PCBs IN INDIANA:
A STUDY IN THE TRANSFER OF CHEMICAL INFORMATION

A report of the

COMMITTEE ON SCIENCE AND SOCIETY
INDIANA ACADEMY OF SCIENCE

prepared by the

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MONS 015202

FOREWORD

The recommendations presented in this report are the result of a year long study of the transfer of chemical information to the Indiana state government agencies using the various PCB decisions as case studies.

The project began early in 1977 with an ad hoc committee of the Indiana Academy of Sciences, under the chairmanship of Dr. Jerry Hamelinck. The committee was completing a study for the Indiana Department of Natural Resources, evaluating the risk to human health of PCBs in the Great Lakes fish. The Committee on Science and Society of the Academy suggested that it would be instructive to record the lessons in technical decision-making from the PCB situation in Indiana in order that the state might be better prepared for the "next PCB", whatever that chemical may be. This ad hoc committee became the steering committee for this project.

Under my direction, individuals at Holcomb Research Institute of Butler University performed the background research. Four Butler undergraduate students played crucial roles. During the summer and fall of 1977, Larry DeGan and Kim Wade carried out the major literature search and interviewed participants in the decision-making. Ted Suchy helped enormously with the project direction in the spring of 1977. Bob Jacobson aided in the completion of the project in the spring of 1978. Two research assistants in the Science and Public Policy Program at Holcomb Research Institute, Susan Becker and Betty Tarnowski, carried the project through the winter of 1977-78.

MONS 015203

The steering committee actively reviewed the progress of our research team. The Butler faculty consultants provided timely advice. The Committee of Science and Society of the Indiana Academy of Sciences diligently reviewed and revised the recommendations.

The recommendations were presented at Holcomb Research Institute on October 17, 1977, to a workshop made up of representatives of state and federal agencies, academic institutions, the state legislature, industry and public interest groups. These individuals provided invaluable criticism.

Listing appreciation of all those individuals who cooperated with me and my research staff would include individuals at all levels of Indiana state government and federal government agencies as well as others and would necessitate much more space. Not once during our interviews were we treated with less than complete cooperation and courtesy. Proper acknowledgment will be accomplished in a more detailed version of this report which is now in preparation. In addition, all references to the statements in this report are included in this longer, more detailed version and may be obtained from me.

I hope that this study contributes in some small way toward the improvement of use of chemical information in the State of Indiana.

William Beranek, Jr.
Indianapolis, Indiana
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MONS 015204

TABLE OF CONTENTS

FOREWARD		i
TABLE OF CONTENTS		iii
INTRODUCTION		1
POLICY RECOMMENDATIONS		3
A STUDY OF PCBs IN INDIANA		16
HISTORY		16
PCBs IN INDIANA MILK		19
PCBs in BLOOMINGTON, INDIANA MUNICIPAL WASTE TREATMENT PLANT		31
PCBs IN THE INDIANA WATERS OF LAKE MICHIGAN		40
APPENDICES		48
APPENDIX A	ABBREVIATIONS	48
APPENDIX B	SCIENCE AND SOCIETY COMMITTEE INDIANA ACADEMY OF SCIENCE	49
APPENDIX C	STEERING COMMITTEE STAFF CONSULTANTS RESEARCH ASSISTANTS	50
APPENDIX D	PCB CONFERENCE PARTICIPANTS	51

MONS 015205

INTRODUCTION

Modern industrial society is making increasingly sophisticated and increasingly extensive use of synthetic industrial chemicals. Assessing the potential of each chemical as a significant environmental and human health hazard is an enormous task which has barely begun.

The Toxic Substances Control Act, signed into law on October 11, 1976, grants the federal government power to obtain from industry data on chemical substances and, if warranted, power to regulate those substances. This will reduce the number of new, untested chemicals released into the environment. However, it is certain that over the years new facts about chemicals now in wide use will identify some of these hazards. Government officials at all levels must be prepared for responsible action. The purpose of this study is to outline such policy considerations for officials in the State of Indiana.

What is the proper action of the state and local government with respect to suspected environmental contaminants? Charged with protecting the health of its citizens as well as their economic and social wellbeing, the primary action must be to assess the risk to human health. The toxicity and the location of the contaminant must be estimated from the incomplete scientific results that are available while the extent of the threat must be obtained from self-interested parties (the sources of the contamination). The governments must determine the sense of urgency of the danger. All affected parties must be informed but public overreaction must be avoided. The entire procedure takes place against a backdrop of

changing federal regulations and enforcement patterns. This activity requires much skill and coordination and yet must be done on a minimal budget.

Two options exist for the state: (1) Seize the initiative early or (2) wait for federal action and then respond. Both require the ability to evaluate technical, social and economic problems in a political arena. Both options have advantages and disadvantages and circumstances may dictate the choice.

In order to develop our policy recommendations, we have examined the Indiana response to the first industrial chemical identified as a widespread environmental contaminant--polychlorinated biphenyls (PCBs). The PCB problem is a good example of a widely used chemical whose hazards became apparent only gradually, accompanied by the confusing debates among the experts which we have become accustomed to in such incidents. The final chapters of the PCB story are now being written nationally, internationally and in Indiana, so this appears to be an appropriate time for such a study.

POLICY RECOMMENDATIONS

I. *INFORMATION FOR DEVELOPING REGULATORY POSTURE*

A. Access to Nationwide Information System

As a method of keeping watch for the next major chemical incident, we recommend increased regular use of the federal information exchange networks such as the National Regional State Telecommunication Exchange Network of the Food and Drug Administration; the Environmental Data Service of the National Oceanic and Atmospheric Administration; the new User Prompted Graphic Data Evaluation of the Council on Environmental Quality and the National Technical Information Service of the Department of Commerce.

Due to the widespread distribution of chemical users throughout the nation, similar chemical incidents will occur in widely separated locations. Information from the entire United States will be essential for the local decision-maker who is attempting to assess potential local problems on the basis of the type of incident. A chemical incident related to a silo is of interest to silo users and to those who regulate them throughout the country. A chemical incident associated with a paper mill in one state is of interest to decision-makers concerned with paper mills elsewhere.

B. Exchange of Facts which are Believed: Personal Relationships

Since the most trusted information exchange seems to occur between those individuals who have an opportunity to know each other personally and develop a rapport, we recommend that the reward structure in the state agencies be modified so that individuals at all levels:

i) are encouraged to develop relationships with individuals in the federal government information

MONS 015208

offices and to use the services regularly.

ii) are encouraged to develop a cooperative relationship with their counterparts in federal, local and other regulatory agencies both in their state and in other states.

iii) are encouraged to develop trusted contacts within the academic and corporate communities of Indiana who can supply reliable advice on chemical incidents.

To carry out each one of these suggestions effectively would require commitment and assistance from the highest office in each agency. The fact that Occupational Safety and Health Administration, Environmental Protection Agency, Food and Drug Administration and the Consumer Product Safety Commission are now formally coordinating some of their technical policies emphasizes the need for closer attention to be paid to federal scientific and regulatory information at the state level.

C. Office of Chemical Risk in the State Board of Health

We recommend that an Office of Chemical Risk be established in the State Board of Health through which are channeled all inquiries on incidents chemical in nature. The organizational structure will be similar to that of a volunteer fire department. The director will be a permanent employee with some knowledge of chemistry. He will have for a crew of "firemen" a carefully selected group of industrial and academic chemical experts in Indiana who are appointed for five year terms. These scientists will be rewarded by official recognition and be compensated by a modest daily allowance and traveling expenses.

The director will be in regular contact with his volunteer scientists. If the situation is deemed serious enough, he may call the crew together

MONS 015209

to meet as a task force to develop a report on the immediate state of knowledge about the potential hazards of a chemical in question.

The responsibilities of the director will be to identify and to assess major chemical incidents in Indiana, to assign priorities for the few that require further study, and to recommend to the Commissioner of the State Board of Health actions that might be taken. He will also establish a procedure for the regular dissemination of information to the appropriate individuals; physicians, for example, should be informed of any new chemical toxicology information that would be of local and immediate concern. This employee will regularly assess the chemically related issues in the State Board of Health, newspaper reports in Indiana, and federal information sources as well as maintain close contact with the Office of the State Toxicologist, the State Epidemiologist and the State Chemist.

