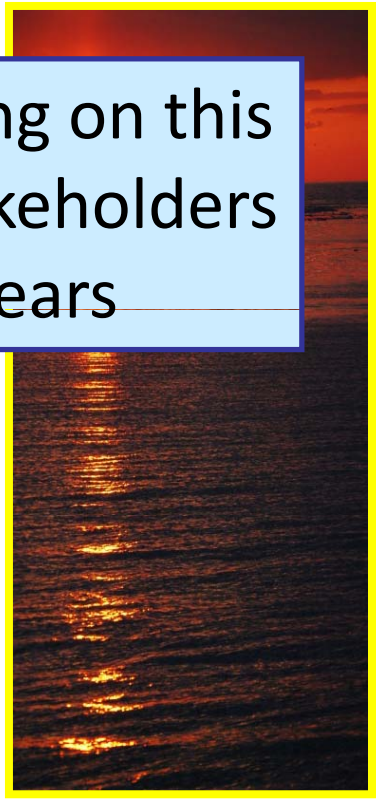
A Recap of the Past Month

- On September 8, MDE brought a new draft regulation on coal-fired power plants to AQCAC
- After a lengthy meeting, with numerous comments, AQCAC recommended to MDE that we move forward with the regulation …
  - But that we work with key stakeholders for about a month to try and resolve several issues
- A follow up AQCAC meeting was scheduled for October 6 for MDE to report back on any changes to the regulation that are needed
- That short stakeholder process has been completed
- We are asking AQCAC to reaffirm their earlier approval to move ahead with the changes being recommended at today's meeting

An Intense Stakeholder Process

- Regulation proposed to AQCAC on September 8, 2014
  - Motion to move forward
    reporting back to the Co
  - Recommended working
    resolve several issues
- MDE met with NRG, Raven Power and Sierra Club to resolve issues
  - A very intense process – Thanks to all
  - Face-to-face meetings on September 10, 17, 22 and 30
  - Numerous – maybe 30 to 40 – calls and individual meetings
- Final proposed regulation is supported by MDE and two of the three key stakeholders

MDE has been working on this regulation … with stakeholders … for almost 2 years



MDE 2014 NOx Regulations

- The basic structure of the regulation is fairly straight forward
- Two Phases – Three steps
  - Phase 1 - Immediate reductions
    - Step 1 - Minimize NOx emissions immediately by using current technologies each day of the summer ozone season
    - Step 2 - Immediately set a maximum "allowable" rate for a companies "system" to insure meaningful, consistent emission reductions from existing control technologies
  - Phase 2 – Deeper reductions later
    - Step 3 - Deeper reductions from units without state-of-the art controls by 2020
      - Focuses on smaller, lower capacity but high "peak-day" emission units
      - Crane 1 and 2, Wagner 2, Chalk Point 2 and the 3 units at Dickerson
      - Provides options to comply and significant time

The Major Changes

Substantive technical changes to step 1 … generally supported by all parties

Substantive technical and structural changes changes to step 3 … supported by MDE and 2 of 3 key stakeholders

Substantive Technical Changes to Step 1

- Regulation .03A(2) requires sources to minimize NOx emissions by optimizing the use of currently installed control technologies
- The regulation establishes emission rates that are used to "sceen" daily emissions
  - Below the rates … good performance
  - Above the rates … submit a report explaining why
- Changes to some of these rates were agreed upon as part of the stakeholder process

Affected Unit	24-Hour Block Average - NOx Emissions in lbs/MMBtu
Brandon Shores	
Unit 1	0.08
Unit 2 < 650 MWg ≥ 650 MWg	~~0.08~~ 0.07 0.15
C.P. Crane	
Unit 1	0.30
Unit 2	0.28
Chalk Point	
Unit 1 only	0.07
Unit 2 only	~~0.30~~ 0.33
Units 1 and 2 combined	~~0.18~~ 0.20
Dickerson	
Unit 1 only	0.24
Unit 2 only	0.24
Unit 3 only	0.24
Two or more Units combined	0.24
H.A. Wagner	
Unit 2	~~0.25~~ 0.34
Unit 3	0.07
Morgantown	
Unit 1	0.07
Unit 2	0.07

Substantive Structural Changes to Step 3

- Regulation .04 requires deeper reductions from sources that currently do not have state-of-the art controls
- The discussion and debate on how to structure this provision was by far the most intense
- The original proposal provided 4 options to comply with this requirement by 2018
- The final proposal provides 3 options but 2 years more time – to 2020
- MDE and 2 of the key stakeholder groups support this new, simplified approach
- A large amount of time was spent trying to find an agreeable solution on how to make the fourth option work
  - The group simply could not reach consensus

Regulation .04 - Deeper Reductions

.04 Additional NO_x Emission Control Requirements Beginning ~~May 31, 2015 and April 1, 2018~~ June 1, 2020.

