Monsanto

St. Louis

January 8, 1968

R. E. Bilger
D. B. Hosmer
W. K. Johnson
R. E. Kelly/W. H. Hunt
R. M. Parks
~~T. M. Patrick~~/R. Keller
W. R. Richard
T. K. Smith, Jr.

TO : C. E. Anagnostopoulos
E. S. Robson

Dr. John Birdsall of Wisconsin Alumni Research Foundation (WARF) called to tell me of studies to be undertaken by WARF on identification of "chlorinated hydrocarbons" residues in gulls and various shore bird species.

The work is at the request of Dr. Joseph Hickey of the U. of Wisconsin, who is being funded by the U. S. Department of the Interior Fish and Wildlife Service. We are familiar with Swedish publications which have identified "chlorinated hydrocarbons" in bird tissue and there is evidence from the Swedish publications that the commonly suspected source of these residues is not DDT or its degradation products (various of which were identified by Birdsall as DDE, DDD, etc.).

The Wisconsin work will be directed at gas chromatographic identification of the residue peaks found and a correlation of these with peaks obtained from chlorinated biphenyls such as Monsanto's Aroclor 1254, etc. The technique contemplated will be addition of aroclors to gull tissue containing known levels of DDT and its breakdown products.

MONS 096496

EXHIBIT WBP M-77

The WARF man responsible for this program is Francis Coon, head of the Chemistry Department (phone (608) 257-4851). Birdsall is suggesting that Monsanto and WARF work openly and share information on this project. WARF obviously will need information on the Aroclors and can and will obtain this from commercial sources in the event we do not choose to cooperate.

EXHIBIT WBP M-22

Bob - I discussed casually c̄ SAH. He brought it up & asked whether I thought we shd. cooperate & thought we should. You'll undoubtedly hear more about it.
[illegible] 1-9-68

LEXOLDMON000609

I indicated that we would discuss this internally and an appropriate delegate from Monsanto would contact Coon within a few days to advise him the extent and nature of Monsanto's willingness to provide samples, technical information, and any cooperative research which might be contemplated.

Since the product responsibility for Aroclors has been assigned the Functional Fluids group, I presume Dr. Anagnostopoulos will designate the appropriate individual and perhaps it would be wise to notify our colleagues in MCL who have already called the Swedish publications to our attention.

S. A. Heininger

rar

LEXOLDMON000610

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
BUILDING 16, DENVER FEDERAL CENTER
DENVER, COLORADO 80225

WRes

January 16, 1968

Monsanto Chemical Company
800 N. Lindbergh Boulevard
St. Louis, Missouri

Gentlemen:

It has been brought to our attention that presumptive evidence of chlorinated biphenyl and chlorinated polyphenyl coupounds have been found in avian and animal tissues.

We are in the process of further investigation of compounds of this series and would appreciate your sending us samples of your Arochlor compounds numbers 1242, 1254, 1260, 1268 and any others which might be extensively used.

Sincerely yours,

Richard A. Wilson, Sr.
Research Chemist (Biochemistry)

EXHIBIT
WBP M-77.1

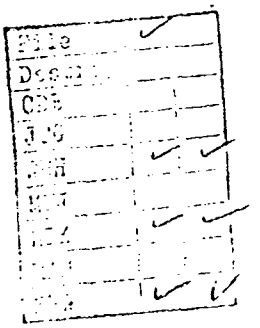
EXHIBIT
WBP M-23

MONS 089193

LEXOLDMON000611

bcc: C. E. Anagnostopoulos CANAG
E. Wilde EWILD
R. E. Kelly/W. Hunt RKELL

February 15, 1968



Dr. Richard A. Wilson, Sr.
U.S. Dept. of the Interior
Fish and Wildlife Service
Bldg. 16, Denver Federal Center
Denver, Colorado 80225

Dear Dr. Wilson:

About two weeks ago we sent you samples of Aroclor 1242, 1254, 1260, and 1268 for your research investigations. These are mixtures of chlorinated biphenyl isomers.

We hope these have helped in the identification of chlorinated biphenyl compounds.

Sincerely,

William R. Richard, Manager
Research & Development
Functional Fluids

WRR:ms

16

EXHIBIT
WBP M-23.1

MON-MT-008576

LEXOLDMON000612

D.W. R. Richard.