He should be aware of the proper questions to ask about the risk to the public from a chemical and should know what is being done nationally to answer them. Thorough and useful guidelines for this have been published by the National Academy of Sciences. For example, toxicity, environmental alteration and persistence, transport mechanisms, carcinogenicity, bioaccumulation and preliminary estimates of human exposure are pieces of information crucial to public policy.

The office will have neither policy making nor policy enforcing responsibilities. Its responsibilities will be restricted to information gathering and dissemination.

D. Obtaining General Chemical Information from Industry

We recommend a study be undertaken to develop a mechanism whereby discussions of potential problem chemicals occur between the State and commercial operations.

MONS 015210

This will be difficult since each company will tend to put forth an optimistic public front. Premature indications of problems may have an effect on future business. Furthermore, preliminary disclosure of suspected problems could leave companies in a poor situation to defend themselves later should the problem become a serious one.

As a related issue, a mechanism should be devised to encourage companies to search through their files and then to divulge the data about their past chemical disposals. Revealing this information cannot help the company. In fact, it may harm its public image or encourage nuisance lawsuits to be filed. Nevertheless, knowledge of old chemical landfills, for instance, would be valuable as drinking water standards tighten and as groundwater use in Indiana is pushed towards its limits.

The Office of Chemical Risk should work closely with the Environmental Protection Agency and utilize the available information. Under Toxic Substances Control Act, Section Eight, the EPA Office of Toxic Substances will have health and safety information for each chemical product.

E. The Regional Environmental Toxicology Research Center

We recommend that a feasibility study be developed for a non-governmental Regional Research Center on Toxicology located in Indiana in the future.

Having ready access to active researchers and laboratory facilities to assist in answering questions for the next chemical incident in Indiana would certainly be a great advantage to the State. The center, by its nature, would have a continuing contact with the national toxicology community. Research results from an independent center would avoid the stigmata that university, industry and government results are given in different circles. Public policy options could also be studied. At this time, the cost of such a center would probably exceed its benefits to Indiana. Should external funds become available, however, such a center should be seriously considered.

MONS 015211

At a meeting of the National Environmental Health Association on June 26, 1977, George C. Whitehead, Deputy Director of the Michigan Department of Agriculture, suggested that states or a group of states cooperate to establish such a center. Perhaps Indiana and Michigan could be the lead states in the establishment of such a center in the Midwest.

II. JURISDICTION AND AUTHORITY

A. Toxic Chemical in Meat Animals

1. We recommend that the State of Indiana have the power to regulate the movement of any animals which contain chemicals in an excess of the amount that the Commissioner of the State Board of Health considers safe for the health of the eventual consumer.

We recommend that the law would be executed by the State Veterinarian using public hearings. He would also be empowered to recommend the extent of state indemnification if any. (See Section III A. 1.)

Presently, neither the State of Indiana nor the federal government has the authority to regulate the intrastate movement of an animal proven to contain chemicals which would pose a potential health hazard should they enter the human food supply. As a result, such an animal can be sold to an unsuspecting buyer for use in the commercial food market. Such cases may have occurred with PCB contaminated milk cows in Indiana.

Of course, all slaughterhouses in Indiana are sampled randomly by the State or the United States Department of Agriculture for chemical testing. But the sampling is for a few specific chemical residues and only for a few animals. The program is designed as a deterent to negligent farmers rather than a screening for approval of the food. If a farmer knows his livestock may be inspected for sulfa, for example, he will take extra

MONS 015212

care that there be no contamination. But other chemicals, such as PCBs that do not concentrate in animals because of the farmers neglect, may contaminate the animals with the farmer completely unaware. It is probable the PCB contaminated animals can be sold to the consumers very easily.

If a dairy cow is giving milk determined to be unfit for human consumption because of chemical contamination, the State should have the power to prevent that animal from being slaughtered for use in the commercial meat market unless the meat is in fact determined safe.

2. We recommend that the State Veterinarian seek the necessary authority staff and funding to perform laboratory tests on live animals on the farm which, after a public hearing, have been determined with good reason to have abnormally high concentrations of a toxic chemical.

No Indiana state agency has the authority to test animals suspected of being chemically contaminated. Since no chemical tests are performed at the time for each animal about to be sold, such an animal enters the food supply with only a routine health inspection.

Requiring chemical tests on every animal which is sold would be prohibitively expensive and would most likely not be acceptable to those involved in the trade (note framer response to diethylstilbestrol request). Therefore, specific checks only on those animals strongly suspected of chemical contamination seems the most reasonable approach to safeguard the general public health. We would expect that responsible farmers would seek to have such animals checked and thus the power of the State to check would be used only for the few cases in which the farmer disagrees with the assessment of risk. The cooperatives may play a large, useful role to insure such an authority of the State is seldom used

MONS 015213

The argument against this recommendation follows from the observation that many organic chemicals concentrate in the fat of an animal. In order to obtain an accurate estimate of the amount of such a chemical, a fat biopsy must be obtained. This is most conveniently accomplished from the base of the tail leaving a noticeable scar which essentially brands the animal forever as having once been suspected of "chemical contamination." At the present time, few animals would be tested and so the scar itself may tend to lower the animal's market value. The point can also be made that such a test provides the potential buyers with the assurance of a clean bill of health.

To minimize the psychological trauma of government officials once more intruding in the farmer's business, perhaps all such tissue samples could be removed by the farmer's veterinarian at state expense.

B. Access to Proprietary Sales Information to Assess the Extent of a Chemical Incident

We recommend that the State not change its laws regarding access by the State to commercial chemical sales information. It should, however, understand the powers of the federal government in this regard.

The Environmental Protection Agency has the power to require chemical users to tell them the sources, quantities, uses and ultimate disposition of a chemical by the authority provided by Section Eight of the Toxic Substances Control Act.

The State should study the Virginia law addressing this problem.

C. State Responsibility to the Individual Private Citizen

1. We recommend extensive publicity of the telephone number of the Office of Chemical Risk. The clerk would refer callers with chemical problems to proper agencies. Presently, it is difficult for private citizens to get such information or even to know whom to ask.

MONS 015214

2. We recommend that a vehicle be provided by the State whereby citizens who suspect the presence of an unwanted chemical under conditions not covered by any state or federal jurisdiction can receive subsidized laboratory analysis. Applicants for such an analysis would be screened for obvious commercial interests and for cranks by the Office of Chemical Risk. The results of such analysis would be a matter of public record. The questions surrounding the use of such analyses for lawsuits would be answered.

As costs of chemical analyses rise in the future, making private laboratories less and less accessible to the average citizen, such a service would clearly be a matter or public health and safety. However, such a subsidized service may be completely unacceptable to private laboratories.

3. We strongly recommend that a State panel study the feasibility of licensing private laboratories (and/or chemists) according to their abilities to analyze classes of chemicals. Such certification of laboratories could be aided by federal agencies and by such professional organizations as the American Chemical Society. License fees could cover the cost of the licensing. The model of certification of medical technologists could be followed. Such a certification program would allow the Office of Chemical Risk to supply a citizen with a list of all certified laboratories without constituting public endorsement of private enterprise.

MONS 015215

III. ACTIONS

A. Legislation

1. State Indemnification Program

We recommend that the State of Indiana expand the program now existing for infectious diseased animals to include toxic chemicals. This would protect the individual who was acting in good faith with the best available information from a disaster due to a chemical difficulty. This would require careful review of the experience of the State of Michigan with PBB indemnification and the federal government experience with pesticide indemnification and with disaster relief. The reasons for indemnification must be specific enough so as not to reward negligence. The amount of the indemnification must be high enough to cover most of the losses but low enough to discourage situations analogous to burning one's own business to collect insurance. One alternative to indemnification is low cost loans from the State.

Since a temporary loss of several thousand dollars can be an enormous blow to a farmer or a small businessman, we recommend that if an indemnification program is developed that it be designed to supply the money as quickly as possible.

2. Contingency Funds and Equipment for Extraordinary Chemical Incidents

We recommend that a State contingency fund be established so that additional personnel and chemical laboratory facilities can be ordered quickly by the Commissioner of the State Board of Health to meet the special demands of an extraordinary chemical event. The money would be used only for special temporary "peak load" situations.

