

**DSIWM GUIDANCE DOCUMENT**

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SUBJECT: Regulatory Status of Ash From The Co-Combustion of Coal and Alternative Fuels

GUIDANCE NUMBER: 0525

REFERENCES: Municipal Solid Waste Industrial Solid Waste Residual Solid Waste  
OAC 3745-27-01 N/A OAC 3745-30-01

CROSS REFERENCES: DSW Policy 0400.007 - Beneficial Use of Nontoxic Bottom Ash, Fly Ash, and Spent Foundry Sand, and Other Exempt Wastes

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**I. PURPOSE**

The purpose of this guidance document is to clarify when bottom ash and fly ash produced by the co-combustion of coal and alternative fuels in fuel burning operations qualify as exempt waste, municipal solid waste, industrial solid waste, residual solid waste, or hazardous waste. This document also outlines the options available to manage each of these ash wastes.

**II. APPLICABILITY**

This guidance document is applicable to anyone who generates an ash material as the result of fuel burning operations.

**III. DEFINITIONS**

OAC Rule 3745-27-01(E)(8) defines **municipal solid waste** as "a type of solid waste generated from community, commercial, and agricultural operations, including, but not limited to the following...(e) fly ash and bottom ash generated from the incineration of municipal solid waste provided the fly ash and bottom ash is not regulated as a hazardous waste."

OAC Rule 3745-30-01(B) defines residual solid waste in terms of the types of wastes which qualify as residual solid waste. Included are "the following wastes generated by fuel burning operations which are regulated by Rule 3745-17-10 of the Administrative Code and which burn as fuel primarily coal: air pollution control wastes, water pollution control wastes, and other wastes with similar characteristics which are approved by the Director or his Authorized Representative."

ORC 3734.01(E) defines **solid wastes** as such unwanted residual solid or semisolid material as results from industrial, commercial, agricultural, and community operations, excluding ... nontoxic fly ash and bottom ash, including at least ash that results from the combustion of coal and ash that results from the combustion of coal in combination with scrap tires where scrap tires comprise not more than fifty per cent of the heat input for any month ...

Ohio EPA Policy DSW 0400.007 defines **Nontoxic bottom ash and fly ash** as bottom ash and fly ash generated by fuel burning operations which burn as fuel primarily coal where the leachate (from either an acid or deionized water extraction of the material, obtained through the toxicity characteristic leaching procedure (TCLP), as determined in accordance with the testing procedures described in this policy) does not exceed thirty times the levels specified in OAC Rule 3745-81-11(B) for any parameter listed in the policy.

**Exempt Wastes** are those wastes that are excluded from the definition of solid waste and include nontoxic fly ash and bottom ash, spent non-toxic foundry sand and slag.

#### IV. BACKGROUND

The Division of Solid and Infectious Waste Management has received several requests for clarification regarding how bottom ash and fly ash generated from the co-combustion of coal and alternative fuels, particularly solid waste (i.e. refuse derived fuel), are regulated. Specifically, DSIWM was asked whether such ashes qualify as exempt wastes. Factors such as whether or not the ash is exempt, is non-hazardous, and the type of alternative fuel co-combusted with the coal all are considerations which affect how the ash should be managed.

The definition of solid waste, in Ohio Revised Code 3734.01(E) and Ohio Administrative Code Rule 3745-27-01(B)(40), exempts certain ash materials from being regulated as solid wastes. Specifically, non-toxic fly ash and bottom ash that result from the combustion of coal or from the combustion of coal and scrap tires (with limitations) are excluded from the definition of solid waste. The determination as to which ashes qualify as exempt is further defined in the Ohio EPA Policy DSW 0400.007, "Beneficial Use of Non-toxic Bottom Ash, Fly Ash, and Spent Foundry Sand, and Other Exempt Waste". The definition in this policy limits the ashes which qualify as exempt to "bottom ash and fly ash generated by fuel burning operations which burn, as fuel, primarily coal." With the exception of ash resulting from fuel consisting at least in part of municipal solid waste or scrap tires, primarily coal has been interpreted to mean a fuel mix consisting of greater than 50% coal by weight. The result is that there are limitations on

the type of alternative fuels (other than scrap tires) that can be used in combination with coal and still produce exempt ash wastes.

