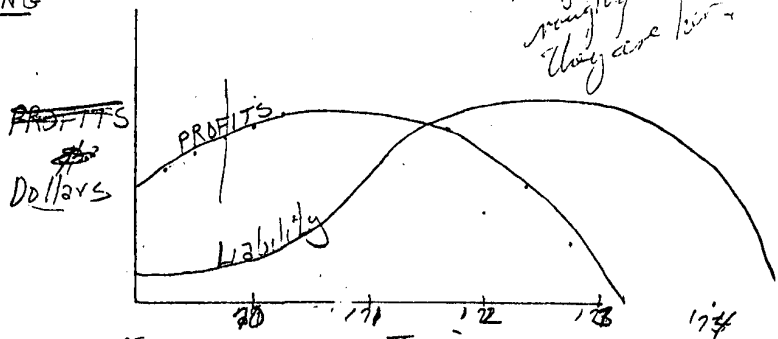
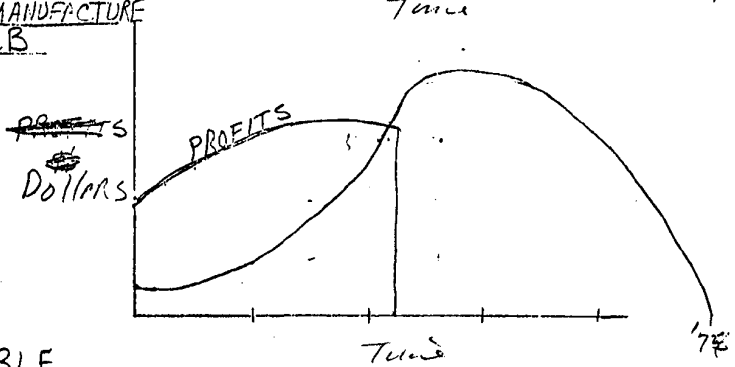
PROFIT AND LIABILITY VS TIME

ACTION

DO NOTHING



DISCONTINUE MANUFACTURE of PCB



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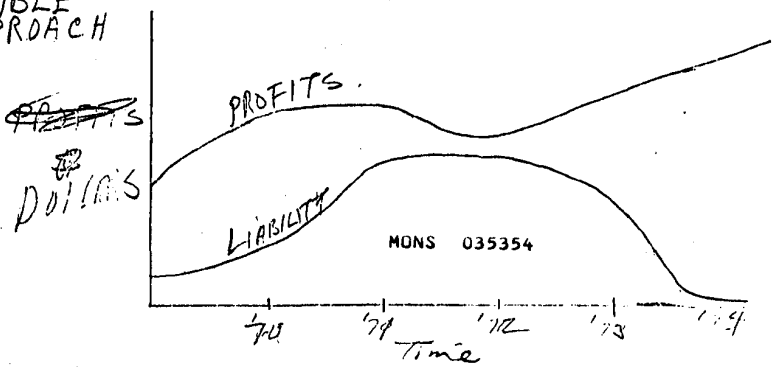

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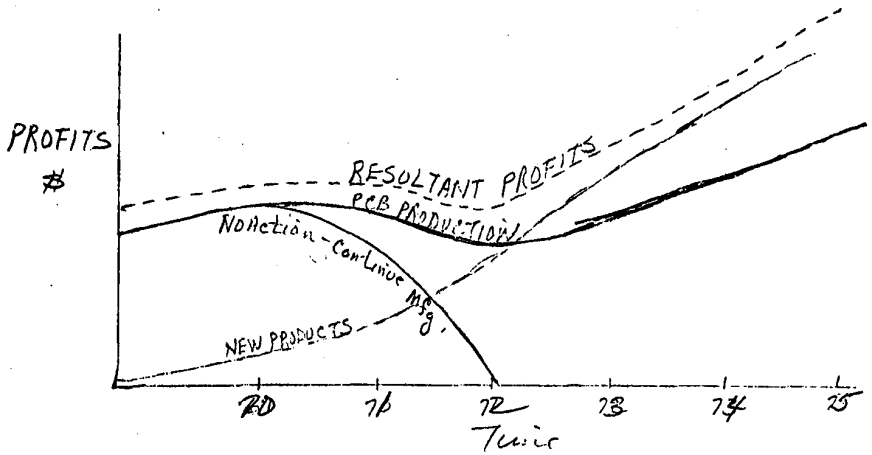
PROBABILITY OF SUCCESS



(1)

Plan

I Objective

II Problem

III Background pages 1, 2, 3, 4a zerox

IV Monsanto confirmation 2, 5, 6

V Seriousness of the Problem to Monsanto 3 4, 7, 8, 9

VI Effect on Monsanto letter

VII Effect on Customers and Ultimate Consumer

VIII Effect on Other Producers (letter)

IX Main Sources of Pollution

X Present Product Knowledge

XI Possible Action Necessary to Combat Pro

XII Alternate Courses of Action Available

[redacted]

XIV Recommended Course of Action

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(II)

XIV Additional considerations within the Recom.. Course of Action

XV Implementation of Recommended Course of Act...

A. Research

B Manufacturing

C Engineering

D Marketing

E Medical

F Environmental Control

~~G Prospecting and Reclamation Contractors~~

G Legal

H Public Relations

I. Patent

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(III)

VI Cost of Program

VII Probability of Success

VIII Timetable for Completion

MONS 035358

I Objective

Develop a plan of action to

A. Protect continued sales and profits of Chl... biphenyl products

B. Permit continued development of new uses ...

C. Develop substitute products where necessa...

D. Stop and/or Control Contamination of the global ecosystem with poly chlorinated biphenyls

E. Protect the Corporate Image as a responsible member of the Business Community in preventing - Controlling Pollution of Environment

F. Reduce legal exposure by phasing out ... having questionable exposure to the en...

MONS 035359

II Problem

Polychlorinated biphenyl (PCB) or Aroclor product contaminates DAMAGE to THE ecosystem by of the environment and its association and airing with DDT FROM.

and other pesticides as members of a family of e[illegible] called "chlorinated hydrocarbons".

