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Hearings on PCBs
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I greatly appreciate the opportunity to present the views of the Environmental Protection Agency concerning the environmental problems associated with the manufacture, use, distribution, and disposal of polychlorinated biphenyls (PCBs). Since its initial days the Agency has been concerned with practical steps that could be taken to clarify and reduce the environmental risks attendant to commercial applications of PCBs. More recently the Agency has intensified its efforts to help insure that unnecessary hazards are effectively curtailed. Thus, we fully share your concerns, and we will continue to work with the State Governments and other interested organizations in seeking feasible solutions to this problem.

In view of the background papers that are available and the detailed statements being presented by specialists participating in these hearings, I will limit my comments to a brief summary of the history of the PCB problem, recent developments that have heightened interest in PCBs, and the current spread of EPA activities directed to PCBs. I will then comment on several aspects of particular interest to the State of Wisconsin.

1972 Findings of Interdepartmental Task Force and Ensuing Actions

In May 1972, the Interdepartmental Task Force concluded that PCBs were highly persistent, could be found in all parts of the environment, could bioaccumulate in fish by a factor of up to 75,000, and could have

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serious adverse effects on human health. The Task Force urged discontinuance of all uses of PCBs except uses in closed electrical systems and called for enactment of the Toxic Substances Control Act to provide a needed regulatory mechanism to deal with PCBs and other problems of this type.

Largely as a result of the activities of the Task Force, the Monsanto Company, the sole US producer of PCBs at that time, voluntarily limited its sales to manufacturers of closed electrical systems. Also, EPA promptly announced that it would begin restricting the discharges of industrial effluents so that the levels of PCBs in rivers or lakes do not exceed 10 ppt. FDA took steps to establish PCB tolerances for several types of food (from .2 ppm in baby food to 5 ppm in fish) and to limit PCB contamination in food packaging and in food plants.

As further follow-up to the Task Force recommendations, the General Services Administration amended its procurement specifications to ban PCBs in paper, and the Department of Interior prohibited future use of PCBs in off-shore oil operations. The American National Standards Institute issued guidelines for industry on the use, disposal, and labelling of PCBs.

Internationally, a Decision of the Organization for Economic Cooperation and Development (OECD) provides that PCBs shall not be used for industrial or commercial purposes except in certain closed systems. However, even with respect to the excepted uses, the OECD Council (a) decided that PCBs should only be used when adequate environmental controls are exercised and when benefits outweigh the risks, and (b) recommended that countries work toward the elimination of PCBs in small capacitors. The Decision leaves it to Member countries to go beyond the Council agreements

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and, in effect, invites governments to phase out PCB uses wherever possible. Japan, in the wake of PCB contamination of rice oil that adversely affected 1000 people, banned future production or import of PCBs. More recently the Canadians have begun to collect necessary data for restricting PCBs pursuant to a new Environmental Contaminants Act which should be enacted this year.

Developments Since the Task Force Report

Health and Ecological Effects

Recent research results have heightened concern over the toxicity of PCBs previously documented in the Report of the Interdepartmental Task Force. Concentrations as low as 2.5 ard 5 ppm have produced serious adverse health effects in monkeys, including loss of hair, acneform lesions, loss of weight, increased secretion of total urinary ketosteroids, irregularities in menstrual cycles, impaired ability to maintain pregnancy, and undersized offspring. A still unpublished report indicates malignant liver tumors in rats exposed to one grade of PCB at levels of 100 ppm. Several superficial reports of chloracne among workers exposed to PCBs have been received. Also, concentrations of 5 ppm in fish eggs have resulted in fry mortality.

In considering these effects it is important to remember that there are eight commercial grades of PCBs, and their toxicity characteristics may vary to some degree. However, there is no basis for assuming that any one of the grades is not a potential hazard.

Monitoring and Exposure Data

As a result of the FDA actions described above, the PCB levels in foods have been steadily declining. At the same time, however, the

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levels detected in fish and wildlife appear to have increased. Available monitoring data for PCBs in the ambient air, water, sediment, soil, or human tissues do not provide a good basis for estimating national environmental trends. For example, analyses of water samples have seldom extended into the parts per trillion range, and thus only rarely have PCBs been detected. Limited adipose tissue samples for FY 1972 and 1973 indicate a slight downward trend with levels in excess of 3 ppm being observed. Unusually high levels of PCBs have been detected in recent months in the fish in Lake Michigan (up to 165 ppm), Lake Pepin (up to 40 ppm), the Hudson River (up to 350 ppm), and Southern California (up to 6.6 ppm), although the average levels are significantly lower than these upper limits. PCBs have been detected in sludge from sewage treatment plants as well as in the effluents from these plants. PCBs have been identified in only two drinking water supplies during the past year. There have been five water spills involving PCB leakage from transformers during the past year, and currently there are tens of thousands of capacitors, each containing several gallons of PCBs, awaiting disposal.

