

Rachel's Environment & Health News

#174 - Hazardous Waste Incineration In Cement Kilns: 'Recycler's' Paradise

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The federal Resource Conservation and Recovery Act (RCRA) is supposed to regulate the generation and disposal of hazardous chemical wastes "from cradle to grave."

Unfortunately, Congress built a feature into the law that EPA (U.S. Environmental Protection Agency) has turned into a loophole. Today, enormous quantities of hazardous waste are escaping regulation through this loophole. Specifically, Congress exempted "recycled" chemical wastes from control under RCRA, and EPA ruled that chemical wastes burned as fuel in industrial boilers, industrial furnaces, aggregate kilns and cement kilns are being "recycled" and are thus exempt from RCRA regulation.

According to Richard Fortuna, director of the Hazardous Waste Treatment Council (an incinerator industry group in Washington, DC), 50 billion pounds of chemical wastes are being burned in unregulated boilers and kilns each year, compared to only 5 billion pounds (or less) being burned in RCRA-regulated hazardous waste incinerators.[1]

A recent report from Greenpeace describes the burning of chemical wastes in aggregate kilns and cement kilns. Page numbers in our text, below, refer to this report, SHAM RECYCLERS, PART 1: HAZARDOUS WASTE INCINERATION IN CEMENT AND AGGREGATE KILNS.

Cement is the raw material from which concrete is made. In a cement kiln, powdered limestone and clay are burned at high temperatures to form a "clinker" that is later ground into a fine powder, which is cement; when water is added to this powder, it hardens. Certain "aggregates" can be added to cement to make mortar, plaster, concrete or other similar materials. As with cement, aggregates are formed by firing them in a hightemperature kiln. Thus aggregate kilns and cement kilns seem ready-made for destroying hazardous wastes. They have to be heated to high temperatures with fuel, so why not substitute hazardous wastes for part of the fuel and burn up the wastes while making aggregate or cement? Save on fuel and destroy wastes--what could be better? This was the question Greenpeace's Science Director, Pat Costner, and her colleague Joe Thornton, set out to answer.

There are at least 24 cement kilns and 17 aggregate kilns in the U.S. burning hazardous wastes today (listed on pgs. 31-33). Together, they burn approximately 3 billion pounds of hazardous wastes, and a recent industry analysis says this amount could double between 1989 and by 1992 (pg. 8).

It is difficult to obtain data on destruction of wastes in kilns precisely because kilns are exempt from RCRA; kilns are not required to meet the permit requirements of regular hazardous waste incinerators, nor are they subject to the operation and emissions standards that control regular hazardous waste incinerators. So long as a company claims to be using hazardous waste as a fuel or as a raw material, they are classified as "recyclers," and there is essentially no review process within EPA to check their claims or their operations. Thus a fraudulent company, bent on unregulated waste disposal, has an easy time exploiting this exemption within RCRA. Marine Shale Processors in Amelia, Louisiana, which was recently closed down by EPA after national TV threw a spotlight on them, is a notorious example of a fraudulent waste hauler disguised as a kiln operator.

Even when the intention is not to defraud, destruction of wastes in kilns is highly questionable. As Costner and Thornton make clear, there are about a dozen good reasons for wanting to prevent wastes from entering kilns. Here are some of them:

Typical wastes burned in kilns include paint, ink, and coatings manufacturers' wastes, spent halogenated and non-halogenated solvents generated by a wide variety of manufacturing processes, still bottoms from solvent recovery operations, petroleum industry wastes, and waste oils including crankcase oil, transmission fluid,

hydraulic and compressor fluids and coolants. Typically, 1.35% of these wastes are metals (including cadmium, arsenic, chromium, lead, mercury, zinc, and thallium). If 1.35% seems like a small amount, remember that 1.35% of 3 billion pounds is 40.5 million pounds of metals. Metals make trouble in incinerators--they are not destroyed but instead pass through the furnace into the outside environment, often in forms that make them more dangerous than when they first entered the kiln (e.g., attached to fine [extremely small] particles that can readily penetrate human lungs or can leach into groundwater) [see RHWN #131, RHWN #132, RHWN #134, RHWN #136, and RHWN #162].

Kilns burning hazardous wastes emit 66% more particles (soot, smoke, haze) than kilns burning normal fuel. Kilns burning halogenated wastes (containing chlorine, bromine, fluorine or iodine) emit 203% more particles than kilns burning normal fuel (pgs. 12, 26). This increased production of particles provides a pathway for metals to escape the incinerator in a form that is particularly dangerous to humans. The metals become attached to the outside of the fine particles and thus become available for humans to breathe. Costner and Thornton estimate that some 2 million pounds of metals may leave kilns attached to fine particles each year (pg. 23). Measurements at one kiln in California indicated it was releasing 15,000 pounds of metals into the local environment via airborne particles each year; measurements at a Florida kiln revealed airborne releases of 21,000 pounds of metals per year (pg. 23). Tests at an Illinois kiln revealed that burning hazardous wastes increased lead emissions 82%, chromium 167% and zinc 662%, compared to the same kiln burning normal fuel (pg. 23).

The fly ash from kilns is loaded with metals if the kiln burns hazardous wastes. Based on EPA data, Costner and Thornton estimate that 18.6 million pounds of metals enter the U.S. environment in fly ash from kilns each year (pg. 25). These metals are in a particularly leachable form, having a large surface area, and are thus available to enter water and living things (see RHWN #162). The high alkalinity (high pH) of kiln ash makes kiln ash even more leachable than ash from normal hazardous waste incinerators (pg. 25). At least two ash disposal sites for cement kilns are on the Superfund list, and neither kiln is supposed to have burned hazardous waste (pg. 25).

Advocates of hazardous waste incineration in kilns often claim that kilns destroy 100% of the wastes entering the furnace. Unfortunately, available data reveal this is not true by a wide margin. Kilns do operate at high temperatures (2000 to 3000 degrees Fahrenheit), but metals are not destroyed at any temperature. Furthermore, a class of chemicals called "products of incomplete combustion" (PICs, which include dioxins, furans, and a broad range of other organic chemicals) are created in a kiln, not in the furnace itself but in lower-temperature parts of the machine (smoke stack, pollution control devices, or ambient air outside the incinerator) (pgs. 18-21, 27-30).

The production of PICs is enhanced by "upsets," which occur in kilns several times each month, when something goes wrong with the machine. During these periods, puffs of hazardous chemicals are emitted into the local environment (pg. 18).

Another source of problems may be chemical releases resulting from transportation accidents. A typical kiln will burn 1,800 tank-truck loads of hazardous wastes per year. Many such trucks operate dangerously, in violation of applicable laws (pg. 18).

--Peter Montague

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[1] Personal communication March 19, 1990, from Richard Fortuna, executive director of Hazardous Waste Treatment Council, Washington, DC; phone (202) 783-0870.

Get: Pat Costner and Joe Thornton, SHAM RECYCLERS, PART 1: HAZARDOUS WASTE INCINERATION IN CEMENT AND AGGREGATE KILNS (Washington, DC: Greenpeace [1436 U Street, NW, Washington, Dc 20009; phone (202) 462- 1177], November, 1989). Greenpeace asks a \$5.00 donation to cover printing and handling costs. Well worth the price.

Descriptor terms: rcra; epa; cement kilns; hazardous waste treatment council; hazardous waste; marine shale processors; ash; heavy metals;