DEPARTMENT OF THE ENVIRONMENT
AIR AND RADIATION ADMINISTRATION

**RESPONSE TO COMMENTS**

for the

PUBLIC HEARING held on September 21, 2018
in BALTIMORE, MD
related to
the amendments to Regulation .01 under COMAR 26.11.01 – General Administrative Provisions, the amendments to Regulations .01, .02, .04, .05, .07 and .08-2, the repeal of Regulation .08-1, and adoption of new Regulation .10 under COMAR 26.11.08 – Control of Incinerators, and the amendment to Regulation .08 under COMAR 26.11.09 - Control of Fuel Burning Equipment, Stationary Internal Combustion Engines, and Certain Fuel-Burning Installations

Purpose of Hearing: The purpose of the public hearing was to allow for public comment on the Maryland Department of the Environment's (the Department or MDE) proposal regarding amendments to Regulation .01 under COMAR 26.11.01 – General Administrative Provisions, the amendments to Regulations .01, .02, .04, .05, .07 and .08-2, the repeal of Regulation .08-1, and adoption of new Regulation .10 under COMAR 26.11.08 – Control of Incinerators, and the amendment to Regulation .08 under COMAR 26.11.09 - Control of Fuel Burning Equipment, Stationary Internal Combustion Engines, and Certain Fuel-Burning Installations.

The proposed action repeals nitrogen oxide (NOx) reasonable available control technology (RACT) requirements under COMAR 26.11.09.08H and establishes new NOx RACT requirements. This action also includes the study of possible additional NOx emission control requirements under COMAR 26.11.08.10 for Large municipal waste combustors (MWCs). Maryland has two existing Large MWCs: Wheelabrator Baltimore L.P. (Wheelabrator or BRESCO) and Montgomery County Resource Recovery Facility (MCRRF).

Additionally, this action amends opacity requirements under 26.11.01, adds definitions, repeals 26.11.08.08-1 and updates references to 26.11.08.08-2, containing the current emission standards and requirements for hospital, medical and infectious waste incinerators (HMIWIs).

Date and Location: The public hearing was held on September 21, 2018 at 10 a.m. at the Department of the Environment, 1800 Washington Boulevard, 1st Floor Aeris Conference Room, Baltimore, Maryland 21230.

Attendance: 51 attendees. (see Attachment A – MWC NOx RACT Hearing Sign-In Sheet)

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

Comments and Responses: Comments were received from Northeast Maryland Waste Disposal Authority (NMWDA), Wheelabrator Baltimore, Inc., CCAN Action Fund, Environmental Integrity Project, Chesapeake Bay Foundation, Food & Water Watch, Energy Recovery Council, Solid Waste Association of North America, Veolia North America, Blue Water Baltimore, United Workers, Clean Water Action, Chesapeake Physicians for Social Responsibility, Energy Justice Network, Interfaith Power & Light and 118 citizens.

A summary of the comments received and the Departments responses are below.

**COMMENT:**
A commenter thanked the Department for the efforts related to drafting the regulations and the stakeholder outreach process. Although the Department was not able to incorporate all of the suggested language, the commenter supports the regulations as proposed and notes that the regulations will help Maryland meet ambient air quality standards for ozone.

**RESPONSE:**
The Department appreciates the comments and recognizes that throughout the stakeholder process, numerous comments and suggestions have been made, some diametrically opposed to comments offered by other stakeholders or federal policy. The Department made efforts to incorporate comments when appropriate and further took efforts to coordinate with federal agencies to develop regulatory language that was in compliance with the Clean Air Act (CAA).

**COMMENT:**
Multiple commenters supported the Department's effort to propose tighter regulations for Large municipal waste incinerators (MWCs). They also suggest that these regulations alone were not enough to be protective of public health and further called upon the Department to ensure that Wheelabrator Baltimore (Wheelabrator or BRESCO) prepares a rigorous and serious study that evaluates all options for pollution reduction as is required in the proposed regulation and that the Department then publish a stricter nitrogen oxide (NOx) regulation for BRESCO.

**RESPONSE:**
The Department appreciates the support for the proposed Large MWC NOx RACT regulations and encourages stakeholders to continue their collaborative efforts with the Department as we continue to review data and potential future control technologies for Large MWCs. With the adoption of the proposed regulations, NOx RACT limits will be effective by May 1, 2019, therefore, NOx reductions will be realized during the 2019 ozone season and beyond.

**COMMENT:**
Many commenters stated that air pollution from incinerators can worsen the symptoms of asthma and allergies, which are prevalent in Baltimore City. The commenters note that asthma is a leading cause of absenteeism in Baltimore schools and also causes Marylanders to miss work and increases health care expenses, causing economic hardship.

**RESPONSE:**
The Department agrees that reducing air pollution in the State of Maryland will provide beneficial human health and environmental outcomes. Researchers have associated ground-level 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 respiratory illnesses. NOx is an ozone precursor, and reducing NOx emissions will also reduce adverse health effects associated with nitrogen dioxide (NO2) exposure. These health benefits include fewer asthma attacks, hospital and emergency room visits, and lost work and school days.

**COMMENT:**
Several commenters stated that BRESCO produces far more NOx per energy output than the coal plants in the state - and its NOx emissions have remained about the same over the last decade, while emissions from coal plants and the state's other incinerator have significantly declined.

