PCB PRESENTATION

Nov 17, 1969

TO

CORPORATE DEVELOPMENT COMMITTEE

I. INTRODUCTION:

We are here today to acquaint you with the PCB (Aroclor) pollution problem and to secure your guidance and approval on a recommended plan of action.

Certain PCB's have recently been identified by various scientists along with DDT in fish, birds, and other wildlife.

From the standpoint of reproduction, the PCB's are highly toxic to birds. In a few moments, Elmer Wheeler will describe the problem in detail.

Our objective is to describe for you the basic problems, the issues involved, review alternative courses of action, and suggest an action plan program for your approval.

This is a serious matter, not only from the pollution viewpoint, but also because of the $22 M worldwide customer business involved with resultant gross profits of $10 M and a net investment of approximately $9 M. In addition, there could be possible adverse legal and public relations problems leveled against Monsanto.

Exhibit No. 12
Date 11-21-92
Susan M. Verga - Reporter
KELLY

Our Agenda will be as follows:

EXHIBIT NO. 1096
11/4/92 KJ

STR CC1555

WATER_PCB-SD0000019840

# PCB AGENDA REVIEW

I. INTRODUCTION

II. THE PROBLEM

- DEVELOPMENTS INCRIMINATING PCB's
- COMPLEXITY OF IDENTIFICATION
- NATURE OF
- SERIOUSNESS

III. LAW DEPARTMENT VIEWPOINT AND RECOMMENDATIONS

IV. EFFECT ON MONSANTO AND ALTERNATIVES

V. FUNCTIONAL FLUID BUSINESS GROUP DISCUSSION

- MARKETS, USES
- SOURCES OF POLLUTION
- CUSTOMER EFFECT

VI. PLASTICIZER BUSINESS GROUP DISCUSSION

- MARKETS, USES
- SOURCES OF POLLUTION

VII. RECOMMENDED ACTION PLAN

VIII. SUMMARY

STR CC156C

WATER_PCB-SD0000019841

By way of introduction, the Organic Division and the Medical Department has been actively engaged for the last 18 months in developing facts and knowledge on this subject by personal visits to Universities and Industrial test laboratories, other worldwide producers, and other industrial collaborators, as well as keeping abreast of all literature and news sources on the subject as well as funding a toxicological and analytical test program in excess of $100 M. We established an Ad Hoc Committee of both Business Groups and Medical which recently issued a report - much of which will be discussed today. We have learned a lot, but there is much yet to learn as you will hear.

What are PCB's? They are polychlorinated biphenyls - better known to us as Aroclors. The next slide will quickly re-familiarize you with our Aroclor business.



WATER_PCB-SD0000019842

## MONSANTO WORLDWIDE AROCLOR BUSINESS

| | |
|---|---|
| POUNDS/YEAR | 104 M (70 M in Functional Fluids<br>34 M in Plasticizers) |
| SALES/YEAR | $22 M ($16 M in Functional Fluids<br>$ 6 M in Plasticizers) |
| GROSS PROFIT/YEAR | $10.0 M ($7.5 M in Functional Fluids<br>$2.5 M in Plasticizers) |
| GROSS INVESTMENT | $13 M ($8.8 M net investment) |
| ROI | 10.5% |
| WORLDWIDE M/I | 62% |
| MONSANTO PRODUCTION LOCATIONS: | USA (2 plants, Anniston, Alabama<br>Sauget, Illinois) |
| | UK (Newport) |
| | JAPAN (Yokkaichi) |
| OTHER PRODUCERS: | Bayer, Prodelec, Caffaro, Flick,<br>Kanegahuchi, and several Eastern<br>European producers (all ex-USA) |

STR CC1562

WATER_PCB-SD0000019843

## THE AROCLOR PRODUCT LINE

| CHEMICAL NAME | TRADE NAME | NATURE OF MATERIAL |
|---|---|---|
| MONOCHLOROBIPHENYL | AROCLOR 1221 | THIN LIQUID |
| DICHLOROBIPHENYL | AROCLOR 1232 | ↓ |
| TRICHLOROBIPHENYL | AROCLOR 1242 | OILY LIQUID |
| TETRACHLOROBIPHENYL | AROCLOR 1248 | ↓ |
| PENTACHLOROBIPHENYL | AROCLOR 1254 | HEAVY MOLASSES |
| HEXACHLOROBIPHENYL | AROCLOR 1260 | THICK TAR |
| HEPTACHLOROBIPHENYL | AROCLOR 1262 | ↓ |
| OCTACHLOROBIPHENYL | AROCLOR 1268 | ↓ |
| DECACHLOROBIPHENYL | AROCLOR 1270 | SOLID |
| TERPHENYLS | SANTOWAX | ↓ |
| CHLORINATED TERPHENYL | AROCLOR 5460 | SOLID |

STR 001563

WATER_PCB-SD0000019844

There are theoretically 210 different isomers of chlorinated biphenyls.