DAMAGE

Background

1. ~~EVIDENCE OF PROBLEM~~

For the last fifteen years there has been growing world-wide concern regarding the persistence of chlorinated pesticides (particularly DDT) and their universal presence in man, food, animals, fish, birds, air, water, and soil. DDT and its metabolites have been found in virtually every living organism and matter around the globe--including penguins in the Antarctic and the polar ice cap.

As analytical techniques for measuring the residues have improved, interfering substances have become apparent and raised doubts as to the quantitative validity of reported concentrations. Gas chromatograph techniques, making possible determination in the parts per billion and parts per trillion range are particularly sensitive not only to DDT but also to its metabolites DDE, the insecticides Dieldrin and Aldrin, and polychlorinated biphenyls (PCB's), isomers of which have similar retention times ("peak locations") in the gas chromatogram.

Identification of some of the major interfering substances as PCB's was announced by Professors Widmark and Jensen of the Institute of Analytical Chemistry at Stockholm in November, 1966. With the identification (confirmed by mass spectroscopy) Widmark and Jensen announced finding PCB's in fish, birds, eggs, ~~pine needles and childrens' hair~~. Samples analyzed were all from Sweden and the Swedish coastal areas.

Subsequently, PCB's were identified in fish and wildlife in Great Britain (1967), the Rhine River and Netherlands estuaries (March, 1969).

In August of 1968, Professor Risebrough of the University of California at Berkeley presented a paper at a private meeting of toxicologists indicating he had found PCB's in fish and wildlife along the coast of California. The first reference in the American public press followed the publication of Risebrough's paper in Nature, February, 1969. At that time the San Francisco Chronicle carried a "scare" story concerning PCB's after an interview with the author.

In the last six months, PCB's have been reported in:

a. Milk in Georgia
b. Waters of Lake Michigan
c. Fish in Connecticut
d. Sea food along the Gulf Coast (toxic--fatal to shrimp at Pensacola)

MONS 035362

1. EVIDENCE OF PROBLEM (Continued)

e. Electric dishwashing compounds
f. Milk in Maryland
g. Bald eagles from the mid-west and
h. Mother's milk (rumor--not confirmed) in Denver.

After investigation--not complete in all cases--the committee has concluded:

1. That the identification of the PCB's as contaminants of the environment is certain;

2. There is no question as to the non or low biodegradability of the PCB's--particularly the higher chlorinated members of the series including Aroclors 1254 and 1260 and probably 1248;

3. The possibility of natural origin of the PCB's (such as biological or chemical degradation of other chlorinated hydrocarbons by natural processes or metabolism in the eco-system) is so remote that it is not a satisfactory explanation of their presence;

4. As discussed in the following section, these may be significant toxicological effects in some species of living organisms; and,

5. Aroclors 1254 and 1260 are the compounds which are found and reported in the literature by the Aroclor trade-names or as the "biphenyls with predominantly 5 to 8 chlorine atoms". We believe that references to Aroclors 1242 and 1268 (and chlorinated terphenyls) in several letters received reflect early non-definitive efforts of the analysts.

2. TOXICOLOGICAL ASPECTS

A. Man--Data available at present indicate that PCB's may be "moderately toxic" to man. Safe industrial usage has been based on a recognition of possible toxic effects and control of exposures to minimize the hazard. There have been a limited number of cases of occupational disease where workmen have been exposed to excessive vapor inhalation or repeated and prolonged skin contact with subsequent development of skin manifestations ("chloracne") or more serious involvement of the liver and kidneys.

B. Animals--Chronic toxicity data for animals (which would allow a better extrapolation of "safety" levels for humans) has been meager. In May, 1969 chronic (two year) feeding studies in rats and dogs were initiated at our consultant's Industrial Bio-Test Laboratories in Chicago. A three generation rat reproduction study is also underway. The purpose of the research is to make available to the U. S. Food and Drug Administration and other federal and state agencies data which will confirm that the levels of PCB's being found in nature--and particularly in human food--do not constitute a serious threat to the public health.

C. Fish--The proven presence of pesticides (and PCB's) in fish is beginning to cause concern for two reasons. In Sweden and other Scandinavian countries where fish make up a large portion of the daily diet, the use of DDT has been temporarily or permanently banned. Similiar action has been taken in several states in the United States and bills have been presented in Congress to outlaw the sale and use of DDT. This summer the U. S. Food and Drug Administration seized and destroyed Coho Salmon caught in Lake Michigan because of DDT content.

This highlights the particular problem with fish which can concentrate/accumulate persistent chlorinated hydrocarbons in their tissues. For example, trout raised in water containing 1 part per billion will contain 1 part per million in their tissues in six weeks. Other marine species exhibit a similar "concentrating" propensity. Although no scientist has maintained that these accumulated levels in fish are toxic per se, the question of the desirability of having such fish in the human diet has caused concern--and in some minds, alarm.

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2. TOXICOLOGICAL ASPECTS (Continued)

A second consequence of the chlorinated pesticide presence in fish, is the alleged effect on species of coastal and other fish-eating birds. There is evidence interpreted by a number of scientists (and seized upon by the conservationist-pseudo-scientists) that several species of birds face elimination or absolute extinction because of persistent chlorinated hydrocarbons in fish which make up the major portion if not all of their diet. Included in the United States are the Peregrine Falcon and the brown pelican. (At a meeting in October, 1969, of the Association of Official Analytical Chemists, will be a paper presented entitled, "The Determination of PCB's in Two Bald Eagles". This is based on work done by the Fish and Wildlife Laboratories of the U. S. Department of the Interior at Patuxent, Maryland. Now the emblem of the heritage of the United States is threatened!)