A second contingency fund for the same purpose might be established in the budget of the legislature. Access to this would be by the executive committee of the legislature, again only for extraordinary circumstances involving chemical risk to the health of the citizens of Indiana.

3. Whistle-blower Legislation

We recommend the formation of a panel to study the question of whistle-blower legislation. Often it will be an individual working in an industrial situation who will have first knowledge of a chemical incident potentially hazardous to the citizens of Indiana. He may likely have strong allegiance to his company and strong concern for his financial security. If he were to "blow the whistle" on his company, providing a great service to Indiana, how would the State be able to protect him from local repercussions. Alternatively, an individual may not be devoted to his company and may blow the whistle as a personal vendetta when the offense is negligible. There must be protection both for the whistle blower and protection from the whistle blower. A form of this type of protection is provided in Section 23 of Toxic Substances Control Act.

B. Regulation

1. Preparedness for Regulatory Enforcement

a) Spill Drill

We strongly urge that the appropriate decision-makers from the local, state and federal regulatory agencies meet so that all understand who has responsibility for what with general chemical problems. New people, new laws and new chemical situations would dictate the necessity of this meeting to be held periodically (at the longest, several year

MONS 015217

intervals). The sessions could last one day and be considered as a Chemical Emergency Preparedness Drill.

Scenarios would be presented and the best course of action to resolve the situation would be discussed. Types of scenarios might include the spill of a potentially toxic substance; the slow leaking of a chemical from an abandoned landfill into a water supply; and the cases, such as with PCB, in which a widely used chemical is discovered to be potentially dangerous. A formal week-long training session led by a federal agency such as the Food and Drug Administration has been recently suggested by D.R. Isleib, Chief Deputy Director of the Michigan Department of Agriculture, to be a useful project to consider.

b. Laboratory Registry

A listing should be presented of those academic, private and industrial chemical laboratories willing to contract with the state government for chemical analyses in special situations. The capabilities in terms of staff equipment and work capacity should be noted but not officially evaluated.

The proposed Office of Chemical Risk would have contact with those individuals with special expertise in Indiana in academic and private positions.

2. Crisis Management Coordination

When a crisis occurs, an ad hoc council of the governor, or his representative, and the heads of the appropriate agencies should meet to coordinate actions, to affirm responsibilities and to enlist outside assistance, if necessary, from the private, academic and federal sectors. This was found to be a crucial management factor for the State of Michigan when dealing with new chemical dilemmas.

MONS 015218

3. Dissemination of Information During a Chemical Incident

We recommend that careful attention be paid to the dissemination of information about a newly discovered chemical risk. The right of affected parties to know the situation is fundamental. Unfortunately, the incompleteness and uncertainty of the information in these situations often results in misinformation being transmitted. The affected party may become either too complacent or overly concerned. Public hysteria to a pervasive, unseen danger and public apathy to the repeated cries of "wolf" are extremes which are difficult to avoid. It may well be that informal discussions with a first rate public relations firm may be useful.

4. Technical Methodology

We recommend that an ad hoc task force of scientists and public health officials develop a procedure to standardize the methodology and interpretation of chemical analyses for organic compounds of interest to the State Board of Health in the coming years. Attention should be given to optimizing the amount of information per sample. The American Organization of Analytical Chemists has this type of a procedure, and the State Chemist is active in the organization. This information can be utilized while a task force can be created to develop procedures for new and unusual chemicals that the American Organization of Analytical Chemists does not provide.

5. Laboratory Facilities Study

We recommend that most economic use of the municipal and state chemical laboratory facilities be studied as the Indiana State Board of Health prepares to meet the Safe Drinking Water Act requirements. The analysis of organic compounds will be much more expensive than

MONS 015219

bacteria or simple inorganics, largely due to the need for highly trained personnel to do routine tasks.

The study should be concerned with the optimization of the use of private laboratories, the laboratory facilities, the communication networks, and the sampling methodology. The use of university facilities should be investigated also.

6. Business and Agency Response to Changing Information About the Hazards of a Chemical

We recommend further discussion on the issues that were in the background during the entire study; that is, the need to know when a business or a government agency should act on the best available information and the need to understand the status of future liability or responsibility for actions taken based on tentative chemical information.

MONS 015220

HISTORY

Polychlorinated biphenyl (PCB) is a family of extremely stable, fire resistant, and water insoluble synthetic chemicals. The non-explosive character of these chemicals led to their wide use in electrical devices. In addition, PCBs have been used commercially in heat transfer systems, printers' ink solvent, carbonless copy paper, lubricating oil, hydraulic fluid, plastics paints, and sealants. Since 1930, when PCBs were first manufactured, United States industries have used 1.25 billion pounds. Most of that has been manufactured by Monsanto in Sauget, Illinois, under the trade name Aroclor. Because of the chemical's stability, sixty percent of the PCBs manufactured are still in use in the United States in electrical transformers and capacitors, and thirty-six percent are intact as waste. Four percent of the amount produced have been destroyed, whether by incineration in special, high temperature units or by slow, natural degradation in the environment.

In 1936, Dr. Louis Schwartz of the United States Public Health Service reported the first toxic effects of PCBs when three workers contracted chloracne, a serious skin inflammation, when exposed to the chemical. In Japan, in 1968, over one thousand people contracted chloracne and other more serious toxic effects from the ingestion of PCB contaminated rice oil or Yusho. Recent studies of both Yusho victims and industrial workers indicate a possible link between PCBs and cancer.

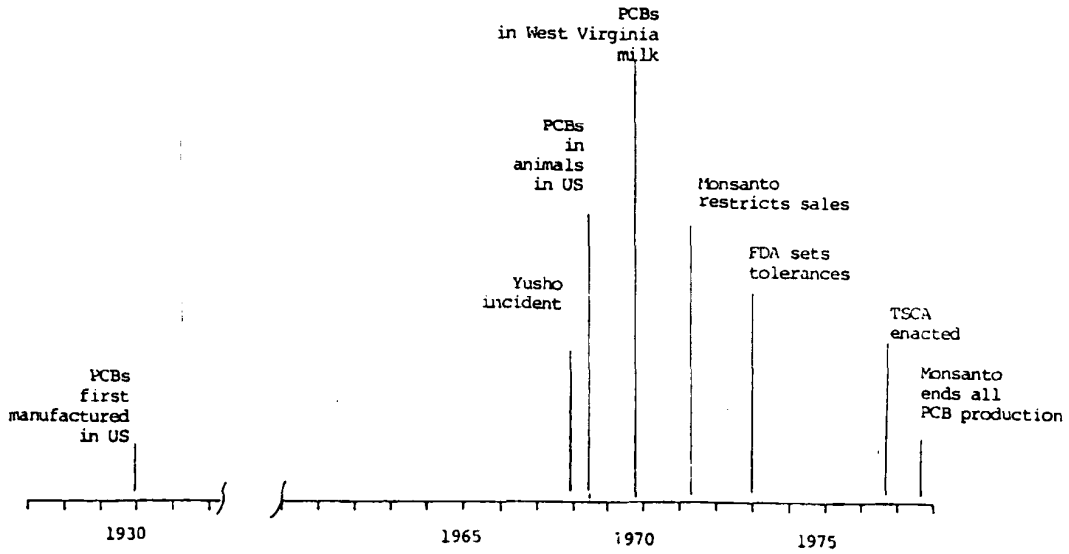
Awareness of the persistency of PCBs in the environment came in the late 1960s with the discovery of PCBs in wildlife and in human food. Jensen first identified PCBs in fish in Sweden in 1966. Rise-

brough in 1968 found PCBs present in species of prey in southwest North America. It was first found in human food by the Food and Drug Administration in Baltimore while making a routine food surveillance in milk in West Virginia in August, 1969. PCBs now are found everywhere in the environment.

In 1971, the lone producer, Monsanto, reacted to the Yusho incident by voluntarily restricting sales of PCBs to uses in which the chemicals remained in sealed containers, eg. transformers and capacitors. At their suggestion, the electrical manufacturers formed a standards committee which outlined procedures for labeling, handling and disposing of PCBs. On July 6, 1973, the Food and Drug Administration set limits for PCB concentrations in animal feeds, foods (including dairy products and fish), and food packaging. Using the Federal Water Pollution Control Act, the Environmental Protection Agency set a 2ppt PCB limit in ambient waters in 1973. This was later reduced to 1ppt in 1977.