FEB 29 1968

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
Pesticides Regulation Division
101 South Laboratory Building, A.R.C.
Beltsville, Maryland 20705

To D.R.E. Kelly

February 21, 1968

Monsanto Chemical Company
Organics Division
800 N. Lindbergh Blvd.
St. Louis, Missouri 63141

Gentlemen:

We would appreciate receiving samples of your various Arochlors (chlorinated polyphenyls) to be used in our laboratory in the enforcement of the Federal Insecticide, Fungicide and Rodenticide Act (as amended). In addition we would also like to have any literature you may have concerning these materials as well as Analytical methods if they are available.

If there is a charge for any or all of these, please submit the bill with the material and we will initiate payment immediately on receipt of the shipment.

Thank you for your attention to this matter.

Sincerely yours,

W. N. Blickenstaff

W. N. Blickenstaff
Chemist in charge

I haven't done anything.
Paton.

EXHIBIT
WBP M-77.2

MON-MT-008577

EXHIBIT
WBP M-24

bcc: W. R. Richard - WRICH
C. Paton - CPATO

February 29, 1968

Mr. W. N. Blickenstaff
U. S. Dept. of Agriculture
Pesticides Regulation Division
101 South Laboratory Bldg, A.R.C.
Beltsville, Maryland 20705

Dear Mr. Blickenstaff:

I enclose our technical bulletin O/PL-306. This describes the physical and chemical characteristics of our 12 Aroclors. Do you want samples of all of them and what size sample are you desirous of obtaining? I presume what you want is the technical Aroclor material as sold.

Could you explain to me your interest in Aroclors. Especially in relationship to the enforcement of the Federal Insecticide, Fungicide and Rodenticide Act. Are Aroclors used in applications that come under this act?

Sincerely,

R. Emmet Kelly, M. D.
Medical Director

REK/ln
enc.

EXHIBIT
WBP M-24.1

MON-MT-008578

Ken Wells

MAR 9 1968

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PESTICIDES REGULATION DIVISION
[redacted]
101 South Laboratory Building, A.R.C.
Beltsville, Maryland 20705

March 6, 1968

Dr. R. Emmet Kelly, Medical Director
Monsanto Company
Medical Department, Mail Zone 001
800 North Lindbergh Boulevard
St. Louis, Missouri 63166

Dear Dr. Kelly:

This will acknowledge receipt of your technical bulletin O/PL-306 and your letter of February 29, 1968.

Our interest in Arochlors stems from recommendations made on page 36 of the above named technical bulletin. Since our organization is directly responsible for the analysis of pesticide formulations under the FIFRA, we desire samples of the various arochlors to use in identity tests and comparison tests when such formulations are analyzed.

You are correct in assuming that we would be interested in the material as it is sold commercially. We are interested in obtaining about 3 ounces of all of the available arochlors. If there is any charge for these, please bill us at the time of shipment and we will initiate payment upon receipt of samples.

Thank you for your consideration.

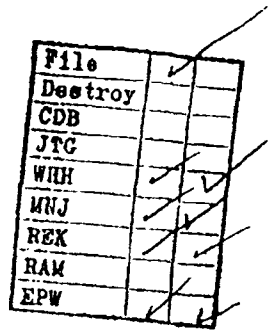
Sincerely yours,

W N Blickenstaff

W. N. Blickenstaff
Chemist in Charge

MON-MT-008579

EXHIBIT
WBP M-24.2



March 12, 1968

Mr. W. N. Blickenstaff
United States Dept. of Agriculture
Pesticides Regulation Division
101 South Laboratory Building, A.R.C.
Beltsville, Maryland 20705

Dear Mr. Blickenstaff:

I have forwarded your letter to Mr. Ken Wells, of our Organic Division, and I am sure you will be hearing from him shortly.

It is true that at quite some time in the past one of the Arochlors was used as a volatilization retarder for some insecticides. Lindane was the only one and I am really not sure how widespread this use was. For all I know, it may not be used anymore; although, certainly, it could be used without our knowledge. We do not, however, have any direct knowledge of its use.

Sincerely,

R. Emmet Kelly, M. D.
Medical Director

REK/ln

bcc: Mr. K. A. Wells - Will you send samples of our Arochlors to Mr. Blickenstaff.

REK

EXHIBIT
WBP M-24.3

MON-MT-008580

LEXOLDMON000616

Monsanto

Cumming Paton - General Offices

APR 29 1968

April 26, 1968

cc W. R. Richard

AROCLORS/
USDA INVESTIGATION

Dr. R. Emmet Kelly
Medical

I refer to your letter of March 6 to Mr. Blickenstaff of USDA in Beltsville, Maryland. It is interesting to note that his interest in Aroclors stems on recommendations on page 36 of our technical bulletin O/PL-306. I am sure he is referring to our recommendations on vapor suppression. In fact, our recommendations are based on those of the USDA scientists at Beltsville, Md.