Production, Imports, and Uses

While Monsanto is believed to be limiting its sales to manufacturers of closed electrical systems, information has been received by EPA indicating that PCB reprocessors may be selling PCBs for other uses. It is believed that most of the PCB imports (which exceeded 375,000 pounds in 1974) are not used in closed electrical systems. Among the PCB uses which are known to persist in the US at present are applications in investment casting processes, heat exchange fluids, and hydraulic fluids. There are a variety of other potential uses of PCBs although firm evidence

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of such current uses is not in hand.

With regard to substitutes, Dow Chemical has developed a product for use in large power capacitors, and Dow Corning has a product which can substitute for PCBs in certain tranformer applications. At least one of these substitutes is reportedly being introduced at the present time in Japan.

Recent Regulatory Actions

In 1973, Water Quality Criteria were proposed to limit PCBs to 2 ppt in ambient waters. Also, a national effluent standard for PCBs was proposed under Section 307(a) of FWPCA. PCBs were included in the advanced proposal of a hazardous substances list under Section 311 of the FWPCA in 1974. Finally, NPDES permits that limit the discharge of PCBs have been issued for at least six facilities; preliminary reports indicate that approximately 10-15 other discharge permits may contain effluent limitations for PCBs. In addition, the effluent guidelines promulgated for the steam electric power generating category contain limitations requiring no discharge of PCBs. A significant percentage of the permits issued for this category to date contain these limitations.

As you know, several states are currently considering imposing limitations on PCBs.

Ongoing Activities of EPA

The following EPA activities to assess and control the PCB problem have been underway for some time.

1. A water quality criteria level of 1 ppt will soon undergo interagency review prior to final promulgation. The originally proposed level of 2 ppt has been reduced in view of the recent ecological effects data.

2. Detailed documentation necessary to support a national standard for water effluent discharges under Section 307(a) is being assembled

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with issuance of a revised proposed standard scheduled in the near future.

3. Proposed levels of harmful quantities of PCBs accidentally released into navigable waters and rates of penalties for such spills are currently being developed pursuant to Section 311 of the FWPCA.

4. A laboratory demonstration program is underway to develop and test control technology for treatment of PCB manufacturing wastes, including the aqueous effluent from PCB users and the discharge from leaks from transformers and capacitors.

5. The scientific literature concerning the health and ecological effects of PCBs is being reviewed. Further, a continuing research program is investigating the metabolism and effects of PCBs. As part of this program, several studies have examined the effects of PCBs in rats after long-term feeding regimes, especially effects on reproduction, liver function, carcinogenesis, and hemoglobin metabolism.

6. Collection and analysis of adipose tissues are continuing.

7. Several laboratories have been conducting research on the ecological effects and environmental fate of PCBs.

8. Studies of the behavior of PCBs in soil, with particular attention to possible ground water contamination following a spill, are underway.

9. Analyses of the technological and cost aspects of using substitutes for PCBs in closed electrical systems are underway.

10. Technical assistance is routinely provided on the storage and disposal of PCB-containing wastes. In addition test burns of capacitors containing such wastes in a high temperature incinerator are planned for early 1976.

Newly Initiated Activities of EPA

In view of the new evidence concerning the toxicity of PCBs and the recent reports of high environmental levels in several areas of the country, EPA has accelerated its efforts directed to PCBs. These activities, being carried out in cooperation with other Federal and State agencies, include:

1. The National Academy of Sciences is being requested to give special attention to whether a drinking water standard for PCBs is needed. Meanwhile, monitoring for PCBs in drinking water supplies is being expanded.

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2. Information concerning the best sampling and analysis techniques for PCBs in different media is being assembled and reviewed to provide guidance to the Regions, states, contractors, and other organizations involved in monitoring.

3. A limited number of ambient air, water, sediment, soil, and fish samples are being collected and analyzed from throughout the country. This data, together with existing data, will provide an up-to-date overview of the current level of environmental contamination by PCBs.

4. In response to local concerns, several Regions will be measuring PCB levels in effluent streams from industrial and municipal sources, receiving waters, and associated fish populations to assist in relating specific discharges to environmental levels of particular concern.

5. Information concerning the use and distribution of PCBs and the levels of PCBs in effluent discharges has been requested from 84 companies which are believed to handle PCB compounds or mixtures in their operations. These requests for information have been made pursuant to EPA's authority under Section 308 of FWPCA and Section 114 of the Clean Air Act.

