

STATEMENT BY
MONSANTO COMPANY
FOR THE
EFFLUENT STANDARDS AND WATER QUALITY
INFORMATION ADVISORY COMMITTEE
ENVIRONMENTAL PROTECTION AGENCY

JULY 16, 1973

MONS 040003

Monsanto Company, as an interested party and a manufacturer of polychlorinated biphenyl (PCB), would like to take this opportunity to share with the Committee, and present for the record, our experiences regarding the manufacture, sale and handling of PCB and its relationship to the environment.

We hope this information, along with the attached exhibits, will be helpful to the Committee and the Administrator when proposing effluent standards for toxic pollutants.

BACKGROUND

Monsanto Company has been a major manufacturer of chemical products since 1901. These products are used in numerous American industries, and in fact, through our research department, we have played a role in developing new products to meet the needs of industry and the consumer.

On some occasions, a chemical compound with specific properties is developed to meet a need in a certain application. In other cases, a chemical compound with unique properties is developed first -- possibly through innovative research or even by happenstance -- and then an end-use is found.

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The chemical structure of PCB has been known for nearly 100 years. It was not until the late 1920s that a use for PCB was found -- as a dielectric fluid in transformers and capacitors. The properties of PCB -- inertness, fire resistance and a nonconductor of electricity -- seemed to be perfectly suited to these electrical applications where high-voltage arcing could occur, possibly resulting in serious fires or damage to the equipment.

Monsanto began commercial production of PCB in 1929. As the unique properties of the material became known, production increased and new uses were found. For example, their fire-resistant nature made them excellent choices for use in heat-transfer fluids. Their inertness gave long-lasting qualities to lubricants. Their use in surface coatings improved waterproofing characteristics.

Handling of the product at the manufacturing level has been relatively easy, as PCB has always been considered less hazardous than many other chemicals in everyday use.

Therefore, it appeared that we had developed a very suitable product which met the needs of industry.

Late in the 1960s, sophisticated analytical procedures were developed which could detect very minute quantities of PCB in nature. Following this analytical breakthrough, researchers discovered that PCB could possibly

be affecting certain forms of marine, terrestrial and avian wildlife.

The persistent nature and stability of PCB, while so desirable from the standpoint of many industrial applications, appeared to be undesirable in terms of our environment.

When questions about the effect of PCB on the environment first surfaced, Monsanto Company reviewed its product line and the applications for these products. As more data were developed and the environmental controversy grew, Monsanto unilaterally, began to take steps intended to reduce the entry of PCB into the environment.

Acting on its own, the company stopped the sale of PCB for use in various applications, except where no acceptable alternatives were available.

Today, virtually all PCB manufactured by Monsanto Company is used in closed systems by the electrical industry as dielectric fluids in transformers and capacitors -- applications for which we understand there are no acceptable substitutes.

Our manufacturing and sales reduction program was a unilateral action taken by Monsanto and was based on our evaluation of developing environmental data.

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Admittedly, it was easier for one company to control the manufacture and sale of a product than if many companies had been involved.

The Hon. David D. Dominick, Assistant Administrator for Categorical Programs, Environmental Protection Agency, spoke to this point before a House of Representatives Subcommittee on Commerce and Finance on Interstate and Foreign Commerce on March 16, 1973, when he said:

"The control of polychlorinated biphenyls (PCB), for example, has been possible largely because of the cooperation of the one domestic manufacturer of that substance in placing voluntary restrictions upon PCB sales."

TOXICITY IN PERSPECTIVE

Let's assume that the definition of a toxic pollutant according to the intent of Section 307(a) is:

"Any substance which is not readily biologically degradable, and at some finite concentration might exert an adverse effect on a municipal waste treatment plant, or on living organisms or the subsequent users of such organisms, or to receiving streams into which the substance is ultimately discharged."

If we accept the above definition as being reasonably correct, then we can say that some PCBs are toxic substances. The harmful effect witnessed in the environment (other than isolated industrial incidents) has been attributed to the biomagnification phenomena which has been demonstrated in certain aquatic and marine organisms.

PCBs are not highly toxic systemic or protoplasmic poisons as are some of the other substances found on the list. (Federal Register, Vol. 38, No. 116, p. 15868)

In over 40 years of manufacturing PCBs, there have been only a few instances where our own employees or our customers' employees have been adversely affected -- usually where normal plant precautions were violated -- and to our knowledge, those involved had only mild effects, principally dermatitis.