Our bulletin CS-6, issued in March, 1961, gives full details of the researches and recommendations given by the USDA workers which appeared to have been carried out for a period of years starting as early as 1954. I wonder if a new breed has arisen at Beltsville which is unfamiliar with the work of their predecessors. Do you think it would be worthwhile sending bulletin CS-6 to Mr. Blickenstaff.

Cumming Paton

dbw

EXHIBIT
WBP M-24.4

MON-MT-008581

St. Louis

April 29, 1968 Mr. W. R. Richard - WRICH

AROCLORS/USDA INVESTIGATION

Mr. Cumming Paton
CPATO

Thank you for your note of April 26 on subject matter. Will you send me Bulletin CS-6, as I think it would be worthwhile to send it along to Mr. Blickenstaff. If your files show the names of anyone at Beltsville with whom we have communicated, I would include that in my letter.

R. Emmet Kelly, M. D.

REK/ln

EXHIBIT
WBP M-24.5

MON-MT-008582

File	✓	
Destroy		
CDB		
JTG		✓
WHH	✓	
MNJ	✓	✓
REK	✓	✓
RAM		
EPW	✓	✓

May 2, 1968

Mr. W. N. Blickenstaff
United States Dept. of Agriculture
Pesticides Regulation Division
101 South Laboratory Bldg., A.R.C.
Beltsville, Maryland 20705

Dear Mr. Blickenstaff:

It appears that the use of Monsanto Aroclor resin as an ingredient in insecticide formulations was based on U.S.D.A. work. I had not realized this when I wrote you earlier.

I am sending you a copy of our data sheet that refers more specifically to it.

I hope by now you have received the samples and if you have not, please let me know.

Sincerely,

R. Emmet Kelly, M. D.
Medical Director

REK/ln

EXHIBIT
WBP M-24.6

MON-MT-008583

Monsanto Chemical Company, Organic Chemicals Division
800 North Lindbergh Blvd. • St. Louis 66, Missouri

CHEMICAL SPECIALTIES DATA REPORT

The information in this report was compiled to assist you in your evaluation and development of special uses for Monsanto products. Every effort has been made to include pertinent material bearing on the subject. This information is intended to guide your development work, but Monsanto cannot take part in the specific formulation or evaluation of any finished product... since knowledge of such should be reserved to yourself and is often your most valuable trade secret.

No. CS-6
Date March, 1961

MONSANTO AROCLOR* RESINS FOR INSECTICIDE FORMULATIONS

A Discovery

A simple method of increasing the service life of expensive lindane sprays was developed several years ago by U. S. Department of Agriculture scientists at their Beltsville, Maryland, testing station. The technique was to incorporate Monsanto's "Aroclor" 5460, a resinous chlorinated terphenyl in the lindane solution. This pale yellow solid reduces volatility of the lindane -- slows it down to an effective, but not wasteful, evaporation rate. The result is an insecticide deposit on treated surfaces that lasts up to ten times longer than that left by straight lindane solutions.

Normally, simple solutions of lindane leave a crystalline residue that dissipates within a few weeks. On hard surfaces such as glass, metal or painted areas, the residues last only about a week. Because lindane is a well established and effective pesticide, U.S.D.A. researchers sought a way to improve the lasting qualities of lindane residues. Of numerous compounds tested, "Aroclor" 5460 gave the best results at lowest cost.

Test Work

A major objective of these studies was to develop a suitable formulation for application to crops and other plants. Although results under carefully controlled conditions were quite promising, subsequent tests by other agricultural experimenters gave only moderate success. Consequently, interest has been slow to develop in agricultural circles. Apparently, the vagaries of sunlight, weather, and plant growth represent too many variables for effective study of the formulation residues by direct application to exposed plants.

* Aroclor: Reg. U. S. Pat. Off.

