bcc: R. E. Keller - Res. 1
W. Farrar - Res. 1
R. Richard - GO
E. P. Wheeler - GO
W. B. Papageorge - Anniston

Monsanto

ORGANIC CHEMICALS DIVISION

Monsanto Company
1700 South Second Street
St. Louis, Missouri 63177
Phone: (314) 621-4000

FF

January 28, 1970

Mr. Donald Swanson
Aerometry Division
National Air Pollution Control
Administration
1055 Laidlaw Avenue
Cincinnati, Ohio 45237

Dear Mr. Swanson:

As per Elmer Wheeler's 1-14-70 letter, I am sending a copy of a method we have employed for the analysis of water and sediment for polychlorinated biphenyls (PCB).

From time to time, we have done some air sampling which I assume is more pertinent to your needs. We usually draw 200-250 liters of air through sec-butanol in a trap of some sort. The alcohol is then diluted with a large excess of water and extracted with hexane (a more suitable solvent for electron capture gas chromatography). The hexane is then washed several times with water to remove any residual alcohol and the hexane extracts analyzed for PCBs as outlined in the enclosed method. It occurs to me that an alternate solvent to sec-butanol, which might be even better to work with is dimethyl formamide. It is less soluble in hexane and it has the necessary characteristics for air sampling. We have not tried this but it appears to be worth looking at.

If I can be of any further assistance, please don't hesitate to call me collect at - Area Code 314, 621-4000, Extension 3480.

Sincerely,

E. Scott Tucker
Senior Research Chemist
Applied Sciences Section

db
Enclosure

EXHIBIT
WBP M-79

MONS 089201

LEXOLDMON000645
WATER_PCB-00036112

Monsanto

ORGANIC CHEMICALS DIVISION

Monsanto Company
1700 South Second Street
St. Louis, Missouri 63177
Phone: (314) 621-4000

February 12, 1970

Dr. L. H. Keith
S. E. Water Laboratory
F.W.P.C.A.
College Station Road
Athens, Georgia 30601

Dear Dr. Keith:

As I indicated to you during our phone conversation, I am having sent to you, under separate cover, one (1) pint each of Aroclors 1221, 1242, 1248, 1254, 1260 and 1268.

Please notify me upon receipt of these samples. My phone number is: Area Code 314, 621-4000, Extension 3480.

Sincerely,

E. Scott Tucker
Senior Research Chemist
Applied Sciences Section

db

cc: M. W. Farrar
R. E. Keller
W. B. Papageorge
W. R. Richard
E. P. Wheeler

EXHIBIT
WBP M-79.1

LEXOLDMON000646
WATER_PCB-00036113

Monsanto

FROM (NAME & LOCATION): R. E. Keller - R&D Laboratories - S. Second Street - St. Louis

DATE: March 18, 1970

SUBJECT: PCB's

REFERENCE: RAL 3/9/70 Memo to REK

TO : R. A. Lidgett
Ruabon

cc R. A. Baxter - Ruabon
H. S. Bergen - GO
M. W. Farrar - S. Second
J. T. Garrett - GO
J. Mason - GO
W. B. Papageorge - GO
T. M. Patrick - S. Second
W. R. Richard - GO
J. E. Springgate - GO
E. S. Tucker - S. Second
H. A. Vodden - Ruabon
E. P. Wheeler - GO

We will be happy to discuss our analytical work on PCB's with G. Telling of Unilever Research Colworth when he visits the USA in June. I suggest that we offer to accommodate him for one day if he wishes to arrange his schedule accordingly. Please advise as to the action needed on our part.

Bill Papageorge, Jack Garrett and I attended a meeting on PCB's called by the Pollution Control Administration in the USA (Duluth, Minnesota) this week. This was originally set up as an office type meeting. It quickly got out-of-hand on the number of attendees. Fifty representatives of government and university laboratories in the USA and Canada attended to hear Monsanto's position on PCB's in the environment and especially in water. These representatives have shifted their emphasis to PCB's from pesticides. They have developed enough experimental evidence on their own to convince themselves that the PCB contamination is real.