**RESPONSE:**
The progress the State has made on air pollution over the past 10 years is remarkable and much of this progress is due to recent laws and programs. In recent years Maryland has implemented the Maryland Healthy Air Act (HAA), one of the toughest power plant emissions laws on the East Coast, the Maryland Clean Cars Program, and the Federal Tier 2 Vehicle Standards. Maryland power plants have invested $2.6 billion in technology to comply with the Maryland HAA. Maryland has also adopted COMAR 26.11.38 - Control of NOx Emissions from Coal-Fired Electric Generating Units which has further reduced NOx emissions from Maryland's power plants.

These proposed regulations will continue the efforts to lower NOx emissions in the State. The proposed NOx RACT limits in this action for Large MWCs will result in approximately 200 tons of NOx emissions reduced on an annual basis. In regard to comparison of NOx per energy output, waste-to-energy (WTE) incineration typically does not have the same heat values that typical coal-fired power plants do because MWCs operate using a non-homogenous fuel source. Unlike the coal-fired power plants that are strictly for power supply, incineration has a dual purpose of reducing waste products and generating energy. BRESCO also generates steam which is used in Baltimore City's steam heating loop and further provides steam to power energy producing turbines.

**COMMENT:**
Several commenters stated that the Baltimore City Council has passed a resolution calling for MDE to use its legal authority to go beyond RACT and establish a 45-ppm NOx limit for the BRESCO incinerator.

**RESPONSE:** On July 17, 2017 the Baltimore City Council introduced Council Bill 17-0034R. In part, the Resolution stated that *"A NOx limit of 150 ppm on a 24-hour basis has been adopted as the RACT standard for municipal solid waste incinerators by the states of Connecticut and New Jersey and has been proposed for adoption in Massachusetts."* The Resolution further read *"That the Council urges the Maryland Department of the Environment to set a nitrogen oxides pollution limit for the Wheelabrator Baltimore incinerator that is no higher than the 150 ppm standard on a 24-hour average that has been adopted by Connecticut and New Jersey and proposed in Massachusetts, or, if at all possible, significantly lower than 150 ppm in order to provide maximum air quality benefits to residents of Baltimore."*

On August 30, 2017, Air Director Tad Aburn submitted a letter to the Baltimore City Council reading, in part, that the Department "*understands that the Council is considering a resolution 'urging the Maryland Department of the Environment to set a NOx pollution limit for the Wheelabrator Baltimore incinerator that is no higher than the 150 ppm standard on a 24-hour average…or, if at all possible, significantly lower than the 150 ppm in order to provide maximum air quality benefits to residents of Baltimore. The Department shares in your interest and concern for the health of our citizens and the protection of our environment'…The Department appreciates the City Council's attention to this matter. At their request, Council Members Edward Reisinger and Mary Pat Clarke have already been added to the Department's stakeholder list for this topic. The Department welcomes all members to attend a stakeholder meeting regarding the proposed regulations."*

On October 16, 2017, the Baltimore City Council adopted the Resolution which stated in part, *"The Council requests that the Maryland Department of the Environment use its legal authority to go beyond the RACT standard in order to set a nitrogen oxides limit of 45 ppm on a 24-hour basis, which is the limit that would likely be set for a new incinerator….Now, therefore, be it resolved by the City Council of Baltimore, That the Council urges the Maryland Department of the Environment to set a nitrogen oxides pollution limit for the Wheelabrator Baltimore incinerator that is no higher than the 150 ppm standard on a 24-hour average that has been adopted by Connecticut and New Jersey and proposed in Massachusetts, or, if at all possible, significantly lower than 150 pmm in order to provide maximum air quality benefits to the residents of Baltimore."*

As stated above, the purpose of these regulations is to establish new NOx RACT emissions rates. Under Section 182 of the CAA, 42 U.S.C. §7511a, sources in ozone nonattainment areas classified as moderate and above are subject to a NOx RACT requirement. Therefore, the CAA requires MDE to review and revise NOx RACT requirements in the Maryland State Implementation Plan (SIP) as necessary to achieve compliance with the NAAQS. EPA defines RACT as "the lowest emissions limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility." In reviewing existing NOx RACT requirements for adequacy, the Department considers technological advances, the stringency of the revised ozone standard and whether new sources subject to RACT requirements are present in the nonattainment area. The Department must examine existing controls on major sources of NOx to determine whether additional controls are economical and technically feasible, and include any such controls in Maryland's RACT SIP, where appropriate, to be approved by EPA.

The proposed amendments to COMAR 26.11.08 contain regulations requiring Wheelabrator to meet a NOx 24-hour block average emission rate of 150 ppmv. This NOx 24-hour block average emission rate of 150 ppmv is consistent with RACT rates in Connecticut, New Jersey and Massachusetts. Additionally, to further ensure consistent long-term operation of NOx control technologies, Maryland has taken the additional step of requiring the Large MWCs to meet new, individual NOx 30-day rolling average emission rates by May 1, 2020. Wheelabrator's NOx 30-day rolling average emission rate is 145 ppmv. The proposed NOx RACT requirements, when effective, will result in immediate reductions in NOx emissions from Wheelabrator.