EXHIBIT
WBP M-24.7

MON-MT-008584

The information in this bulletin is, to our best knowledge, true and accurate, but all recommendations or suggestions are made without guarantee, since the conditions of use are beyond our control. The Monsanto Chemical Company disclaims any liability incurred in connection with the use of these data or suggestions. Furthermore, nothing contained herein shall be construed as a recommendation to use any product in conflict with existing patents covering any material or its use. AD 7a

LEXOLDMON000620

A New Idea

But another possibility for putting the U.S.D.A. discovery to work has lain dormant until recently; this is the possibility of using to good advantage the ability of "Aroclor" resins to make the lindane adhere to smooth hard surfaces like metal, glass, painted areas, etc. This would consist of painting or spraying "Aroclor"/lindane formulations on such areas as the inside of garbage can lids, on window screens, doorsills, the painted walls of outbuildings, dairy plants, storage areas, etc., in order to obtain lasting control of flies, ants, roaches, silverfish and other troublesome pests. Suitable formulations can be readily packaged in shoe-polish type "dauber" bottles, aerosol spray cans, and bulk packages for mechanical spray application. Development of this idea is based on the following:

Advantages of Using "Aroclor" Resins in Insecticide Formulations

* A suitable "Aroclor" (Monsanto makes seven) can remarkably extend the effective life of lindane and other chlorinated insecticides as much as ten times (up to 2 and 3 months).

* "Aroclor" resins are very low in cost (around 20¢/lb.).

* Small quantities are sufficient (5 to 25 parts per hundred, by weight).

* Formulation is extremely simple -- the resin is dissolved in a suitable solvent compatible with the insecticide.

* Stable in inventory and in insecticide formulation. "Aroclor" resins are fire-resistant, non-oxidizable, non-corrosive, withstand weather extremely well.

* Non-staining "Aroclor"/insecticide films formed when the solutions dry are practically invisible. "Aroclor" 5460 has a pale yellow color as supplied. Other suitable "Aroclor" products are nearly colorless.

* "Aroclor" resins are odorless -- won't impart "chemical" odors.

* "Aroclor" resins are safe to handle as long as they are not volatilized and inhaled. They are practically non-volatile at ordinary temperatures, do not irritate or sensitize normal skin.

* The nature of the residue can be varied. Monsanto supplies a variety of "Aroclor" resins. These are chlorinated to various degrees and vary in physical properties as follows:

MON-MT-008585

LEXOLDMON000621

Chlorinated Terphenyls

Aroclor 5460 - Yellow, transparent, friable solid (dries hard)
Aroclor 5442 - Yellow, transparent, sticky semi-solid (dries tacky)
Aroclor 4465 - Yellow, transparent, brittle resin (dries sticky)

Chlorinated Biphenyls

Aroclor 1262 - Light yellow, sticky, viscous semi-solid (dries stick
Aroclor 1260 - Pale yellow, soft, sticky semi-solid (dries sticky)
Aroclor 1254 - Pale yellow, viscous oil (dries "wet")

Experimental Work and Formulations

The following information was derived from preliminary reports on work done by U.S.D.A. research groups. These data are not to be construed as recommendations by either the U.S.D.A. or Monsanto, but rather are intended to serve as a guide or starting point for the development of private formulations.

Fifty to 200 milligrams of lindane per square foot of surface has given good insect control on nonporous surfaces. The ratio of lindane to "Aroclor" 5460 has been varied from 1:1 to 1:4. For most purposes a 1:1 or a 1:2 mixture is satisfactory.

Formulations as used in the U.S.D.A. experiments are:

1) For application as a solution.

Lindane	5 parts by weight
"Aroclor" 5460	5 parts by weight
Carbon Tetrachloride	750 parts by weight

(Carbon tetrachloride is toxic and should be handled with extreme caution. Less toxic solvents are easily obtained.)

2) For application as an emulsion.

Lindane	20 parts by weight
"Aroclor" 5460	20 parts by weight
Xylene	100 parts by weight
"Triton" X-100 (available from Rohm & Haas)	3 parts by weight

To obtain a stable 1% lindane emulsion, mix 1 part by weight of the above concentrate to 13 parts by weight of water.

MON-MT-008586

LEXOLDMON000622

3) For use as a pressurized (aerosol type) spray.

a)	Lindane	5 parts by weight
	"Aroclor" 5460	5 parts by weight
	Methylene chloride	40 parts by weight
	"Freon" 12 (DuPont)	50 parts by weight
b)	Lindane	5 parts by weight
	"Aroclor" 5460	5 parts by weight
	Cyclohexanone	10 parts by weight
	Ortho-dichlorobenzene	35 parts by weight
	"Freon" 12 (DuPont)	45 parts by weight

Experimental Results - American Roaches

Using Formula 3a or 3b, the toxicant was applied onto a painted wall, depositing about 200 mg./sq. ft. of lindane and a like amount of "Aroclor" 5460.