In December, 1975, EPA administrator Russell Train announced that he had plans to ban PCB effluents and the manufacture of PCBs. The Toxic Substances Control Act, which passed in October, 1976, strengthened the power of the Environmental Protection Agency and specified immediate action to be taken to restrict and control polychlorinated biphenyls. In October, 1977, Monsanto voluntarily ended all PCB production.

Chronology of Important PCB Events



MDNS 015223

PCBs IN INDIANA MILK

Background

The source of PCBs in Indiana milk was CUMAR, a sealant for silo interiors which Michigan Silo Company used since 1948 to prevent silage juices from corroding concrete staves. When Michigan Silo Company reorganized in 1966, its branch in Bloomfield, Indiana, became the Bloomfield Silo Company. PCB, as 15 percent of the CUMAR mixture, dissolved slowly from the walls of the Bloomfield silos into the fermenting silage. Dairy cattle fed such silage produced milk for public consumption with PCB residues.

Formulated in 1941, CUMAR was not identified as a potential hazard until March, 1970, when the Ohio State Department of Agriculture identified the PCB isomer mixture, Aroclor 1254, in milk in the Cincinnati milkshed and traced the problem to the silo sealant used by Bloomfield Silo Company. In September, 1971, responding to this new information, Bloomfield Silo Company changed its sealant from CUMAR to Kleer Kote, which contained no Aroclor 1254 and had much reduced levels of other PCBs.

Disposition

Indiana, along with 13 other states, became aware of the PCB problem in milk through the Ohio incident, and in the spring of 1971 the Dairy Division of the Indiana State Board of Health (ISBH), began monitoring PCB concentrations in Indiana raw milk. Between 1971 and 1976 the ISBH monitored silage and silo sprapings, raw milk, and

MONS 015224

finished products. When significant levels of PCB were found, farmers were advised to remove their animals from the source of PCBs. During this period of time, the ISBH prevented one farmer from selling his milk, due to excess of PCB. This occurred in 1974. In addition to the involvement of state officials, farmers were warned by 1973 about silos coated with CUMAR in periodicals such as Hoard's Dairyman, a journal widely read by farmers. The FDA established guidelines of 2.5 ppm in milk July 6, 1973.

In late 1975 the Detroit District Office of the FDA received an ISBH report showing one sample above the 2.5 ppm level and conducted a follow-up investigation. It asked the state to determine the extent of the PCB problem, enforce tolerance levels and take measures to reduce levels of PCBs in milk in Indiana. Through the winter pressures from other chemical issues built up. The PBB contamination of Michigan cattle and the PCB identified in Bloomington sewage treatment plant sludge each resulted in a vocal public response which, in isolated cases, approached mass hysteria.

In May, 1976, on a routine pesticide check for dieldrin (FDA is required by law to test 12 samples of milk per year in Indiana for pesticides), the FDA discovered PCB levels of 7.5 ppm in the milk of a Johnson County farmer. On June 3 it sent an information letter to the milk plant which processed this farmer's milk. As opposed to a regulatory letter which is used when the FDA is prepared to order an injunction, an information letter indicates a possible violation and asks for a response on the matter within ten days. This letter notified the milk plant

MONS 015225

that it was using what FDA considered to be an adulterated raw material in its operation. The milk plant stopped purchasing milk from the farmer. The FDA sent no other notices to farmers in Indiana.

On June 23, the ISBH halted the transport of milk from this, as well as three other farms. Depending on the levels of PCB in the milk, the farmers were kept off the market two weeks or more. The milk was dumped into fencerows on the farms, at a loss to the average farmer estimated at $200 per day.

During the summer the ISBH determined the extent of the milk problem by conducting surveys of raw milk routes and finished products. The surveys showed that the PCB contamination was restricted to farms located in one area of the state. As the ISBH laboratory had a backlog of work and was not equipped to handle such a large number of such time-consuming samples (ISBH collected 78 bulk route samples), the FDA Cincinnati District Office performed the analyses. The results were relayed back to the ISBH via the computerized apparatus NRSTEN (National-Regional-State Telecommunication Exchange Network installed at the ISBH Bureau of Food & Drugs in April, 1975).

The State Chemist tested feed, seed, silage and environmental samples for farmers, and the ISBH conducted silo surveys to determine the number of farmers having problem silos. Warning letters were then issued by the Purdue-USDA Cooperative Extension Service (July) and the ISBH (August and December) to over 140 farmers stating that they may have cows producing milk with violative or near-violative concentrations of PCBs because of the sealant in their silos. County agents from the

MONS 015226

Cooperative Extension Service advised and aided the farmers on removal of contaminated feed and procedures for recoating or dismantling the silos. No dairy cows were quarantined or destroyed because of PCBs found in the milk they produced, although at least six farmers were kept off the market for a period of time. It has been suggested that one or more dairy farmers may have shuffled contaminated cattle from one farm to another to dilute the PCB-containing milk.

At the end of July there was in Indiana newspapers publicity about the four farmers ordered off the market. At least 25 papers carried an Associated Press article about the incident, although public awareness and mass hysteria were much less than in the Bloomington issue and the PBB incident.

The four farmers whose milk was impounded were indemnified by the Indiana State Legislature in an act passed in April, 1977. This indemnification act (PL 182) paid the farmers 80 percent of the value of the milk they lost. The total amount of money divided among the farmers was $40,000. One of the farmers quit the dairy business.

Based on a new interpretation of Japanese human PCB data, on April 1, 1977, the FDA proposed changing its tolerance level for PCBs in milk to 1.5 ppm.

Analysis

Key decisions in the Indiana PCB contaminated commercial milk public policy problems of a) interstate and intrastate jurisdiction of agencies, b) enforcement profiles of agencies, c) establishment and agreement on tolerance levels, d) avoidable vs. unavoidable contamination, e) the definition of adulteration (involving quality of the finished

MONS 015227

product as opposed to quality of the components), f) sampling procedure and methodologies, and g) indemnity for business loss. Public hysteria and the media were not the large factors they were in the Bloomington issue.

A. Interstate and Intrastate Jurisdiction of Agencies

Traditionally, and as set out by the Indiana Statutes, the Dairy Division of the ISBH has had sole jurisdiction over commercial milk produced and sold within the State of Indiana. It monitors the intrastate shipment of milk and also has jurisdiction granted by FDA over raw milk produced in neighboring states which is shipped into Indiana to be sold as finished milk products within the state. By agreement, the state of origin does the testing in these cases.

The ISBH can prevent the marketing of raw milk or finished milk products which are in violation of sanitary or chemical standards or deemed adulterated. Primary in the ISBH's duties is the goal to protect the health, safety, and welfare of citizens of the state, and it is on this basis that the ISBH implements its intrastate jurisdiction.

All federal authority over chemical adulteration in food in interstate commerce has been delegated to the FDA - except meat - in which case the USDA has authority. (The EPA sets the tolerance levels for pesticides, but FDA still has the enforcement jurisdiction for food.) The FDA, therefore, controls the interstate sale of milk products. Since most dairy business of Indiana is intrastate in nature, the FDA has little direct involvement with Indiana milk. The direct authority of FDA for milk shipped within a state is the interstate shippers list. Only those milk plants which the FDA approves for listing may be licensed

for interstate shipment of milk. Even if they are not engaged in interstate commerce, being on the list is important because it signifies a quality of product.

Thus, when the FDA sent its May, 1976, information letter to the milk plant, both dairymen and state officials regarded the FDA as overstepping its jurisdiction.

B. Enforcement Profile of Agencies

Between the regulator and those regulated there is always tension—whether at the local, state, or federal level. Nevertheless, the tension level can be affected by the enforcement profile of the regulator. The agency which enforces its regulations strictly, actively, and openly is said to have a high enforcement profile. The former U. S. Public Health Service, for example, had a low profile. They tended to assist those they were regulating. Presently, the EPA, FDA, and OSHA can be said to have high enforcement profiles. Understaffed, they have difficulty in developing a cooperative working relationship with the people they regulate. The ISBH has a much lower enforcement profile. The state people working in the field know and understand the problems of the farmers. Many farmers accept them more readily than federal officials. They can enforce their regulations with consideration for the farmers' difficulties.

