

Regulatory Status of Spent Fabric Filter Bags Generated by Resource Recovery Municipal Waste Combustors (Waste to Energy Units)

RIN Presentation

November, 2014

Purpose of Discussion

- To explain EPA's determination that the current (and common) practice of managing and burning used fabric filter bags on-site in the combustion unit resource recovery municipal waste combustor (RRMWC) or waste to energy (WTE) facility¹ is consistent with EPA's 1995 implementation strategy, also referred to as the "four walls" policy.
 - The "four walls" policy identifies the point at which RCRA Subtitle C jurisdiction for RRMWC ash and other materials applies.
 - A waste that falls within the scope of the four walls policy is not be subject to RCRA Subtitle C regulation even when it would otherwise be hazardous (e.g., toxic for lead and cadmium).

¹ Note: This briefing will use the term RRMWC, which has the same meaning as a waste-to-energy combustion unit.

Agenda

- Background
 - RRMWC industry profile
 - Information on Baghouse filters
- Short Legal and Regulatory History
- EPA's "four walls" policy
- Issue genesis
- Agency decision

Industry Profile

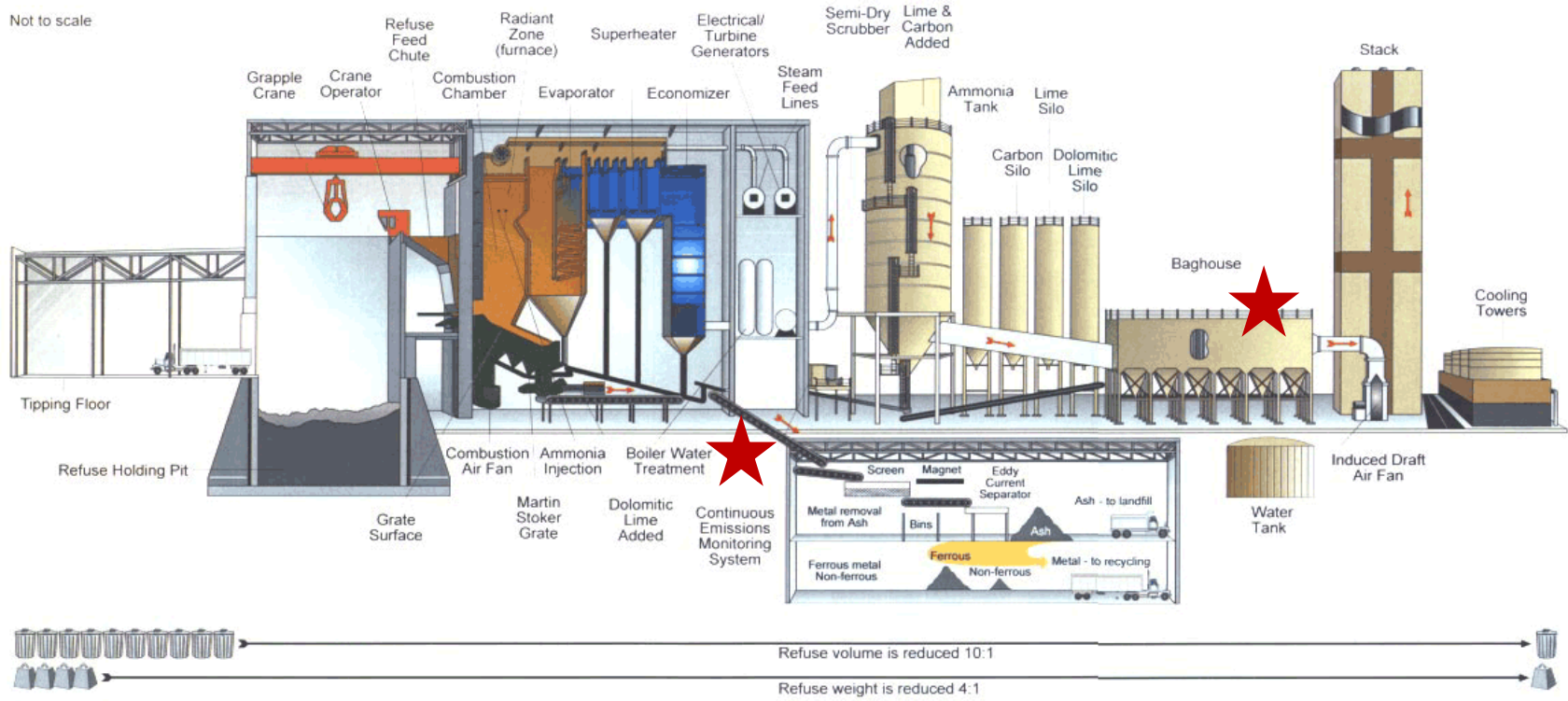
- The MWC industry, as of 2010, consists of 86 RRMWC facilities across 24 states. Most facilities are in Regions 1 through 5.
 - Of the 86 facilities, **71 use baghouse fabric filters** to control particulate matter (PM) emissions. The remainder use electrostatic precipitators.
 - A baghouse at a WTE facility may use thousands of fabric filter bags.
- Existing studies show that fly ash, which is typically captured by baghouse filter bags, contains the highest concentrations of inorganic chemical constituents and is more likely to fail the TC than either bottom ash or combinations of bottom ash and fly ash.
- Discussions with EPA's air office indicate that Clean Air Act (CAA) regulations do not specifically address the disposition of spent fabric filter bags.