D. Birds--The effect in birds appears to be due to an upset of enzyme metabolism in the liver leading to the laying of eggs with thin or no shells at all. On Anacapa Island, near Oxnard, California, only three of one thousand brown pelican eggs were found this year with shells and only one bird was born. This was due allegedly to anchovies--the main diet of the pelican--containing "DDT and hundreds of parts per million of PCB's".

Preliminary results from studies at Industrial Bio-Test Laboratories indicate that 100 ppm of Aroclors 1242, 1254 and 1260 in the diet of white leghorns causes a reduction in egg shell thickness and an effect in chick embryos which prevents hatching.

E. Shrimp--In August, 1969, West Florida State University at Pensacola reported to our Pensacola Plant that PCB's (Aroclor 1254) had been found in the Escambia River below our outfall. The amount was reported as 40-45 parts per billion one quarter mile below the plant and 1 ppb at the bridge over the river as it enters Pensacola Bay.

The Gulf Breeze Laboratories of the Bureau of Commercial Fisheries (U. S. Department of Interior) at Pensacola next reported that 40 ppb killed baby shrimp in 96 hours. Further study indicated that 5 ppb killed 18 of 25 baby shrimp in 18 days.

Aroclor 54%

Plant investigation revealed that one to three gallons per day of Aroclor 1254 was being lost to the river from the use of Pydraul AC in air compressors.

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2. TOXICOLOGICAL ASPECTS (Continued)

F. Summary of Toxicity Considerations

a. The PCB's are "moderately" toxic to man. A probable safe level for Aroclor 1254 and 1260 in the diet will be something less than one part per million.

b. Although only "moderately" or "slightly" toxic to adult birds and fish on the basis of acute exposure, the "safe long term" or "chronic dose" is less than 100 ppm insofar as reproduction is concerned.

c. In the case of shrimp, the "safe" or no effect" level for Aroclor 1254 is less than 5 parts per billion.

It thus appears that, while we may be able to show some kind of reasonable numbers for "safe levels" of Aroclors 1254 and 1260 (and other lower chlorinated biphenyls)in some species, there are other species of life in the ecosystem where a zero to 5 parts per billion limit for Aroclor 1254 and 1260 (and possibly other more highly chlorinated biphenyls) will be the tolerance level.

3. PERSISTENCE OR LACK OF BIODEGRADATION

Evidence for the persistence of Aroclors 1254 and 1260 in the environment includes:

a. The chemical stability of most of the chlorinated aromatic hydrocarbons.

b. The identification of Aroclors 1254 and 1260 in the environment as itemized in Section 1.

c. Reports from Sweden indicating the presence of Aroclors 1254 and/or 1260 or competitive equivalent products in the sludge from municipal waste treatment plants.

d. The lack of data up to now indicating that lower chlorinated PCB's are interfering in the pesticide residue analysis in spite of the equivalent usage of some of them (e.g. Aroclor 1242) and undoubted losses to the environment depending on use applications and ultimate disposal. (Comfort in this conclusion is tempered by some evidence that the preparation of samples for GC analysis--destroying the DDT and metabolites--may be causing destruction of Aroclor 1242).

e. Literature evidence that other lower chlorinated hydrocarbons in a series of compounds (e.g. mono and di-chlorophenols) are subject to biodegradation whereas increase in chlorination makes them more refractory (pentachlorphenol).

f. Early reports of research in Monsanto's Ruabon Laboratories that indicate that Aroclor 1242 is indeed subject to biodegradation in biological waste treatment plants (research scale).

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4. PRESSURES WHICH WILL AFFECT SALES AND USE OF AROCLORS 1254 AND 1260

As of this date (October, 1969), there are no restrictions which control the current uses of our Aroclors or PCB's. We are faced instead with pressures being applied relative to persistent chlorinated hydrocarbon pesticides in general and specifically DDT. The evidence proving the persistence of these compounds and their universal presence as residues in the environment is beyond question. Although the significance of these residues is subject to wide difference of opinion among reasonable scientists, the development of "lunatic fringe" post-Rachel Carson has led to a domination of the media by scare publications in the public and scientific press. Only the most myopic individual in the business world could be unaware of the overwhelming interest and influences being directed at preventing contamination of the environment. The principal groups with an apparent avowed mission of providing a world of pristine pure food, water and air include many in academic and political fields who recognize the headline value of statements supporting these ideals.

In the case of the PCB's as environmental contaminants, the committee believes that Monsanto is faced with a barrage of adverse publicity in all elements of the news media--including those with national coverage. Factual basis will be sparse or non-existent but guilt by association (with DDT) will provide background and prevail.

As indicated in the earlier sections of this report, it will be impossible to deny the presence and persistence of Aroclors 1254 and 1260 at least. The public and legal pressures then to eliminate or prevent global contamination are inevitable and probably cannot be contained successfully.

In defense of the chlorinated pesticides, their manufacturers will not be loath to incriminate the PCB's as being culprits in the development of misleading data relative to their concentrations as residues. Secondly, the manufacturers of competitive products will seize any opportunity to point out to our customers their potential problems if they continue to use products containing Aroclors. This has already occurred in the case of our Pydrauls.

There are pertinent federal laws and regulations relating to environmental control as discussed in the following section.

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5. LAWS AND REGULATIONS CONTROLLING ENVIRONMENTAL CONTAMINATION

A. U.S. Department of Health, Education and Welfare - Food and Drug Administration

The most pertinent legislation governing the quality of human food is the 1958 Act amending the Food, Drug and Cosmetic Act and the regulations which have been established thereunder. Briefly, the requirements relate to food additives - direct and indirect, and control food production and processing to insure a supply free from bacterial contamination and unauthorized chemicals (or levels greater than established "tolerances"). The regulations also include animal feeds.

No acceptable or "safe" levels for PCB's in human foods or animal feeds have been established. Currently, there has been no indication that the FDA is seriously concerned about the levels of PCB's which have been reported alone or in conjunction with chlorinated pesticide residues. At the same time, the Pesticide Tolerance Branch of FDA has requested (late September) samples of Aroclors 1254 and 1260 for the expressed purpose of initiating acute toxicity studies in laboratory animals.