This action also requires analysis of possible additional NOx emission control requirements under COMAR 26.11.08.10 for Large MWCs that may be needed by Maryland to attain and maintain compliance with the 2015 ozone NAAQS. Not later than January 1, 2020, Wheelabrator shall submit to the Department a feasibility analysis regarding additional control of NOx emissions from the Wheelabrator facility. Specifically, the proposed regulation under COMAR 26.11.08.10E(1)(b) requires: *"A written narrative and schematics detailing various state-of-the-art NOx control technologies for achieving additional NOx emission reductions from existing MWCs, including technologies capable of achieving NOx emission levels comparable to those for a new source in consideration of the overall facility design at Wheelabrator Baltimore Inc. facility;"*

**COMMENT:**
Some commenters stated that an expert evaluation of control tests and studies produced through the stakeholder process concluded that BRESCO could meet a 135-ppm daily NOx limit today just by optimizing its existing control technology. MDE should require BRESCO to run its existing controls in the most effective way possible. Requiring the most reduced emissions rate for this source category would be consistent with Maryland's statements in its Clean Air Act 126 and 176a Petitions.

**RESPONSE:** The Department has included optimization language in the proposed regulations that is similar to and consistent with the optimization language in Maryland State NOx regulations for coal-fired power plants and the requests in Maryland's CAA section 126(b) Petition. The proposed COMAR 26.11.08.10A requires: *"The owner and operator of a Large MWC 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 CFR §60.11(d)) for such equipment and the unit at all times the unit is in operation, including periods of startup and shutdown."*

With the inherent variability of the refuse being incinerated at Large MWCs, municipal solid waste is considered a non-homogeneous fuel. Correspondingly, there is the potential for variability in the NOx emissions depending on multiple factors including the variability of the waste itself (including seasonal variability), moisture levels, temperature, etc. Considering the optimization study conducted by Wheelabrator was of a limited time frame, the Department does not believe there is currently sufficient evidence to support a lower 24-hour NOx RACT emission limit. In addition, in order to ensure compliance and avoid violation with the proposed 24-hour NOx RACT limit, it is anticipated that operators will control NOx emission levels below 150 ppmv on an hourly basis.

**COMMENT:**
Multiple commenters stated the Maryland should be moving towards zero waste initiatives and stated that there is no need for the BRESCO facility.

**RESPONSE:**
The Department promotes and encourages waste diversion across the State of Maryland. Waste diversion combines both recycling and source reduction activities. In 2017, Governor Hogan signed Executive Order 01.01.2017.13 – Waste Reduction and Resource Recovery Plan for Maryland. This Executive Order calls for the Department to consult with stakeholders on the State's methodology for tracking waste generation, recycling, and source reduction, and to (1) recommend to the Governor a method of obtaining business source reduction and recycling data; (2) establish an improved method of tracking the statewide recycling and source reduction rates; and (3) establish voluntary statewide goals to encourage continuous improvement of sustainable materials management. MDE recently put Goals and Measurements Draft Recommendations out for public comment.

Currently, the primary metrics tracked in Maryland are those established under the Maryland Recycling Act (MRA). These include county and statewide recycling rates and waste diversion rates. The waste diversion rate consists of the recycling rate plus a "source reduction credit" of up to 5 percentage points. The credit is derived from activities that the counties report having conducted to reduce the generation of waste (*e.g.*, conducting waste prevention outreach). Under the MRA, counties are required to plan for and meet minimum recycling rates of 20 or 35 percent, depending on their populations. In 2012, the State established a voluntary statewide goal of 55 percent recycling and 60 percent waste diversion by 2020. Maryland's waste diversion rate has increased steadily from a 19% recycling rate in 1992 to the 46.9% waste diversion (*i.e.*, 42.9% recycling rate + 4% source reduction credit) rate in 2016.

According to Baltimore City's 10-Year Solid Waste Management Plan[1], Wheelabrator accepts waste from Baltimore City, and Harford, Howard, Anne Arundel, Montgomery, and Prince George's Counties. In 2011, Wheelabrator Baltimore, L.P. accepted 701,636 tons of commercial and residential refuse. A majority of this waste, 415,865 tons, is mixed municipal solid waste from Baltimore City.

Further, the Plan reads:
*"…the City will continue to investigate other techniques and technologies to further enhance not only its disposal capability but also its recycling and reuse strategies. A proven strategy such as reusing landfill space through "landfill mining" will be explored… Waste prevention and source reduction are the most cost effective ways to cope with declining landfill capacity. The City of Baltimore is actively promoting waste reduction within City government, among its citizens, and within the Baltimore region. In the same way that the American public has embraced the concepts of recycling and demanded of their governments and institutions that recycling programs be initiated, waste prevention and reduction are developing increased support."*

[1] City of Baltimore 10 Year Solid Waste Management Plan for 2013-2023
http://publicworks.baltimorecity.gov/sites/default/files/10%20Year%20Solid%20Waste%20Management%20Plan%20w%20Appendices_0.pdf

**COMMENT:**
A commenter stated that waste-to-energy (WTE) technology provides a reliable and renewable source of energy that results in net carbon reductions when compared with most other methods of waste disposal. For this reason, a well-run and maintained WTE facility can be a valuable component of a local government's integrated solid waste management plan. This would be in conjunction with existing and planned waste prevention, waste reduction and recycling programs. It is important to understand how waste-to-energy fits into the USEPA's current waste management hierarchy, the solid waste management plans of the communities they serve, and the long term-needs of local governments.

A commenter further stated that beneath Baltimore City's streets and bridges are extensive heating and cooling networks providing steam, hot water and chilled water to over 255 commercial, healthcare, government, institutional and hospitality customers in the central business district and in Inner Harbor East. Steam from the Wheelabrator facility supplies nearly 50 percent of the steam that a single energy business delivers through its Baltimore district energy system, avoiding 47,000 tons of CO2 annually– the equivalent of removing 8,400 cars from the road, and displacing the need for onsite boiler plants. Due to Wheelabrator's energy recovery systems, our business' steam system is four times more efficient than if steam was generated by combined heating and power alone – in addition to providing an alternative to fossil fuels like natural gas and fuel oil. The use of this renewable energy also helps the State of Maryland meet its goal of generating 25 percent of its energy from Tier 1 renewable resources by 2020.