In short, a massive nationwide PCB program is unfolding in public agencies in the USA. One possible future result of this effort will be the setting of limits for PCB's in the environment. We provided methodology packages representing the state-of-the-art in our laboratories at this meeting.

We will keep you posted on further developments.

Bob K.

R. E. Keller

db

EXHIBIT
WBP M-79.2

MONS 098460

IM 10 REV 11 65

LEXOLDMON000647
WATER_PCB-00036114

Montana State University
Bozeman, Montana 59715 Tel. 406-587-3121

Department of Chemistry
College of Letters and Science

27 March 1970

Monsanto Chemical Company
Research and Engineering Division
Dayton, Ohio

Dear Sir:

I plan to begin electron capture gas chromatographic studies on polychlorinated biphenyls and would appreciate it if you could provide me with samples of Aroclor 1254 and 1262. Part of the work will consist of attempting to synthesize biphenyls with various degrees of chlorination. It would limit the amount of synthetic work if you could include samples of chlorobiphenyls such as the mono and dichlorobiphenyls which Harold Weingarten mentioned in his article in Analytica Chimica Acta 26: 391-94 (1962).

Thank you very much.

Yours very truly,

Frederick A. Beland

Frederick A. Beland

FAB/ssb

MON-MT-008711

EXHIBIT
WBP M-79.3

bcc: W. B. Papageorge
E. P. Wheeler
E. S. Tucker

ATTENTION SCOTT TUCKER - Please handle the forwarding of Arocler samples covered by this letter. RKK

April 27, 1970

Professor Frederick A. Beland
Montana State University
Department of Chemistry
Bozeman, Montana 59715

Dear Professor Beland:

Your March 27 letter requesting samples of Arocler 1254 and 1262 has been forwarded to my attention. We are sending samples of Arocler 1254, 1260 and 1262 representative of our current production material, under separate cover to your attention. Also being sent under separate cover are 20 milligram amounts of the 4-, 2,2'-, 2,3'-, 2,4'-, 2,5', 3,5', 4,4' isomers. We are unable to provide absolute purity data for these materials. Unfortunately, we have no additional isomers for your studies.

We are also enclosing a packet of methods representing our current state-of-the-art for PCB's.

Sincerely,

Robert K. Keller
Manager
Applied Sciences Section

db
Enclosure

2,3', 3,5', 35

MON-MT-008712

EXHIBIT
WBP M-79.3.1

LEXOLDMON000649
WATER_PCB-00036116

bcc: W B. Papageorge
E. P. Wheeler
J. T. Garrett

April 27, 1970

Mr. A. F. Tabri
Field Investigations
FWPCA - Department of the Interior
5555 Ridge Avenue
Cincinnati, Ohio 45213

Dear Mr. Tabri:

Your recent inquiry of Dr. E. Emery of our department for PCB information has been brought to my attention. We are enclosing a packet of methods for PCB's which you might find useful.

Please let us know if we can be of further assistance.

Sincerely,

Robert E. Keller
Manager
Applied Sciences Section

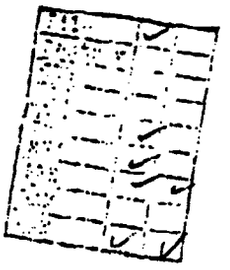
db
Enclosure

EXHIBIT
WBP M-79.4

MON-MT-008713

LEXOLDMON000650
WATER_PCB-00036117

MAY 18 1970



May 13, 1970

Dr. Edward J. Burger, Jr.
Office of Science & Technology
Executive Office Building
Washington, D.C. 20506

Dear Dr. Burger:

During our recent meeting in your office, you requested information on the physical properties of the chlorinated biphenyls which are produced by Monsanto. Enclosed herewith you will find the necessary information and, in addition, I give below water solubilities of Aroclors 1242, 1248 and 1254.

Aroclor 1242	-	200 parts per billion
Aroclor 1248	-	100 " " "
Aroclor 1254	-	50 " " "

I apologize for the delay in supplying this information but I have been waiting for the latest water solubility figures from our research facilities.