Industry Profile (continued)

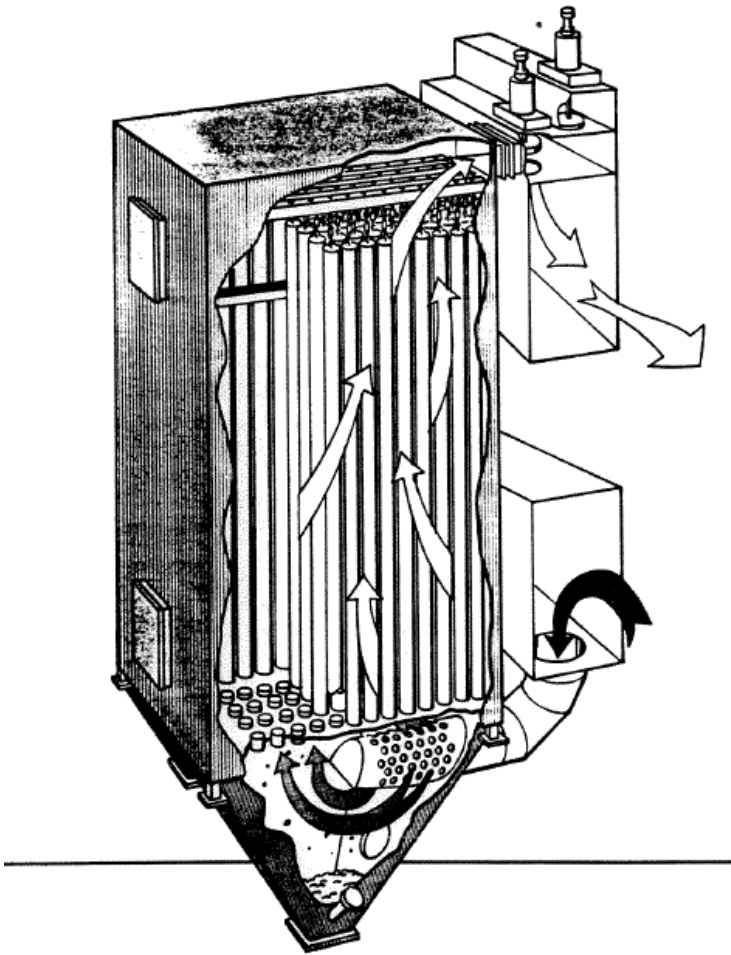
- Spent baghouse filter bags are often characteristically hazardous for cadmium and lead
- ORCR is aware of two industry practices related to spent baghouse filters:
 - Burn the spent filters on-site-(80% of facilities): These facilities double-bag the spent filters, remove them from the baghouse building, truck them to the waste feed area, and burn them in their RRMWC. If tested, these spent filters would apparently fail the TC for lead and cadmium.
 - Send the spent filters to an off-site TSDf-(20% of facilities): These facilities manage spent filters that fail the TC as hazardous waste and send them off-site to a TSDf.
 - **Note:** Removal of these filter bags mostly occurs once every 3-5 years for about a week.
- Under section 129 of the CAA, RRMWCs are subject to numerical emission limits at all times for both cadmium and lead. RRMWCs are subject to periodic performance (stack) testing to demonstrate compliance.
 - ORCR has very little data showing emission levels of cadmium and lead when burning spent filters.
 - Covanta, the largest owner/operator of RRMWC facilities, provided data to Connecticut DEEP that estimated a minor increase in cadmium and lead when burning spent filters (6-7%). However, it is not clear how Covanta developed these estimates.
 - A recent risk analysis sponsored by the American Society of Mechanical Engineers' (ASME) Research Committee on Energy, Environment, Waste and the Materials and Energy Recovery Division estimates the increased risks from burning spent baghouse filters in MWCs to be negligible.

