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the Environment

NO_x RACT for Municipal Waste Combustors (MWCs)



AQCAC Briefing – June 6, 2016

Topics Covered

- MD NO_x RACT Review for Large MWCs
- MD MWC Sources
- Federal NO_x RACT Requirements
- Federal MWC Requirements
- MD Existing NO_x RACT for MWCs
- Regional and MDE NO_x RACT Updates
- Emission Reductions
- Regulation Timeline



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MD NO_x RACT Review for Large MWCs

- The purpose of this review is to establish new NO_x RACT standards and requirements for large municipal waste combustors (MWCs) with a capacity greater than 250 tons per day.
- There are two large MWCs in Maryland; Wheelabrator Baltimore, L.P. and Montgomery County Resource Recovery Facility (MCRRF).
- The Department has engaged in an active stakeholder process with affected sources and EPA



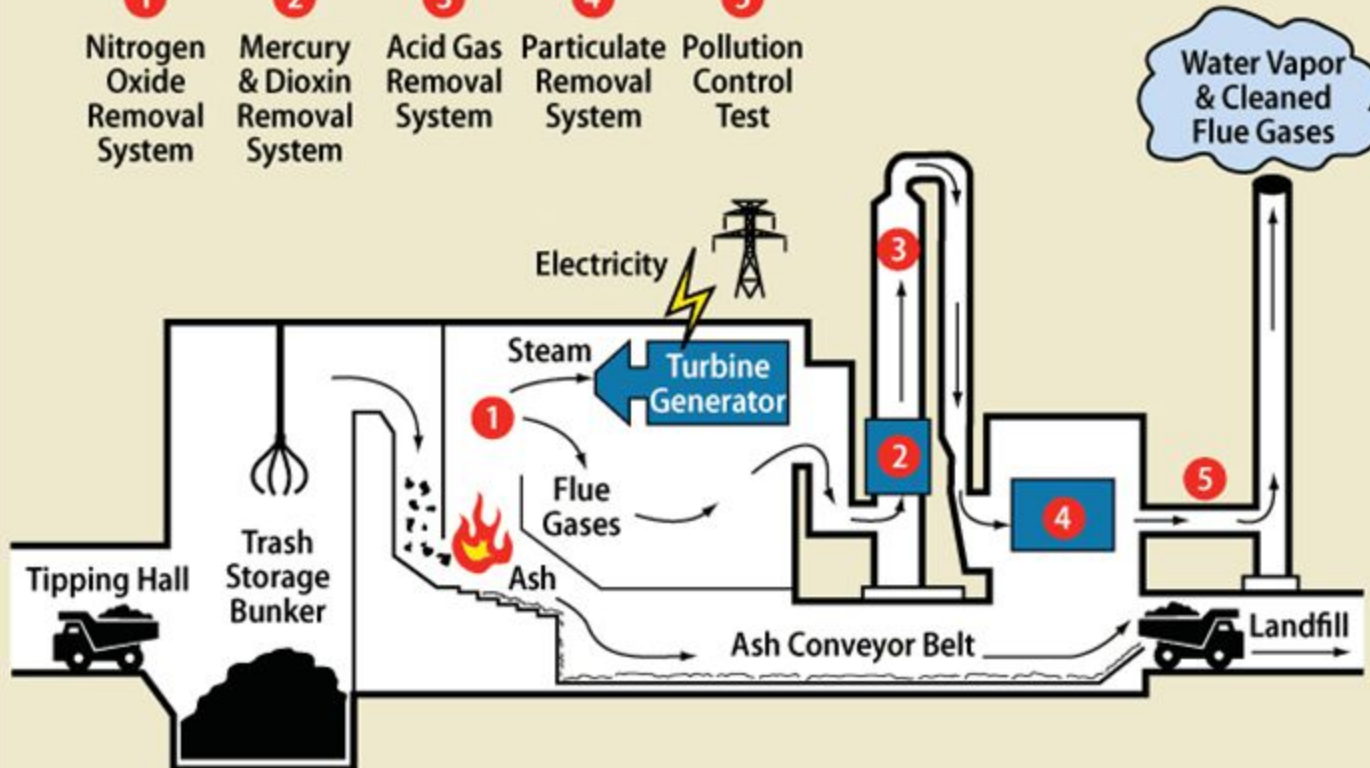
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What is a MWC?

