

"ASH UTILIZATION: AN IDEA BEFORE ITS TIME?", is the title of Dr. Richard Denison's latest paper on the environmental and health concerns related to the utilization of municipal solid waste (MSW) incinerator ash. For any community that is considering the "beneficial" uses of MSW ash, this 13 page, well-referenced, paper is **essential reading**. The following excerpts do not do justice to Denison's paper, but merely attempt to relate some of the information. "...The levels of toxic metals present in ash and ash-derived cement products are comparable to those found in other materials classified as or otherwise known to be hazardous. These include several metal-containing wastes listed by EPA as hazardous waste. In addition to heavy metals, MSW incinerator ash, especially from facilities achieving less than optimal combustion efficiency, may contain significant levels of toxic organic contaminants, including dioxins. Dioxins and PCBs tend to concentrate almost exclusively in fly ash, while certain polycyclic aromatic hydrocarbons (PAHs) and phthalates accumulate preferentially in bottom ash. EPA studies of coal ashes revealed only very low or non-detectable levels of dioxins. These data indicate that use of ash as a substitute for coal ashes or cement will result in a product material that contains vastly greater concentrations of several toxic metals (and, in some cases, dioxins or other organics) than the unsubstituted products..."

COMPARISON OF TOTAL CONCENTRATIONS OF SIX HEAVY METALS IN FRACTIONS OF MSW INCINERATOR ASHES AND COAL ASHES (Source: Bridle et al., 1986) *

FBC=fluidized bed combustor; PCF=pulverized coal-fired; PPM=parts per million, by weight

(In PPM)	MSW ASHES			COAL ASHES			
	BOTTOM	BOILER	ECONOMIZER	FBC BED	FBC FLY	PCF BOTTOM	PCF FLY
TOTAL LEAD	4,300	19,900	28,300	45	140	10	45
TOTAL CADMIUM	46	746	835	1	15	0.8	0.8
TOTAL CHROMIUM	139	385	413	10	23	0.8	23
TOTAL NICKEL	226	65	63	27	47	97	93
TOTAL COPPER	2,200	402	531	7.7	29	74.9	78
TOTAL ZINC	4,800	48,100	41,800	209	343	57	103

* The incinerator that provided these ash samples had no ESP or baghouse controls

COMPARISON OF TOTAL CONCENTRATIONS OF SEVEN HEAVY METALS IN PORTLAND CEMENT, ORDINARY CEMENT BLOCKS, AND BLOCKS MADE USING MSW INCINERATOR COMBINED OR FLY ASH (Source: Roethel, 1986)

(In PPM)	FLY ASH BLOCK	COMBINED ASH BLOCK	CEMENT BLOCK	PORTLAND CEMENT
TOTAL ZINC	18,618	4,482	53	29
TOTAL LEAD	7,278	5,137	4	1
TOTAL COPPER	606	4,668	13	9
TOTAL NICKEL	78	109	47	18
TOTAL CHROMIUM	190	146	31	38
TOTAL CADMIUM	731	44	0.26	0.04
TOTAL ARSENIC	73	5	33	2

"Ash utilization potentially comprises a broad range of actual applications or uses, from use as fill material or deicing grit for roads, to aggregate use in building construction materials or roadbeds, to use in blocks for coastal erosion control or artificial reef formation. The potential for human or environmental exposure to the metals in utilized ash will likely differ dramatically across such a range of uses. In addition, some proposals involve treatment of the ash which incidentally or deliberately reduces exposure from at least certain pathways. Nevertheless, virtually all uses possess several exposure-enhancing 'characteristics' that distinguish them from ash

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disposal..." Dr. Denison quotes the EPA's Science Advisory Board statements of 1988: "Beyond consideration of mobility and identity, the environmental persistence of the compounds [present in incinerator ash] should be explored. Persistence is easily as important to fate prediction as is mobility, since a compound that has the potential to migrate but is not persistent poses little hazards. Conversely, a compound that does not migrate but does persist can pose a serious problem through mechanisms other than leaching." Denison then goes on to examine the potential for the fate and ultimate disposition of utilized ash products and calls for "considering all plausible routes and time frames for exposure to utilized ash. Yet for many of these, the tools needed for such an evaluation are simply not yet developed; for example, there is no procedure for measuring --let alone any actual data on-- the rate of erosion or dusting from a cement surface under various conditions. This property may be of little concern for ordinary cement, which does not have an appreciable toxic metals content; it is of major concern for cement formed using ash as a substitute aggregate..." Copies of this paper are available from: Dr. Richard Denison, Senior Scientist, Environmental Defense Fund, 1616 P Street N.W., Washington, DC 20036. Tel: 202-387-3500.

"STOP STYRO: CLEARINGHOUSE FOR PLASTICS AND PACKAGING REDUCTION," is a new information network set up to assist local governments, community activists, environmental groups and others in developing legislation, education and other actions designed to reduce and eliminate wasteful, environmentally unsound packaging. The Clearinghouse will offer fact sheets and information on styrofoam and other forms of packaging, model legislation from across the country aimed toward packaging reduction, information on tactics and arguments used by the plastics industry, and lists of other groups working on this issue. Calling for a **peaceful overthrow of wasteful plastic** the Clearinghouse advocates **pre-cycling**: making environmentally sound decisions at the store by reducing waste before you buy, or what might be called "demand-side waste management." The Clearinghouse is determined to help combat the plastic giants propaganda campaigns and the (dis)information campaigns they use to stop the grassroots movements against plastic. The Clearinghouse has been initiated by Berkeley, CA, councilmember Nancy Skinner (who introduced Berkeley's first styro ban) and the **Berkeley Ecology Center**. **Waste Not** urges readers to become involved. Address: **Stop Styro: Clearinghouse for Plastics and Packaging Reduction**, Berkeley Ecology Center, 1403 Addison Street, Berkeley, Ca 94702. Tel: 415-548-2220. Councilmember Nancy Skinner's office: Martin Luther King Jr. Civic Center, 2180 Milvia Street, Berkeley, CA 94704. Tel: 415-644-6359. By sending a check in the amount of \$12 to the Clearinghouse you will be able to obtain a copy of all of their current information.

INDEX TO WASTE NOT. Issue # 48 completes the first year of **Waste Not**. An index to the first 48 issues will be available within the next month. If you want to obtain a copy of the index please send \$4 to **Waste Not**. Free copies will be mailed to Group Subscribers.

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