Background: Example RRMWC Facility (Fairfax County's Energy Resource Recovery Facility)

★ Focus areas for today's briefing



Background: Baghouse/Fabric Filter



- Air pollution control device designed to remove PM and other pollutants entrained in the flue gas.
- Baghouse is the structure that houses the fabric filter system.
- Fabric filters typically consist of one or more compartments containing long cylindrical fabric bags.
 - Baghouse at Fairfax County's Energy Resource Recovery Facility:
 - 12 compartments of 210 bags each = 2,520 fabric filter bags
 - Designed to use 10 of 12 compartments at full operation
- Particles collect on the filters and form a dust cake layer on the filter surface which enhances collection efficiency & adsorption.
- Cleaning systems vary, but PM generally falls to the collection hopper beneath the fabric filter system where it is refined as fly ash.
- Fabric filters are very efficient PM-collection devices.
 - Well designed, operated, and maintained devices should achieve PM removal efficiencies > 99.9%

Background: Baghouse/Fabric Filter



- Fabric materials usually woven fabric, felted fabric, or membrane:
 - Natural fibers (cotton)
 - Synthetic fibers (e.g., Nylon, Teflon, Nomex, Gortex, fiberglass, acrylic)
- Factors for fabric selection:
 - Temperature
 - Corrosion resistance
 - Ability to handle effects of humidity
 - Fabric mechanical strength
- Typical bag life is 2 to 5 years.
- Common causes of fabric failure:
 - Improper bag installation
 - High temperatures
 - Condensation
 - Chemical degradation
 - Bag abrasion
 - High pressure drop

Short Legal and Regulatory History

DRAFT DELIBERATIVE DO NOT CITE

- May 2, 1994 Supreme Court decision (*City of Chicago v. Environmental Defense Fund, Inc.*)
 - Case focused on the scope and applicability of Section 3001 (i) of RCRA (Clarification of Household Waste Exclusion) which was added to RCRA as part of the 1984 Hazardous and Solid Waste (HSWA) Amendments
 - This provision exempted from Subtitle C regulation resource recovery facilities recovering energy from the mass burning of municipal solid waste if such facility receives and burns only household hazardous wastes (HHW) and nonhazardous commercial and industrial wastes.
 - In codifying Section 3001 (i) into regulation in **1985**, EPA interpreted the statute to **not exempt the management of ash from Subtitle C.**
 - In September **1992**, EPA Administrator signed memorandum announcing **that the Agency re-interpreted Section 3001 (i) to exempt ash from all Subtitle C requirements** at RRMWC facilities burning exempt HHW and nonhazardous commercial and industrial wastes.
 - EDF sued EPA for its re-interpretation exempting ash from all Subtitle C requirements.
- The Supreme Court interpreted Section 3001 (i) and held that **ash** exhibiting a hazardous waste characteristic generated at resource recovery facilities only burning HHW and non-hazardous commercial wastes **is not exempt from the hazardous waste requirements of RCRA Subtitle C.**
- However, the Court also did not specify the **point at which the ash generated** by the RRMWC facility becomes subject to Subtitle C of RCRA.