This difference in enforcement profiles created difficulties when the FDA sent its information letter in 1976. Its style, perceived as no-nonsense, no compromise, strict compliance with Washington regulations enforced by strangers was greeted with hostility by many of the farmers.

MONS 015229

C. Establishment and Agreement on Tolerance Levels

The milk incident also involved the question of how tolerance levels should be set and enforced. The FDA based its 2.5 ppm level on scientific studies from animal data and the Japanese Yusho incident. The FDA's Division of Toxicology divided the lowest dose known to create overt symptoms in humans by a safety factor of 10. In addition, choice of the 2.5 ppm level was influenced by a nationwide survey conducted in 1972 which showed one out of 520 farms surveyed to have PCB levels in milk of 2.5 ppm.

Some people outside the FDA raised objections to the 2.5 ppm value chosen for milk, and to the whole procedure of setting and enforcing tolerance levels. Scientific data on the toxicity of PCBs had not been entirely gathered when FDA set its guidelines in 1973. Since the federal agency acted on incomplete information, the opponents of the guidelines felt that should PCBs prove less toxic than estimated, farmers would have incurred much unnecessary loss in their business. Moreover, opponents argued that shutting down a farmer at 2.6 or 2.7 ppm is unfair because of the margin of error of sample results. Finally, delays in the time for testing introduced unfairness. Action could be taken toward a farmer, based on milk samples several weeks old, if the laboratories had a backlog. If the farmer had removed feed suspected of contamination from his cows, in that same amount of time the level of PCBs could have been reduced by 50 percent.

The FDA, on the other hand, contends that it must act on what scientific data are available. If it must err, the government agency must err on the side of protecting the public health. Sample results,

it maintains, have incorporated the margin of experimental error. Moreover, since studies after 1973 have shown PCBs to be a potential carcinogen, FDA considers strong control of PCBs in a food to be even more important than before.

D. Avoidable vs. Unavoidable Contamination

Closely correlated with setting and enforcing tolerance levels is the question of avoidable vs. unavoidable contamination. The FDA contends that in enforcing the guidelines, it should be considered whether or not the PCBs in the milk were avoidable.

Since the state started monitoring milk in 1971, and since farmers were advised of the possibility of problems with PCBs in milk resulting from the silo sealant and also advised of corrective measures (at least by 1973), it seemed reasonable to the FDA that by 1976 most farms could have eliminated their PCBs. On the basis of the time factor in warning and of the possibility of corrective measures to be taken, FDA considered PCB levels in excess of 2.5 ppm to be avoidable after 1973. One reason for this policy is to reward the conscientious farmers who did spend time and money to clean their operations voluntarily.

E. Defining Adulteration

The longstanding policy of the FDA is to consider a finished food product to be adulterated if any of the raw materials going into its production was adulterated. This is an expecially useful policy for adulteration by microorganisms because the small innoculum may well multiply and contaminate the entire finished product.

In the case of chemical adulteration, the policy may not be universally applicable. Toxic concentrations of a metal in a raw material,

for instance, may be diluted to non-toxic, even beneficial, concentrations in the finished food product.

FDA policy required that it consider raw milk with PCB levels above 2.5 ppm to be adulterated. No amount of dilution with other milk could remove the adulterated taint. Strict adherence to this policy minimizes low levels of extraneous chemicals in the general food supply.

The ISBH considered the PCB levels in the finished product to be the crucial factor in assessing risk to public health. If the levels in milk which the individual was consuming were safe according to FDA standards, then it was acceptable to blend milk from different herds to achieve the required levels. Since comparatively few farms were affected, adequate blending occurred during normal operations in the Indiana milk plants.

F. Sampling Procedures and Methodologies

The ISBH and the FDA have their own procedures for sampling milk. The ISBH takes a screening sample in a plastic bag from the milk hauler at the milk plant. This sample is for analysis of chemicals that might be present in the combined milk on the milk hauler's route. Plasticizers such as PCBs and other similar organic compounds might be absorbed into the plastic bag, however. A truckload of milk found to contain an undesirable concentration of a certain chemical is then further scrutinized; the ISBH goes to the farms on that route and takes an official sample from each in a glass container. Results from this sample can be defended in court. At an appropriate time (2-3 weeks later) the ISBH takes a second check sample. Appropriate regulatory action is then taken.

MONS 015232

The FDA collects a 2-pint sample at first, half of which must be available to return to the farmer, should he decide to run an independent analysis at a private laboratory. This 2-pint collection is the FDA's official sample. The same sample is then analyzed again by a second chemist.

In analyzing for PCBs there was a difference in interpretation of data. The ISBH measurements were always lower by 20 percent than those of FDA; they looked for most peaks of the PCB Aroclor 1254 in the gas chromatogram, whereas the FDA looked at the main peaks in the gas chromatogram. Comparing the presence of main peaks of a milk sample and a pure Aroclor 1254 sample will mean a higher ppm result than if all peaks were compared. The reason for this difference is that the cow metabolizes the lower percent chlorine homologs so that the peaks for these homologs are not present in the gas chromatogram.

It is best to standardize and make consistent these methodologies for reasonable tolerance level enforcement. The ISBH has now incorporated FDA's methods into its own.

G. Indemnity For Business Loss

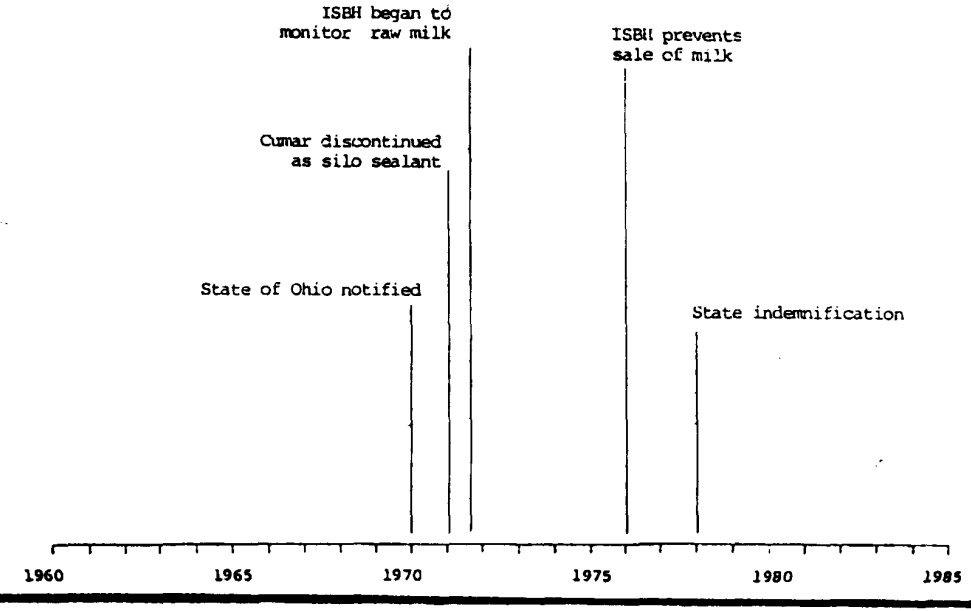
Although the goal of government agencies is to protect the public from exposure to toxic chemicals--which may require keeping PCB-containing milk off the market--much of the burden of economic loss may fall unfairly on the farmer. The dairyman acted in good faith when he bought CUMAR to keep his silo from being eaten away by silage juices; PCBs were not known to pose an environmental hazard when he did so. Moreover, it is an emotional issue for the farmer who must milk his cows

MONS 015233

every day, anyway, to then dump the milk every day and see his money wasted in fencerows.

There is no national or state basis for relief for the farmer under these conditions--only special legislation. Although there is movement to change this, federal legislation for disaster relief does not cover chemicals, nor do agricultural insurance programs. The national pesticide program indemnifies only loss due to pesticides. Special legislation takes time, as it did in the Indiana milk incident. The four farmers who were shut down in June, 1976, did not receive relief until the vote in April, 1977. Payment came in December, 1977. A farmer can lose his business during a delay of this length.