And, a commenter states that WTE plants supply much needed base load renewable electricity to the nation's power grid. WTE facilities operate 365 days a year, 24 hours a day and can operate under severe conditions. For example, WTE facilities have continued to operate during hurricanes. In the aftermath of the storms, they have provided clean, safe and reliable waste disposal and energy generation. WTE facilities operate at an average of greater than 90% availability, which is higher than many forms of energy production.

**RESPONSE:**
The Department recognizes the benefit provided to Baltimore City through the production of steam and energy from Wheelabrator. According to Baltimore City's 10-Year Solid Waste Management Plan, Wheelabrator incinerates Baltimore's waste 24 hours a day, 7 days a week, and produces 510,000 pounds of steam per hour that is sold on the market and distributed through the City's steam heating loop or sent through power turbines that can produce 60 megawatts; enough to power 68,000 homes. The electricity generated at Wheelabrator is purchased by Baltimore Gas and Electric Company.

**COMMENT:**
Several commenters stated that incinerators are huge emitters of greenhouse gases and further stated that in 2015, the BRESCO incinerator emitted roughly double the amount of greenhouse gases per megawatt hour of energy than each of the six largest coal plants in Maryland.

Several commenters stated that the BRESCO incinerator receives subsidies under Maryland's Renewable Portfolio Standard (RPS) amounting to $10 million over the past six years, receiving

the same subsidies as wind and solar in our state. The commenters noted that the environmental community is working with the state legislature to stop subsidizing incineration.

A commenter supports the adoption of the proposed NOx RACT requirements reducing emissions from Maryland's two large WTE facilities, stating that both facilities are a clean, renewable, efficient, and economical form of energy production that have long been a proven and effective means of managing post-recycled waste within the State. WTE helps the U.S divert waste from landfills while producing renewable energy to reduce our reliance on fossil fuels to generate electricity.

**RESPONSE:**
Maryland has adopted numerous strategies as part of the ongoing efforts to combat climate change and reduce greenhouse gas emissions. Maryland's RPS requires Maryland to obtain 25 percent of its electricity from renewable sources, as defined by statute, by 2020, with a solar carve-out which requires that two percent be obtained from solar energy generation by 2020. The RPS incentivizes the development of renewable energy by requiring electricity suppliers to meet a prescribed portion of their energy supply needs using renewable energy sources.

Additionally, the State believes that enhanced recycling also plays an important role in reducing greenhouse gas emissions. In 2017, Governor Hogan signed Executive Order 01.01.2017.13 – Waste Reduction and Resource Recovery Plan for Maryland. This Executive Order lays out a path for even better results and a greater emphasis on sustainable materials management, and beneficial reuse. This promotes aggressive but achievable goals by coordinating Departmental efforts with local-decision-makers, business, and environmental stakeholders. Through that coordination, the Department continues to work on establishing multi-family and event recycling, finalizing and implementing new composting regulations and publishing composting facility guidance, encouraging food donation before composting or disposal, studying and updating source reduction credits, collaborating across agencies on business and market development, increasing environmentally preferable procurement and management of electronics and other materials, and conducting a waste study to target materials that can most easily be diverted from disposal.

**COMMENT:**
Commenters have stated that after reviewing numerous materials related to the BRESCO facility, that there are no technical impediments to the implementation of the most effective NOx-reducing technologies, such as selective catalytic reduction (SCR) (or hybrid SNCR/SCR), in the appropriate locations along the gas paths at each of the BRESCO boilers. These technologies should be reviewed in the feasibility analysis and could be installed to greatly reduce its NOx emissions and reduce the health burden of its pollution on Baltimoreans.

Further, commenters have stated that the feasibility analysis for BRESCO should, at minimum, address the installation of the following control technologies:

- Optimized SNCR, including analysis of ammonia versus urea injection
- Flue Gas Recirculation
- Fuel nitrogen content reduction strategy
- In-duct Hybrid SNCR/SCR

- Regenerative SCR (RSCR)
- Advanced Natural Gas Injection
- Injection or Combustion Optimization
- Additional temperature and flow profiling to inform injector height, positions, injection rates, and injector technology
- Additional flow modeling (in boiler and ducts) and optimization of combustion practices
- Replacement of electrostatic precipitator (ESP) with Baghouses
- Boiler modification to accommodate Covanta Low-$NO_x$ or similar technology
- Boiler replacement

**RESPONSE:**
The Department's "Technical Support Document (TSD) for Amendments to COMAR 26.11.08" on page 8 reads, in part, *"The feasibility analysis for Wheelabrator Baltimore Inc. should review and examine NOx emission control technologies capable of achieving NOx emission levels comparable to those for a new source (e.g. selective catalytic reduction – SCR)… The intent of the feasibility analysis is to evaluate what lower NOx RACT emission limit could be achieved at Wheelabrator Baltimore Inc. without a re-build of the entire facility."*

Further, the proposed regulation under COMAR 26.11.08.10E(1)(b) requires:
*"A written narrative and schematics detailing various state-of-the-art NOx control technologies for achieving additional NOx emission reductions from existing MWCs, including technologies capable of achieving NOx emission levels comparable to those for a new source in consideration of the overall facility design at Wheelabrator Baltimore Inc. facility;"*

As noted in the above TSD and regulatory excerpts, it is the Department's intent that the feasibility analysis shall include the review of various state-of-the-art NOx control technologies.