Short Legal and Regulatory History (continued)

- On February 3, 1995, EPA responded to numerous requests for clarification on the point of generation question by issuing a Notice of Statutory Interpretation of when **ash** generated by a RRMWC facility is first subject to RCRA Subtitle C (60 FR 6666).
 - EPA concluded in its FR notice that the point the ash exits the RRMWC, defined as the combustion building and connected air pollution control system (APCS) is the location where a hazardous waste determination must be conducted and becomes the point of generation of the ash.
 - This approach was practical and implementable for local governments, and environmentally protective.
 - Therefore, fly ash and bottom ash that were combined at the end of the combustion process and within the combustion building, and exhibited no hazardous waste characteristics (i.e., it passes the TCLP) when it exits that building, may be sent to a nonhazardous waste facility for disposal.
 - **Note:** This strategy soon took on the name of the “**four walls**” principle.
- There also was no discussion or indication in either the interpretive rule or implementation strategy regarding baghouse filter bags and how they were to be addressed.

“Four Walls Policy”

- The 1995 implementation strategy recognized that the combustion building and air pollution control system (APCS) are not always confined within a single structure enclosed by four walls. The 1995 strategy provides:
 - At RRMWCs where the ash always moves between structures (combustion building, APCS, ash conditioning building) in enclosed conveyers, such configurations would fall within the common sense meaning of the resource recovery facility. Thus, the point of Subtitle C jurisdiction would be the point the ash leaves the last enclosed ash management unit.
 - For example, one practice is to automatically convey (in an enclosed system) fly ash and bottom ash to a separate ash building where the combined ash is conditioned prior to being sent to a disposal unit. The point of Subtitle C jurisdiction is when the combined ash leaves the ash conditioning building.
- In contrast, ash that is not in an enclosed system would fall outside of the meaning of resource recovery facility and the point of Subtitle C jurisdiction would be at the various exit points from the resource recovery facility.
 - For example, in a facility configuration where bottom ash leaves the combustion building, while fly ash is collected in a roll-off container located near the fly ash baghouse, two separate exit points exist. Here, the RRMWC operator would need to make a hazardous waste determination at each location.

Issue Genesis

- About 18 months ago, EPA became aware of several RRMWC facilities around the country burning the spent fabric filter bags in their WTE combustion unit.
- A few states with several RRMWC facilities (e.g., New Hampshire, Connecticut and possibly Massachusetts) had either taken enforcement action or were contemplating taking enforcement action against these facilities, citing the facility for treating a hazardous waste without a RCRA hazardous waste permit.
- During the spring and summer of 2013, the Agency received letters from the Town of Huntington, New York, and the States of New Hampshire, Connecticut and Florida seeking clarification on whether the baghouse filters fit within the “four walls” principle or were subject to RCRA subtitle C regulation.
- Also during this time period ORCR met with representatives from MWC companies, municipalities, and trade associations representing the MWC industry and municipalities to discuss this issue.
 - The discussions focused on the safety of existing practices and the economic and enforcement implications of a potential EPA policy change on their facility or industry.
- Throughout the fall and winter, EPA also continued to receive letters from municipalities and trade associations primarily supporting the existing “four walls policy.”

Agency Decision

- Based on our analysis of the 1995 statutory interpretation regarding ash, and as articulated in the Barnes Johnson’s letter, the Agency has found that spent baghouse filters, when managed as follows:
 - Spent baghouse filters are removed from the air pollution control equipment
 - Double bagged to ensure containment, then
 - Removed from the baghouse building and directly transferred to the waste feed area, and immediately
 - Inserted into the combustor.....

 - Fits within the scope of EPA’s 1995 interpretation because the baghouse filters are still “constructively” within the resource recovery facility. Thus, baghouse filters remain excluded from Subtitle C control.

 - As part of our decision, we also emphasized that this interpretation is limited to the immediate burning of the baghouse filters, and is not related to any other materials generated by a WTE facility that may not necessarily be managed within the resource recovery facility.