In the past, the FDA has not seized and destroyed food contaminated by the unintentional or unexplained presence of "adulterants" unless there has been some basis for a judgement that the adulterant was toxic or might pose a threat to health. An exception has been milk because of its primary role in the diet of children. Seizure and destruction of milk containing any "adulteration" has not been uncommon. It can be assumed that the finding of PCB's in milk in Georgia in June and in Baltimore in September has created a new interest in and emphasis on the PCB problem.

B. U.S. Department of Agriculture - Under laws and regulations governing the use of economic poisons which include insecticides, rodenticides, fungicides, this department shares with the FDA the responsibility for establishing safe levels or tolerances for these products. It does seize and destroy meats and poultry subject to inspection under regulations controlling the processing of these foods - originally those entering interstate commerce but more recently, practically all slaughtered and processed items.

As in the case of FDA, the USDA has not established any acceptable or tolerance levels for the PCB's in products subject to their control.

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. LAWS AND REGULATIONS CONTROLLING ENVIRONMENTAL CONTAMINATION (Continued)

C. U.S. Department of Interior - Federal Water Pollution Control Administration

Under the provisions of the Clean Water Act of 1967, the FWPCA has to approve standards of water quality established by the individual state regulatory agencies. For practical purposes, this has meant that FWPCA has set not only parameters but actual numbers for dissolved oxygen, pH, temperature, solids, etc. including the broad category of "toxic" compounds. As of this date, no limits per se have been promulgated for pesticides including the chlorinated hydrocarbons. This week (October 10), a bill has been introduced in Congress requiring the FWPCA to establish "limits" for pesticides. Obviously this is associated with the furor over DDT and the persistent chlorinated hydrocarbons. Hearings on the proposed legislation are expected early in 1970 soon after the Congress reconvenes.

It is reasonable to expect that the PCB problem will be brought up at these hearings. Further, with the political and public interest in all forms of environmental contamination, it is likely that the legislation will be broadened to include all persistent chemicals.

D. State Legislation - In addition to Federal legislation, all states have regulatory programs governing the adulterations of food, the contamination of intrastate and interstate waters, and the protection of fish, wildlife and natural resources. Up to this point most of the state government agencies which have contacted Monsanto represent water pollution control, natural resources, or agriculture areas of interest.

No states have established any "tolerance" limits for PCB's but a number of states have banned or restricted the use of DDT and have expressed more than a casual interest in the PCB's. In expressing such interest, several states (and the Province of Ontario) have pointed out the actions which have been taken against DDT.

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3. Man - There is no harmful effect known to man or other mammals after 40-years of production. Studies are underway by various sources.

4. Political and Public Emotion - PCB's linked to DDT because PCB's show up in analyses for DDT. Linked with other permanent chlorinated hydrocarbon pesticides.

EFFECT ON MONSANTO:

1. Business potential at stake on a worldwide basis:

Fluids	Plasticizers	Total/Year
70 M Lbs.	34 M Lbs.	104 M Lbs.
$16 M	$6 M	$22 M
$6-8 M GP	$2-3 M GP	$8-11 M Gross Profit

2. Legal responsibility.

3. Public image.

4. Effect on other product areas.

EFFECT ON CUSTOMERS AND ULTIMATE CONSUMERS:

1. Affects entire electrical industry - capacitors and transformers.

2. Affects food processing.

3. Affects die casters and other "hot metal" working industries.

4. Affects wide range of plastics and adhesive applications.

5. Affects wide range of paints and coatings.

EFFECT ON OTHER PRODUCERS:

There are at least six other producers of PCB's ex-USA. Monsanto has discussed problem with two in Europe. No great concern there yet.

c. Set reclaim or disposal of fluids

d. Work on name association problems

5. Patent

Investigate trademarks registered

Cover with patents any work felt patentable

6. Environmental Control

Develop cheap disposal systems for customers

a. Incineration or pyrolysis

b. Biodegradation unit etc.

c. Consultants in pollution control

7. Legal

Investigate and define our position on Royalty secrecy agreements.

Contracts - Raw Material and Customer

8. Public Relations

Portray to public positive actions at correcting the contamination problem. Release periodical statements covering our position.

XIII. Probability of Success

XIV. Cost of Program

Neither the program nor the costs have been clearly defined at this time. However, a cost estimate of $220,000 for toxicological work alone has been presented. Tentative figures indicated under the worst conditions the entire program could run as high as $2.0-2.5M. At this stage it is very difficult if not impossible to develop a reasonable cost figure but one point is clear it will be larger than the normal research budget can handle. For this reason, assuming the approach is acceptable, we shall be forced to ask for additional appropriations to fund the program.

XV. Future

Follow developments on the problem as they unfold.

Develop an aggressive research program to confirm or deny findings and better understand the problem.

Develop costs for the duplementation of the Recommended course of action.