**COMMENT:**
Commenters have stated that BRESCO did not maintain the same emissions reductions that it achieved during 2017 optimization testing in the following months.

**RESPONSE:**
The Department acknowledges that the Wheelabrator facility demonstrated the ability to operate their NOx emission controls more effectively to limit air pollution during the 2017 optimization testing. The optimization study conducted by Fuel-Tech for Wheelabrator stated that: *"Longer term testing needs to be conducted to ensure that the 150 ppmdc target can be sustained while WTE units are operating throughout the normal range of fuel variations and boiler maintenance cycles."*

The Department is not aware of any further long term testing conducted by the Wheelabrator facility by operating their NOx emission controls at the optimized levels to demonstrate and ensure the long-term capability to do so. The proposed action requires Wheelabrator to meet the 24-hour NOx RACT limit of 150 ppmv starting May 1, 2019.

**COMMENT:**
Commenters have stated that MDE should begin to collect data from BRESCO now in order to evaluate the feasibility study. Data to be collected should include temperature profile and

computational fluid dynamics modeling, ammonia CEMS data, temporal fuel/waste composition data, and gas composition samples.

**RESPONSE:**
Under existing COMAR regulations, Large MWCs shall continuously monitor NOx emissions with a continuous emission monitoring system (CEM) in accordance with COMAR 26.11.01.11. This regulation further requires the submittal of quarterly reports to the Department.

Beginning July 1, 2019, the proposed amendments to COMAR 26.11.08.10 also require Large MWCs to submit quarterly reports to the Department containing data, information, and calculations which demonstrate compliance with the NOx RACT emission rates and NOx mass loading emission limits. The data to be collected includes NOx continuous emission monitoring data, stack flow data, and total urea flow rate to the boiler averaged over a 1-hour period. The reports shall include flagging of periods of startup and shutdown and exceedance of emission rates, as well as documented actions taken during periods of startup and shutdown in signed, contemporaneous operating logs.

Under COMAR 26.11.08.10E(1)(c) and E(2) the Department requires:
*(c) An analysis of whether each state-of-the-art control technology identified under §E(1)(b) of this regulation could technically be implemented at the Wheelabrator Baltimore Inc. facility; and*
*(2) Upon written request, Wheelabrator Baltimore Inc. shall submit any other information that the Department determines is necessary to evaluate the feasibility analysis.*

The Department considers these provisions sufficient to collect the appropriate information to determine whether various NOx emission control technologies could be installed at the Wheelabrator facility.

**COMMENT:**
Commenters have stated that MDE must revise subparagraphs E1(b) and (c) in proposed COMAR 26.11.08.10 to prevent BRESCO from excluding the most effective NOx controls from the analysis.

**RESPONSE:**
The Department disagrees that subparagraphs E1(b) and (c) in proposed COMAR 26.11.08.10 allows BRESCO to exclude the most effective NOx controls from the analysis. The Department requires BRESCO to analyze all state-of-the-art NOx control technologies in the feasibility analysis and then demonstrate to the Department whether such control technologies are technically feasible in consideration of the overall facility design at BRESCO.

**COMMENT:**
Commenters have stated that MDE should revise subparagraph E(2) in proposed COMAR 26.11.08.10 to require that additional information be provided within a defined time frame.

**RESPONSE:**
The Department disagrees with the concept of adding arbitrary deadlines into subparagraph E(2) in proposed COMAR 26.11.08.10. The Department does not know how extensive any such

future request to Wheelabrator will be, nor of the reasonable time frame needed to respond to such request. The Department does intend to utilize all information collected from the feasibility analysis and other available technical information to determine further NOx emission control needs for Wheelabrator.

**COMMENT:**
Commenters have stated that a presumptive limit should have been included in the rule requiring that BRESCO achieve SCR-level reductions of NOx and requiring a demonstration by Wheelabrator that it cannot meet this limit if the company wishes to avoid the presumptive limit.

**RESPONSE:**
The Department disagrees with the concept of establishing presumptive limits upon industry prior to determining the technical feasibility of implementing proven NOx emission control technology. This issue was debated before the Air Quality Control Advisory Council on December 17, 2017 and the Council concurred with the Department on this matter.

**COMMENT:**
Commenters have stated that MDE must revise the preamble to the proposed rule to state that MDE will commence a second rulemaking in 2020 in order to adopt stronger NOx limits for the Wheelabrator incinerator.

**RESPONSE:**
As the Department communicated to the Air Quality Control Advisory Council on December 17, 2017, after reviewing the results of the feasibility analysis, the Department intends to adopt a rule, as expeditiously as practicable, which will strengthen the NOx emissions limits at levels that are determined to be feasible. The Department has worked in partnership with affected sources, environmental organizations and the local community on the development of the proposed NOx RACT limits for Large MWCs and shall continue to do so following the submittal of the feasibility analysis.

**COMMENT:**
Commenters have stated that MDE must revise the proposed rule to clarify requirements during startup and shutdown events and further stated that MDE should clarify how a startup or shutdown event affects the period over which the 24-hour limits applicable during normal operations are calculated.