We emphasize these facts to avoid the human inclination to make illogical associations such as:

"Cyanide ion is very toxic to humans;

PCBs are on a list of toxic materials

with cyanide ion;

Therefore, PCBs are very toxic to humans."

This is simply not true. On a scale of 10, cyanide ion might be considered No. 10, or the most toxic; PCB would have to be put nearer No. 1, or least toxic.

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Further, benzidine has been declared a human cancer-causing agent by the Occupational Safety and Health Administration. The appearance of benzidine on this list of "toxic pollutants" should not lead one to the assumption that all materials on the list are carcinogenic. Again, there is currently no basis for this kind of conclusion.

We don't mean to belabor the Committee with this discussion of toxicity and its definition. Your credentials certainly put you in a position to understand the term fully.

We mention it only to illustrate -- to those less sophisticated in the sciences -- that the word "toxic" is a very relative term.

BIODEGRADATION

In assessing the environmental impact of polychlorinated biphenyls, one must consider the persistence rather than the toxicity of these materials. Reports, unsupported by any serious studies, have stated that PCBs are biologically nondegradable. Admittedly, much work remains to be done. However, an analysis of available information, and information from studies by Monsanto, indicates beyond any reasonable doubt that the many PCB isomers biologically degrade in the environment at different rates.

This information indicates that under the proper conditions of use and control, some of the commercial PCBs, which are mixtures of several isomers, can be utilized and their safety benefits can be realized without serious adverse consequences to the environment.

In May, 1972, we shared with members of the Federal Interdepartmental Task Force on PCBs the results of studies of residual PCBs in animal tissues and biodegradation by activated sludges. A copy of this presentation is attached for review by the Committee.

TASK FORCE REPORT

We would like to take this opportunity to compliment the Interdepartmental Task Force on PCBs and the document it prepared, "Polychlorinated Biphenyls and the Environment." In our opinion, it is an excellent reference document and we recommend it to the Committee as a valuable source of scientific and technical material as you consider proposed standards.

The Task Force report (copy attached) stated under "Findings, Conclusions and Recommendations," page 4, item 5:

"Housekeeping is particularly important in the manufacture, use and disposal of PCBs. Under a program of limitation on the sale of PCBs, the electrical industry will continue to be the

principal user of PCBs; it, as well as industries now holding inventories of PCBs, have a special responsibility for monitoring and controlling their wastes. In this connection, the Environmental Protection Agency will restrict industrial liquid discharges of PCBs from PCB users. To keep levels in fish as low as possible, and in any case below FDA's interim action level of 5 parts per million, concentrations in rivers or lakes from all sources should not exceed 0.01 parts per billion."

It is important to note, that not many laboratories have the capability to detect PCB in natural waters, at this extremely low level (0.01 ppb), with current analytical methods. Therefore, we believe any proposed standards should not be more strict than this concentration level proposed by the Interdepartmental Task Force.

CONCLUSION

Briefly restated, here are the salient points of this testimony:

-- Monsanto's voluntary action to reduce sales of PCB to dielectric uses and offer a service to destroy spent PCB by controlled incineration has already resulted in reduced entry of the material into the environment;

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-- The toxicity of PCB should not be exaggerated by association;

-- Contrary to popular opinion, PCB isomers do biologically degrade, but at different rates, thus allowing their continued use without adverse environmental consequences;

-- Finally, Monsanto Company supports the Interdepartmental Task Force report and recommends the allowable concentrations of PCB in rivers and lakes be established at 0.01 ppb.

In our considered opinion, standards designed to control concentration levels in surface waters are a more practical and less cumbersome approach to improving environmental quality than individual source standards.

We appreciate the opportunity the Committee has provided for interested parties to contribute information, as you consider proposed effluent standards. If you have any questions concerning this testimony or any of the attachments, Monsanto Company will be pleased to supply further explanations or information upon request.

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LIST OF EXHIBITS ATTACHED

The Polychlorinated Biphenyls Literature

References.

Peakall, D. B.; Lincer, J. L.; BioScience (1970), Vol. 20, No. 17, pp 958-964.

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Hubbard, H. L.; Encyclopedia of Chemical Technology (1965), Vol. 5, pp 289-297.

Safe, S.; Hutzinger, O.; Nature (1971), Vol. 232, pp 641-642.

Hutzinger, O.; Safe, S.; Zitko, V.; Environmental Health Perspectives (April, 1972), pp 15-20.

Monsanto Company; Presentation to the Interdepartmental Task Force on PCBs (May 15, 1972), Washington, D.C.

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Polychlorinated Biphenyls and the Environment
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