When the toxicant coat was one month old, it gave 90-100% kill of American roaches when the roaches contained in a petri dish were placed against the surface of the treated wall for two hours.

The U.S.D.A. research team found that the lindane-"Aroclor" 5460 mixture (used at the rate of 50 mg. of actual lindane per sq. ft.) would kill 80% of all cockroaches exposed for 2 hours to a 60-day-old treated surface. It remained lethal to 66% of the roaches after 90 days. Regular lindane sprays used at the same rate killed only 4% of the roaches after 60 days.

Results with Houseflies

Deposits of 25 mg. of lindane plus 25 mg. of "Aroclor" 5460 applied from carbon tetrachloride onto glass and aluminum (hard surfaces) gave 100% kill of normal houseflies exposed for 2 hours to these treated surfaces after they had aged 18 weeks, the duration of the test.

Without the "Aroclor" the hard surfaces treated with lindane alone were effective only about a week.

A lindane plus "Aroclor" mixture sprayed as an aerosol onto leaves of a willow tree continued to kill houseflies after 2 months of outdoor weathering. Careful inspection of the treated leaves showed that the toxicant was held firmly to the surface and notwithstanding rain and weather, the coating remained in good condition. Also, within limits of a preliminary inspection there seemed to be no injury to the willow leaves.

MON-MT-008587

LEXOLDMON000623

(Note: The primary purpose of this report is to provide information for the development of suitable insecticide formulations for application to "nonsensitive" surfaces such as metals, glass, paints, and other materials that will not be damaged by the application. Development of formulations for living plants requires sufficient test work to insure that the formulations will not be injurious to the plants or their products.)

Another Formulation Reported

A more recent development in these experiments is the following simple formulation:

"Aroclor" 5460	25%
Lindane	25%
Methylethyl Ketone (MEK)	50%

Work on this was reported in the August 14, 1954 issue of Chemical Week magazine.

This simple formulation appears to be most suitable for "painted on" formulations packaged in bottles but should be used with caution in mechanical spray equipment since the MEK solvent will soften rubber and certain plastics. The formulation could also be modified easily for aerosol packaging.

Since MEK evaporates rapidly, it should not seriously affect painted areas unless too heavy applications are made. The package label should include a caution to this effect. Also, MEK is flammable. Possible substitutes that are less flammable are methylchloroform or a mixture of methylchloroform and methylene chloride.

Formulating Other Insecticides

The beneficial effects of "Aroclor" 5460 apply generally to other chlorinated insecticides including chlordane, aldrin and dieldrin, but do not apply to phosphate type insecticides such as TEPP, parathion, methylparathion, malathion and chlorothion.

* * * *

For samples of the "Aroclor" products mentioned in this report, contact the nearest branch office (see attached list) or write to:

MONSANTO CHEMICAL COMPANY
Organic Chemicals Division
Plasticizers Department
800 North Lindbergh Boulevard
St. Louis 66, Missouri

MON-MT-008588

LEXOLDMON000624

MONSANTO CHEMICAL COMPANY
Organic Chemicals Division
District Sales Offices

ATLANTA: 1401 Peachtree St. N.E., Atlanta 5, Georgia

BOSTON: Everett Station, Boston 49, Massachusetts

CHICAGO: McGraw-Hill Building, 520 N. Michigan Ave., Chicago 11, Ill.

CINCINNATI: 2330 Victory Parkway, Cincinnati 6, Ohio

CLEVELAND: 427 Hanna Building, Cleveland 15, Ohio

DETROIT: 18230 Grand River Avenue, Detroit 23, Michigan

HOUSTON: 2472 Bolsover St., P. O. Box 6863, Houston, Texas

LOS ANGELES: 6670 E. Flotilla St., Los Angeles 22, California

MINNEAPOLIS: Foshay Tower, Room 515, Minneapolis 2, Minnesota

NEW YORK: 445 Park Avenue, New York 22, New York

PITTSBURGH: 20 Cedar Boulevard, Pittsburgh 28, Pennsylvania

SAN FRANCISCO: 111 Sutter Street, San Francisco 4, California

SEATTLE: 911 Western Avenue, Seattle 4, Washington

SYRACUSE: 731 James Street, Syracuse 3, New York

WILMINGTON: 2005 Concord Pike, Fairfax, Wilmington 3, Delaware

* * * * *

LONDON: Monsanto House, 10-18 Victoria St., London S.W. 1, England

MELBOURNE: 256 Flinders Street, Adelaide, Australia

MONTREAL: P. O. Box 900, Montreal 3, Canada

TORONTO 183 Front St. East, Toronto 2, Ont., Canada

VANCOUVER: 1550 Rand Avenue, Vancouver 14, B. C., Canada

LEXOLDMON000625

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
Pesticides Regulation Division
101 South Laboratory Building, A.R.C.
Beltsville, Maryland 20705