Waste to Energy Plant Diagram

Pollution Control System

- | | | | | |
|-------------------------------|---------------------------------|-------------------------|----------------------------|------------------------|
| 1 | 2 | 3 | 4 | 5 |
| Nitrogen Oxide Removal System | Mercury & Dioxin Removal System | Acid Gas Removal System | Particulate Removal System | Pollution Control Test |



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Wheelabrator Facts

2,250

Tons of Waste Processed per day

730,150

Tons of Waste Processed Last Year



64 MW

Energy Generation Capacity

40,000

Homes Powered

1985

Began Operations



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Wheelabrator 2014 NOx Emissions

2014 Top 15 NOx Emission Sources in MD

No.	FACILITY	NOx Emissions(tpy)*
1	NRG Chalk Point Generating Station	3,877
2	Fort Smallwood Road Complex	3,638
3	Lehigh Cement Company LLC	2,902
4	Luke Paper Company	2,696
5	NRG Dickerson Generating Station	1,688
6	NRG Morgantown Generating Station	1,323
7	C. P. Crane LLC	1,247
8	Holcim (US), Inc	1,173
9	Wheelabrator Baltimore, LP	1,076
10	AES Warrior Run Inc	552
11	MCRRF	427
12	Harford County Resource Recovery Facility	284
13	Constellation Power - Perryman Generating Station	215
14	Mettiki Coal, LLC	125
15	Brandywine Power Facility	118

* Facility-wide NOx emissions



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MCRRF Facts

1,800

Tons of Waste Processed per day

599,250

Tons of Waste Processed Last Year



52 MW

Energy Generation Capacity

37,000

Homes Powered

1995

Began Operations



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MCRRF 2014 NOx Emissions

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Federal NOx RACT Requirements

- Under the Clean Air Act (CAA), 42 U.S.C. § 7401 et seq., sources in ozone nonattainment areas classified as moderate and above are subject to a NOx Reasonably Available Control Technology (RACT) requirement.
- Section 182 of the CAA requires States to review and revise NOx RACT requirements as necessary to achieve compliance with ambient air quality standards.
- EPA defines RACT as the lowest emissions limitation (e.g., on a part per million or pound per million Btu basis) that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility.



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MDE NO_x RACT Review

- MDE considers technological advances, the stringency of the revised ozone standard and whether new sources subject to RACT requirements are present in the nonattainment area.
- MDE also reviews regional RACT SIPs for existing sources to determine if meeting new standards or installing control technologies are economically and technically feasible.



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Federal Requirements for MWCs

- On December 19, 1995, EPA adopted standards for new MWC plants in 40 CFR 60 Subpart Eb and Emission Guidelines (EG) for existing MWCs Subpart Cb as part of an action under Section 111(d) and 129 of the CAA.
- On November 17, 1997, the Department adopted these regulations in COMAR 26.11.08.08 which, in part, established a **NO_x emission standard of 205 ppmv (parts per million by volume) based on a 24 hour average.**



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111(d) and 129 Requirements

- Section 111(d) establishes technology-based emission standards for major sources of dangerous air pollutants that are not tied to an air quality value or an ambient standard.
 - There are section 111(d) pollutants, and emission standards by source are set and approved through a “State Plan”.
- Section 129 requires plans for solid waste incinerators and establishes emission guidelines for both traditional criteria pollutants and non-criteria pollutants.