Sincerely,

John Mason
Assistant General Manager

JM/gl

Encs.

cc: Dr. R. E. Kelly

EXHIBIT
WBP M-79.5

MON-MT-008714

LEXOLDMON000651
WATER_PCB-00036118

Monsanto
COMPANY

ORGANIC CHEMICALS DIVISION

1700 South Second Street
St. Louis, Missouri 63177
(314) MAin 1-4000

June 1, 1970

Miss Ella Mae Smith, Chemist
State Chemical Laboratories
Pesticide Division
7th and Court
Des Moines, Iowa 50316

Dear Miss Smith:

I am sending you, under separate cover, analytical samples of Aroclor 1254 and 1260. I have enclosed a copy of our "Monsanto Methodology for Aroclor" which I hope will be useful to you.

If I can provide you with any further information, or if you have any questions, please let me know. My phone number is (314) 621-4000, Station 3480.

Very truly yours,

E. S. Tucker
db

E. S. Tucker
Senior Research Chemist

db
Enclosure
cc: R. E. Keller
W. S. Clark
W. B. Papageorge

EXHIBIT
WBP M-79.6

MON-MT-008715

LEXOLDMON000652
WATER_PCB-00036119

bcc: V. B. Papageorge
E. P. Wheeler
W. R. Richard
J. T. Garrett
M. W. Farrar
E. S. Tucker

Monsanto COMPANY

ORGANIC CHEMICALS DIVISION

1700 South Second Street
St. Louis, Missouri 63177
(314) MAin 1-4000

June 5, 1970

Dr. E. H. Dustman, Director
Department of the Interior
Fish and Wildlife Service
Patuxent Wildlife Research Center
Laurel, Maryland 20810

Dear Dr. Dustman:

My apologies for not answering your letter of May 7 sooner. I have just returned from a three week business trip in Europe and I'm finally starting to catch up with my correspondence.

We are sending 20 milligram amounts of the following isomers to the attention of Mr. William L. Reichel, Chief Chemist, Patuxent Wildlife Research Center, Laurel, Maryland 20810. We regret that we do not have larger quantities of these isomers for your use. We can make no comment about purity of these materials and suggest that they should be checked in your laboratories.

2,5,2'
3,4,2'
2,3,2'
2,5,4'
3,5,4'
2,3,4'

We hope that these isomers will prove useful in the analytical aspects of your work. If other isomers in the higher chlorine numbers become available in the future, we will alert you of this availability.

Please let us know if we can be of further assistance.

Sincerely,

Robert E. Keller
Manager
Applied Sciences Section

EXHIBIT
WBP M-79.7

db

NOTE TO E. S. TUCKER - Please forward the samples covered by this letter as indicated. REK

LEXOLDMON000653
WATER_PCB-00036120

September 17, 1970

Dr. E. H. Dustman, Director
Department of the Interior
Fish and Wildlife Service
Patuxent Wildlife Research Center
Laurel, Maryland 20810

Dear Dr. Dustman:

Confirming our earlier telephone conversation, Mr. William B. Papageorge and I will appreciate it if we can meet with you and your associates at 9:00 a.m. on Thursday, September 24 at Patuxent.

The objective of our meeting is to leave with you and discuss the current status reports of our chronic toxicity and reproductive studies with the polychlorinated biphenyls.

We look forward to seeing you.

Sincerely,

Elmer P. Wheeler
Manager, Environmental Health

EPW:ju

c.c. Dr. Lucille Stickel
Mr. W. B. Papageorge

EXHIBIT
WBP M-79.8

MON-MT-008717

LEXOLDMON000654
WATER_PCB-00036121

CCB - US FDA

OCT 1 1970

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
CONSUMER PROTECTION AND ENVIRONMENTAL HEALTH SERVICE
WASHINGTON, D.C. 20204

FOOD AND DRUG ADMINISTRATION

September 22, 1970

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 follow-up of our telephone conversation on September 21, 1970, concerning shipment of ten-pound amounts of Aroclors 1242, 1248, 1254 and 1260 to:

Dr. Theodore M. Farber
Chief Biodynamics Section
Special Pharmacological Animal Laboratories
SPAL (BF-149)
Food and Drug Administration
200 C St. S.W.
Washington, D.C. 20204

Dr. Farber primarily intends to study the effects of these chemicals on microsomal drug metabolism in the rat, dog and pig and to search for possible in vivo interactions with drugs, food additives, pesticides and other chemicals. For any additional questions, Dr. Farber can be contacted on area code 301-776-6311.