MAY 15 1968

May 10, 1968

R. Emmet Kelly, M. D.
Medical Director, Monsanto Co.
800 N. Lindbergh Boulevard
St. Louis, Missouri 63166

Dear Dr. Kelly:

Thank you for your letter of May 2, 1968 which contained a data sheet concerning the use of Monsanto Arochlor resins in pesticide formulations.

We did indeed receive samples of Arochlors 1254 and 1260 and wish to extend our thanks for these samples. In order for us to have as complete references for our analytical laboratory, would it be possible for us to get similar samples of the other 9 Monsanto Arochlors.

Again, if there is any charge for these samples, please forward the bill with the samples.

Sincerely yours,

W. N. Blickenstaff

W. N. Blickenstaff
Chemist in Charge

EXHIBIT
WBP M-24.8

MON-MT-008590

LEXOLDMON000626

St. Louis

May 16, 1968

File	✓	
Destroy		
CDB		
JTG		
WHH	✓	
MHJ	✓	
REK	✓	✓
RAM		
EPW	✓	

Mr. K. A. Wells

The attached letter is self-explanatory. Can you send 3 ounces of the other 9 Aroclors to Mr. Blickenstaff.

R. Emmet Kelly, M. D.

REK/ln
att.

EXHIBIT
WBP M-24.9

MON-MT-008591

LEXOLDMON000627

E. Kelly

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
Pesticides Regulation Division
101 South Laboratory Building, A.R.C.
Beltsville, Maryland 20705

June 3, 1968

Dr. William R. Richard, Manager
Research and Development
Organic Chemicals Division
Monsanto Company
800 N. Lindbergh Boulevard
St. Louis, Missouri 63166

Dear Dr. Richard:

On Friday, May 24, 1968, Mr. Ronald Thomas of our laboratory spoke with Dr. Early of your Washington office. At that time Dr. Early indicated that he had contacted you concerning a request from our laboratory for samples of the various arochlors.

We would be interested in receiving samples of all of the arochlors except 1254 and 1260. If there is a charge for these samples please enclose the bill with the samples and we will see that payment is made.

Thank you for your consideration in this matter.

Sincerely yours,

W. N. Blickenstaff

W. N. Blickenstaff
Chemist in charge

1221
1232
1242
1248
1254
1260

EXHIBIT
WBP M-24.10

MON-MT-008592

LEXOLDMON000628

June 18, 1968

Mr. W. N. Blickenstaff
Chemist in charge
U. S. Dept. of Agriculture
Pesticides Regulation Div.
101 South Lab. Bldg., A.R.C.
Beltsville, Md. 20705

Dear Mr. Blickenstaff:

We are enclosing, per your request, samples of the following Aroclors:

Aroclor 1221
" 1232
" 1242
" 1248
" 1262
" 4465
" 5442
" 5460

I hope they arrive in good condition.

Sincerely,

W. R. Richard
Manager R & D

WRR:mo

Encs.

EXHIBIT
WBP M-24.11

MON-MT-008593

LEXOLDMON000629

cc: W. K. Johnson
E. Kelly

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
FOOD AND DRUG ADMINISTRATION
WASHINGTON, D.C. 20204

June 7, 1968

JUN 20 1968

File	✓	
Destroy		
CDB		
JTG		
WHH	✓	✓
MHJ	✓	✓
RAK	✓	✓
RAM		
EPW	✓	✓

AIR MAIL

Dr. William R. Richard
Manager, Research and Development
Organic Chemicals Division
Monsanto Company
800 North Lindbergh Boulevard
St. Louis, Missouri 63166

Dear Dr. Richard:

This is a letter confirmation of our telephone conversation on June 3, 1968, concerning samples of and information on a representative series of Arochlors.

