

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.

Our Agenda will be as follows:

Exhibit No. 12
Date 11-21-69
Susan M. Vesez - Reporter
KELLY

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EXHIBIT NO. 1096

11/4/92 Km

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

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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.

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MONSANTO WORLDWIDE AROCLOR BUSINESS

POUNDS/YEAR	104 M (70 M in Functional Fluids 34 M in Plasticizers)
SALES/YEAR	\$22 M (\$16 M in Functional Fluids \$ 6 M in Plasticizers)
GROSS PROFIT/YEAR	\$10.0 M (\$7.5 M in Functional Fluids \$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 Sauget, Illinois) UK (Newport) JAPAN (Yokkaichi)
OTHER PRODUCERS:	Bayer, Prodeles, Caffaro, Flick, Kanegahuchi, and several Eastern European producers (all ex-USA)

U.S. M.I.

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THE AROCLOR PRODUCT LINE

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

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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 ^{the by com. pet} 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:

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AROCLOR SALES

(M POUNDS)

	<u>FLUIDS</u>	<u>PLASTICIZERS</u>	<u>TOTAL</u>
AROCLOR 1254	1.45	5.4	6.85
AROCLOR 1260 & ABOVE	<u>3.7</u>	<u>1.7</u>	<u>5.4</u>
	5.15	7.1	12.25

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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 M (10¢/share) or if biphenyl included \$8.8 M (12¢/share). In addition, inventory disposition, continuing cost of utilization, 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.

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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.

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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} 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:

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FLUIDS USE OF AROCLORS
BY MARKET AREA

<u>AROCLOR PRODUCT</u>	<u>DOMESTIC MARKET AREA</u>			<u>TOTAL</u>
	<u>INDUSTRIAL</u>	<u>HEAT TRANSFER</u>	<u>ELECTRICAL</u>	
1242	4.1	1.1	36	41.2
1248	1.2	1.0	-	2.2
1254	-	0.1	0.8	0.9
1260 & Above	<u>0.6</u>	<u>-</u>	<u>3.5</u>	<u>4.1</u>
	5.9	2.2	40.3	48.4

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SOURCES OF FLUIDS POLLUTION

<u>APPLICATION</u>	<u>INTENSITY OF POLLUTION</u>	
INDUSTRIAL FLUIDS	GREATEST	(DIRECT)
DIELECTRICS	↓	(INDIRECT CONTAINED)
HEAT TRANSFER		(INDIRECT CONTAINED)
PRODUCING PLANTS		LEAST (DIRECT)

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FLUIDS CUSTOMER ALTERNATIVES

<u>AREA OF APPLICATION</u>	<u>PRODUCT OF CHOICE</u>	<u>CUSTOMER OPTIONS</u>
Industrial Fluids	Pydraul 312/P-9/ A-200/Phosphate Esters/ Water Glycol	Customer could get along without us, but Pydraul 312 favored. H ₂ O Glycol has some pollution problem. Phosphate ester route ok at present.
Transformer	Air/Oil/Aroclor/Gas	Could drop Aroclor at sacrifice of safety, cost 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 equipment.
Heat Transfer	Therminol	No option for FR liquid market. Other system possibility.
	Oil/Dowtherm/T66 T55 T77 T88	Liquid systems favored. T66 and T55 increasing rapidly in use. Oil also a pollution problem.

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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:

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FLUIDS BUSINESS THREATENED

(1970 BUDGET)

<u>PROBLEM</u>	<u>SALES</u>	<u>GROSS PROFIT</u>
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
	<u>\$12.0 M</u>	<u>\$7.36 M</u>

Turn over to Jim Springer

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VI

PLASTICIZERS
(WORLD-WIDE)

	<u>ALL PROCESSIONS</u>	<u>APROCESSION 1254/1260</u> <u>TYPE</u>
1969 SALES, DOLLARS	\$ 6.0 M	\$1.7 M (28%)
POUNDS	34.0 M	9.5 M (28%)
1969 GROSS PROFIT	\$ 2.5 M	\$0.8 M (32%)

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COMMENTS: DISCREPANCIES FROM F.P.

1. Large number of direct U.S. customers - 570.
2. Customers are small: 23 direct customers - 475 A-1254/1260 sales.
3. 50% domestic A-1254/1260 sales through distributors - difficult to police.

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<u>MARKETS</u>	<u>1968 SALES</u>	<u>MAJOR AROCLOR USED</u>
Carbonless Carbon Paper	6.5 M lb.	Aroclor 1242
Hot Melt Adhesives	5.7 M lb.	Aroclor 5450
Swimming Pool Paints	1.7 M lb.	Aroclor 1254 ✓ Aroclor 5450)
Protective Coatings	5.3 M lb.	Aroclor 1254 ✓ Aroclor 5450)
Emulsion Adhesives	1.5 M lb.	Aroclor 1254 ✓ Aroclor 1250)
Sealants	3.0 M lb.	Aroclor 1254 ✓ Aroclor 1252)
Heat Stabilization	2.0 M lb.	Aroclor 1254 ✓ Aroclor 5450)
Various Uses	5.0 M lb.	Aroclor 1254 ✓ Aroclor 1250)

- Notes:
1. USA major customer (85% of Aroclor 12-2 sold).
 2. 15% of domestic Aroclors sold through distributor.

POSSIBLE CONTAMINATION SOURCES

(PLASTICIZERS)

<u>DEGREE OF CONTAMINATION</u>	<u>MATERIAL</u>	<u>APPLICATION</u>	<u>SOURCE</u>	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 Modifications	-	Vaporization	Yes
	Emulsion Adhesives	-	Contact with product via packaging. In- cubation.	Yes
	Hot Melt Adhesives	-	Contact with product via packaging. In- cubation.	No
Least	Stalant	Automotive Construction Joint Sealants	Long-term leaching	Yes

REMARKS:

- On the whole, Arcelon plasticizers are combined into plastics to produce the final product - therefore, for this reason.
- Problems such as wastes from our manufacturing plants, chemical plants and the loading of drums common to both groups.
- As for protective coatings are not considered a high risk.
- The question of applying during their processing or later.

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PLASTICIZER BUSINESS TRENDING

<u>PROMISE</u>	<u>SALES RETAINED</u>	<u>\$ G.P. RETAINED (LOSS)</u>
1. Confined to A-1254/1260 type only.	\$4.3 M	\$1.7 M (-\$0.8 M)
2. Spread to all calculated phenyls.	\$2.0	\$0.6 M (-\$1.9 M)
3. Spread to all PC's and all calculated phenyls	0.0	0.0 (-\$2.5 M)

*Based on 360 prospects.

REMARKS Manufacturers sell Acetone 1262/465 which are very close to A-1254/1260 and these have been included in A-1254/1260.

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

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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 Cl₂ 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 Pindett.)

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:

<u>PROBLEMS</u>	<u>CONVERT OR RETAIN</u>	<u>\$M SALES OUT OF PRESENT</u>	<u>ODDS OF SUCCESS</u>
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.

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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.

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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

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