6. A special review of past and recent data to assess the carcinogenic potential of PCBs is underway.

7. Test data on the chemical properties and potential bioactivity of substitutes for PCBs have been requested from Dow Chemical and Dow Corning.

8. Imported PCBs and polychlorinated terphenyls (PCTs), are being analyzed to identify possible contaminants. In addition, the techniques for detecting PCBs, PCTs, and polychlorinated biphenyls (PBBs) are being examined to determine whether interference among the substances prevent reliable analysis for any one of them.

9. General guidance for proper disposal of wastes containing PCBs will be developed.

10. The Department of Defense, the General Services Administration, and other agencies will be requested to review and to amend as appropriate their procurement specifications and those of their contractors concerning the purchase of PCBs and materials containing PCBs.

11. Consultations with the Japanese Government are being initiated concerning their experience in implementing a ban on the production and import of PCBs.

12. Consultations with OECD Governments are continuing in an effort to determine the effectiveness of the 1973 Decision in reducing the PCB problem on a worldwide basis and to encourage expeditious carrying out of the provisions of the 1973 agreement.

13. Consultations are being conducted with the Canadian Government to inform them of our information and activities concerning PCB users in Canada and to coordinate future actions.

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Reducing Contamination Levels in the Aquatic Environment

EPA considers that a PCB concentration of 1 ppt in the ambient water environment represents an appropriate goal for the nation. This conclusion is reflected in the Water Quality Criteria which are currently undergoing final review prior to promulgation. We would suggest that this goal serve as very broad guidance in developing strategies on a nationwide basis and locally to control discharges of PCBs into our waterways.

However, we are not prepared at this time to provide more specific guidance on the control strategies that should be adopted nationally or locally concerning the regulation of individual dischargers. We are developing a nationwide strategy with a significant component of our approach to be reflected in a toxic effluent standard for PCBs scheduled for proposal early next year. At the same time, we recognize that a nationwide standard might not be adequate in addressing local problems in some areas, and the control strategies adopted locally may of necessity require an elaboration of the national approach.

In any event, we believe that better information is needed concerning the specific facilities discharging into the aquatic environment before reaching a final judgement on a national standard. Also, it is important to clarify the portion of the PCB contamination problem which can be attributed to specific dischargers and the practical feasibility of reducing the discharges. As a key step in this regard, on August 16, we requested from 84 companies detailed information concerning their activities involving PCBs including details on their uses of PCBs and monitoring

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data in the effluent stream and in the receiving waters. With this information in hand, we believe we will be in a much better position to develop meaningful regulatory approaches which take into account the realities of current industrial activities.

The Role of the Toxic Substances Control Act

As I have indicated, EPA is currently utilizing or preparing to utilize authorities under the Federal Water Pollution Control Act which address the problems of effluents and spills containing PCBs in an effort to reduce the environmental levels of PCBs. Additional authorities may also be used if warranted by further information concerning levels of PCBs in drinking water or even possibly in air. However, each of these available authorities has a limited focus and none provides the most critically needed authority -- to limit selected uses and distribution of PCBs. Indeed, even with the cooperation of Monsanto to limit production as well as the use of existing authorities, it seems clear that the PCB problem will continue to persist in some form.

Under the pending Toxic Substances Control Act, however, EPA would have the needed authority and could deal with the problem in a far more effective manner. In addition to authority to restrict the production and use of PCBs, the legislation would, if necesseary, enable EPA to require testing concerning the health and ecological effects of the proposed substitutes for PCBs.

With regard to the limitations that might be considered under this legislation, the 1972 Task Force Report concluded that there were appropriate substitutes, presumably at reasonable cost, for all non-electrical uses of PCBs. We have no information which would contradict this conclusion.

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However, we currently are carefully analyzing each PCB use and the technological, environmental, and cost aspects of possible substitutes to insure the soundness of the conclusion. Also, we are carefully reviewing the recent developments concerning substitutes for PCBs in closed electrical systems before reaching our final conclusions concerning the extent and character of limitations that would be appropriate under this authority. We are optimistic that we will have this authority within a few months, but as you know, further movement in this regard rests with Congress.

Finally, one key aspect of the Toxic Substances Control Act should be emphasized: the authority to review new chemicals before they are marketed and if appropriate require testing or take steps to limit the production or use if there is reason to believe a hazard to human health or the environment might ensue. This preventive or "front-end" approach to the control of chemical hazards would provide a more reasonable and cost-effective approach than current efforts to correct problems after the damage has been done. Not only would the public benefit from the environmental point of view but also the economic costs to industry would be minimized by taking actions prior to the time major investments would be made. It is clear that the past policies of allowing uncontrolled proliferation of chemicals such as PCBs in the environment, chemicals which have proven to be both persistent as well as hazardous, can no longer be tolerated.

