STATEMENT BEFORE PUBLIC HEARING OF
WAYNE COUNTY AIR POLLUTION CONTROL AGENCY
REGARDING INCINERATION OF LIQUID PCBS
AT PEERLESS CEMENT COMPANY
DETROIT, MICHIGAN
AUGUST 2, 1977

My name is Alan S. Corson. I'm a Program Manager in the Office of Solid Waste, U.S. Environmental Protection Agency. Our office is responsible for providing guidance for effective management of solid wastes and, under the recently adopted Resource Conservation and Recovery Act, establishing a regulatory program for the management of hazardous wastes. Also, I am a member of the Agency's working group on PCBs, and chaired the disposal subcommittee of that group.

Polychlorinated biphenyls (PCBs) are chlorinated aromatic organic compounds which give rise to concern because of their chronic toxicity, their pervasiveness and persistence in the environment, and their tendency to accumulate in food chains.

It is the combination of these characteristics which cause the present and continuing concern over the disposition of PCBs to the environment.

The chemical properties that make PCBs desirable industrial materials are their excellent thermal stability, their strong resistance to both acidic and basic hydrolysis, and their general inertness. They are quite resistant to oxidation. Unfortunately, some of the characteristics

(stability, nondegradability) which make PCBs so valuable in industrial applications also make them highly persistent in the environment.

PCBs are not intended to get into the environment, but they do because their unique chemical properties prevent them from being destroyed by usual waste treatment methods. Thus, they inadvertently escape and become widely dispersed.

As part of our ongoing activities in the Office of Solid Waste, we have been investigating incineration and other treatment methods for effective control or neutralization of bothersome (or potentially hazardous) wastes. We have also conducted some full-scale demonstrations of incineration techniques for various wastes. Based on these investigations we consider high temperature incineration to be the primary disposal method for PCBs. This disposal method is the only technique that will result in the destruction of PCBs and prevent the eventual escape of the chemical to the environment.

Proper incineration of PCBs involves a suitable balance among combustion temperatures in the incinerator, dwell time of the waste materials and combustion products in the firing chamber, and oxygen exposure. Investigations into incineration requirements by industry and government representatives under the auspices of the American National Standards Institute (ANSI) resulted in ANSI recommendations

for the incineration of liquid PCB chemical substances and mixtures. These recommendations have been adopted in the proposed regulation for disposal of PCBs, issued by EPA in the Federal Register on May 24, 1977. Previously these had been issued by EPA on April 1, 1976, as guidance. The recommended requirements, based on the use of commercial industrial incinerators, are: 2-second dwell time at 1100 C (2000 F) and 3 percent excess oxygen in the stack: or 1-1/2 second dwell time at 1500 C (2700 F) and 2 percent excess oxygen in the stack gas. Open hearth and other incinerators used for municipal refuse incineration are not normally suitable; the relatively low operating temperature of such equipment would only volatilize the PCBs and pollute the atmosphere. In addition, instrumentation and handling equipment are usually not sufficient for managing hazardous materials. Therefore, PCB-containing waste should not be sent to such municipal incinerators for disposal.

However, we have recognized that other techniques for incineration might be equally effective in accomplishing our dual objective--destruction of the PCBs and protection of the environment. This leads to a brief disucssion of the program (in which we participated) conducted by the Environmental Protective Service in Canada.

Chlorinated hydrocarbon wastes were burned in a carefully controlled experimental trial as a partial fuel at

the St. Lawrence Cement Co., Mississauga, Ontario. The experiment was conducted to determine whether chlorinated hydrocarbon wastes could be burned in a cement kiln without adverse effects on air pollution levels.

The wastes used included a variety of chlorinated hydrocarbons in the series of program phases designed to progress from easily combusted chlorinated hydrocarbons to those which are combusted only with difficulty. The last phase consisted mainly of polychlorinated biphenyl wastes.

Atmospheric emission measurements were made before, during and after the burning of each blend of chlorinated waste. Two methods of emissions sampling were used during each phase, the method normally used for measuring emissions of particulate matter, and a sampling train designed specially for determining emissions of organic material. All samples from both systems were analyzed for unburned chlorinated hydrocarbons. It was concluded that the combustion efficiency was at least 99.986 percent for the chlorinated hydrocarbons. Approximately 50 ppb of volatile low molecular weight compounds were found in the emission samples. There were no detectable quantities of high molecular weight chlorinated compounds in the stack gases.

A mass balance was carried out on chlorine and potassium. This showed that the chlorine input as chlorinated hydrocarbon was completely reacted with the process solids.

The alkali content of the clinker showed a reduction which corresponded exactly with the quantity of chlorine input to the system. This agreement further confirms the data from emission testing and the mass balance.

While burning chlorinated hydrocarbons with approximately 40 percent chlorine, a decrease in oil consumption equivalent to 65 percent of the BTU content of the chlorinated hydrocarbons was obtained.

The only differences in the quality of clinker produced while burning chlorinated hydrocarbons were the beneficial effects which were expected through the reduction in alkali content.

It was concluded that chlorinated hydrocarbon wastes may be used in cement kilns, replacing other forms of chlorine used for reduction of alkali content. A small proportion of fossil fuel required for cement manufacture is conserved through use of these materials. Burning chlorinated hydrocarbon wastes is considered a valuable means of destroying persistent and toxic forms of pollutants while recovering useful heat values.

In summary, our position at EPA may be stated as:

.1) PCBs should be destroyed whenever practical.

.2) Incineration is the only demonstrated technique for destruction of PCBs.

.3) operating characteristics for incineration have been established and verified.

.4) A cement kiln operates, and can be controlled to maintain operation, with the required characteristics to destroy PCBs without the introduction of increased PCBs to the environment.