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Maryland NOx RACT for MWCs

- On October 18, 1999, the Department adopted source specific RACT limitations for a variety of major NOx emission sources, including MWCs, under COMAR 26.11.09.08.
- The NOx RACT for Large MWC sources required that NOx emissions may not exceed the NOx emission standards in COMAR 26.11.08.08 or applicable Prevention of Significant Deterioration limits, whichever is more restrictive.



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Regional Updates to MWC NOx RACT

- Region-wide, several states have proposed or revised NOx RACT standards for large MWCs.
- On April 20, 2009, New Jersey established a NOx RACT emission rate of 150 ppmvd.
 - Includes alternative compliance option allowing MWCs to apply for an alternative NOx emission rate.
- In May of 2013, Massachusetts proposed a NOx RACT of 150 ppmvd for MWCs equivalent to the type of large MWC plants operating in Maryland.
 - To date, Massachusetts proposal has not moved forward for adoption.
- Most recently, on April 23, 2016, Pennsylvania updated their RACT requirements and established a NOx emission rate of 180 ppmvd for MWCs.

MDE Updates to MWC NO_x RACT

- Based upon regional RACT amendments and source optimization studies conducted by Maryland sources, the Department has concluded that the NO_x RACT standards for MWCs can be improved upon based on the design of the combustor and year of installation.
- Maryland MWCs have demonstrated the potential to reduce NO_x emissions through analysis and optimization of existing controls.
- Updating NO_x RACT for MWCs in Maryland will result in reductions in NO_x emissions from these sources, which are needed to attain and maintain compliance with federal ozone standards.

Regulation Timeline

- **Stakeholder Meetings**
 - July 21, 2015
 - January 13, 2016
 - TBD Summer 2016
 - Numerous emails and conference calls with individual sources and EPA
- **AQCAC Briefing**
 - June 6, 2016
- **AQCAC Action Item**
 - September 19, 2016
- **Regulation Adoption**
 - NPA – December 2016
 - Public Hearing – January 2017
 - NFA – March 2017
- **Compliant Effective Date**
 - May 1, 2017



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Questions and Discussion



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Additional Slides



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Wheelabrator Baltimore, L.P. MWC

- Wheelabrator, formerly known as Baltimore RESCO, was built in Baltimore City in 1985 and operates three large mass-burn-waterwall MWCs each rated at 750 tons per day (TPD).
 - The facility can generate 60 megawatts (MW) of electricity.
 - Each MWC unit is equipped with a urea injection selective non-catalytic reduction (SNCR) system to control NO_x emissions; a “slaked lime” spray dryer absorber system to control acid gas emissions; an activated carbon injection system for mercury and dioxin/furan removal; and a four field electrostatic precipitator to remove particulate matter and metals from the exhaust stream.
 - Continuous monitors are required for carbon monoxide, oxygen, opacity, oxides of nitrogen, and sulfur dioxide.

Montgomery County Resource Recovery Facility (MCRRF)

- The MCRRF is operated by Covanta Montgomery, Inc. on behalf of the Northeast Maryland Waste Disposal Authority.
 - The facility is located in Dickerson, Montgomery County, Maryland and started operation in May 1995.
 - The MCRRF consists of three independent combustion trains and has a nominal design capacity of 1,800 tons per day TPD at 5,500 Btu/lb heating value of refuse.
 - The thermal output from the facility is used to generate 63 MW of electricity. The plant uses approximately 7 to 8 MW per hour of electricity.
- The emission controls consist of an ammonia injection SNCR system for control of NO_x, a dry scrubber for primary acid gas control and an activated carbon injection system for mercury control in series with a baghouse for removal of particulate matter.
 - Each unit has a furnace dry lime injection system that is capable of feeding hydrated lime directly into the combustion zone for additional acid gas control on an as needed basis.
 - Continuous monitors are required for carbon monoxide, oxygen, opacity, oxides of nitrogen, and sulfur dioxide.

MWC Emissions from 2011 NEI

State	NO _x TPY
CT	3,036
MA	4,781
MD	1,893
ME	1,521
NH	541
NJ	2,074
NY	4,660
PA	4,011



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