Experience in Japan

The most relevant foreign experience in regulating PCBs has probably been the recent efforts in Japan where PCBs have been under governmental

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regulation since 1972. The Japanese Government has recently provided us with some preliminary insights as to their experience. The following comments are based on the initial reports we have received, and we plan to obtain more definitive information in the near future.

According to information provided by the Japanese Government, there has been practically no production, import, or export of PCBs in Japan since 1972. The only two companies which had been producing PCBs in Japan stopped production and suspended sales in early 1972. One exception has been the production of PCBs for railroad transformers which was discontinued in September 1973. Use of existing stocks of railroad transformers and condensers, but no new equipment, using PCBs is permitted. Even this limited use is subject to the restriction that no discharge of PCBs to the environment may occur. Beginning in 1976, paper plants will be prohibited from accepting PCB contaminated paper for recycling and such plants will be required to build treatment plants which will meet general discharge standards.

Further, we understand that the import of equipment using PCBs has also been virtually eliminated as of September 1972, and for those few products which are permitted into the country, importers must cooperate with the ultimate users to ensure that the components containing PCBs are recovered and properly disposed. Disposal is regulated by the Waste Disposal and Public Cleaning Control Law which was amended in February 1975 to include PCBs. Currently there are no regulations for labelling or handling PCBs.

The present limitations on the use, import, and export of PCB are based on Article 3 of the Chemical Substances Control Law which went into effect on June 10, 1974. Any manufacturer who wishes to produce

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PCBS in the future must apply to the Ministry of International Trade and Industry, although approval of such a request is regarded as highly unlikely. The Japanese Government projects that a total ban on PCBs will take effect in approximately six to ten years, when the current stock of equipment containing PCBs is exhausted.

The Japanese Government has established PCB contamination limits for fish and shellfish of 3 ppm for near-shore varieties and 0.5 ppm for ocean varieties. These limits are derived from a basic limitation for human intake of 5 mg/kg of body weight per day. Guidelines first set in 1973 for water quality and bottom sediment were revised in February 1975 to "not detectable" (less than 0.5 ppb) for ambient water and 10 ppm for bottom sediment. These standards are not necessarily permanent standards, since they were set with current monitoring capabilities in mind. Under the Water Quality Control Law, the authority used in setting these standards, penalties are imposed for exceeding authorized limits. Monitoring of the water quality and bottom sediment by each prefecture is required by this Law.

We have only very sketchy information concerning effluent limitations. According to the reports we have received, the Japanese Prime Minister's Office Ordinance based on Article 3 of the Water Quality Control Law sets the maximum permissible PCB concentration in effluents at the point of discharge into rivers or lakes at 3 ppm. Coupled with this limitation is a provision authorizing a penalty for exceeding the effluent limit.

The environmental levels of PCBs in Japan have subsided in the last two years and are expected to continue to diminish. In a 1974 survey of bottom sediment including 1789 samples, 14 samples had PCB concentrations of over 50 ppm, 37 had concentrations of 10 to 50 ppm, and 21 had concentrations

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of 5 to 10 ppm. In the previous year, some PCB levels had exceeded 10,000 ppm; no such peaks were found in 1974. Concentrations of PCBs in the milk of mothers were down over the previous two years, although 25 percent of the samples were contaminated in excess of the prescribed level.

The Japanese Association for Disposal of PCBs is responsible along with local Governments for the collection and temporary storage of household electric appliances and other electrical equipment containing PCBs. The Association will develop PCB treatment technology and treatment plants for disposal, although the latter effort has been delayed by public opposition to the selection of proposed treatment plant sites.

Substitutes for PCBs that are currently in use in Japan include (1) for carbonless carbon paper, alkyl naphthalene, alkyl phenylethane, (2) for heat transfer, diphenyl, diphenylether, alkyl diphenyl, alkyl napthalene, alkyl benzene, and mineral oil, and (3) for transformers and capacitors, mineral oil and silicone oil.

Conclusion

In conclusion, I would like to stress that EPA intends to continue to give high priority to the problems associated with PCBs. The recent data on toxicity and levels of environmental contamination have heightened our concerns and have stimulated considerable new activity.

Much is known about PCBs, and much more will be known in a few months as our current data collection efforts are brought to fruition. In recognition of the national interest in the PCB problem, and particularly the interest in the Great Lakes area, I am pleased to announce that in late fall EPA, in cooperation with other Federal agencies, will sponsor

a national symposium in Chicago to further clarify selected aspects of the PCB problem. The State of Wisconsin herewith receives our first invitation to participate.

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