In addition, there are also wide variations among kilns and plants in the amount of net CKD (i.e., CKD that is either disposed or used beneficially offsite) that is generated. For example, 25 percent of the facilities produce essentially no net CKD, while 10 plants (about 10 percent of the population) generate 40 percent of all net CKD.

Finally, the Agency also found that the burning of hazardous waste is correlated with the volume of dust that is actually disposed. Kilns that burn hazardous waste remove from the kiln system an average of 75 to 104 percent more dust per ton of clinker than kilns that do not burn hazardous waste. Regression modeling conducted by EPA for the NODA analyses showed a consistent, statistically significant association between hazardous waste fuel burning in cement kilns and increased CKD generation on a gross, net, and disposed basis. EPA's work does not establish the cause of this statistical relationship between hazardous waste fuel burning and CKD generation. The Agency, however, believes that increased CKD generation is maybe due either to the burning of hazardous waste, or to some other plantspecific operating factors such as the composition of the raw material feed.

B. Current and Alternative CKD Management Practices

Most of the gross CKD-8.2 million metric tons, or 64 percent-was recycled directly back into the kiln or raw feed system in 1990. For that portion of CKD that is disposed, standard industry practice is to place it in piles, quarries, or landfills, most of which are unlined and uncovered. Some active piles are also managed underwater or adjacent to surface water and/or agricultural lands. Although most CKD removed from the kiln system is disposed on-site, some is sold for offsite beneficial use. For example, in 1990, about 7 percent of CKD generated (897,000 metric tons) was sold for offsite use, most of it as a waste stabilizer, liming agent, or materials additive.

Cost-effective opportunities may exist, however, to further reduce the amount

of CKD that is disposed by recycling it back into the kiln. The Agency has identified a number of pollution prevention opportunities, including flue gas desulfurization, fluid-bed dust recovery, and leaching with water, that may, in some instances, represent lowcost and potentially profitable alternatives to CKD disposal. In addition, the Agency has received some evidence, in comments from cement companies, that raw material substitution may be a highly effective means of increasing CKD recycling rates. This may be done by controlling the input of contaminants (in raw materials and fuels) to the kiln system, thereby reducing or eliminating the need to purge the kiln system of contaminants by removing larger volumes of CKD from the system.

C. Existing Regulatory Controls

Federal statutes that potentially affect CKD management include the Clean Air Act (CAA), Clean Water Act (CWA), the **Resource Conservation and Recovery** Act (RCRA), and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Regulations developed under authority of the CAA and CWA impose controls on releases of CKD to the air (via stack or fugitive dust emissions, 40 CFR Part 50) and water (National Pollution Discharge Elimination System (NPDEŠ), 40 CFR Part 122, point source effluent discharges, and 40 CFR Part 411, effluent guidelines for cement manufacturing facilities), respectively. Under both RCRA and CERCLA, the Federal government can respond where the release of CKD or its constituents may present an imminent and substantial danger to human health or the environment. CKD that is not directly recycled is also subject to regulation under Subtitle D of RCRA as a solid waste. In addition, CKD generating facilities that burn RCRA hazardous waste in kilns are subject to the RCRA Boiler and Industrial Furnace (BIF) rule (40 CFR part 266) and other RCRA requirements if the CKD from that combustion is "significantly affected"

by the hazardous waste fuel. See 40 CFR 266.112.

For states with the highest cement production capacity (California, Michigan, Pennsylvania, and Texas), the Agency has found that CKD waste is subject to some regulation under State and local laws, but the requirements vary significantly from State to State. For example, California regulates CKD as a non-RCRA hazardous waste, but has suspended enforcement of the management requirements for CKD that fails the State's hazardous waste corrosivity test, pending the results of further study of CKD and other cementitious materials. Pennsylvania regulates CKD as a residual waste, requiring facilities to comply with sitespecific disposal requirements and waste reduction strategies, which are both periodically updated by the State. In contrast, Michigan and Texas both consider CKD an industrial nonhazardous waste. Michigan requires permits, ground water monitoring, and regular reports of ground water sampling results, whereas Texas issues non-enforceable guidance.1

D. Waste Characteristics

While CKD itself does not exhibit the RCRA Subtitle C hazardous waste characteristic of corrosivity (40 CFR 261.22)², EPA's data show that mixtures of CKD and water often exhibit the characteristic of corrosivity. In particular, runoff from precipitation that contacts CKD storage and waste piles generates considerable volumes of wastewater. EPA data show that the pH level in such precipitation runoff typically exceeds 12.5 standard units, the standard for the corrosivity characteristic for hazardous wastes (40 CFR 261.22).

In addition, EPA's analyses of CKD show that CKD does contain certain metals listed in Appendix 8 ("Hazardous Constituents") part 261 of RCRA. Table 1 presents the range of total concentration levels for a number of other toxic metals EPA has observed in CKD.

TABLE 1.—Measured Metals Levels in CKD¹

[Mg/kg (parts per million), total basis]

Metal	No. of sam- ples	Min.	Mean	Max.
Antimony	52	0.09	11.5	102
Barium Bervlium	59 53	0.20	181	900 6.2

¹ Texas is in the process of developing on-site management standards for cement kiln dust and expects to propose them in 1995. ² EPA hazardous waste identification rules do not include a characteristic or definition for solid corrosives.