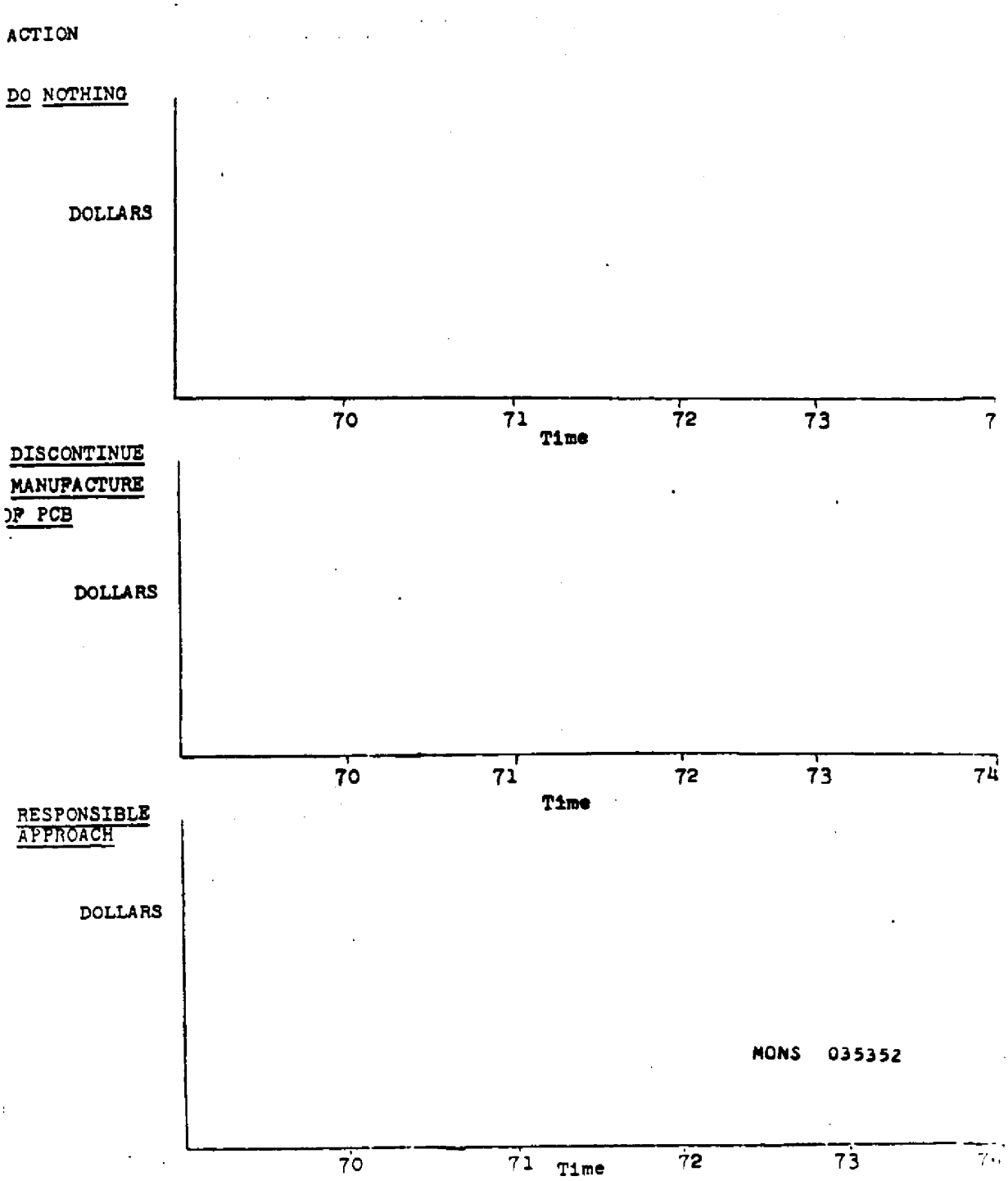
Develop specific actions with each department involved

Submit the actions with costs for approval

Develop a timetable to solve the overall problem.

Prepare for "precipitious pullout" or drastic legislative action although we do not feel this is a likely possibility.

PROFIT AND LIABILITY VS. TIME



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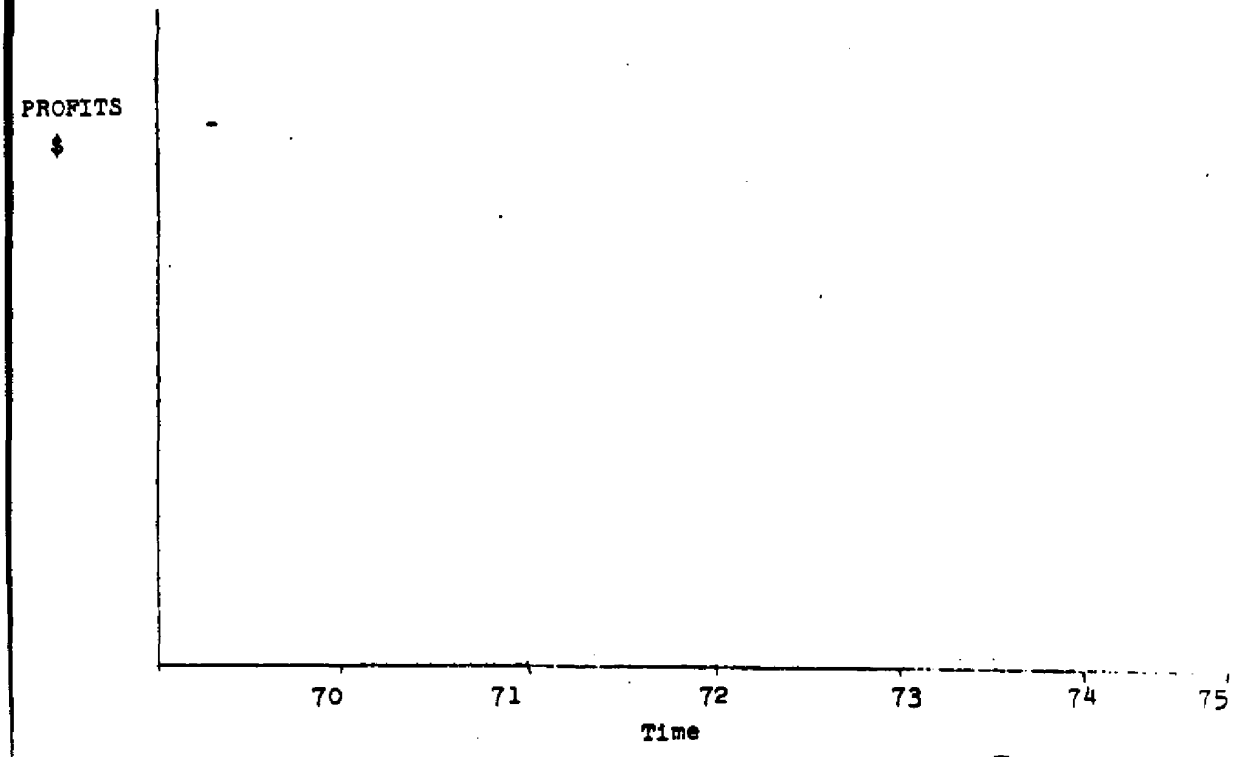