We are most appreciative that you will be able to send us 100-gram samples of the following Arochlors:

a. 1221, mixture of chlorinated biphenyls, 21% Cl.
b. 1232, mixture of chlorinated biphenyls, 32% Cl.
c. 1260, mixture of chlorinated biphenyls, 60% Cl.
d. 1262, mixture of chlorinated biphenyls, 62% Cl.
e. 4465, mixture of chlorinated biphenyls and terphenyls, 65% Cl.
f. 5442, mixture of chlorinated terphenyls, 42% Cl.
g. 5460, mixture of chlorinated terphenyls, 60% Cl.

The following information which we discussed will be very helpful: GLC data on one typical Arochlor; solubility in common organic solvents; technical bulletins on their uses and physical properties; and stability on storage.

It would also be quite useful if you could include any data you have on the elemental analysis, molecular weight range and the amount of unreacted biphenyl and terphenyl in these Arochlor mixtures. Does the chlorinated terphenyl mixtures include chlorinated m-terphenyl (1,3-diphenyl benzene) and o-terphenyl (1,2-diphenyl benzene) in addition to the p-terphenyl (1,4-diphenyl benzene)?

EXHIBIT
WBP M-77.3

EXHIBIT
WBP M-25

MON-MT-008594

LEXOLDMON000630

We thank you and Dr. Early for your cooperation in supplying these samples and information.

Sincerely yours,

A. R. Glasgow, Jr.

Dr. A. R. Glasgow, Jr., Chief
Pesticides Reference Standards
Section, Pesticides Branch
Division of Food Chemistry
and Technology

cc:
Dr. Jack D. Early
Technical Representative
Monsanto Chemical Company
1101 Seventeenth Street, N.W.
Washington, D. C. 20006

LEXOLDMON000631

June 18, 1968

Dr. A. R. Glasgow, Jr.
Dept. of Health, Education & Welfare
Food and Drug Administration
Washington, D. C. 20204

Dear Dr. Glasgow:

We are enclosing samples of the following Aroclors, as you requested:

Aroclor	1221
"	1232
"	1260
"	1262
"	4465
"	5442
"	5460

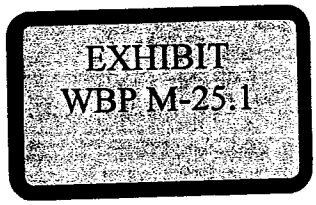
I hope they arrive in satisfactory condition.

Sincerely yours,

W. R. Richard
Manager, R & D

WRR:ms

Encs.



LEXOLDMON000632

7/15

bcc: Dr. J. Early - Wash. D.C
Dr. E. Kelly EKEL
Dr. W. K. Johnson WJOH
Dr. R. Keller JFQ
Mr. J. D. Sullivan JSUL
Dr. C. Anagnostopoulos CANA

July 15, 1968

Dr. A. R. Glasgow Jr.
Chief Perticides Reference Standards Section
Pesticides Branch Div. of Food Chemistry
and Technology
Dept. of Health, Education & Welfare
Food & Drug Administration
Washington, D. C. 20204

Dear Dr. Glasgow:

FF

I am sending Technical Bulletins "The Aroclor Polychlorinated Polyphenyls" and "Aroclor Plasticizers" under separate cover. These bulletins contain information on solubility in common solvents and physical properties. To preserve the highest quality as for dielectrical insulation use the Aroclors are best stored in opaque containers at normal storage conditions. In addition, I have included a paper on GLC analysis of Aroclors by Weingarten, Ross, Schlater and Wheeler.

The average chlorination value by weight is reflected by the last two numbers of the four digit number: i.e., Aroclor 1242 would have approximately 42% by weight of chlorine. The amount of unreacted biphenyl and terphenyl will vary inversely with the degree of chlorination. Aroclor 1221 may contain 15% biphenyl; Aroclor 1232 may contain 8% biphenyl and Aroclor 1260 will have <0.1%.

The chlorinated terphenyl products will contain a mixture of chlorinated o, m, and p terphenyl.

Sincerely yours,

W. R. Richard
Mgr., R & D

WRR:ms

MON-MT-008597

EXHIBIT
WBP M-25.2

LEXOLDMON000633

Polychlorinated biphenyls

10-9-68

Elmer Kuehn
Scott Tucker

9:30 Walter Dykstra - FWL 343-2616
Room 400 Wyatt Bldg. - 777 14th St. at Pa. Ave.