Chronology of the Milk Incident



MONS 015235

PCBs IN BLOOMINGTON, INDIANA

Background

In the winter of 1975-76, the detection of PCBs in a sewage treatment facility, sewage sludge, streams and certain garden plots in the vicinity of Bloomington, Indiana, drew the attention of local, state and federal agencies. Subsequent publicity elicited responses from the local population ranging from apathy to outrage. The source of the PCBs was a Westinghouse plant which used Inerteen, a PCB mixture, as a dielectric insulating fluid in the manufacture of power capacitors. Being nonflammable, chemically stable, and nonexplosive, the PCBs had been the insulating fluid of choice since the early 1930s for sensitive uses such as in buildings, tunnels and ships where fire is a danger. The Westinghouse capacitor plant in Bloomington opened in late 1957 using a PCB mixture from the start.

PCBs from the Westinghouse plant were discharged to the environment in two ways. One was the burial of solid wastes, saturated with PCBs, in local landfills and disposal sites. This practice was discontinued in 1972. Environmental Protection Agency analyses of soil and water samples show no evidence of any large scale leakage of PCBs from these sites. The second mode of discharge of PCBs was in the plant wastewater sent through seven miles of pipe to the city of Bloomington's Winston Thomas sewage treatment plant. Though discharged at the parts per billion level, PCBs were found to concentrate in the sewage sludge. This sludge was given away to local farmers and gardeners for use as fertilizer, a practice predating

the construction of the Westinghouse plant. Root crops, such as carrots and beets, grown in soil treated with this sludge have been shown to contain varying but substantial quantitites of PCBs.

Considerable amounts of the PCBs passed through the treatment plant without being absorbed by the sludge. With the treatment plant's effluent they flowed into Clear Creek, Salt Creek, and the East Fork of the White River. General Motors' Central Foundry is also suspected of having contributed PCBs to the East Fork of the White River. Because aquatic organisms, including fish, tend to bioaccumulate PCBs in their bodies, up to tens of thousands of times the concentration in the ambient water, the PCBs in these waterways interfered with recreational fishing. Fish samples from Salt Creek were found to contain PCBs well above the FDA limit of five ppm. The highest sample recorded was 343 ppm. In the spring of 1976, fishermen were advised by state and county health authorities not to eat fish taken from Clear Creek, Salt Creek, and the East Fork of the White River below Bedford.

Some landowners along these waterways may have a different sort of PCB problem. During periods of heavy rainfall, the creek overflows its banks, flooding pasture and farmland. When the waters recede, sediment which may contain PCBs remains on the land.

Disposition

Awareness of the solid waste problems with PCBs increased gradually between 1968 and 1972. The Indiana State Board of Health

MONS 015237

attempted to control the landfilling of PCB-saturated wastes, but with little effect. In June, 1972, Bloomington's Environmental Quality and Conservation Commission questioned Westinghouse's waste disposal practices. Westinghouse voluntarily stopped the landfilling in August, 1972, and since that time has shipped its PCB-laden solid wastes to a scientific landfill in New York.

The problem of PCB discharge to waterways gained nationwide attention during 1975. The activity centered around incidents involving two General Electric plants in New York and the EPA's subsequent search for potential PCB problems in other capacitor and transformer manufacturing facilities. In August, 1975, Westinghouse received a letter from the EPA requesting information about its use of PCBs and about its reclamation and disposal practices. In September, 1975, Westinghouse notified the Bloomington City Chemist that they were using a PCB compound in capacitor manufacture. Also, in September, 1975, Don Jordan, at that time an environmental writer for the Bloomington newspaper, began a series of articles about PCBs. At first his articles covered the New York incidents with the General Electric plants, but later he focused on the local problem. From late 1975 and throughout 1976, local public awareness of the PCB problem in Bloomington was very high.

In November, 1975, after the EPA-sponsored National Conference on Polychlorinated Biphenyls in Chicago, the Bloomington Utilities Department stopped distribution of sewage sludge to farmers and gardeners. In mid-December, 1975, the Indiana Department of Natural

Resources began monitoring the concentrations of PCBs in fish from Clear and Salt Creeks. On January 20-21, 1976, the EPA, accompanied by the Indiana State Board of Health, conducted an extensive PCB survey of the Bloomington area, including the Westinghouse plant, the Winston Thomas sewage treatment plant, and the three landfill sites which had been used by Westinghouse. Results of these tests showed PCB levels of eighty ppb in the Westinghouse effluent, seventy-one - ninety-nine ppb in the carrier effluent within the sewage treatment plant, and measurable quantities of PCBs in the soil and leachate from all three landfill sites. These areas were retested periodically. On March 11-12, 1976, test results showed PCB levels of 118 ppm in the sludge from the digesters in the sewage treatment plant. During March and April, 1976, the Indiana State Board of Health and county health departments posted the banks of Clear and Salt Creeks with signs warning that fish taken from these waters were unfit for human consumption.

On April 28, 1976, Barry S. Brown, Prosecuting Attorney for Monroe County, and Raymond J. Schneider of the Monroe County Board of Health, filed with the Environmental Management Board (EMB) of the State of Indiana a notice of intent to file a citizen's suit against Westinghouse unless the EMB itself took action. The Indiana Attorney General's office advised the EMB to initiate proceedings and write a Findings of Fact.

In May, 1976, Bloomington Mayor Francis McCloskey, contacted the United States Environmental Protection Agency and requested assistance in assessing the risk, if any, to Bloomington area

MONS 015239

residents from exposure to PCBs. Mayor McCloskey was referred to the United States Public Health Service and the Center for Disease Control. In January, 1977, health officials from those agencies came to Bloomington. Free medical examinations were offered to those residents who had used PCB-containing sludge on their gardens. The results of these tests were released to the patients and their personal physicians.

Mayor McCloskey and the Bloomington Utilities Service Board also requested the assistance of the United States Labor Department's National Institute of Occupational Safety and Health (NIOSH) to assess the health risk, if any, to the employees of the Winston Thomas sewage treatment plant. Environmental and medical tests were performed in August and September, 1976. Results of the study were released in June, 1977. The investigators concluded that no problem with PCB toxicity existed at the treatment plant.

The Bloomington Utilities Service Board held a public meeting on June 30, 1076, to discuss possible regulatory action against Westinghouse, including the possibility of disconnecting Westinghouse from the city sewer system. Westinghouse plant manager, Mr. Donald Sauter, estimated that if a disconnection were ordered, the jobs of half the six hundred to eight hundred Westinghouse employees would be affected. Consequently, the Board Meeting was well-attended by those fearful of losing jobs, as well as those afraid and angry at Westinghouse because of the PCBs in its effluent.

MONS 015240

The Service Board voted to give Westinghouse until December 1, 1976, to lower the levels of PCBs in their effluent. Exact discharge limits were not set pending publication of federal regulations by the EPA.

On November 9, in the absence of federal guidelines, the discharge limit was set at three ppb. On December 1, 1976, Westinghouse reported to the Bloomington Utilities Service Board and the Indiana Stream Pollution Control Board that the deadline for the installation and operation of pollution control equipment had been met.

On July 9, 1976, fourteen Bloomington area residents filed a class action suit against Westinghouse asking for damages. These people had either spread PCB-laden sludge on their gardens or owned property along Clear and Salt Creeks. The suit has not yet been settled as of the writing of this report.

On September 30, 1976, the Environmental Management Board of the State of Indiana began a hearing to investigate the PCB problem in Bloomington. The purpose of the hearing was to hear evidence so that a Findings of Fact could be written for the Indiana State Board of Health. The hearings continued until, on May 24, 1977, they were recessed in order that the attorneys involved might have time to discuss a settlement. A settlement has not yet been reached.

MONS 015241

Analysis

The PCB situation in Bloomington is an example of a large-scale environmental disaster that seems to involve no negligence. The Westinghouse rationale for the use of PCBs in capacitor manufacture was consumer safety, since capacitors containing PCBs are not a fire hazard, unlike those containing mineral oil. In 1971, Monsanto, the PCB manufacturer, issued warnings to PCB users, including Westinghouse, about the possible dangers of PCBs. In correspondence of June 5, 1972, with the Monroe County Health Board and Indiana State Board of Health regarding the solid waste disposal problem, Westinghouse said the PCBs may be a potential environmental contaminant. As the environmental and health hazards of PCBs were discovered and regulatory posture was set, Westinghouse complied with and was frequently one step ahead of the PCB regulations.