We thank Monsanto for their cooperation in supplying these chemicals for these special studies.

Sincerely yours,

A.R. Glasgow, Jr.

A.R. Glasgow, Jr., Ph.D.
Chief, Reference Standards Section
Residue Chemistry Branch
Division of Pesticide Chemistry and Toxicology

EXHIBIT
WBP M-79.9

MONS 090705

LEXOLDMON000655
WATER_PCB-00036122

PCB

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
PATUXENT WILDLIFE RESEARCH CENTER
LAUREL, MARYLAND 20810

TELEPHONE - Area Code 301
776-6760 (Maryland Exchange)

TELEGRAMS
Bureau of Sport Fisheries and Wildlife
Washington, D. C. 20240

OCT 5 1970
WRes
Patuxent

September 30, 1970

Dr. E. P. Wheeler
Monsanto Company
1700 South Second Street
St. Louis, Missouri 63177

Dear Dr. Wheeler:

I am sorry that I was not present when you visited our laboratory on September 24, 1970. I have been informed that you inquired if we had tested the pure isomers of PCB that were mentioned in Mr. Robert Keller's letter of June 5 to Dr. Dustman. I regret to inform you that I never received the supply of isomers. Perhaps they were lost in the mail. I would appreciate receiving the isomers if they are still available.

Thank you for the copy of your analytical methodology for analyzing and identifying polychlorinated biphenyls.

Sincerely yours,

William L. Reichel
Chief, Section of Chemistry

EXHIBIT
WBP M-79.10

MON-MT-008718

LEXOLDMON000656
WATER_PCB-00036123

Monsanto

ORGANIC CHEMICALS DIVISION

Monsanto Company
1700 South Second Street
St. Louis, Missouri 63177
Phone: (314) 621-4000

October 26, 1970

Dr. E. H. Dustman, Director
Department of the Interior
Fish and Wildlife Service
Patuxent Wildlife Research Center
Laurel, Maryland 20810

Dear Dr. Dustman:

The following isomers are being sent for your use, as requested by Dr. R. E. Keller.

PCB Isomer Samples: 2; 4; 2,3+3,4; 2,3; 2,4; 2,4';
2,2'; 2,5; 3,5; 4,4'; 3,4,2';
2,5,4'; 2,5,2'; 2,3,2'; 2,3,4'.

Please let us know if we can be of further assistance.

Very truly yours,

EST

E. S. Tucker
Senior Research Chemist

db
Encl.

bcc: R. E. Keller
W. B. Papageorge
E. P. Wheeler

EXHIBIT
WBP M-79.11

LEXOLDMON000657
WATER_PCB-00036124

TELEPHONE - Area Code 301
776-8760 (Maryland Exchange)

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
PATUXENT WILDLIFE RESEARCH CENTER
LAUREL, MARYLAND 20810

TELEGRAMS
Bureau of Sport Fisheries and Wildlife
Washington, D. C. 20240

WRes

November 10, 1970

Dr. E. S. Tucker
Senior Research Chemist
Monsanto Company
1700 South Second Street
St. Louis, Missouri 63177

Dear Dr. Tucker:

Thank you for supplying the PCB isomer standards on October 26, 1970. Making these materials available is a great service and a real contribution in the field of residue analysis. We will compare these PCB isomers with compounds found in wildlife tissues using a combined gas chromatograph-mass spectrometer.

Sincerely yours,

E. H. Dustman

E. H. Dustman
Director

laboratories research efforts

Thank you, we had hoped these samples would be ~~do really~~ of help to your ~~research efforts~~. The contribution was Monsanto's!

Sincerely, EST

cc: WBP
REK
EPW

MON-MT-008720

EXHIBIT
WBP M-79.12