C. General Requirements. The owner or operator of the affected electric generating units subject to this regulation shall choose from the following:

(1) Not later than June 1, ~~2018~~ 2020:

(a) Install and operate a selective catalytic reduction (SCR) control system; and

(b) Meet a NOx emission rate of ~~0.07~~ 0.09 lbs/MMBtu, as determined on a 30-day rolling average during the ozone season;

(2) Not later than June 1, ~~2018~~ 2020, permanently retire the unit; or

(3) Not later than June 1, ~~2018~~ 2020, switch fuel from coal to natural gas for the unit; ~~or~~

~~(4) Not later than April 1, 2016, meet a system-wide NOx emission rate during the ozone season or system-wide daily NOx tonnage cap during the ozone season calculated by assuming SCR controls at C.P. Crane units 1 and 2, Chalk Point unit 2, Dickerson units 1, 2, and 3 and H.A. Wagner unit 2 operated in a manner consistent with the requirements in § § .03A(2) and .04C(1)(b) and actual operations after 2007.~~

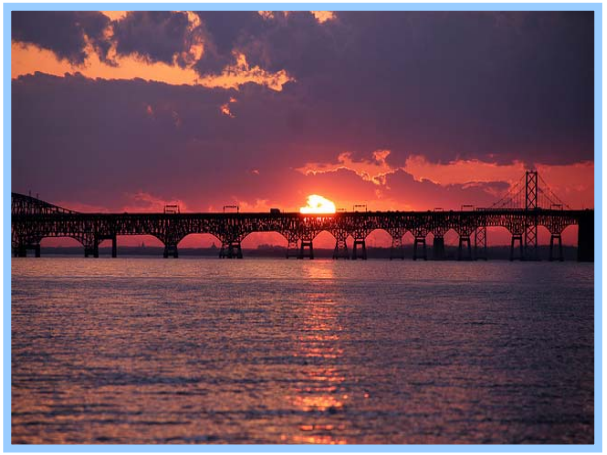
Other Changes

- Refined language for the definition of system operating day – p. 2
- Clarification on .03A(2) plan requirements – p. 3
- Inclusion of EPA in plan approvals – several pages
- Clarification on compliance procedures for .03A(2) – p. 4
- Other miscellaneous clarifications and clean-ups resulting from revised regulatory language

Key Issues …

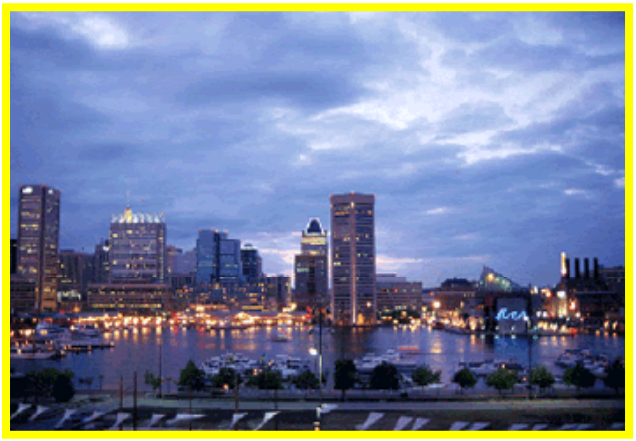
… and How They Were Resolved

- Insuring public health protection
- Maximizing reductions from existing control technologies
- Consistency with other states
- Providing time and flexibility to sources to implement Phase 2



Insuring Public Health Protection

- Maryland's ozone problem is amongst the worst in the Country
- Exposure to ground level ozone is a serious public health issue linked to asthma, many other respiratory problems and early mortality
  - Children are particularly sensitive
- The phased reductions in the regulation will reduce emissions significantly and help Maryland protect public health and meet current and future standards
- Will be one of the three largest ozone reducing programs in the new ozone plan (or SIP) required next June



Minimizing Emissions from Current Technologies

- Recent changes in the energy market and market-based control programs that use “ozone season emission caps” have lead to an unexpected situation where sources may comply with current regulations without always running control technologies effectively on the worst ozone days
- This regulation fixes that issue
- During the ozone season sources must optimize the use of existing control technologies to minimize NOx emissions each day
- There was unanimous support for this provision of the regulation

Consistency with Other States

- The regulation makes Maryland's requirements for coal-fired power plants consistent with other states like Delaware, New Jersey, New York, Connecticut, and Wisconsin.
- Pennsylvania's recently proposed update to their coal-fired power plant rule appears to be less stringent
  - It is being challenged by many interested parties

Flexibility and Time

- One of the major issues that MDE has attempted to address is how to avoid plant retirements
- The regulation's deadline for the deeper reductions was extended to 2020 to insure that companies had ample time to modernize the older less efficient units in their fleet
  - Most of these units in Maryland were built more than 50 years ago
- All of the older, less efficient units in Maryland are already investigating new technologies and fuels
  - For example, as recently as 2012, the 3 units at the Dickerson plant and Chalk Point unit 2 were planning to install SCRs by 2018. These plans have changed.
  - Several units have begun to actively investigate the use of natural gas as an alternative fuel
- The extension of the Phase 2 deadline to 2020 was a major compromise intended to give companies time to modernize their older units and avoid shutdowns

Proposed Regulatory Schedule

- 2012 to 2014
  - Many meetings, calls and other discussions with interested stakeholders
- October 6, 2014
  - Air Quality Control Advisory Council (AQCAC) Confirmation
- December 2014
  - Proposal in Maryland Register
- February 2015
  - Regulations become effective
- May 2015
  - Reductions begin