concentrations found in CKD produced in plants burning FF and WDF. That determination noted that:

For many of the toxic metals, the concentrations detected in kiln dust were not significantly different whether the dust is generated from kilns that burn or do not burn hazardous waste. However, for lead, cadmium, and chromium, the mean concentrations found in CKD generated by kilns that burn hazardous waste is measurably higher than in CKD from those kilns that do not burn hazardous waste; conversely, thallium and barium concentrations are measurably higher in CKD from kilns that do not burn hazardous waste (Ref. 3, p.7369).

Again, the evidence is inconsistent; concentrations of some metals in WDFgenerated CKD are higher, but others are lower. The continuing difficulty, however, is in establishing causality. As previously noted, the concentration of metals found in any given plant's cement results from complex interactions among several site-specific variables; in the absence of a study controlling for these variables, one cannot confidently attribute variations in metal concentrations among plants to any one source. There is one industry study, A Comparison of Metal and Organic Concentrations in Cement and Clinker Made With Fossil Fuels to Cement and Clinker Made with Waste Derived Fuels (Ref. 4), that determined the concentrations of metals in cement produced at a single facility that initially used WDF, and then switched temporarily to FF. Other operating conditions were held constant in both time periods, and 20 cement samples were taken in each. That study found detectable amounts of four metals. In one phase (pH=5 extract waters), the mean concentration of antimony was statistically significantly higher in the cement generated burning WDF, but there were no significant differences for either cadmium or chromium. In the second phase (pH=10 extract waters), the mean concentration of chromium in cement produced while burning WDF was statistically significantly lower than in cement produced burning FFexactly opposite to the PCA findings. The differences for nickel were insignificant.

The totality of evidence, then, does not confirm that burning WDF in kilns materially increases concentrations of metals in cement. It also shows that decreased concentrations of metals can occur, and the net human health potential, if any, is simply unknown. In any event, based on the available information, the type of fuel burned in kilns appears to be a minor determinant of the concentration of metals in cement relative to (a) the extent to which CKD is recycled as feedstock, and (b) the metals content of the original feedstock. Finally, the evidence indicates that all domestic² cement poses a potential problem to long-term users who fail to take precautionary steps to avoid exposures. Any labeling intended to warn users of this hazard should therefore be applied to all cement, not simply to cement produced with WDF.

VII. OSHA's Labeling Requirement

The current regulatory situation recognizes the need for comprehensive labeling of cement. Although petitioners state that the problems they discuss cannot be adequately addressed under other statutes, OSHA's Hazard Communication Standard (29 CFR 1910.1200) does, in fact, require cement manufacturers to label virtually all containers of their products with essentially all of the information petitioners want to convey, other than the fact that the cement was produced through burning of WDF. This requirement extends to all cement, not just that produced with WDF. Pertinent provisions of the Hazard **Communication Standard require** chemical manufacturers (cement producers, for this purpose, are considered chemical manufacturers) of products for which there is evidence of health hazard to label all containers of the product providing: (a) the identity of the chemical; (b) appropriate hazard warnings; and (c) the name and address of the manufacturer (29 CFR 1910.1200(f)). Manufacturers must also ensure that distributors and employers using the product are furnished with appropriate MSDS, and downstream wholesalers and retailers are required to ensure that these warnings are carried with the product through the distribution chain to the ultimate enduser. A typical cement bag label reads as follows:

CAUTION EYE AND SKIN IRRITANT

Contains Portland Cement (CAS No. 65997–15–1). Do not allow contact with eyes or skin. Contains concrete aggregates Sand/ Gravel (CAS No. 14808–60–7). Avoid breathing dust—respirable Silica may cause serious lung problems.

Use gloves, goggles, dust masks, and waterproof protective clothing. If material gets into eyes, rinse immediately with clean water and seek prompt medical attention. If material gets onto skin or saturates clothing, rinse immediately and thoroughly with clean water. CONTACT WITH WET PORTLAND CEMENT MAY CAUSE SERIOUS SKIN BURNS."

EPA believes that the hazard communication label required by OSHA provides sufficient warning to users of cement to allow them to take appropriate steps to protect themselves from exposure to cement products.

VIII. Comments Received

EPA published a Notice of Receipt of the Petition in the **Federal Register** (60 FR 30538; June 9, 1995), in order to provide opportunity to comment to all interested parties. Comments were received from 8 individuals, all of whom supported the petition, and 10 organizations. Several samples of current cement packaging and MSDSs were also received. All comments were reviewed and considered by the Agency before reaching its final determination to deny the petition.

Six of the 10 organizations wrote in support of the petition. Of these, 3 were among the 24 signers of the petition itself; 1 is another environmental group; 1 is a general contractor; and 1, Rollins Environmental Services, operates hazardous waste incinerators. The Rollins submission included two studies bearing on the question of the contribution of WDF to metals in cement. The first study was a mass balance analysis conducted at Rutgers University with the support of the Association for Responsible Thermal Treatment (ARTT), an organization of some hazardous waste incinerator companies. That study models the operation of cement kilns, and concludes, among other things, that burning WDF could increase the metals content of cement. The second study is a risk assessment undertaken by ENVIRON Corporation, using the data generated by the Rutgers model, and a portion of the PCA data. These studies were reviewed by EPA, insofar as time permitted, but did not alter the Agency's decision on the petition because: (a) there is no apparent justification for substituting modeling data for the extensive empirical monitoring data available; (b) the model itself appears flawed in that a light weight aggregate kiln, rather than a cement kiln, was used in its development; (c) the model has only recently been developed, and has not yet been peer reviewed; and (d) the ENVIRON study is largely based upon the unpersuasive modeling results (Refs. 5 and 6).

The four organizations that wrote in opposition to the petition included the CKRC; the International Brotherhood of Boilermakers, Iron Ship Builders, Blacksmiths, Forgers Helpers; LaFarge Corporation, a cement producer that

²There is some evidence that the hexavalent chromium content of cement can be reduced by adding ferrous sulfate. Petitioners cite references indicating that Denmark has made it illegal to sell cement with more than 2 ppm CR (VI).