Workers in a sewage treatment plant cannot be held accountable for every organic chemical passing through the facility in micro-quantities. Prior to 1975, no one in the Bloomington Utilities Department knew what a PCB was, much less that the chemical had been present in the Westinghouse effluent since 1958.

Bloomington residents interested in organic gardening certainly did not have the expertise to judge the chemical safety of sewage sludge provided by the city for use as fertilizer. They could only believe what public officials told them. Now their land is tainted with PCBs and they wonder who is responsible.

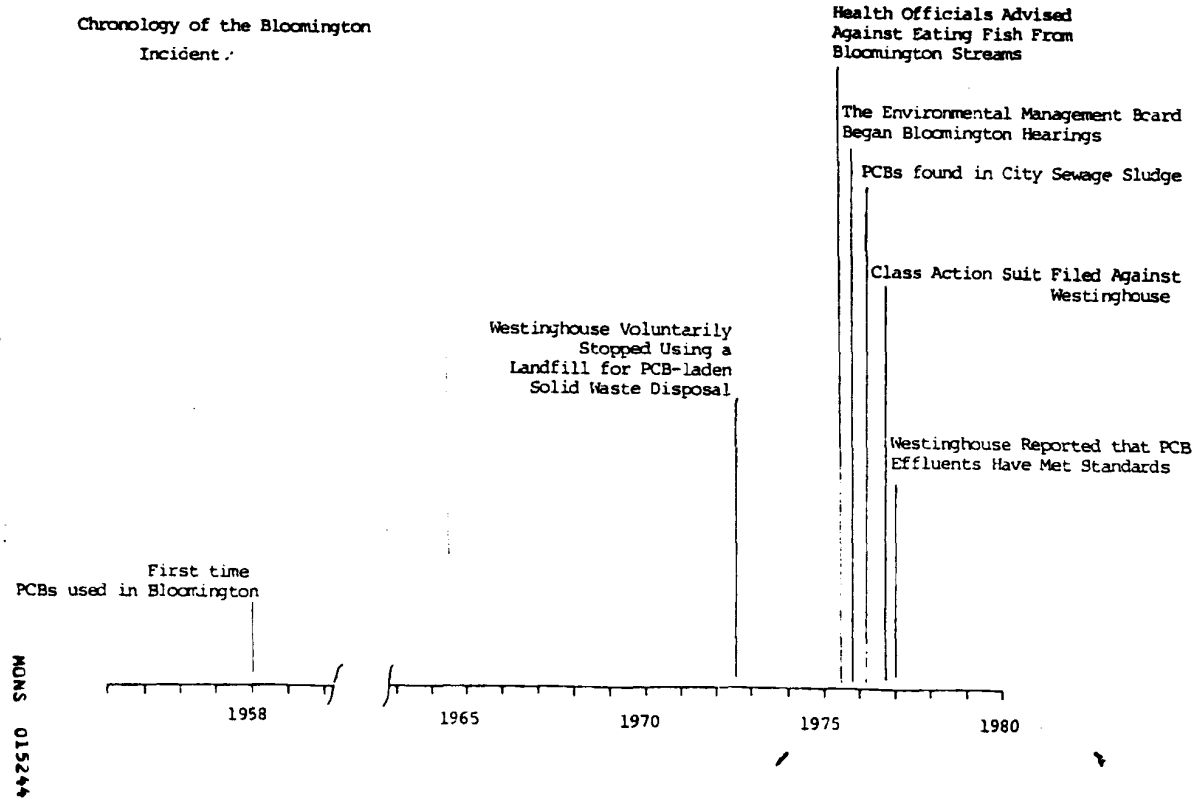
If the responsibility for this incident cannot be placed on any one person or organization, then who should pay the damages?

MONS 015242

Who should pay to clean out or replace seven miles of city sewer pipe? Who should pay for the proper disposal of several hundred tons of accumulated sewage sludge heavily impregnated with PCBs? Who should compensate the Bloomington residents for the contamination of their property? Perhaps the federal government should provide aid as in cases of disaster relief and pesticide indemnification. Perhaps state funds should be used for indemnification as they were when Indiana dairy farmers suffered a great loss due to PCB contamination of milk. Perhaps industry should develop no-fault product liability insurance to compensate victims of chemical disasters when no negligence is involved. Perhaps the entire incident should be written off as an unfortunate mishap and the people of Bloomington will have to bear the entire financial burden alone.

MONS 015243

Chronology of the Bloomington Incident



MONS 015244

PCBs IN THE INDIANA WATERS OF
LAKE MICHIGAN

Background

Through a multimillion-dollar revitalization program which eventually stocked the lake with over 100 million trout and salmon, the United States was developing the once depleted Lake Michigan into a commercial and sports fishery when in March, 1969, monitoring initiated by the Food and Drug Administration identified the chemical polychlorinated biphenyl in Great Lakes fish. The Food and Drug Administration formally incorporated the examination for PCBs into its food surveillance programs in November, 1969. On February 3, 1970, the Food and Drug Administration established an actionable level of PCBs at five ppm in the edible flesh of fish, enabling it to halt the interstate shipment of fish that exceeded that amount.

In 1971, Gilman Veith at the Duluth National Water Quality Laboratory reported that trout and salmon longer than twelve inches had PCB residues greater than the allowable Food and Drug Administration five ppm level. Fish that contained less body fat, such as the rainbow smelt, had less PCB concentrations.

The federal government officials, along with the officials in the Great Lakes states, had to evaluate the human health hazard to their citizens of the existing fish. In 1970, Soren Jensen reported from Sweden that the PCBs seriously affect the aquatic species by interfering with the reproductive processes and hatchability of fish eggs. In December, 1970, in Michigan, Aulerich reported that Lake Michigan coho salmon containing PCBs fed to mink harmed the

MONS 015245

animals reproductivity.

PCBs availability to humans was established in a 1973 study of the University of Michigan and the Food and Drug administration. The concentration of PCBs present in the blood of humans was shown to correlate directly with the amount of Lake Michigan fish consumed. In January, 1973, the United States - Canadian International Joint Commission recommended several actions to the governments of the United States and Canada. These recommendations included joint research to provide information on the effect of small amounts of PCBs on human health. Also recommended was the inventory of present stocks of PCBs and of materials that contain them, and the regulation of the manufacture, the importation, and the release of PCBs and of the products that contain them. These recommendations were partially adopted by the International Organization for Economic Cooperation and Development in Paris, February, 1973. The member countries agreed to control the manufacture and trade of PCBs. Nations further agreed to exchange data for the next three years on the amounts of PCBs (by type) manufactured, imported, exported, incinerated and consumed, the replacements supplied, and the disposals of surplus PCBs. In July of that year, the United States Food and Drug Administration established its maximum allowable PCB concentrations in animal feeds, food and food packaging material. For the edible portion of fish, 5 ppm was reaffirmed as the limit. The problems which state officials faced with the discovery of PCBs in Lake Michigan can be

MONS 015246

discussed in terms of the source of trusted information concerning the PCBs and the communication with the public concerning that information.

Disposition

In Indiana, the Department of Natural Resources and the State Board of Health were the two principal agencies involved. The Department of Natural Resources had specific responsibility for the safety of the fishermen and the fishery. In 1971 it received data on PCBs in Lake Michigan fish from analytical reports of DDT monitoring studies that were performed by the State Board of Health. The concentrations measured ranged from 5.8 to 37 ppm PCB. Since these exceeded the Food and Drug Administration actionable levels the Indiana Department of Natural Resources and the State Board of Health issued a joint statement in November, 1971, advising against the consumption of coho salmon from Lake Michigan as a "dietary staple food course".

Representatives from the Indiana Stream Pollution Control Board participated in a public session on PCBs with other Lake Michigan States and the United States Environmental Protection Agency in November, 1972. Recommended was the formation of a Toxic Substances Committee and the prompt identification of PCB sources in the Lake Michigan basin through state managed surveys. Acting on those recommendations, the Division of Water Pollution of the Indiana State Board of Health participated in the newly formed Lake Michigan Toxic Substances Committee which met in

MONS 015247

February and May, 1973, and in July, 1975.