10:30 Dr. Donald Spencer - NACA - 296-1585
5th Floor Madison Office Bldg -
15th St. NACA Offices

2:30 Mr. William L. Reichel - chemist
Patuxent Wildlife Sta - 776-4760
X 46

EXHIBIT
WBP M-77.4

Dr. Lucille Stickel
Biologist

George E. Bagley
Patuxent Research Center
Laurel, Md. 20810

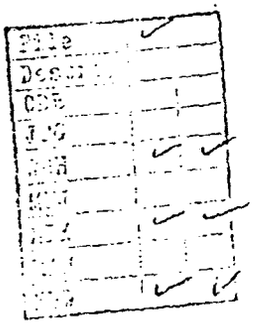
EXHIBIT
WBP M-28

MON-MT-008605

LEXOLDMON000634

bcc: C. E. Anagnostopoulos CANAG
E. Wilde EWILD
R. E. Kelly/W. Hunt RKELL

February 15, 1968



Dr. Richard A. Wilson, Sr.
U.S. Dept. of the Interior
Fish and Wildlife Service
Bldg. 16, Denver Federal Center
Denver, Colorado 80225

Dear Dr. Wilson:

About two weeks ago we sent you samples of Aroclor 1242, 1254, 1260, and 1268 for your research investigations. These are mixtures of chlorinated biphenyl isomers.

We hope these have helped in the identification of chlorinated biphenyl compounds.

Sincerely,

William R. Richard, Manager
Research & Development
Functional Fluids

WRR:ms

16

EXHIBIT
WBP M-77.5

EXHIBIT
WBP M-23.1

MON-MT-008576

cc: W. K. Johnson
E. Kelly

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
FOOD AND DRUG ADMINISTRATION
WASHINGTON, D.C. 20204

June 7, 1968

JUN 20 1968

File	✓	
Destroy		
CDB		
JTG		
WHH	✓	✓
MHJ	✓	✓
[illegible]	✓	✓
RAM		
EPW	✓	✓

AIR MAIL

Dr. William R. Richard
Manager, Research and Development
Organic Chemicals Division
Monsanto Company
800 North Lindbergh Boulevard
St. Louis, Missouri 63166

Dear Dr. Richard:

This is a letter confirmation of our telephone conversation on June 3, 1968, concerning samples of and information on a representative series of Arochlors.

We are most appreciative that you will be able to send us 100-gram samples of the following Arochlors:

a. 1221, mixture of chlorinated biphenyls, 21% Cl.
b. 1232, mixture of chlorinated biphenyls, 32% Cl.
c. 1260, mixture of chlorinated biphenyls, 60% Cl.
d. 1262, mixture of chlorinated biphenyls, 62% Cl.
e. 4465, mixture of chlorinated biphenyls and terphenyls, 65% Cl.
f. 5442, mixture of chlorinated terphenyls, 42% Cl.
g. 5460, mixture of chlorinated terphenyls, 60% Cl.

The following information which we discussed will be very helpful: GLC data on one typical Arochlor; solubility in common organic solvents; technical bulletins on their uses and physical properties; and stability on storage.

It would also be quite useful if you could include any data you have on the elemental analysis, molecular weight range and the amount of unreacted biphenyl and terphenyl in these Arochlor mixtures. Does the chlorinated terphenyl mixtures include chlorinated m-terphenyl (1,3-diphenyl benzene) and o-terphenyl (1,2-diphenyl benzene) in addition to the p-terphenyl (1,4-diphenyl benzene)?

EXHIBIT
WBP M-77.6

EXHIBIT
WBP M-25

MON-MT-008594

LEXOLDMON000636

We thank you and Dr. Early for your cooperation in supplying these samples and information.

Sincerely yours,

A. R. Glasgow, Jr.

Dr. A. R. Glasgow, Jr., Chief
Pesticides Reference Standards
Section, Pesticides Branch
Division of Food Chemistry
and Technology

cc:
Dr. Jack D. Early
Technical Representative
Monsanto Chemical Company
1101 Seventeenth Street, N.W.
Washington, D. C. 20006

LEXOLDMON000637

June 18, 1968

Mr. W. N. Blickenstaff
Chemist in charge
U. S. Dept. of Agriculture
Pesticides Regulation Div.
101 South Lab. Bldg., A.R.C.
Beltsville, Md. 20705

Dear Mr. Blickenstaff:

We are enclosing, per your request, samples of the following Aroclors:

Aroclor 1221
" 1232
" 1242
" 1248
" 1262
" 4465
" 5442
" 5460

I hope they arrive in good condition.

Sincerely,

W. R. Richard
Manager R & D

WRR:ms

Encs.

EXHIBIT
WBP M-77.7

EXHIBIT
WBP M-24.11

MON-MT-008593

LEXOLDMON000638