Provided that they do not qualify as hazardous wastes, all other ashes resulting from fuel burning operations, because they are not specifically exempted from the definition of solid waste are, by default, solid wastes and must be managed as such. Ash wastes that are considered to be solid waste include ashes generated from the co-combustion of coal and refuse-derived fuel, and air pollution control wastes (i.e. flue gas desulfurization and fluidized bed combustion wastes). Non-exempt, non-hazardous ash wastes, such as those listed above, resulting from the co-combustion of coal and an alternative fuel can be managed as municipal, industrial, or residual solid wastes, depending upon the type and quantity of alternative fuel in the fuel mix. All of the solid waste ashes can be managed as municipal solid waste. There are restrictions on which solid waste ashes can be managed as industrial solid waste and which can be managed as residual solid waste. For a more in-depth discussion regarding the management options for solid waste ashes, see the criteria outlined in the Procedure section of this document.

Ash that is produced from the co-combustion of scrap tires and coal is exempted by rule from being solid waste, provided that less than 50% of the heat input in any month is obtained from scrap tires. This criterion (i.e. less than 50% of the heat input) allows the co-combustion of tires and coal to qualify as "primarily" coal burning. However, this criterion is only to be used for coal/scrap tire fuel burning and not for the co-combustion of coal with refuse derived fuel.

## **V. PROCEDURE**

All ash materials, regardless of their status as exempt or solid waste, can either be recycled or disposed at a solid waste disposal facility, provided they are not hazardous. The type of disposal facility (i.e. municipal, industrial, or residual) where the ash can be disposed will depend upon the type and, in some cases, quantity of materials combusted to produce the ash. Alternately, ash materials can be beneficially used in accordance with Ohio EPA's policy DSW 0400.007. However, if the beneficial use would involve placing ash material that is solid waste onto or into the ground, then the person wanting to perform the beneficial use would need to obtain authorization from the Director of the Ohio EPA under the solid waste statute (Ohio Revised Code (ORC) Chapter 3734) prior to conducting the beneficial use.

The following table summarizes the regulatory status of ashes produced from the co-combustion of coal and other fuels.

**Table 1: Regulatory Status of Ashes Generated by the Co-Combustion of Coal and Other Fuels**

	Coal & Alternative Fuels (i.e. Coke, Oil, or Natural Gas)	Coal & Refuse Derived Fuel (MSW)	Coal & Refuse Derived Fuel (non-MSW)		Coal & Tires	
<b>Coal Content</b>	N/A	N/A	< 50% Coal by weight	> 50% Coal by weight	< 50% Coal by heat input	> 50% Coal by heat input
<b>Regulatory Determination</b>	Ash is Exempt*	Ash is MSW**	Ash is ISW	Ash may be RSW	Ash is SW	Ash is Exempt*

\*provided it is nontoxic

\*\*provided it is not hazardous

**Ashes Generated By the Co-Combustion of Coal and Municipal Solid Waste:**

Refuse derived fuels containing MSW have the potential to produce an ash that is characteristic of hazardous waste. Due to a recent U.S. Supreme Court decision, City of Chicago vs. Environmental Defense Fund, Case No. 92-1639 (May 2, 1994), if the refuse derived fuel is composed of MSW, the ash must be evaluated to determine whether it qualifies as hazardous waste. If the ash exhibits the characteristics of hazardous waste, then it should be managed accordingly.