Monsanto entered the Aroclor market in 1930 by acquiring Swan Chemical Company. The first load of Aroclor went out of Anniston, Alabama to General Electric in 1931. Since then, the market has grown to one of Monsanto's most profitable franchises. This franchise is now being threatened by recently found pollution problems which Elmer Wheeler will now discuss.

II. The Problem (Wheeler) - see attached Appendix A

III. Law Department Viewpoint and Recommendations (French)

IV. Effect on Monsanto and Our Alternative Courses of Action

As discussed, Aroclors 1254 and 1260 -- the 5 and 6 Cl ringed biphenyls are the ones most seriously involved in the pollution problem. Both Plasticizers and Fluids Groups are involved as shown:

STR CC15e4

WATER_PCB-SD0000019845

## AROCLOR SALES

(M POUNDS)

| | FLUIDS | PLASTICIZERS | TOTAL |
|---|---|---|---|
| AROCLOR 1254 | 1.45 | 5.4 | 6.85 |
| AROCLOR 1260 & ABOVE | 3.7 | 1.7 | 5.4 |
| | 5.15 | 7.1 | 12.25 |

STH CC15e5

WATER_PCB-SD0000019846

We considered 4 alternative courses of action:

(Slide)

Alternative 1: Do nothing was considered unacceptable from a legal, moral, ~~and~~ customer, public relations & company policy viewpoint. This is also the quickest route to being forced out of business.

Alternative 2: Go out of total Aroclor business was considered unacceptable from a Divisional viewpoint, but from a Corporate viewpoint may be necessary. ~~Only you can make that decision.~~ All Aroclor products are not serious pollutants - many degrade; there is too much customer/market need and selfishly too much Monsanto profit to go out. To go out would require a write off of Aroclor net investment of $7 MM (10¢/share) or if biphenyl included $8.8 MM (12¢/share). In addition, inventory disposition, continuing cost of utilities, and back-up capital and serious manpower & resources reallocation at Anniston.

Alternative 3: Go out of Aroclor 1254 and 1260. This was seriously considered and may eventually occur by our actions and customer actions, nevertheless, we feel that segments of this business are defensible or are so "confined" in use that specific plans of action are called for this portion. Our reasons for eliminating this alternative will become clearer as we outline our action plans.

STR CC15ee

WATER_PCB-SD0000019847

## ALTERNATIVE COURSES OF ACTION

1. DO NOTHING - JUST REACT TO LEGISLATION AND EMOTION.
2. GO OUT OF TOTAL AROCLOR BUSINESS.
3. GO OUT OF AROCLOR 1254 AND 1260 PRODUCTION
4. DEVELOP SPECIFIC ACTION PLANS "TAILORED" TO EACH BUSINESS GROUP AND EACH CUSTOMER/MARKET SITUATION TO "CLEAN UP" THE MESS.



WATER_PCB-SD0000019848

Alternative 4: Develop specific action plans tailored to each Business Group and each customer/market situation, - was the alternative selected at this point of time and based on our knowledge from a Divisional viewpoint as making Monsanto act in the most positive, responsible way to society and our customers, as well as our interests.

However, because of the magnitude and seriousness of this problem and its total implications for Corporate Monsanto, the final decision on this matter must be made by the CDC.

V. Functional Fluids Business Group Discussion:

Aroclors are used widely in 3 of our 4 market areas in the Fluids Group:

STR CC1506

WATER_PCB-SD0000019849

## FLUIDS USE OF AROCLORS BY MARKET AREA

| AROCLOR PRODUCT | DOMESTIC MARKET AREA | | | TOTAL |
|---|---|---|---|---|
| | INDUSTRIAL | HEAT TRANSFER | [illegible] | |
| 1242 | 4.1 | 1.1 | 36 | 41.2 |
| 1248 | 1.2 | 1.0 | - | 2.2 |
| 1254 | - | 0.1 | 0.8 | 0.9 |
| 1260 & Above | 0.6 | - | 3.5 | 4.1 |
| | 5.9 | 2.2 | 40.3 | 48.4 |

STR CC15e9

WATER_PCB-SD0000019850

## SOURCES OF FLUIDS POLLUTION

| APPLICATION | INTENSITY OF POLLUTION | |
|---|---|---|
| INDUSTRIAL FLUIDS | GREATEST | (DIRECT) |
| DIELECTRICS | ↓ | (INDIRECT CONTAINED) |
| HEAT TRANSFER | ↓ | (INDIRECT CONTAINED) |
| PRODUCING PLANTS | LEAST | (DIRECT) |