PROFIT AND LIABILITY VS TIME

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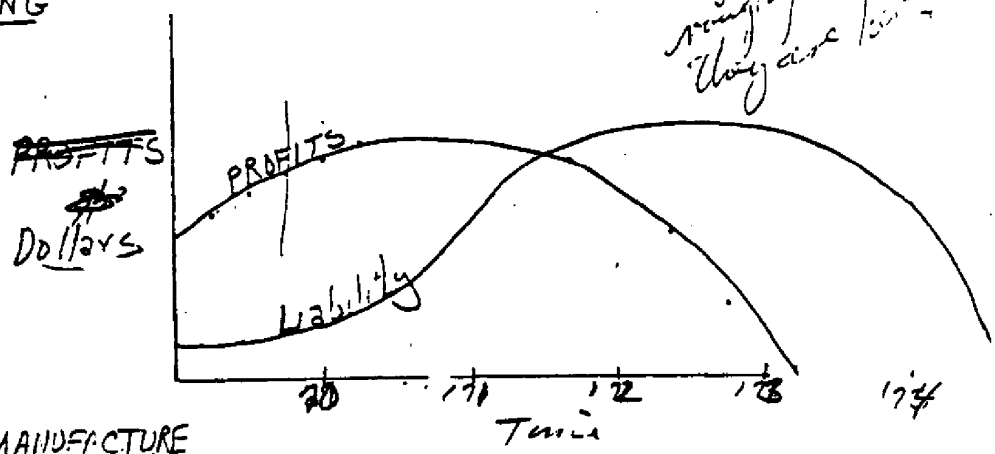

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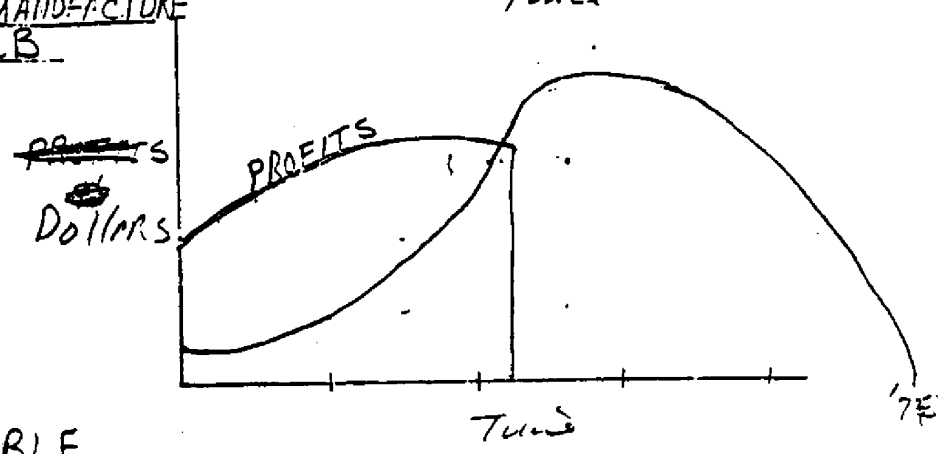

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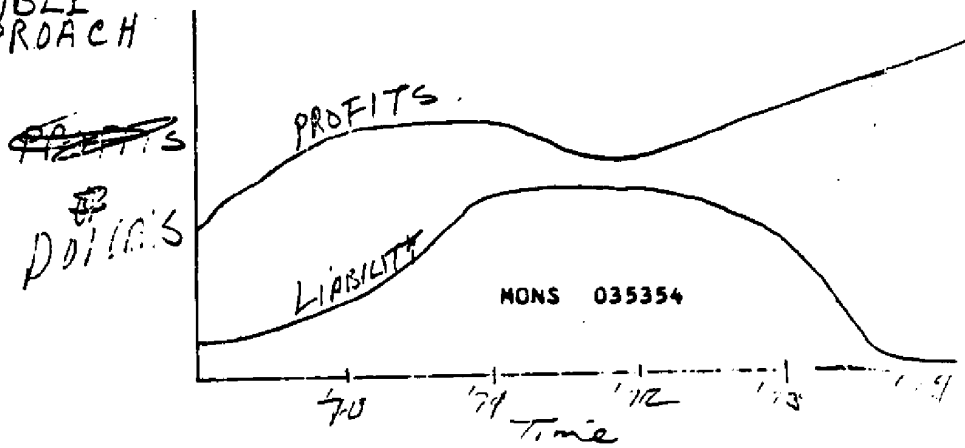

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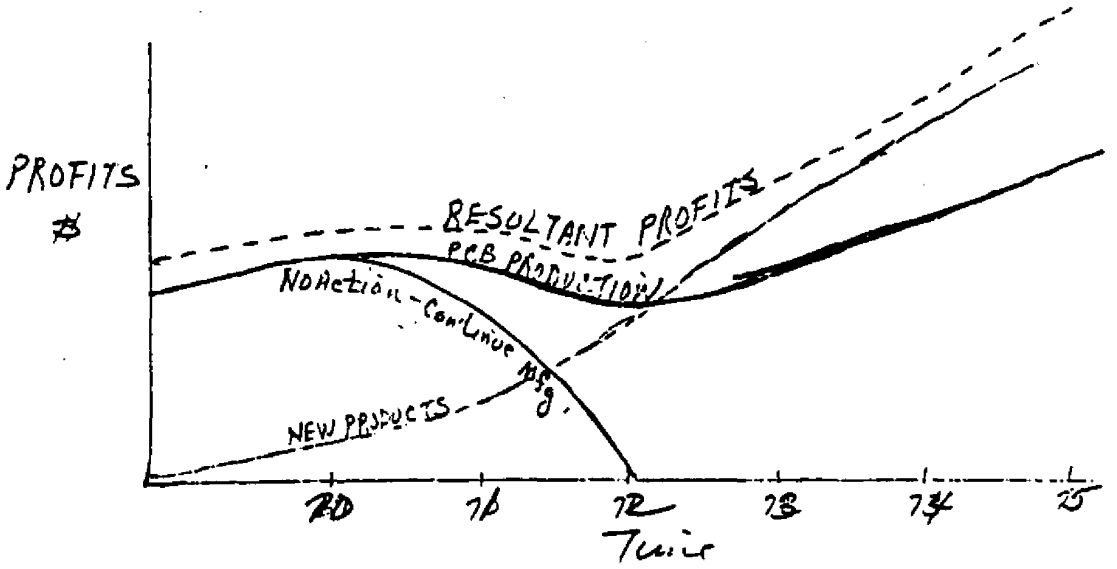
PROBABILITY OF SUCCESS