According to the definition of municipal solid waste in OAC Rule 3745-27-01(E)(8), non-hazardous fly ash and bottom ash generated from the combustion of refuse derived fuel consisting of MSW are considered to be municipal solid waste and, hence, are not exempt. Unlike for other refuse derived fuels, the determination for MSW is not based on the percentage of coal that is burned in conjunction with the refuse derived fuel (i.e. there is no "primarily coal" criteria). As a result, fly ash and bottom ash generated by the burning of coal with any amount of MSW will always be regulated as MSW and cannot be exempted from the solid waste rules (see Table 1 at the beginning of this section).

**Ashes Generated By the Co-Combustion of Coal and Industrial or Residual Solid Waste:**

Air pollution control wastes (i.e. flue gas desulfurization and fluidized bed combustion wastes) are, in accordance with OAC Rule 3745-30-01(B)(1), by definition residual solid wastes and can be managed as such.

Ash that is generated by the combustion of refuse derived fuel that is composed of non-MSW (i.e. industrial solid waste (ISW) or residual solid waste (RSW)) is solid waste, not exempt waste. These ashes can be managed as industrial solid waste, or, depending upon the amount of coal in the fuel mix, as a residual solid waste. To qualify as RSW, the ash must meet two qualifications which are stipulated in the definition of Residual Solid Waste in OAC Rule 3745-30-01(B)(1): 1) the ash must result from fuel burning operations which are regulated by OAC 3745-17-10 (i.e. from installations in which fuel is burned for the primary purpose of producing heat or power by indirect heat transfer); and 2.) the fuel must consist of "primarily coal". The primarily coal determination is based on the percentage of coal in the fuel mix.

If greater than 50% by weight of the fuel mix is composed of non-MSW refuse derived fuel (i.e. less than 50% coal, by weight), then the ash would qualify as an industrial waste and would need to be managed as such. If less than 50% by weight of the fuel mixed is composed of non-MSW refuse derived fuel (i.e. greater than 50% coal, by weight), then the ash may qualify as a residual solid waste (see Table 1 at the beginning of this section).

#### **Ashes Generated By The Co-Combustion of Coal and Scrap Tires:**

The definition of solid wastes in ORC 3734.01(E) allows certain ashes generated by the co-combustion of coal and scrap tires to be exempted from being solid waste, depending on the percentage of heat input contributed by tires. If less than 50% of the heat input is contributed by scrap tires (i.e. greater than 50% of the heat input from coal), then the resulting ash is exempt from being a solid waste. Conversely, if greater than 50% of the heat input is contributed by scrap tires (i.e. less than 50% of the heat input from coal), then the resulting ash is solid waste (see Table 1 at the beginning of this section).

Anyone wanting to beneficially use exempt coal/tire ash material would request permission to do so through a beneficial use request (see Ohio EPA Policy DSW 0400.007 - Beneficial Use of Nontoxic Bottom Ash, Fly Ash, and Spent Foundry Sand, and Other Exempt Wastes for more information regarding beneficial use requests).

#### **Ashes Generated By The Co-Combustion of Coal and Traditional Fuels:**

Although ash that is generated by the co-combustion of coal and other traditional fuels such as coke, oil, or natural gas is not specifically exempted from being regulated as solid waste, DSIWM will consider this ash material to be exempt waste (see Table 1 at the beginning of this section). All of the fuels used in the mixture are directly related to the combustion processes (i.e. they are typically used as combustion fuels). Adding these other traditional fuels to coal does not cause a change in the composition of the resulting ash.

Fly ash and bottom ash generated from the co-combustion of coal and traditional alternative fuels can be beneficially used in accordance with the Ohio EPA Policy DSW 0400.007 provided that the use has received prior approval from the Ohio EPA, Division of Surface Water (DSW). (See Ohio EPA Policy DSW 0400.007 - Beneficial Use of Nontoxic Bottom Ash, Fly Ash, and Spent Foundry Sand, and Other Exempt Wastes for more information regarding beneficial use requests).

**VI. Point of Contact:**

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