
ENVIRONMENTAL Fact Sheet



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Air Emissions in New Hampshire: Municipal Solid Waste Incinerators

Background

Until the mid 1970s, most of New Hampshire's solid waste was disposed of in landfills and town dumps. At that time, however, landfills were reaching capacity and state and federal regulations were passed prohibiting open burning at town dumps. The federal Resource Conservation and Recovery Act (RCRA) was also enacted in 1976 encouraging non-polluting methods of solid waste disposal. In response to the need for an alternative solid waste disposal method, municipal solid waste (MSW) incineration was implemented by a number of cities and towns throughout New Hampshire. Incinerators burn MSW to reduce the volume of solid waste, resulting in the production of ash which requires further disposal. Waste-to-energy incinerators recover energy from the burning of MSW in the form of electricity generation.

New Hampshire law (RSA 149-M *Solid Waste Management*) supports integrated solid waste disposal solutions which are environmentally safe and economically sound. The solid waste disposal methods endorsed by the state law include waste-to-energy technology and incineration of MSW without energy recovery. The law states that it is important to reserve landfill and incinerator capacity for solid wastes which cannot be reduced, reused, recycled, or composted. A key public health and environmental concern related to MSW incineration is its emissions to the air.

What is Municipal Solid Waste?

As used in this fact sheet, municipal solid waste includes primarily residential wastes with some commercial, industrial and institutional wastes, which are collected, transported, processed and disposed of by conventional means. It does not include medical and infectious waste, hazardous waste or construction and demolition (C&D) waste.

Municipal Solid Waste Incinerators in New Hampshire

As of January 2012, three MSW incinerators operate in New Hampshire, two of which are waste-to-energy facilities. General characteristics of each of these facilities are presented in the table below. More detailed information regarding each facility is available via DES's OneStop online database at: <http://www.des.state.nh.us/onestop/index.htm>.

Facility	Number of Municipal Waste Combustion units	Maximum Design Capacity (tons per day)	Maximum Permitted Capacity (tons per year)	Waste to Energy Facility?	Date Construction Commenced	# of NH Municipalities
Wheelabrator Concord	2	575	210,000	Yes; Gross generating capacity - 16 megawatts (MW)	1988	29
Wheelabrator Claremont	2	230	73,000	Yes; Gross generating capacity - 6 MW	1985	30
Hebron-Bridgewater Refuse District	1	9	3,285	No	2003	2

Air Emissions from MSW Incinerators

Air emissions from municipal solid waste incinerators vary depending on the contents of the solid waste and the completeness of combustion. Pollutants from MSW combustion have potential health-related risks and adverse environmental impacts. Pollutants from MSW burning often include:

- Acid gases - sulfur dioxide (SO₂) and hydrogen chloride (HCl);
- Particulate Matter - non-gaseous portion (unburned MSW, unburned fuel, sulfur compounds, carbon, ash, dust);
- Carbon Monoxide - a product of incomplete combustion;
- Nitrogen oxides - contributes to smog, acid rain, particulate formation and regional haze;
- Metals - Cadmium, lead and mercury;
- Dioxins and furans - family of chemical compounds that share certain similar chemical characteristics, and common mechanisms of toxicity.

State-of-the-art combustion facilities are equipped with pollution control equipment to reduce air emissions. Pollutants present in air emissions can be controlled in several ways:

1. Separation Prior to Combustion - Separation of certain materials prior to incineration is the best way individuals can reduce harmful air emissions. In particular, metals emissions are reduced if separation occurs before incineration. In efforts to remove toxic substances from the waste stream, New Hampshire has enacted legislation that requires manufacturers to phase out the presence of lead, cadmium, mercury and hexavalent chromium in packaging (Toxics-in-Packaging Law), and bans disposal of lead acid batteries in landfills and incinerators. New Hampshire state law also placed restrictions on the sale of certain mercury-added products and prohibits disposal of mercury-containing products in solid waste landfills, transfer stations, or incinerators.
2. Combustion Control - Proper combustion conditions are important in controlling air emissions. "Good combustion practices" include:
 - a. Operator training and certification;

- b. Operating requirements such as limits on steam production and carbon monoxide emissions; and
 - c. Continuous monitoring of emissions and operating parameters.
3. Removal of Pollutants from Gases by Using Post-Combustion Pollution Control Equipment - Air pollution control equipment used at the MSW combustion facilities in New Hampshire are summarized in the table below:

Facility	Air Pollution Control Equipment	Air Pollutants Controlled
Wheelabrator Concord	Selective Non-Catalytic Reduction with urea injection	NOx
	Powdered Activated Carbon Injection (PACIS)	Mercury
	Spray Dryer Absorber (SDA) with lime injection	Acid gases HCl & SO ₂ ; Also lowers exhaust gas temperature and produces optimum condition for carbon to bond with mercury
	Fabric filter	Particulate matter and metals such as cadmium and lead
Wheelabrator Claremont	PACIS	Mercury
	SDA with lime injection	Acid gases HCl & SO ₂ ; Also lowers exhaust gas temperature and produces optimum condition for carbon to bond with mercury
	Fabric filter	Particulate matter and metals such as cadmium and lead
Hebron-Bridgewater Refuse District	Wet Scrubber	Particulate matter and metals such as cadmium and lead

State and Federal Regulations to Control Air Emissions from MSW Incinerators

In addition to many efforts to limit toxic compounds from entering the waste stream, DES regulates air emissions from MSW incinerators under the New Hampshire Code of Administrative Rules and the federal Clean Air Act Amendments of 1990. Regulatory applicability is dependent upon the combustion capacity of the facility and the date the facility was constructed or modified.

Section 129 of the Clean Air Act (CAA), entitled “Solid Waste Combustion”, requires EPA to develop and adopt New Source Performance Standards (NSPS) and emission guidelines for solid waste incineration units pursuant to sections 111 and 129¹. Section 111(b) of CAA (NSPS program) addresses emissions from new MWC units and section 111(d) of CAA (emission guidelines program) addresses emissions from existing MWC units. The NSPS are directly enforceable federal regulations. The emission guidelines are implemented by State air pollution control agencies through sections 111(d)/129 State plans.

EPA developed emission guidelines for three categories of existing MWCs. The categories, defined as “large MWCs”, “small MWCs” and “very small MWCs”, are classified based on the total design capacities of the incineration units.

1. Existing large MWCs are defined as those units that have a combustion capacity greater than 250 tons per day (tpd) of MSW and for which construction was commenced on or

¹ Federal solid waste rules can be found at <http://www.epa.gov/ttn/atw/eparules.html>.

before September 20, 1994. EPA established emission guidelines for large MWCs under 40 Code of Federal Regulations (CFR) 60 subpart Cb. Wheelabrator Concord facility has two large MWC units.

2. Existing small MWCs are defined as those units that have a combustion capacity of 35 to 250 tpd of MSW and for which construction was commenced on or before August 30, 1999. Small MWCs are further subcategorized as Class I and Class II units. Class I units are small MWC units that are located at municipal waste combustion plants with an aggregate plant combustion capacity greater than 250 tpd of MSW. Class II units are small MWC units that are located at municipal waste combustion plants with an aggregate plant combustion capacity less than or equal to 250 tpd of MSW. EPA established emission guidelines for small MWCs under 40 CFR 60 subpart BBBB. Wheelabrator Claremont facility has two class II MWC units.
3. Existing very small MWCs are defined as those units that have a combustion capacity of less than 35 tpd of MSW and for which construction was commenced on or before December 9, 2004. EPA established emission guidelines for very small MWCs under 40 CFR 60 subpart FFFF. Hebron-Bridgewater Regional Refuse District operates one very small MWC unit.

The New Hampshire Department of Environmental Services (DES) adopted Env-A 3300 *Municipal Waste Combustion*, incorporating the requirements of 40 CFR subparts Cb and BBBB for existing large and small MWC units. Similarly, New Hampshire adopted Env-A 4300 *Other Solid Waste Incineration* incorporating the requirements of 40 CFR 60 subpart FFFF for very small MWC units. Both the rules established emission standards for:

- Particulate matter;
- Opacity;
- Acid Gases - SO₂ and HCl;
- NO_x
- Metals - Cadmium, lead, and mercury;
- Organics - Dioxins and furans;

DES rules² require operator training and certification, continuous emissions monitoring, continuous parameter monitoring and performance testing. DES monitors these parameters through its Title V operating permit program.

For More Information

For more information on municipal solid waste incinerators in New Hampshire and federal and state regulations for controlling air emissions from these facilities, please contact the:

New Hampshire Department of Environmental Services

Air Resources Division

(603) 271-1370

www.des.nh.gov

² Municipal Waste Combustion regulations adopted by DES can be found at:
<http://www.des.state.nh.us/organization/commissioner/legal/rules/index.htm#air>