(I)

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~~G Distribution and Reclamation contractors~~

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III

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II. Probability of Success

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MONS 035358

I. Objective

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B. Permit continued development of new uses

C. Develop substitute products where necessary

D. Stop and/or control Contamination of the general ecosystem with poly chlorinated biphenyls

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2. TOXICOLOGICAL ASPECTS (Continued)

A second consequence of the chlorinated pesticide presence in fish, is the alleged effect on species of coastal and other fish-eating birds. There is evidence interpreted by a number of scientists (and seized upon by the conservationist-pseudo-scientists) that several species of birds face elimination or absolute extinction because of persistent chlorinated hydrocarbons in fish which make up the major portion if not all of their diet. Included in the United States are the Peregrine Falcon and the brown pelican. (At a meeting in October, 1969, of the Association of Official Analytical Chemists, will be a paper presented entitled, "The Determination of PCB's in Two Bald Eagles". This is based on work done by the Fish and Wildlife Laboratories of the U. S. Department of the Interior at Patuxent, Maryland. Now the emblem of the heritage of the United States is threatened!)

D. Birds--The effect in birds appears to be due to an upset of enzyme metabolism in the liver leading to the laying of eggs with thin or no shells at all. On Anacapa Island, near Oxnard, California, only three of one thousand brown pelican eggs were found this year with shells and only one bird was born. This was due allegedly to anchovies--the main diet of the pelican--containing "DDT and hundreds of parts per million of PCB's".

Preliminary results from studies at Industrial Bio-Test Laboratories indicate that 100 ppm of Aroclors 1242, 1254 and 1260 in the diet of white leghorns causes a reduction in egg shell thickness and an effect in chick embryos which prevents hatching.

E. Shrimp--In August, 1969, West Florida State University at Pensacola reported to our Pensacola Plant that PCB's (Aroclor 1254) had been found in the Escambia River below our outfall. The amount was reported as 40-45 parts per billion one quarter mile below the plant and 1 ppb at the bridge over the river as it enters Pensacola Bay.

The Gulf Breeze Laboratories of the Bureau of Commercial Fisheries (U. S. Department of Interior) at Pensacola next reported that 40 ppb killed baby shrimp in 96 hours. Further study indicated that 5 ppb killed 18 of 25 baby shrimp in 18 days.

Plant investigation revealed that one to three gallons per day of Aroclor 1254 was being lost to the river from the use of Pydraul AC in air compressors.

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2. TOXICOLOGICAL ASPECTS (Continued)

F. Summary of Toxicity Considerations

a. The PCB's are "moderately" toxic to man. A probable safe level for Aroclor 1254 and 1260 in the diet will be something less than one part per million.

b. Although only "moderately" or "slightly" toxic to adult birds and fish on the basis of acute exposure, the "safe long term" or "chronic dose" is less than 100 ppm insofar as reproduction is concerned.

c. In the case of shrimp, the "safe" or no effect" level for Aroclor 1254 is less than 5 parts per billion.

It thus appears that, while we may be able to show some kind of reasonable numbers for "safe levels" of Aroclors 1254 and 1260 (and other lower chlorinated biphenyls)in some species, there are other species of life in the ecosystem where a zero to 5 parts per billion limit for Aroclor 1254 and 1260 (and possibly other more highly chlorinated biphenyls) will be the tolerance level.

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3. PERSISTENCE OR LACK OF BIODEGRADATION

Evidence for the persistence of Aroclors 1254 and 1260 in the environment includes:

a. The chemical stability of most of the chlorinated aromatic hydrocarbons.

b. The identification of Aroclors 1254 and 1260 in the environment as itemized in Section 1.

c. Reports from Sweden indicating the presence of Aroclors 1254 and/or 1260 or competitive equivalent products in the sludge from municipal waste treatment plants.

d. The lack of data up to now indicating that lower chlorinated PCB's are interfering in the pesticide residue analysis in spite of the equivalent usage of some of them (e.g. Aroclor 1242) and undoubted losses to the environment depending on use applications and ultimate disposal. (Comfort in this conclusion is tempered by some evidence that the preparation of samples for GC analysis--destroying the DDT and metabolites--may be causing destruction of Aroclor 1242).

e. Literature evidence that other lower chlorinated hydrocarbons in a series of compounds (e.g. mono and di-chlorophenols) are subject to biodegradation whereas increase in chlorination makes them more refractory (pentachlorphenol).

f. Early reports of research in Monsanto's Ruabon Laboratories that indicate that Aroclor 1242 is indeed subject to biodegradation in biological waste treatment plants (research scale).