**RESPONSE:**
Section XI.D. of the EPA Startup, Shutdown and Malfunction (SSM) Policy provides recommendations for the development of alternative emission limitations applicable during startup and shutdown. *See* 80 Fed. Reg. at 33980. The EPA recommends that, in order to be approvable (*i.e.,* meet CAA requirements), alternative requirements applicable to the source during startup and shutdown should be narrowly tailored and take into account considerations such as the technological limitations of the specific source category and the control technology that is feasible during startup and shutdown.

During periods of startup and shutdown, the NOx mass loading emission limitations of COMAR 26.11.08.10 D(1) or (2) shall apply. A startup or shutdown period is restricted to 3-hours. The

NOx emission limit average mass loading calculation includes the 3-hours during the startup or shutdown period plus the remaining 21-hours of the 24-hour period.

During periods of startup and shutdown, COMAR 26.11.08.10D(3) or (4) specifies that the facility-specific NOx 24-hour average emission rates of §B shall apply to the 24-hour period after startup or the 24-hour period before shutdown, as applicable.

As an example for a startup, COMAR 26.11.08.10D(3) specifies that the facility-specific, NOx 24-hour average emission rate of COMAR 26.11.08.10B shall apply and be calculated utilizing the 24-hour period beginning at the end of the 3-hour startup period. Additionally, the NOx 24-hour average block emission rate of §B shall begin to be calculated anew during midnight following initiation of a startup.

This process ensures that during all hours of operation there is an applicable standard in place, as is required by EPA's 2015 SSM policy.

**COMMENT:**
Commenters have stated that MDE should require that the mass-based startup and shutdown limits for the BRESCO incinerator must be calculated based on stack flow rates derived from flow monitors.

**RESPONSE:**
The mass emission limit calculations for Wheelabrator are derived utilizing 40 CFR 60.58b(h)(2) of subpart Eb (Concentration correction to 7 percent oxygen) and EPA Method 19 to determine NOx emission rates based upon oxygen concentrations. Facility average flue gas flow rates are also utilized into the calculations. The calculation methodology for the mass emission limit is based upon the existing Prevention of Significant Deterioration (PSD) Approval for Wheelabrator and follows EPA approved methodology.

**COMMENT:**
Commenters have stated that MDE should require installation of Ammonia CEMS at BRESCO.

**RESPONSE:**
On June 5-9, 2017, Fuel-Tech conducted optimization tests and analysis for Wheelabrator as detailed in their report entitled, *NOx Optimization Project Wheelabrator Baltimore Inc. Baltimore, Maryland Units 1, 2 & 3.*

Fuel-Tech's optimization test objective was to achieve NOx levels consistently below 150 ppmdc with low ammonia slip, without producing a visible plume at the stack and to minimize impact of SNCR operation on waterwall platens. An excerpt from the optimization analysis reads as follows:

*"The use of the additional rear wall injector ports and modified injector tips enhanced the coverage of the injectors allowed for more flexibility to optimize the SNCR system to control NOx below the 150 ppmdc (corrected to 7% O2) target while simultaneously maintaining low ammonia slip levels."*

and…

*"Measuring the ammonia slip, a by-product of the SNCR process, is a very important part of evaluating SNCR performance in any application. Excessive ammonia slip can result in the formation of a detached visible ammonium chloride plume above the stack. As such, keeping the slip as low as possible is always a priority but increasing the NOx reduction efficiency is also as important. Finding the optimum balance between minimizing slip and achieving desired NOx reduction or emission levels is the key in getting the most out of the SNCR process.*

*The ammonia slip measurements that were taken on all 3 units were done using a modified EPA wet extraction method. This method is used exclusively by FTI to get a quick measurement of the slip. On all 3 units the slip samples were taken before the SDA to ensure that the measured slip was representative of the actual slip coming after the SNCR process. The samples were taken using a single glass lined and heated probe. During testing the plant was also monitoring the possible presence of a visible plume and at no time during the 3 days of testing and while running the units at the 150 ppmdc NOx set point was a detached plume visible. Ammonia slip results during the week registered the highest slip at 10 ppm but most of the tests were less than 5 ppm."*

Additionally, Large MWCs are subject to stringent continuous opacity monitoring and visible emission requirements as specified in COMAR 26.11.01.10 and 26.11.08.04 which ensures that enforcement measures are in place to detect and determine compliance in the event of a detached plume resulting from excess ammonia emissions.

**COMMENT:**
A commenter stated that Baltimore Harbor is the most polluted tributary to the Chesapeake Bay, and was first listed in 1996 as impaired for nutrients on Maryland's 303(d) list. Baltimore Harbor suffers from chronic discharges of nitrogen pollution from two wastewater treatment plants, significant sewage system leakage and overflows, and stormwater pollution. Atmospheric deposition of nitrogen contributes to the impairment of our waterways. In 2010, when the Chesapeake Bay TMDL for nutrients was established, atmospheric deposition was the largest source of nitrogen to the Chesapeake Bay watershed. NOx are the primary source of this atmospheric nitrogen. NOx emissions from the Wheelabrator incinerator are a substantial contributor to poor local and regional water quality.

**RESPONSE:**
The Department recognizes that air deposition is a significant source of the nitrogen pollution entering the Chesapeake Bay. Pollutants released into the air from local and out-of-state sources (primarily from power plants, industry and vehicle emissions) eventually make their way back down to the earth's surface and are dispersed onto the land and transported into waterways. In addition to other State and federal regulations currently in effect, the standards and requirements in the proposed regulation will reduce the amount of nitrogen entering the Bay each year.