WATER_PCB-SD0000019851

# FLUIDS CUSTOMER ALTERNATIVES

| AREA OF APPLICATION | PRODUCT OF CHOICE | CUSTOMER OPTIONS |
|---|---|---|
| Industrial Fluids | Pydraul 312/F-9/ A-200/Phosphate Esters/ Water Glycol | Customer could get along without us, but Pydraul 312 favored. $H_2O$ Glycol has some pollution probl Phosphate ester route ok at present. |
| Transformer | Air/Oil/Aroclor/Gas | Could drop Aroclor at sacrifice of safety, cos or size of equipment or noise level. |
| Capacitors | Aroclors | No immediate replacement available. Longer term oil at expense of size and cost of efficiency and redesign of equipmen |
| Heat Transfer | Therminol | No option for FR liquid market. Other system possibility. |
| | Oil/Dowtherm/T66<br>T55<br>T77<br>T88 | Liquid systems favored. T66 and T55 increasing rapidly in use. Oil also a pollution problem. |



WATER_PCB-SD0000019852

Customer Choices & Alternatives & Penalties:

Summarizing, some of our customers have no immediate alternative, some could change only at sacrifices of safety, or cost or various technical factors. Only in the Industrial field could the customer make an immediate conversion.

PCB Threat to Functional Fluids Business and Profit:

STR 00157

WATER_PCB-SD0000019853

## FLUIDS BUSINESS THREATENED

## (1970 BUDGET)

| PROBLEM | SALES | GROSS PROFIT |
|---|---|---|
| 1. Confined to A-1254/ 1260 only. | $ 3.0 M | $1.36 M |
| 2. Spreads to A-1242 and 1248 | | |
| First to: a) Industrial Fluids | $ 4.0 M | $1.6 M |
| Then to: b) Dielectric Fluids | $ 8.0 M | $3.8 M |
| Then to: c) Heat Transfer | $ 1.0 M | $ .6 M |
| | $16.0 M | $7.36 M |

Turn over to Jim Springgate

STR 001573

VI

## PLASTICIZERS
## (WORLD-WIDE)

| | ALL AROCLORS | AROCLOR 1254/1260 USES |
|---|---|---|
| 1969 SALES, DOLLARS | $ 6.0 M | $1.7 M (28%) |
| POUNDS | 34.0 M | 9.5 M (28%) |
| 1970 GROSS PROFIT | $ 2.5 M | $0.8 M (32%) |

STR C0157

WATER_PCB-SD0000019855

COMMENTS: DISTRIBUTIONS FROM F.F.

1. Large number of direct U.S. customers - 570.
2. Customers are small: 23 direct customers - 47% A-1254/1260 sales.
3. 50% domestic A-1254/1260 sales through distributors - difficult to police.

STR 001575

WATER_PCB-SD0000019856

| MARKETS | 1968 SALES | MAJOR AROCLOR USED |
|---|---|---|
| Carbonless Carbon Paper | 8.5 M lb. | Aroclor 1242 |
| Hot Melt Adhesives | 5.7 M lb. | Aroclor 5460 |
| Swimming Pool Paints | 1.7 M lb. | Aroclor 1254<br>Aroclor 5460 |
| Protective Coatings | 5.3 M lb. | Aroclor 1254<br>Aroclor 5460 |
| Emulsion Adhesives | 1.5 M lb. | Aroclor 1254<br>Aroclor 1260 |
| Sealants | 3.0 M lb. | Aroclor 1254<br>Aroclor 1262 |
| Wax Modification | 2.0 M lb. | Aroclor 1254<br>Aroclor 5460 |
| Miscellaneous | 5.0 M lb. | Aroclor 1248<br>Aroclor 1254 |

COMMENTS: 1. [illegible] major customer (85% of Aroclor 12-2 sold).

2. [illegible] of domestic Aroclors sold through distributors.