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4. PRESSURES WHICH WILL AFFECT SALES AND USE OF AROCLORS 1254 AND 1260

As of this date (October, 1969), there are no restrictions which control the current uses of our Aroclors or PCB's. We are faced instead with pressures being applied relative to persistent chlorinated hydrocarbon pesticides in general and specifically DDT. The evidence proving the persistence of these compounds and their universal presence as residues in the environment is beyond question. Although the significance of these residues is subject to wide difference of opinion among reasonable scientists, the development of "lunatic fringe" post-Rachel Carson has led to a domination of the media by scare publications in the public and scientific press. Only the most myopic individual in the business world could be unaware of the overwhelming interest and influences being directed at preventing contamination of the environment. The principal groups with an apparent avowed mission of providing a world of pristine pure food, water and air include many in academic and political fields who recognize the headline value of statements supporting these ideals.

In the case of the PCB's as environmental contaminants, the committee believes that Monsanto is faced with a barrage of adverse publicity in all elements of the news media--including those with national coverage. Factual basis will be sparse or non-existent but guilt by association (with DDT) will provide background and prevail.

As indicated in the earlier sections of this report, it will be impossible to deny the presence and persistence of Aroclors 1254 and 1260 at least. The public and legal pressures then to eliminate or prevent global contamination are inevitable and probably cannot be contained successfully.

In defense of the chlorinated pesticides, their manufacturers will not be loath to incriminate the PCB's as being culprits in the development of misleading data relative to their concentrations as residues. Secondly, the manufacturers of competitive products will seize any opportunity to point out to our customers their potential problems if they continue to use products containing Aroclors. This has already occurred in the case of our Pydraul's.

There are pertinent federal laws and regulations relating to environmental control as discussed in the following section.

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5. LAWS AND REGULATIONS CONTROLLING ENVIRONMENTAL CONTAMINATION

A. U.S. Department of Health, Education and Welfare - Food and Drug Administration

The most pertinent legislation governing the quality of human food is the 1958 Act amending the Food, Drug and Cosmetic Act and the regulations which have been established thereunder. Briefly, the requirements relate to food additives - direct and indirect, and control food production and processing to insure a supply free from bacterial contamination and unauthorized chemicals (or levels greater than established "tolerances"). The regulations also include animal feeds.

No acceptable or "safe" levels for PCB's in human foods or animal feeds have been established. Currently, there has been no indication that the FDA is seriously concerned about the levels of PCB's which have been reported alone or in conjunction with chlorinated pesticide residues. At the same time, the Pesticide Tolerance Branch of FDA has requested (late September) samples of Aroclors 1254 and 1260 for the expressed purpose of initiating acute toxicity studies in laboratory animals.

In the past, the FDA has not seized and destroyed food contaminated by the unintentional or unexplained presence of "adulterants" unless there has been some basis for a judgement that the adulterant was toxic or might pose a threat to health. An exception has been milk because of its primary role in the diet of children. Seizure and destruction of milk containing any "adulteration" has not been uncommon. It can be assumed that the finding of PCB's in milk in Georgia in June and in Baltimore in September has created a new interest in and emphasis on the PCB problem.

B. U.S. Department of Agriculture - Under laws and regulations governing the use of economic poisons which include insecticides, rodenticides, fungicides, this department shares with the FDA the responsibility for establishing safe levels or tolerances for these products. It does seize and destroy meats and poultry subject to inspection under regulations controlling the processing of these foods - originally those entering interstate commerce but more recently, practically all slaughtered and processed items.

As in the case of FDA, the USDA has not established any acceptable or tolerance levels for the PCB's in products subject to their control.

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LAWS AND REGULATIONS CONTROLLING ENVIRONMENTAL CONTAMINATION
(Continued)

C. U.S. Department of Interior - Federal Water Pollution Control Administration

Under the provisions of the Clean Water Act of 1967, the FWPCA has to approve standards of water quality established by the individual state regulatory agencies. For practical purposes, this has meant that FWPCA has set not only parameters but actual numbers for dissolved oxygen, pH, temperature, solids, etc. including the broad category of "toxic" compounds. As of this date, no limits per se have been promulgated for pesticides including the chlorinated hydrocarbons. This week (October 10), a bill has been introduced in Congress requiring the FWPCA to establish "limits" for pesticides. Obviously this is associated with the furor over DDT and the persistent chlorinated hydrocarbons. Hearings on the proposed legislation are expected early in 1970 soon after the Congress reconvenes.

It is reasonable to expect that the PCB problem will be brought up at these hearings. Further, with the political and public interest in all forms of environmental contamination, it is likely that the legislation will be broadened to include all persistent chemicals.

D. State Legislation - In addition to Federal legislation, all states have regulatory programs governing the adulterations of food, the contamination of intrastate and interstate waters, and the protection of fish, wildlife and natural resources. Up to this point most of the state government agencies which have contacted Monsanto represent water pollution control, natural resources, or agriculture areas of interest.

No states have established any "tolerance" limits for PCB's but a number of states have banned or restricted the use of DDT and have expressed more than a casual interest in the PCB's. In expressing such interest, several states (and the Province of Ontario) have pointed out the actions which have been taken against DDT.

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3. Man - There is no harmful effect known to man or other mammals after 40-years of production. Studies are underway by various sources.

4. Political and Public Emotion - PCB's linked to DDT because PCB's show up in analyses for DDT. Linked with other permanent chlorinated hydrocarbon pesticides.

EFFECT ON MONSANTO:

1. Business potential at stake on a worldwide basis:

Fluids	Plasticizers	Total/Year
70 M Lbs.	34 M Lbs.	104 M Lbs.
$16 M	$6 M	$22 M
$6-8 M GP	$2-3 M GP	$8-11 M Gross Profit

2. Legal responsibility.

3. Public image.

4. Effect on other product areas.

EFFECT ON CUSTOMERS AND ULTIMATE CONSUMERS:

1. Affects entire electrical industry - capacitors and transformers.

2. Affects food processing.

3. Affects die casters and other "hot metal" working industries.

4. Affects wide range of plastics and adhesive applications.

5. Affects wide range of paints and coatings.

EFFECT ON OTHER PRODUCERS:

There are at least six other producers of PCB's ex-USA. Monsanto has discussed problem with two in Europe. No great concern there yet.