**COMMENT:**
A commenter stated that while we understand the language *"emission levels comparable to those for a new source"* was added to the feasibility study as result of a December 11, 2017 Air Quality

Control Advisory Council (AQCAC) meeting recommendation and that MDE is bound by AQCAC's decision to include such language, we do not agree that it is consistent with further evaluation of RACT based NOx limits for existing MWCs. Thus, the language should not be included in the final regulation.

**RESPONSE:**
The Department is obligated to consider recommendations from AQCAC. The Department has stated in the Notice of Proposed Action published in Volume 45, Issue 17, of the August 17, 2018 Maryland Register that "This action also contains possible additional NOx emission control requirements that may be needed by Maryland to attain and maintain compliance with the 2015 ozone NAAQS." The Department may determine that additional NOx emission reductions from Large MWCs are needed by Maryland to achieve and maintain compliance with the 2015 70 ppb ozone NAAQS. This does not imply that such a requirement would necessarily be NOx RACT for Large MWCs.

**COMMENT:**
A commenter stated that we are pleased that MDE has provided clarification to the feasibility study requirement in the "Technical Support Document (TSD) for Amendments to COMAR 26.11.08", stating that NOx technologies capable of achieving "emission levels comparable to those for a new source" is not intended to include Selective Catalytic Reduction (SCR) as the significantly high cost and design complexity of SCR goes well beyond what would be considered NOx RACT for an existing MWC facility. Like MDE, we are unaware of any existing MWCs that have retrofitted SCR and the application of SCR NOx control technology remains strictly in the realm of NOx control technology for new MWCs facilities where SCR can be cost effectively integrated into the new facility design and footprint.

**RESPONSE:**
The Department's "Technical Support Document (TSD) for Amendments to COMAR 26.11.08" on page 8 reads, in part, *"The feasibility analysis for Wheelabrator Baltimore Inc. should review and examine NOx emission control technologies capable of achieving NOx emission levels comparable to those for a new source (e.g. selective catalytic reduction – SCR). The Department conducted research on existing MWCs around the country and was not able to find examples of existing MWCs that were retrofitted with an SCR. Adding SCR NOx emission control technologies, or other comparable NOx emission reduction strategies, would likely not be considered RACT because of the complex design requirements and cost issues. SCR NOx emission control strategies are standard equipment on new Large MWCs. The intent of the feasibility analysis is to evaluate what lower NOx RACT emission limit could be achieved at Wheelabrator Baltimore Inc. without a re-build of the entire facility."*

Further, the proposed regulation under COMAR 26.11.08.10E(1)(b) requires:
*"A written narrative and schematics detailing various state-of-the-art NOx control technologies for achieving additional NOx emission reductions from existing MWCs, including technologies capable of achieving NOx emission levels comparable to those for a new source in consideration of the overall facility design at Wheelabrator Baltimore Inc. facility;"*

The TSD language and the regulatory requirements of COMAR 26.11.08.10E(1)(b) do require that Wheelabrator's feasibility analysis includes the evaluation of SCR and all other state-of-the-art NOx control technologies that could be employed to further reduce NOx emissions from the Wheelabrator facility.

The Department does recognize that, to date, there have not been any existing MWCs identified that have been retrofitted with an SCR. However, this technology could potentially be installed at the Wheelabrator facility without a re-build of the entire facility, but that has yet to be determined. The third-party feasibility analysis should thoroughly and definitively detail whether SCR and other state-of-the-art NOx control technologies could technically be installed at Wheelabrator, independent of cost issues.

The Department stated in the TSD that *adding "SCR NOx emission control technologies, or other comparable NOx emission reduction strategies, would likely not be considered RACT because of the complex design requirements and cost issues"*. However, the Department may determine that additional NOx emission reductions from Large MWCs are needed by Maryland to achieve and maintain compliance with the 2015 70 ppb ozone NAAQS. This statement was intended to clarify that, while MDE may require additional controls, those controls would not necessarily be considered NOx RACT for Large MWCs.

**COMMENT:**
A commenter has stated that MDE further clarifies in the TSD that the intent of feasibility study is to evaluate what lower NOx RACT limit could be cost effectively achieved at Wheelabrator without a rebuild of the entire facility. Additionally, since the feasibility study requirement goes well beyond what is required for the ozone attainment state implementation plan (SIP), it should not be included in Maryland's SIP submitted to EPA for the 2008 ozone standard and should remain only a State requirement.

**RESPONSE:**
As noted in the Department's response above, the TSD language and the regulatory requirements of COMAR 26.11.08.10E(1)(b) do require that Wheelabrator includes the evaluation of SCR and all other state-of-the-art NOx control technologies that could be employed to further reduce NOx emissions from the Wheelabrator facility, that do not necessitate a rebuild of the entire facility. The third-party feasibility analysis should thoroughly and definitively detail whether SCR and other state-of-the-art NOx control technologies could technically be installed at Wheelabrator, independent of cost issues.

The amendments pertaining to COMAR 26.11.08.10E will not be submitted to the U.S. Environmental Protection Agency (EPA) for approval as part of Maryland's State Implementation Plan (SIP) at this time. The Department does not consider COMAR 26.11.08.10E to be NOx RACT for the 2008 ozone NAAQS.

**COMMENT:**
A commenter states that given that the State and Baltimore Area are already very close to attaining the 2015 ozone standard, and if the voluntary Peak Ozone NOx Reduction Program is

successful, further NOx reductions may not be required in the State plan to meet the state air quality goals.