STR CC1576

# POSSIBLE CONTAMINATION SOURCES

## (PLASTICIZERS)

| DEGREE OF CONTAMINATION | MARKET | APPLICATION | SOURCE | IS A-1254 /1260 USED? |
|---|---|---|---|---|
| Most | Coatings | Marine Paints Water tank linings | Leaching | Yes |
| | Coatings | Swimming Pool Paints | Leaching | Yes |
| | Carbonless Carbon Paper | - | Vaporization | No |
| | Wax Modification | - | Vaporization | Yes |
| | Emulsion Adhesives | - | Contact with product via packaging. Incineration. | Yes |
| | Hot Melt Adhesives | - | Contact with product via packaging. Incineration. | No |
| Least | Sealants | Automotive Construction Joint sealants | Long-term leaching | Yes |

COMMENTS:

1. Unlike fluids, Aroclor plasticizers are combined into plastics to produce the final product - therefore, far less mobile.
2. Problems such as wastes from our manufacturing plant, [illegible] plants and and leasing of drums common to both groups.
3. [illegible] protective coatings are not considered a high [illegible].
4. [illegible] of [illegible] plant processing or [illegible]

STR CC1577

WATER_PCB-SD0000019858

## PLASTICIZER BUSINESS THREATENED

| PROBLEM | SALES RETAINED* | $ G.P. RETAINED (LOST) |
|---|---|---|
| 1. Confined to A-1254/1260 type only. | $4.3 M | $1.7 M (-$0.8 M) |
| 2. Spreads to all chlorinated biphenyls. | $2.0 | $0.6 M (-$1.9 M) |
| 3. Spreads to all PCB's and all chlorinated terphenyls | 0.0 | 0.0 (-$2.5 M) |

*Based on 969 prospects.

COMMENTS Plasticizers sell Aroclor 1262/4465 which are very close to A-1254/1260 and these have been included in A-1254/1260.

STR CC1578

## RECOMMENDED ACTION PLAN

THE JOINT ACTION PLAN DEVELOPED BY THE FUNCTIONAL FLUIDS AND PLASTICIZER BUSINESS GROUPS, AND THE MEDICAL AND LAW DEPARTMENTS IS AS FOLLOWS:

1. Appoint a Project Manager - responsible for the overall management of the Aroclor pollution problem. He would be assisted by a Task Force from members of each Business Group plus Medical, Law, Engineering and Manufacturing.

2. Notify all Aroclor customers of PCB problem and relabel containers - within 60 days.

3. Clean up Monsanto plants' effluents within 12 months.

4. Develop and implement new packaging systems for Aroclor 1254/1260 - within 6 months.

5. Educate customers on need for clean-up at their plants - within 4 months.

6. Introduct to market, replacement products for Aroclor 1254/1260 - beginning 1/1/70 (Fluids), 4/1/70 (Plasticizers).



WATER_PCB-SD0000019860

## RECOMMENDED ACTION PLAN

7. Continue and expand biodegradation test program with Aroclor series, particularly 1242, 1248 and 1254.

8. Continue toxicological test program.

9. Accelerate present analytical test program.

10. Determine feasibility and cost of eliminating 5/6 $Cl_2$ in Aroclors 1242 and 1248. (3/70)

11. Study incineration products. (3/70)

12. Develop business plan to offer:

    Monsanto Fluid Reclamation and Recovery with Enviro Chem (4/70). (Reclamation already underway at Findett.)



WATER_PCB-SD0000019861

## WHAT SHOULD WE EXPECT FROM THIS PROGRAM?

Through this action program, Monsanto would expect to:

1. Retain or convert a good portion of our business and profits:

| PROBLEMS | CONVERT OR RETAIN | $M SALES OUT OF PRESENT | ODDS OF SUCCESS |
|---|---|---|---|
| a. Confined to A-1254/ 1260. | $20.3 M | $22 M | 70% |
| b. Spreads to A-1248 and 1242. | $10 M | $22 M | 60% |

2. Gain further valuable knowledge and time to:
   a. Learn more facts.
   b. Protect our position.
   c. Make further decisions regarding our program.
   d. Contribute to overall pollution knowledge.

3. Clean up the major contributing PCB pollution factors.

4. Minimize customer complaints and hardships.



WATER_PCB-SD0000019862

22
23

The Program Would:

1. Cost some money.

   Est. SARE - $400-500 M

   Est. Capital - $700 M

   $1.1 M - 1.2 M

2. Expose us to continued adverse publicity and possible law suits.

3. Cause some customer discontent - but much less than an abrupt termination of production.

STR CC1582

WATER_PCB-SD0000019863

SUMMARY

In summary, the PCB pollution problem is a very serious one. It is a worldwide ecological problem. At present the most serious offenders are the 5 and 6 chlorine containing products (Aroclors 1254 and 1260). There are some indications other members are biodegradable to varying degrees. Currently, much scientific testing is underway and more information will be forthcoming. Monsanto must act in a positive cooperative fashion. A plan of action has been discussed which we feel indicates responsible action. Our stakes are large and because of the many possible effects on the Corporation -- your guidance and approval of the suggested action program is requested.

Thank you for your consideration. May we answer any questions

STR C

WATER_PCB-SD0000019864