In 1973, the Department of Natural Resources was told by the State Board of Health that based on the evidence at hand any action concerning PCBs in Indiana would be premature. The Department of Natural Resources continued to monitor and wait for more definitive research on toxicity that would indicate harm. In 1976, the Department of Natural Resources requested technical advice from the Indiana Academy of Science to assess the health hazards of PCB in Lake Michigan. Scientists measured dramatic increases in concentrations of PCBs in the Lake Michigan fish in October, 1976. Since the Department of Natural Resources lacked the staff and expertise for such an assessment, these reports of especially high PCB concentration in the fish prompted the Department of Natural Resources and the Indiana State Board of Health to issue a joint release in April, 1977, before the Academy study was complete. This release advised fishermen not to consume any Lake Michigan trout.

The Indiana Academy of Science's study was completed in the summer of 1977 and discussed three major topics, human health, PCB analysis, and contamination reduction. Among the several conclusions drawn were: that the five ppm PCB limit is reasonable for sport fish, but a lower limit is suggested for commercial fish; that the analysis done often lacks quality assurance; that contamination may ruin the analysis, and that the concentrations in the lake are unstable. It was recommended that consumers be advised of the contamination by a program supported by a monitoring program with a good analytical facility.

The State Boards of Health for the four states surrounding Lake Michigan held a meeting in July, 1977, to draft a unified statement regarding consumption of Lake Michigan fish. The representatives did not call for a prohibition. Rather they suggested limits on the consumption of the fish. Indiana officials, however, decided not to release that statement until the PCB levels decrease in the fish in Indiana waters to a reasonable level. At the time of this writing, the stricter April, 1977, advisory remains in effect.

The other Lake Michigan states developed their own mechanisms for collecting, digesting and relaying information. In 1972, Michigan officials initiated a state-federal study of the PCB levels in the Great Lakes fish. Their data indicated that Lake Michigan lake trout and coho salmon had PCB concentrations that exceeded the United States Food and Drug Administration five ppm limit. Soon after, in June, 1975, the Michigan Department of Natural Resources recommended that the legislature enact a law that would prohibit by July 1, 1977, the manufacture and purchase of PCBs, except for use in closed systems. Michigan officials adopted the Food and Drug Administration consumption limits of five ppm and recommended that its citizens not eat more than one fish meal a week. It published that information in 1977 in the fishing license brochures.

Wisconsin, too, used that information and began publishing the limits on consumption in fishing license brochures in 1976. Their unique experience with the DDT incident in the late sixties

MONS 015249

sensitized its citizens to the hazards of persistent chemicals in the environment and Wisconsin officials took legislative actions to control PCBs. The information from the DDT investigation gave Wisconsin scientists a better understanding of the assessment of PCB concentrations.

Officials from Minnesota encountered similar problems with PCBs. Minnesota's state agencies formed a close alliance with several Wisconsin and federal agencies to sample fish in 1975. Because of the discovery of high PCB concentrations, the Commissioner of Health advised on May 27, 1975, that the consumer limit the intake of certain fish.

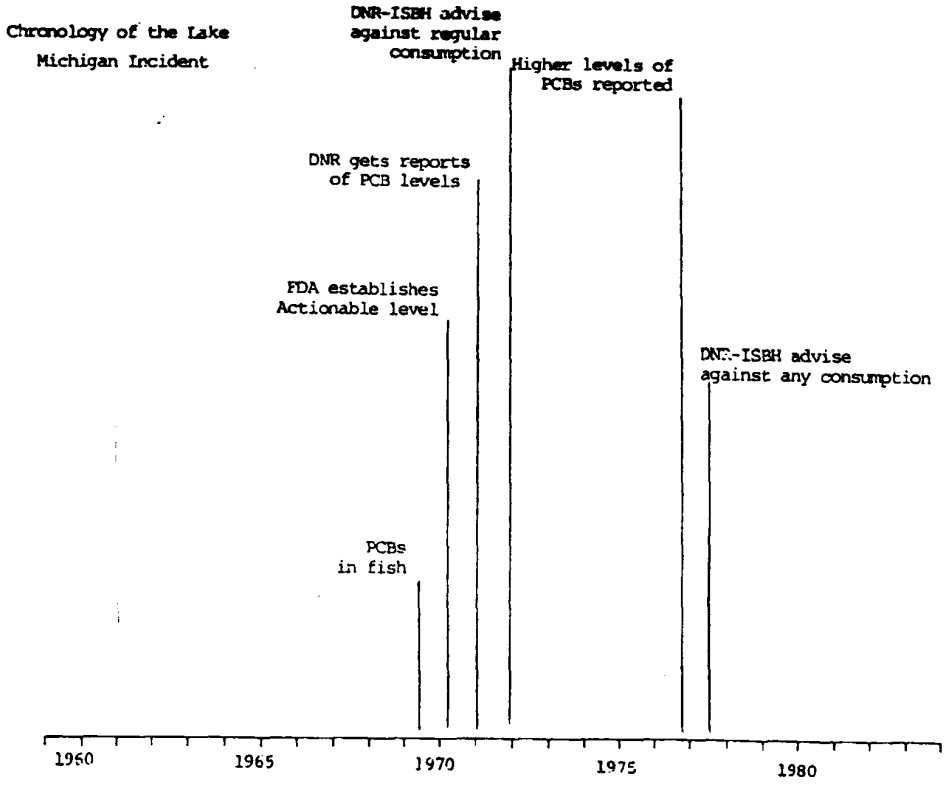
Analysis

To summarize, although the manner of collecting information varied from state to state, the building of communication channels and networks that transmitted information from the federal government to state government and from state to state occurred in all cases. For example, Minnesota's officials set up an ad hoc system that functioned well. The meeting of the four Lake Michigan states demonstrated the usefulness of such programs for communication and decision-making. Indiana's Department of Natural Resources and State Board of Health cooperated in sharing advice for policy formation. However, in all states, the actual information was collected at many different levels. The contact that state agencies had with the federal government in some cases proved helpful in obtaining data. Even the federal assessment of that data was sometimes relied

upon. For example, the Food and Drug Administration's standards were adopted by many states. The Department of Natural Resources' use of the Indiana Academy of Science demonstrated a benefit from cooperation between a public agency and a private group. It also demonstrated the need for Indiana agencies to have trusted advice on chemical questions in order to evaluate federal rulings.

Real difficulties arise in relaying information to the public. In order to prevent mass hysteria, good timing and cautious wording become extremely important. Though no state had specific mechanisms for assuring this, some states released information in a helpful manner by using fishing brochures as the vehicle. Practical systems of relaying public information with a development of communication networks in all areas offers potential to improve Indiana's structure for handling chemical incidents.

MONS 015251


Chronology of the Lake Michigan Incident
DNR-ISBH advise against regular consumption
Higher levels of PCBs reported
DNR gets reports of PCB levels
FDA establishes Actionable level
DNR-ISBH advise against any consumption
PCBs in fish
1960
1965
1970
1975
1980

MDNS 015252

APPENDIX A

ABBREVIATIONS

PCB - Polychlorinated biphenyl

PBB - Polybrominated biphenyl

EPA - Environmental Protection Agency (U.S.)

FDA - Food and Drug Administration (U.S.)

OSHA - Occupational Safety and Health Administration (U.S.)

FIFRA - Federal Insecticide, Fungicide and Rodenticide Act

TSCA - Toxic Substances Control Act

OECD - Organization for Economic Cooperation and Development

FWPCA - Federal Water Pollution Control Act

ISBH - Indiana State Board of Health

EMB - Environmental Management Board (Indiana)

NRSTEN - National Regional State Telecommunication Exchange Network (Food and Drug Administration)

NIOSH - National Institute of Occupational Safety and Health (U.S. Labor Department)

NTIS - National Technical Information Service (Department of Commerce)

UPGRADE- User Prompted Graphic Data Evaluation (Council on Environmental Quality)

MONS 015253

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MONS 015254

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Ms. Kimberly Wade

MONS 015255

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MONS 015256