**RESPONSE:**
On October 1, 2015, EPA strengthened the NAAQS for ozone to 70 ppb, based on scientific evidence about ozone's effects on public health and welfare. The Baltimore metropolitan area currently has a design value of 75 ppb, which exceeds the 2015 ozone NAAQS.

The Department appreciates the voluntary efforts that are being made by facilities and hopes to see measurable NOx emission reductions from facilities on predicted unhealthy ozone days, and a corresponding decrease in ground-level ozone from the Department's air quality monitoring network.

**COMMENT:**
A commenter requests that the proposed January 1, 2020 feasibility study submittal date be pushed back one year until January 1, 2021. The proposed date for the study is not even one year after the 150 ppm limit is required to be achieved and is before the 145 ppm limit requirement by May 1, 2020. As such, there is very little time to gain experience complying with the new 150 ppm limit and no time to gain experience with the 145 ppm limit, especially with respect to evaluating potential impacts on facility reliability. As MDE is aware, there is potential for accelerated boiler corrosion and decrease in facility reliability from the increase in urea use required to meet the RACT limits. From a practical perspective, since further evaluation and optimization of existing NOx control technologies will be a large part of the feasibility study, sufficient time is needed in order to do a comprehensive evaluation since the outcome of the study is proposing new NOx limits that must be continuously achieved.

**RESPONSE:**
The Department believes that sufficient time is provided in the regulation to conduct the feasibility analysis. On January 9, 2017, MDE had requested that Wheelabrator address the feasibility of installing COVANTA's Low-NOx control technology at BRESCO. Wheelabrator was able to perform an initial feasibility analysis of the Low-NOx control technology and present this information to stakeholders on January 17, 2017. The feasibility analysis requirements of COMAR 26.11.08.10E require a more thorough and robust study on potential NOx control technologies. However, this preliminary analysis conducted by Wheelabrator demonstrates that an analysis should be able to be prepared in time to meet the January 1, 2020 compliance date.

Wheelabrator has had the optimized NOx control technologies in place since June 2017, which provides two and a half years to conduct long-term testing and evaluation of the NOx emission controls operating to meet a 24-hour 150 ppmv emission limit.

**COMMENT:**
A commenter states that the quarterly reporting requirements under Section H (proposed COMAR 26.11.08.10H) could be aligned with reporting requirements under COMAR 26.11.01.1 lE(2)(c). As with these current reporting requirements, quarterly NOx RACT reporting would include dates, times, and information (i.e. reasons and corrective actions) for any exceedance of the NOx RACT limits and dates and averages for each startup and shutdown.

**RESPONSE:**
The Department agrees that a single quarterly report may be submitted to the Department that contains information to satisfy the requirements of COMAR 26.11.01.11E(2)(c) and COMAR 26.11.08.10H.

**COMMENT:**
A commenter states that MDE should clarify what is meant by "data, information and calculations" to be submitted in quarterly reports. Is the intent for MDE to receive all one hour averages of all NOx monitoring data to reconstruct the averages to verify compliance?

**RESPONSE:**
Correct. The Department requires hourly averages of NOx CEM data to be included in the quarterly report. The quarterly report should also contain NOx 24-hour average and 30-day average values as applicable.

**COMMENT:**
A commenter states that they are unsure why this level of information is required to be submitted quarterly for NOx RACT compliance since MDE has no such reporting requirement for the SO2, NOx and CO CEMS based limits under COMAR 26.11.08.08A - Emission Standards and General Requirements for Large MWCs. In accordance with COMAR 26.11.01.11E(2)(c), MDE already has the discretion to ask for any additional information necessary to evaluate compliance with limits.

**RESPONSE:**
The regulations contained under COMAR 26.11.08.08A are not part of Maryland's SIP for Large MWCs. COMAR 26.11.08.08A satisfies Maryland 111d and 129 State Plan requirements. Section 129 of the Clean Air Act (CAA) directs the Administrator to develop regulations under section 111 of the Act limiting emissions of nine air pollutants (i.e., particulate matter, carbon monoxide, dioxins/furans, sulfur dioxide, nitrogen oxides, hydrogen chloride, lead, mercury, and cadmium) from four categories of solid waste incineration units: municipal solid waste; hospital, medical and infectious solid waste; commercial and industrial solid waste; and other solid waste.

MDE is authorized to require information as necessary to determine continuous compliance. The reporting requirements specified under existing COMAR 26.11.01.11E(2)(c) and proposed COMAR 26.11.08.10H serve the purpose of demonstrating compliance for Maryland's SIP to satisfy the ozone NAAQS. MDE believes the quarterly reports are necessary and appropriate.

**COMMENT:**
A commenter requests that the 24-hour NOx limit of 150 ppmv compliance date for Wheelabrator could be changed to 6 months after the effective date of the regulation or May 1, 2019 whichever is later and the 30-day NOx limit of 145 ppmv compliance date could be 12 months after effective date of the regulation or May 1, 2020 whichever is later.

**RESPONSE:**
The Department believes that sufficient time has been provided to meet the compliance dates contained in COMAR 26.11.08.10. Wheelabrator has had the optimized NOx control technologies in place since June 2017, which provided a full year to conduct long-term testing and evaluation of the NOx emission controls to meet a 24-hour 150 ppmv emission limit and an additional year to demonstrate compliance with the 30-day 145 ppmv emission limit. Additionally, altering the compliance dates contained in the regulation would constitute a substantive amendment which would require re-proposal of the entire regulation and would delay adoption of the regulation for another full year.